

Fire

Sharing Knowledge Through Wildland Firefighter Health and Safety Reports

Since 1962, the Missoula Technology and Development Center (MTDC) has conducted laboratory and field studies that relate to firefighting. This work is the product of a cooperative research agreement with the University of Montana Human Performance Laboratory. Results of the studies are sent to the field periodically through *Wildland Firefighter Health and Safety Reports*.

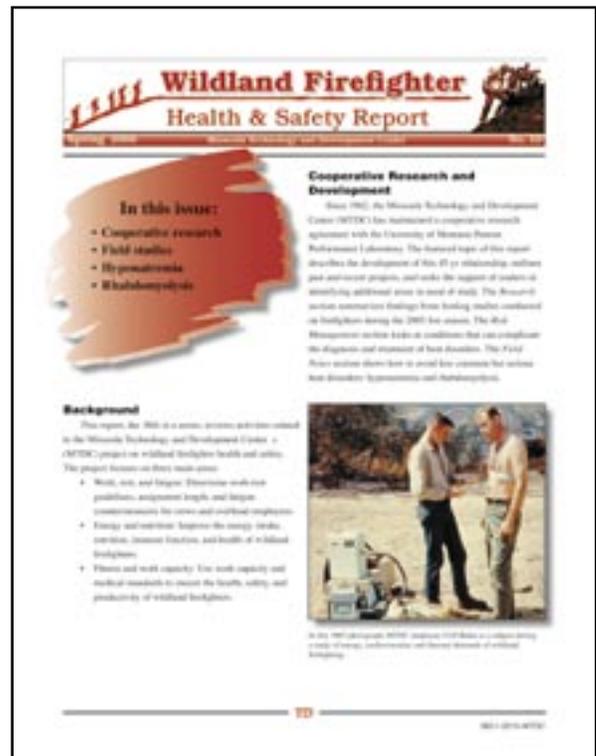
The latest report, *Wildland Firefighter Health and Safety Report: No. 10* (0651-2810-MTDC), describes the 45-year history of the partnership. Projects have focused on three main areas:

- Work, rest, and fatigue
- Energy and nutrition
- Fitness and work capacity

This report highlights the latest research on the food and snacks firefighters can eat to maintain work capacity. Heat stress, hyponatremia (caused by drinking too much water), and rhabdomyolysis (a problem that inactive individuals can experience after heavy exercise), also are discussed.

For more information, contact Brian Sharkey, project leader (phone: 406-329-3989; e-mail: bsharkey@fs.fed.us).

To order a copy of the report, contact Cailen Hegman, MTDC publications (phone: 406-329-3719; e-mail: cahegman@fs.fed.us).



Reduce Forest Fuels With Air Curtain Destructors

Thinning for wildland fire mitigation and forest health is critical to fire and fuels management. Although prescribed fires and burn piles have been the traditional methods of removing the excess fuel and vegetation, the San Dimas Technology and Development Center (SDTDC) has evaluated the use of air curtain destructors.



The tech tip, *The Use of Air Curtain Destructors for Fuel Reduction and Disposal* (0551-1303P-SDTDC), provides information on this alternative method of removing excess fuel.

Air curtain destructors are self-contained burning chambers. High-velocity air is blown across the top of the chamber:

- Increasing the amount of oxygen available for combustion
- Raising burning temperatures inside the unit
- Contributing to more complete combustion
- Reducing emissions and smoke

For additional information about air curtain destructors, contact Sue Zahn, project leader (phone: 909-599-1267, ext. 226; e-mail: szahn@fs.fed.us).

An informational video is available. If you are interested in obtaining copies of the video, please send an e-mail message to Janie Ybarra (jybarra@fs.fed.us) or Sue Zahn (szahn@fs.fed.us).

To order the tech tip, contact Robin Schnepf, SDTDC publications (phone: 909-599-1267, ext. 235; e-mail: rschnepf@fs.fed.us).

Aviation

New Reusable Bulk Bags for Helicopter Transport of Sand and Gravel

In the past, helicopters within the Forest Service have used flexible intermediate bulk containers (FIBCs) to transport dry-flow materials, such as sand or gravel. Because these bags could be used only once, they were not cost effective and their popularity waned.

The tech tip, *Reusable Flexible Intermediate Bulk Containers* (0557-1304P-SDTDC), describes reusable bulk bags that are now available. The new design is constructed from a heavier polypropylene fabric with sturdier weaving that has been treated with ultraviolet light inhibitors to prevent sun damage and chemical degradation.



Reusable bags cost two to three times more than nonreusable ones. However, with proper inspection and maintenance, a reusable bulk bag can last until a project is completed.

The tech tip includes a list of bag manufacturers, ordering information, and maintenance instructions.

For more details on reusable flexible intermediate bulk containers, contact Ron Tam, project leader (phone: 909-599-1267, ext. 274; e-mail: rontam@fs.fed.us).

To order the tech tip, contact Robin Schnepf, SDTDC publications (phone: 909-599-1267, ext. 235; e-mail: rschnepf@fs.fed.us).

Reforestation

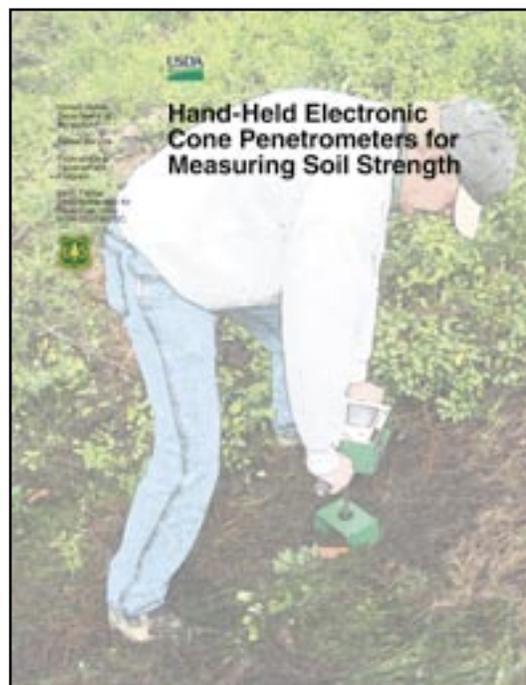
Checking Soil Strength With Hand-Held Electronic Penetrometers

Heavy equipment used during forest management activities can leave ruts and compact the soil, preventing roots from growing freely. Electronic penetrometers collect data that can be combined with information on soil moisture, structure, and texture to provide a more accurate picture of soil properties, such as soil strength and compaction. Forest tree nurseries could benefit from this information, but many high-tech penetrometers designed for environmental and geotechnical investigations are large, expensive, and require two operators.

Hand-held electronic cone penetrometers that can be operated by a single person are available. MTDC went to the Forest Service's Coeur d'Alene nursery to compare three hand-held electronic penetrometers: the CP40, the Field Scout SC-900, and the Penetrologger. The results of the evaluations are in the report, *Hand-Held Electronic Cone Penetrometers for Measuring Soil Strength* (0524-2837-MTDC).

For more information on hand-held electronic penetrometers, contact Gary Kees, project leader (phone: 406-829-6753; e-mail: gkees@fs.fed.us).

To order the report, contact Cailen Hegman, MTDC publications (phone: 406-329-3978; e-mail: cahegman@fs.fed.us).



Recreation

Injuries Prompt Modifications of Hydrant Handles

Visitors to Forest Service recreation sites in the Southern United States will be able to draw water with less chance of injury, thanks to MTDC's work determining how to modify the handles of older water hydrants. Thousands of older water hydrants are still being used.

The tech tip, *Modifying Water Hydrant Handles To Make Them Safer* (0523-2348-MTDC), explains how MTDC modified the design of the Woodford MK-6 frost-free hydrant by milling metal from the handle. A parts list for maintaining the hydrant is included in this tech tip.

For more information, contact Mary Ann Davies, project leader (phone: 406-329-3981; e-mail: madavies@fs.fed.us).

To order the report, contact Cailen Hegman, MTDC publications (phone: 406-329-3978; e-mail: cahegman@fs.fed.us).



Archeologists in the Southern Region Try Out the Heritage Digital Toolkit

When archeologists needed an inexpensive way to streamline data collection, SDTDC decided to develop a hand-held digital toolkit.

The tech tip, *Heritage Digital Toolkit: Final Report and User's Guide* (0523-1305P-SDTDC), presents the results of 2 years of field tests. Employees at the University of Alabama's Office of Archeological Research and Forest Service employees from the Southern Region worked together on the toolkit. Dr. Kent Schneider, now retired, was the project leader.

For further information, contact Drew Selig, project assistant (phone: 828-257-4209; e-mail: dselig@fs.fed.us) or Rodney Snedeker, archeologist (phone: 828-257-4255; e-mail: rsnedeker@fs.fed.us).

To order the tech tip, contact Robin Schnepf, SDTDC publications (phone: 909-599-1267, ext. 235; e-mail: rschnepf@fs.fed.us).



Isolation Bags Aid Tree Improvement Programs

Tree improvement programs strive to grow trees with desirable traits, such as disease resistance, cold hardiness, and fast growth. Controlled pollination mates genetically superior trees. During the selective breeding process, isolation bags are placed over the branch tips of trees to prevent unwanted pollen from reaching female pine cone flowers. But isolation bags are not all the same; high-quality isolation bags are hard to find.



MTDC found three distributors of isolation bags. Three types of bags were sent to the Forest Service's Coeur d'Alene Nursery near Coeur d'Alene, ID, and to the Dorena Genetic Resource Center near Cottage Grove, OR, for field evaluation.

One bag was immediately rejected because it would have allowed too much sunlight into the bag, overheating the developing pine cone flowers. Of the two remaining bags, both worked well, although one bag cost five times as much as the other.

The tech tip *Suitable Pollen Isolation Bags for Selective Breeding of Conifers* (0624–2308–MTDC) discusses the results of the evaluations and includes ordering information.

For more information, contact Mary Ann Davies, project leader (phone: 406–329–3981; e-mail: mdavies@fs.fed.us).

To order the report, contact Cailen Hegman, MTDC publications (phone: 406–329–3978; e-mail: cahegman@fs.fed.us).

Safety

Safety and Health Training Made Easy

Safety and Health Training for Contracting Officer's Representatives and Inspectors (0567–2C04–MTDC) is a CD designed as supplemental training for Forest Service employees who administer contracts. This CD offers flexible, inexpensive training. Segments of the CD or all of it can be used by an individual or by a facilitator teaching a group of students.

This training CD contains 171 PowerPoint slides that cover important topics including regulatory guidance, multiemployer worksites, OSHA standards, and contract language.

The CD can be used with other specialized courses to get a clearer understanding of safety standards prescribed by law (29 CFR 1910 and 1926).

This training can be viewed as a PowerPoint presentation at http://www.fs.fed.us/t-d/pubs/ppt_html/htm05672C01/ (Username: t-d Password: t-d)



Other safety training CDs that have been developed by the MTDC Safety and Health Program are *Occupational Safety & Health Act (OSHA) Compliance Training Guide* (0567-2C01-MTDC) and *Occupational Safety & Health Training for Supervisors and Managers* (0367-2C09-MTDC).

For more information on safety and health training available from MTDC, contact Gary Hoshide, program manager (phone: 406-329-1029; e-mail: ghoshide@fs.fed.us).

To order the CD, contact Cailen Hegman, MTDC publications (phone: 406-329-3978; e-mail: cahegman@fs.fed.us).

Engineering

Launching the Geotechnical Web Site

Technology sharing and communications play a key role in cost-effective geotechnical engineering. Michael Mitchell, SDTDC project engineer, and Mary Trankel, MTDC Webmaster, worked together to develop a geotechnical Web site on the Forest Service's internal computer network (<http://fsweb.sdtc.wo.fs.fed.us/geotech/>).

At this Web site, geotechnical engineers can share innovative ideas and current information about geotechnical engineering. The site can also benefit other Forest Service employees working in civil engineering, geology, dams, hydrology, and other programs.

Information is organized into the following sections:



About this Site

Introduction, coordinators list, and an e-mail comment form.

GeoTech Contacts

Contact information about Forest Service geotechnical engineers and their individual fields of expertise.

Training

Scheduled training, conferences, and meetings with the appropriate dates, times, sponsors, and locations for each event.

Government agencies,

universities, and professional organizations that offer related training and individual Web page addresses.

Resources

Government agencies, professional organizations, and professional publications relating to geotechnical engineering.

Projects

Geotechnical project case histories sorted by region. Each case history includes: project name, location, contact person, abstract of the project, and photographs.



Services

Available geotechnical services, such as lab testing, drilling, and architecture and engineering for each region.

Equipment, Tools, Supplies

Available geotechnical equipment for each region.

The interactive design of the geotechnical Web site allows Web site coordinators to easily add, delete, or edit information without the need for Web programming skills. A special administrative area is protected by a secure login system. Once authorized, a Web site coordinator can easily add, edit, or delete Web site content by filling out Web page forms.

Share your geotechnical information or field experiences by contacting one of the Web site coordinators. Help make this site a success.

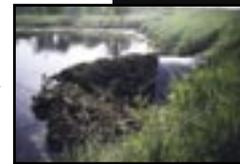
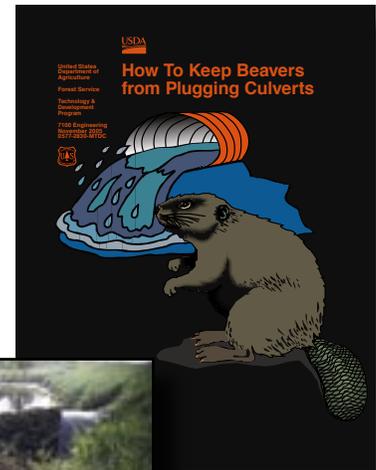
For more information, contact Mike Mitchell, project engineer (phone: 909-599-1267, ext. 246; e-mail: mrmitchell@fs.fed.us) or Mary Trankel, Webmaster (phone: 406-829-6726; e-mail: mtrankel@fs.fed.us).

Don't Leave It to Beavers

Beaver populations have increased significantly during the last half century and have spread across most areas of the country. As beaver populations expand, the problems created when they instinctively dam culverts become a concern for road engineers and maintenance crews. MTDC, with the assistance of U.S. Department of Agriculture Animal and Plant Health Inspection Service National Wildlife Research Center experts, published a report detailing methods to prevent beavers from plugging culverts. The report, *How to Keep Beavers from Plugging Culverts* (0577-2830-MTDC), also discusses methods tried successfully and unsuccessfully by Forest Service personnel.

For more information, contact Andy Trent, project leader (phone: 406-329-3912; fax: 406-329-3719; e-mail: atrent@fs.fed.us).

To order a copy of the report, contact Cailen Hegman, MTDC publications (phone: 406-329-3719; e-mail: cahegman@fs.fed.us).

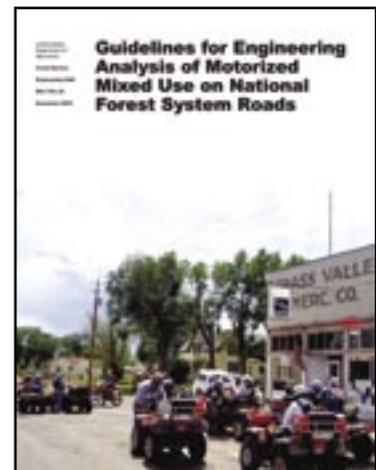


Help With Engineering Analyses for Mixed-Use Roads

The new travel management rule (36 CFR part 212) requires national forests to designate roads, trails, and areas that are open to motor vehicles, by class of vehicle.

Before a National Forest System road is designated for motorized mixed use (use both by vehicles that are highway legal and those that are not), a qualified engineer should conduct an engineering analysis. SDTDC has prepared *Guidelines for Engineering Analysis of Motorized Mixed Use on National Forest System Roads* (EM-7700-30) to help engineers conducting these analyses. The guide is available on the Forest Service's internal computer network at <http://fsweb.sdtc.wo.fs.fed.us/programs/eng/Motorized%20Mixed%20Use/>

For more information on conducting an engineering analysis, contact Ed Gililland, project leader (phone: 909-599-1267, ext. 237; e-mail: egililland@fs.fed.us).



Travel Management Regulation Training Available

SDTDC has created a training course to help Forest Service employees implement the Travel Management Regulation (36 CFR part 212) consistently across the country.

This regulation requires all motorized vehicle use on a forest or grassland to take place on designated routes (roads and trails) and on small, sustainable areas that appear on an official map. This represents a major shift for most national forests and grasslands.

The course will provide standardized information in modules and interactive learning exercises. The course also references the *Guidelines for Engineering Analysis of Motorized Mixed Use on National Forest System Roads* (EM-7700-30).

For more information about the course, contact Jerry Ingersoll (phone: 202-205-0931; e-mail: jingersoll@fs.fed.us).



2005 Engineer of the Year Awards

Every year the Forest Service recognizes the work of engineering employees. In the past, *Engineering Field Notes* published accounts of the winners.



Now that *Engineering Field Notes* is no longer published, Mary Trankel, MTDC's Webmaster, had to find a new way to share the stories of Tim Chesley, Renee Flanagan, Jose "Joe" Acosta, and William Angelus, winners of the 2005 Engineer of the Year Awards.

Trankel incorporated their stories into *Engineering Field News* on the Forest Service's internal computer network at <http://fsweb.mtdc.wo.fs.fed.us/pubs/htmlpubs/htm06713802/> and on the Internet at: <http://www.fs.fed.us/t-d/pubs/htmlpubs/htm06713802/> (Username: t-d Password: t-d).

The winners traveled to Washington, DC, in April for the U.S. Department of Agriculture 2005 Forest Service Engineer of the Year awards ceremony.

Spreading the News About Forest Service T&D at the New Employee Orientation

For the fourth year, T&D employees raised awareness of the T&D mission, products, and services at the Forest Service's New Employee Orientation. This year, MTDC employees Mary Trankel (Webmaster) and Andrew McLean (program analyst) attended the orientation April 3 to 6 in Jacksonville, FL, as new employees. They also provided information about the T&D program. The *T&D 60 Years of Innovation and Problem Solving* display was exhibited. Last year, employees from SDTDC attended the orientation to spread the news about Forest Service T&D. About 500 employees attended the orientation this year.



A New Look for the SDTDC Conference and Training Facilities

The SDTDC conference and training rooms have been renovated recently and now have full audiovisual capability.

	Capacity
Conference Room	12
Library	18
Assembly Room	48



Forest Service employees who wish to use the conference and training rooms can contact Julie Pak (phone: 909-599-1267, ext. 221; e-mail: jpak@fs.fed.us).



New Faces

New Faces at SDTDC and MTDC



Ed Messerlie joined SDTDC in March 2005 as a project leader in the forest management program. He received a bachelor's degree in forest management from University of Wisconsin-Stevens Point and a bachelor's degree in mechanical engineering from University of Wisconsin-Platteville. As a seasonal forestry technician on the Arapahoe and Roosevelt National Forests, he conducted regeneration surveys, stand exams, and precommercial thinning. Ed prepared forest management plans and monitored contracts for the Colorado State Forest Service, spent a year as an owner/operator in timber harvesting and management, and worked as a consultant on forest management and inventory and monitoring projects. Ed is interested in building better software tools for forest and fuels management and in improving the efficiency of harvest systems. His other interests include alternative energy production and use.



Michelle (Sunni) Bradshaw



R.L. (Lance) Collister



Jacob Cowgill



Heather Matusiak



Andrew D. McLean



Lisa Outka-Perkins



Joyce M. Shafer



Mary Trankel

Michelle (Sunni) Bradshaw became an MTDC career intern as a library technician in February 2006. Sunni is assigned to the Equestrian Design Guidelines recreation project. Previously she worked for MTDC as a contractor, researching and writing for fire, engineering, and recreation projects. Sunni holds a bachelor's degree in recreation management from the University of Montana.

R.L. (Lance) Collister began working for MTDC in April 2004 as a temporary employee with the wildland fire chemical systems group. In April 2005 he became a physical science technician under an internship program. Lance holds a bachelor's degree in physics from Middlebury College and has worked for three decades in the private sector as a design engineer, technical project manager, general manager, and independent consultant. He holds six patents from his previous product development work.

Jacob Cowgill began working as a Web designer at MTDC during 1998. He earned a bachelor's degree in fine arts with a minor in computer science from the University of Montana in 2001. Jacob is now completing a master's degree in environmental studies at the University of Montana.

Heather Matusiak joined MTDC in May 2005 as a temporary receptionist. In October 2005, she became an office automation assistant in the student temporary employment program. Heather is a senior at the University of Montana earning her bachelor's degrees in accounting, marketing, and international business.

Andrew D. McLean accepted a full-time position as a program analyst with MTDC after receiving his bachelor's degree in May 2005 from the University of Montana. He works primarily in the recreation and safety programs, while also serving as a contact for Information Resources Management. Andrew began working at MTDC in January 2001 in the student temporary employment program. In 2002, he entered the student career experience program as an information technology trainee.

Lisa Outka-Perkins started a career internship as a sociologist with MTDC in January 2005. She received her master's degree in sociology with an emphasis in criminology from the University of Montana in 2001 and had been working for MTDC under temporary appointment. The fire, recreation, and safety and health programs have been the focus of Lisa's most recent project work.

Joyce M. Shafer joined MTDC in September of 2005. As a warranted purchasing agent, she is responsible for procuring services and supplies up to \$25,000.

Mary Trankel began working at MTDC in January 2002 as an information technology specialist and was promoted to Webmaster in November 2003. She had been a self-employed consultant since 1991, performing research, program evaluations, database management, and Web site development for numerous private businesses and Government agencies throughout Montana. Mary earned a bachelor's degree in sociology, with an emphasis in criminal justice, from Carroll College in 1980. She worked for 2 years in the criminal justice system as a deputy sheriff/community corrections specialist before starting her graduate work. Mary completed her Ph.D. in sociology, with special emphasis in criminology and applied research methods, from the University of Montana, Missoula, in 1991.

On the Web...

- Forest Service and Bureau of Land Management employees—View MTDC and SDTDC documents at:
<http://fsweb.mtdc.wo.fs.fed.us/search>
<http://fsweb.sdtc.wo.fs.fed.us>

- Everybody—View SDTDC documents at:
<http://www.fs.fed.us/eng/pubs/>

- Everybody—View MTDC and SDTDC documents at:
<http://www.fs.fed.us/t-d/>
(Username: t-d, Password: t-d)

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Forest Service Intranet Web site: <http://fsweb.mtdc.wo.fs.fed.us>

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444 East Bonita Ave.; San Dimas, CA 91773-3198
Phone: 909-599-1267 • Fax: 909-592-2309
Forest Service Intranet Web site: <http://fsweb.sdtc.wo.fs.fed.us>

Library Card

McLean, Andrew; Wolf, Jerry Taylor. 2006. T&D news: No. 1, 2006. Tech. Rep. 0671-2818-MTDC. Missoula, MT: U.S. Department of Agriculture Forest Service, Missoula Technology and Development Center. 12 p.

Describes projects that are underway and finished products that are available at the Forest Service's Missoula and San Dimas Technology and Development Centers. Topics in this issue include:

- Sharing Knowledge Through Wildland Firefighter Health and Safety Reports
- Reduce Fire Fuels With Air Curtain Destructors
- New Reusable Bulk Bags for Helicopter Transport of Sand and Gravel
- Checking Soil Strength With Hand-Held Electronic Penetrometers
- Injuries Prompt Modifications of Hydrant Handles
- Archeologists in the Southern Region Try Out the Heritage Digital Toolkit
- Isolation Bags Aid Tree Improvement Programs
- Safety and Health Training Made Easy
- Launching the Geotechnical Web Site
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Keywords: air curtain destructors, archeology, awards, beavers, culverts, firefighting, geotechnical engineering, newsletters, penetrometers, safety at work, training, travel planning, Web sites

Forest Service Technology & Development Program
PROJECT PROPOSAL

Project Name/Title:



Date: _____

Submitted by: _____

Unit: _____

Address: _____

Phone: _____ E-mail: _____

OVERALL PROBLEM/OBJECTIVE STATEMENT *(Describe the problem, how the work is currently being done, and why improvement is needed):*

PROPOSED TECHNOLOGY & DEVELOPMENT WORK *(Describe your concept of the end product, such as a new equipment design, a PowerPoint presentation, a video, a handbook, Web site, CD, etc.):*

POTENTIAL BENEFITS *(Describe how this project will reduce cost, save time, improve safety, increase efficiency, or improve resource management):*

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