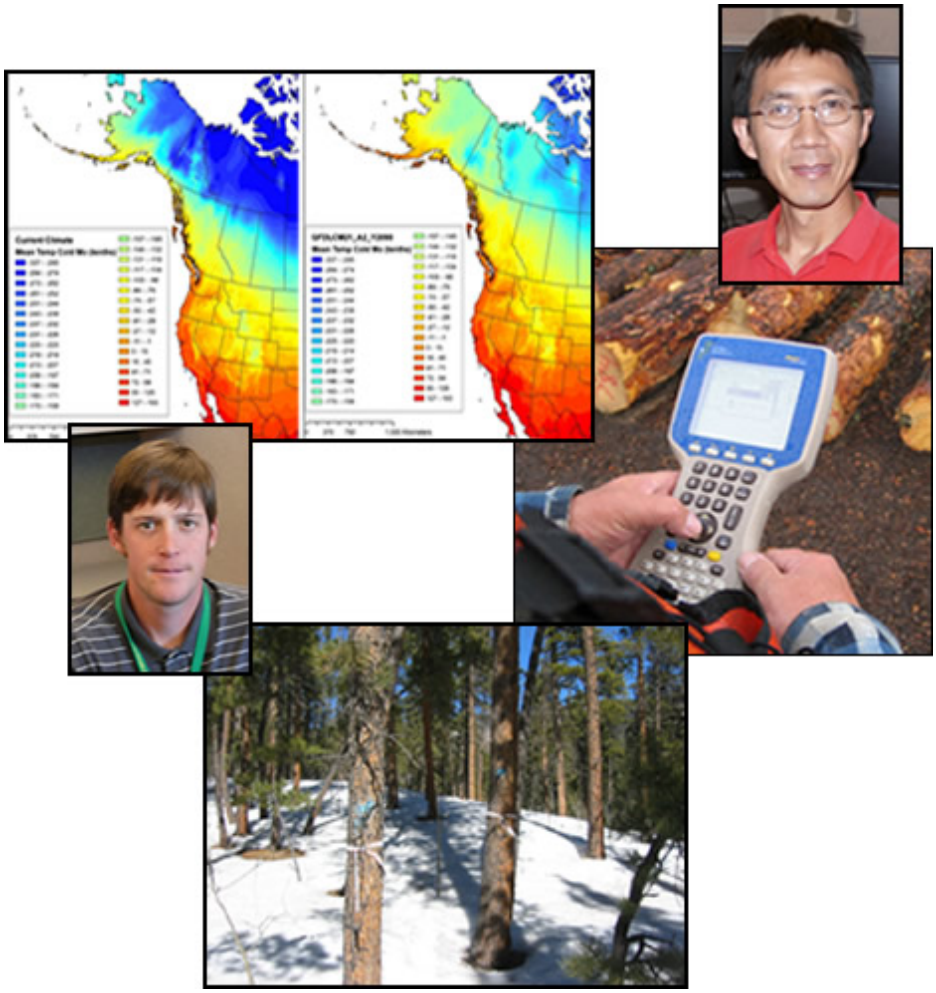
United States
Department of
Agriculture

Forest Service

Forest
Management
Service
Center

Forest Management Service Center

Annual Staff Report
Fiscal Year 2011

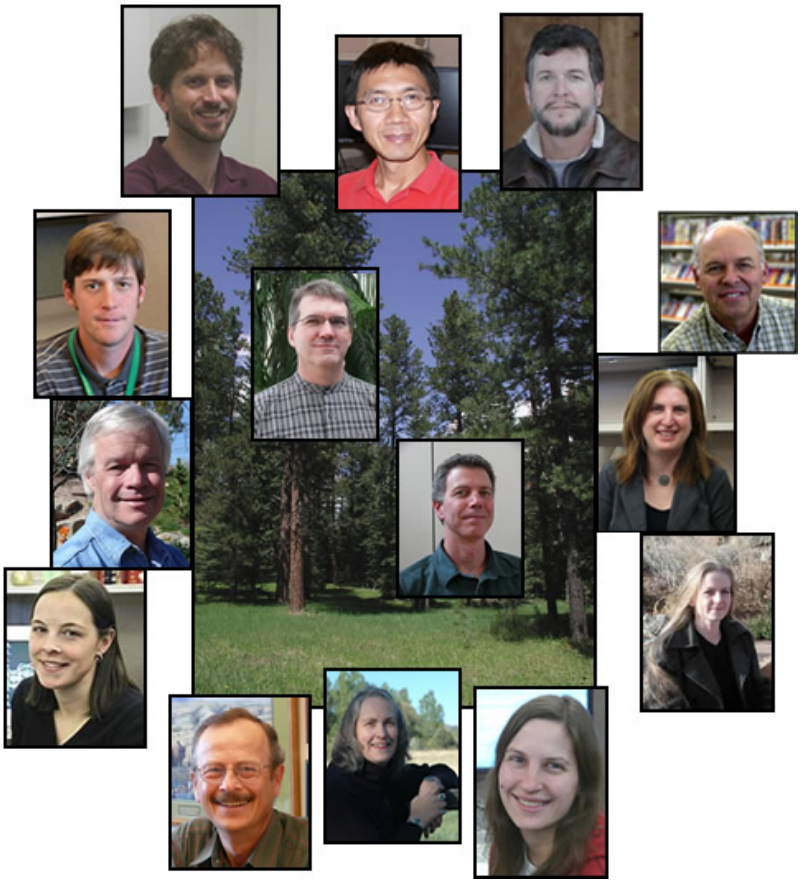


About Us

The Forest Management Service Center (FMSC), located in Fort Collins, Colorado, is a detached unit of the USDA Forest Service National Forest System Forest Management Staff, Washington Office. The Service Center provides mensuration, statistical, modeling, biometric, sampling, and analysis skills to the Forest Service and also cooperates and works in partnership with other government agencies (federal, tribal and state), research, colleges and universities, forest industry, consultants, and individuals in the United States and other countries. The FMSC is staffed with biometric and mensuration specialists possessing skills not available at most regional and forest level offices and is considered an extension of each region's technical staff.

Our Program Emphasis

We provide products and technical support for forest vegetation modeling and forest products measurement to the National Forests and our partners.



Message from the FMSC Center Manager

This past year was a challenging year in the delivery of biometric services to the field in the areas of Forest Vegetation Simulation (FVS) and Forest Products Measurements as we had several staffing changes during a declining budget.

In the FVS area, new activities focused on climate change and how it may affect vegetation. The Climate-FVS model was released for the western United States, and an introductory webinar was provided. Development has begun on an eastern version of Climate-FVS. Dr. Phil Radtke from Virginia Tech is the principal investigator for this effort. It should be completed during the next year.

Last year the FVS group received funding from the Joint Fire Science Program to improve the performance and interoperability of FVS so it will run more efficiently and operate better within large software frameworks. This effort is now underway. It involves changing the software architecture of FVS, and will result in better linkages for use in other models. Several partners have joined in the effort, including BLM, BIA, British Columbia Ministry of Forests, and ESSA Technologies.

A cost share agreement with Michigan Tech University for validation work on the Lakes State and Central States variants is ongoing. We also initiated a contract to incorporate the ORGANON growth and yield model as a variant in FVS. This provides additional modeling options for Douglas-fir and associated species in Oregon and Washington.

We began a cooperative program with the Farm Services Agency and several eastern states to provide simulated prescriptions for the conversion of farmland to forest and calculate how much carbon is stored over time.

This past year we conducted eight week-long, formal FVS classes. We provided FVS support in the form of phone calls, emails, instant messages, and personal visits. We answered more than 1200 support requests, requiring over 600 hours of staff time. We assisted nearly every National Forest, and made numerous site visits. Approximately 45% of the requests came from outside of the Forest Service.

On the Forest Products Measurements side, we maintain a suite of programs related to cruising, scaling, volume estimation, and area determination.

In FY11, we began an important re-engineering effort for the timber cruising software. This effort will result in more stable software better able to adapt to changing operating systems.

The National Check Cruise program (NCC) was released as a production version this fiscal year. The Average Piece Size Simulator (APSS) for estimating average log lengths removed from a timber sale for use in timber sale appraisals was released as a beta version.

The Volume Library provides consistent volume estimation from tree measurements and is used in nearly all of our software applications and also used by our partners. The development of a new Biomass Estimator Library has been completed and incorporated into FMSC software. This provides estimates of biomass for the bole, branches, crown, stump, and bark in both dry and green tons.

The TwoTrails program is becoming a tool used by many timber cruisers for area determination, navigation, group selections, and similar cruising survey needs. Handbook FSH2409.12 chapter 50, Area Determination, has been undergoing intensive review to meet the demands of dynamic technical changes.

We had several staffing changes. Leah Rathbun, who was hired at the on-the-spot hiring effort at the 2009 Society of American Foresters' Convention, was converted to a permanent position on our staff. Leah works both in growth and yield and measurements. Two key persons on our staff left for promotions: Don Vandendriesche to Region 3, and Troy Heithecker to FIA in Ogden, Utah. Don is replaced by Chris Dahl, who received his BS and MS in forestry at Penn State. Troy is being replaced by Yingfang Wang, who received his PhD at University of Alberta and his undergraduate degree at Beijing Forestry University.

We anticipate our budget to be about $1.5 million, down about 2% from last year.

Dave Cawrse
Director, FMSC

Forest Products Measurements Staff Report

We maintain a suite of programs related to cruising, scaling, volume estimation, and area determination and provide hotline support and training.

Cruising

Timber cruising is the process of measuring forest stands to determine stand characteristics, such as average tree sizes, volume, and quality. The primary purpose of cruising is to obtain a volume estimate to appraise and prepare timber sales.

In FY11, we began the process to move all of the cruising software to a robust database system for data collection and processing, moving away from a binary flat file. This effort involves re-engineering the cruising software and will result in more stable software able to adapt to changing operating systems. This effort will continue into FY12.

FScruiser was maintained throughout 2011 and continues to run on many field data recorders and personal digital assistants (PDAs).

General maintenance on the CruiseProcessing program continued throughout 2011 with new releases made available as needed.

The National Check Cruise program (NCC) was released as a production version this fiscal year. Many check cruisers are utilizing the program and have offered refinement suggestions to improve the program overall.

The Cruise Object Editor program was released in FY11 as beta. The program allows merging of units from different, unsold sales into a new sale. The program also has limited functionality to repair corrupted cruise files and edit cruise data to repair common mistakes.

We are working with the BLM to develop a new three stage sampling method combining 3P sampling with the Point Count Measure sampling method. Development and testing will continue through FY12.

The Average Piece Size Simulator (APSS) for estimating average log lengths removed from a timber sale for use in timber sale appraisals was released as a beta version and continues to be developed, adding additional logging methods as needed.

A new program, RandomSetsCreator, was developed and released in FY11. This program creates lists of random, systematic, or randomized block numbers for use in the field.

Volume Estimation

The Volume Library provides consistent volume estimation from tree measurements using state-of-the-art volume models and is used in nearly all of our software applications and also used by our partners. This year, the library had several updates including the ability to modify merchandizing rules.

We provided technical assistance on a volume validation study in Region 3 and will continue to support the effort in FY12. We are working with Region 8 and 9 on potential volume issues in Arkansas.

The development of a new Biomass Estimator Library has been completed and incorporated into FMSC software. The Biomass Estimator Library provides componentized estimates of biomass material for the bole, branches, crown, stump, and bark in both dry and green tons. The FMSC is working with the Regions, other agencies, and outside cooperatives to continue development and validation of biomass equations. The randomized branch sampling method for estimating crown biomass is currently being used in the field.

Scaling

Scaling is the determination of the gross and net volume of logs. The primary purpose of scaling is to determine the volume by product or species to be charged at a predetermined rate. The measurements group maintains the FSscaler field data collection software and the Scale Expansion Program which transmits data to the Timber Information Management system (TIM).

The Scale Expansion Program is being re-engineered, moving to a more robust database structure. The re-engineering will be completed in FY12.

We are continuing to work with the San Dimas Technology & Development Center (SDTDC) to incorporate voice activated data entry to the FSscaler program to explore hands free data entry.

Area Determination

The measurements group is also working on efficient ways to quickly and quantitatively measure land area and assist with navigation using GPS and traditional traverse methods. We continue to work with the Missoula Technology and Development Center (MTDC) supporting procedures using GPS and other surveying techniques in Forest Service operations including expanding the Accuracy Matrix for the various GPS units.

The TwoTrails program is becoming a tool used by many timber cruisers for area determination, navigation, group selections, and similar cruising survey needs.

Handbook FSH2409.12 chapter 50, Area Determination, has been undergoing intensive review to meet the demands of dynamic technical changes. A draft suitable for training has been created and shared with the goal of formalizing the changes in FY2011. Several Regions have already implemented the new direction as Regional Supplements to Handbook FSH2409.12.

Several training sessions on the new changes to Chapter 50 have been completed successfully using Video Teleconferencing technology. The Service Center will continue to expand the use of VTC technology in training throughout FY12.

One of our team members, Gary Boyack, serves on the national Mobile GPS Technology Advisory Group (MGTAG), which looks at developing a consistent policy to manage GPS as a national asset.

General

We coordinate the National Measurements Steering Committee which meets annually and provides direction for the measurements group.

The Service Center has been working with the Regions to update the Timber Cruising Handbook to accommodate an increased emphasis on biomass products for potential inclusion in timber sales. Adraft version of FSH2409.12 chapter 30, Cruising Systems, was released for review by the measurements specialists.

Important Partnerships

We are gaining more partners in the measurements area. Besides the National Forests, users of our measurements software include state, tribal, and other federal agencies, educational institutions, Forest Service Research Stations, private individuals and companies. Nearly all land management agencies involved with area and timber measurement currently use our software (BLM, BIA, National Park Service, Agriculture Research Service, Fish and Wildlife Service, Natural Resource Conservation Service, Army Corps of Engineers and the Department of Defense), as well as five state forestry agencies. Ken Cormier was also invited to join the Scaling Primary Forest Products committee of the Canadian Standards Association and will serve as the USDA Forest Service Representative.

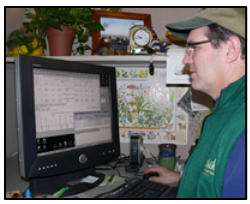
Customer Support

In FY11, the measurements staff participated or assisted in cruiser training workshops for Regions 1, 2, 3, 4, 6, 8, 9, and 10. Additional training on TwoTrails and new area determination procedures were provided to Regions 2, 6, and 8.

The measurements staff averages about 30 hotline contacts, emails and phone calls per week relating to volume, cruising, scaling, and area determination questions from all regions of the Forest Service and other government agencies, as well as state agencies, universities, and private consultants.

Contact	% of contacts
Forest Service	75
Other Gov. Agencies	10
State/University	10
Private	5

Future Initiatives and Projects

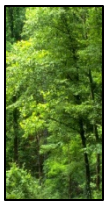


Future projects include continuing to expand the biomass estimator library and explore cost effective methods for cruising biomass material. We will continue to support all software components within the National Cruise System. Software enhancements will include moving to a robust database system for data collection and processing, moving away from a binary flat file. FScruiser enhancements include a redesign of the program to provide a more stable data collection platform. Computer-based tutorials will continue to be developed to assist in cost effective training. A monthly webinar series is being developed to provide additonal training on measurement issues and FMSC software. FSscaler software will be updated to allow for Scribner and long log data entry and processing as required legislatively in Region 10. Also in the scaling area, the National Scale Expansion program will be converted to a database system compatible with current Forest Service architecture. Finally, updated handbook direction for FSH2409.12 chapters 30 and 50 will be reviewed and finalized.

Forest Vegetation Simulation (FVS) Staff Report

The Forest Vegetation Simulator (FVS) is a forest dynamics model simulating growth and mortality for most tree species, forest types, and stand conditions. FVS can simulate a wide range of silvicultural treatments, fire, insects, diseases, and other disturbances. It can calculate stocking levels, harvest yields, biomass amounts, carbon allocations, fuel loads, fire effects, and many other metrics.

National



At the national level, one of our most important jobs is to maintain, enhance, and support the FVS code. This includes the base model as well as the Fire and Fuels Extension (FFE) and other extensions. Here are just a few highlights of our national efforts:

- Release of the FIA2FVS data translation program;
- Created new down wood volume and cover reports;
- Additional warning messages and enhanced error code summarization;
- New default variant map and default location code map;
- Improved down wood initialization and modeling;
- Validation of UT and WS variants;
- New dwarf mistletoe height growth impact option.

Additionally, we maintained, supported and upgraded the Suppose interface, as well as the FVS pre- and post-processing programs. All FVS documentation was kept up-to-date, with significant updates to several documents.

The FVS Steering Team continued to provide strategic guidance in the development and enhancement of FVS using best available science. The fourth annual meeting was held in April. The proposed program of work was discussed. Guidance was given on needs for base model and extension enhancements, validation, training, and project work. In addition, the Steering Team acts as a valuable networking group and a means to ensure incorporation of the best available science into FVS. Nearly a third of a million dollars has been generated in partnerships aimed at improving and validating FVS, and developing a climate sensitive version of FVS.

The FVS carbon reports continue to be used not only by the Forest Service but also by many consultants and other users outside the Forest Service.

The Climate-FVS model was released for the western United States, and an introductory webinar was provided. Development has begun on an eastern version of Climate-FVS. Dr. Phil Radtke from Virginia Tech is the principal investigator for this effort. It should be completed during the next year.

Last year the FVS group received funding from the Joint Fire Science Program to improve the performance and interoperability of FVS so it will run more efficiently and operate better within large software frameworks. This effort is now underway. It involves changing the software architecture of FVS, and will result in better linkages for use in other models. Several partners have joined in the effort, including BLM, BIA, British Columbia Ministry of Forests, and ESSA Technologies.

A cost share agreement with Michigan Tech University for validation work on the Lakes State and Central States variants is ongoing. We also initiated a contract to incorporate the ORGANON growth and yield model as a variant in FVS.

We began a cooperative program with the Farm Services Agency and several eastern states to provide simulated prescriptions for the conversion of farmland to forest.

Regional and Forest Support

We provided national FVS support to Regions and National Forests for various projects. Much of this support included site visits. Here are just a few highlights of our regional support efforts:

- Assisted Region 2 with Forest Plan Revision efforts;
- Continued collaboration with the Pacific Northwest Research Station on integration of FVS with the Fuel Characteristics Classification System (FCCS);
- Expanded the Western Sierra Nevada (WS) variant from 11 to 43 species;
- Updated volume equations in the Eastern region;
- Added crown width equations to Inland California Southern Cascades (CA) variant;
- Improved estimates of ponderosa pine canopy fuels for Region 1;
- Continued development of the northern boreal variant for interior Alaska;
- Updated plant association list for Region 6;
- Officially replaced the Region 9 TWIGS variants with the newer variants.

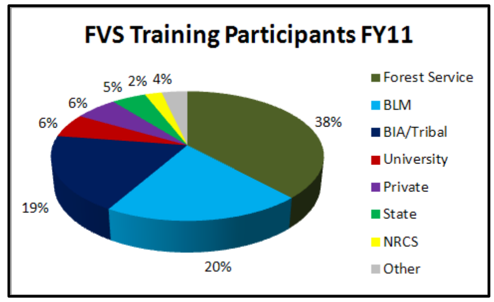
Important Partnerships

Our partners include Forest Service Research Stations as well as universities and other land management agencies, including the BLM and BIA. Some of our important partners and projects this year included:

- Rocky Mountain Research Station on FVS, FFE, and Climate Change development;
- Northern Research Station on FFE carbon reporting;
- Southern Research Station on integration of REGEN into FVS;
- NRIS-FSVEG staff on maintaining FVS data link with FSVEG;
- Forest Health Technology Enterprise Team (FHTET) on maintaining and enhancing FVS insect and disease extensions;
- Virginia Tech University and Southern Research Station on the expansion of Climate-FVS to the east;
- University of Maine on development of the Acadian variant;
- Bureau of Indian Affairs (BIA) on coordination efforts for FVS modeling;
- BLM, Department of Defense, State and Private Forestry, and University of Alaska on the development of the Alaska boreal forest (interior) FVS variant;
- Utah State University on validation work for the Western Sierra Nevada and Utah variants.
- Michigan Tech University on validation studies using the FVS Lake States variant.

Customers

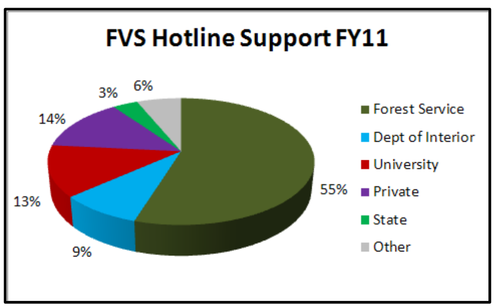
Besides the National Forests, other users of FVS software include Bureau of Land Management, Bureau of Indian Affairs, National Park Service, Department of Defense, and other federal agencies, as well as state and tribal agencies, educational institutions, private companies, and individuals. FVS software has been increasingly used internationally to model growth and yield. We have an ongoing partnership with Beijing Forestry University.



Customer Support

This past year we conducted eight week-long, formal FVS classes. We trained approximately 170 users, with approximately 2/3 of the students being non-Forest Service employees. In addition, several shorter training sessions were conducted.

Training documentation was updated to reflect changes in software and methodologies. Bulletins were sent out announcing each software release. The FMSC web site was kept current with software and documentation updates, and was recently completely restructured.



We provided FVS hotline support during normal working hours on every federal workday of the year. Requests came in the form of phone calls, emails, instant messages, and personal visits. We answered more than 1200 support requests, requiring over 600 hours of staff time. We assisted nearly every National Forest, and made numerous site visits. Approximately 45% of the requests came from outside of the Forest Service.

Future Initiatives and Projects

For FY12, in addition to the on-going activities of model maintenance, enhancements, and training, our future initiatives and projects include: continued expansion of variant species lists; additional validation work; continued development of Climate-FVS modeling capabilities in the eastern US; incorporation of the national Biomass Estimator Library algorithms; completion of a water yield model; incorporation of weather data into the general defoliator (budworm) model; and many more projects.

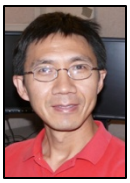
Forest Management Service Center Staff

Front L to R: Lance David, Stephanie Rebain, Erin Smith-Mateja, Josie Wedlock, Don Vandendriesche
Back L to R: Chad Keyser, Leah Rathbun, Andrew Sánchez Meador, Matt Oberle, Troy Heithecker, Dave Cawrse, Ken Cormier, Andrea Steiner, Mike Van Dyck, Bob Havis, Gary Boyack
New staff members (below): Yingfang Wang, Chris Dahl
Behind the camera: Barbara Menzel

Dave Cawrse, Center Manager
Josie Wedlock, Administrative Support

Mike Van Dyck, FVS Group Leader
Chris Dahl, FVS Model Support, Training
Lance David, Insect and Disease Model Development, Training Coordinator
Bob Havis, FVS Programming
Chad Keyser, FVS Model Support, Training
Leah Rathbun, FVS Model Development, Training
Stephanie Rebain, Fire and Fuels Model Development
Erin Smith-Mateja, FVS Model Development

Ken Cormier, Measurements Group Leader
Gary Boyack, Forest Product Measurement Support
Barbara Menzel, Cruise Processing Programming Support, Training Support
Matt Oberle, Field Data Collection Programming Support
Andrea Steiner, Computer Programming Assistant
Yingfang Wang, Volume and Biomass Estimation Support



Our website can be reached through the following link:
http://www.fs.fed.us/forestmanagement/