Spring 2006

WSA Currents & PROFILES

INFORMATION WITHIN REACH

Welcome

to the first issue of Currents & Profiles, the National Watershed, Soil, and Air Technology and Development Centers' news and notes to the field.

We plan to put out issues every spring and fall to update the watershed community on the T&D program, the progress of our projects, newly available publications, and opportunities to propose new projects. You will find the following topics in this issue:

Mission Statement

To systematically apply scientific knowledge and advanced technology to create new or substantially improved equipment, systems, materials, processes, techniques, and procedures to meet the challenges and objectives of sustainable forest ecosystems management practices.

Watershed, Soil, and Air Technology & Development Program

• CURRENT PROJECTS

Water Diversion Control Structures

Proposed by: Dave Gloss, Medicine Bow National Forest (Region 2)

This project addresses the problem of low-tech water diversions that do not adequately control the volume of water diverted. In some cases, required in-stream flows are not maintained. The project will gather information about the types of diversion and headgate structures that are being used on national forests and elsewhere, and evaluate their pros, cons, and effectiveness. The product will be a compendium including recommendations about what structures and procedures work in different situations. For additional information, contact San Dimas Technology and Development Center (SDTDC) project leader Kim Clarkin by phone: (909) 599-1267, ext. 209, or e-mail: kclarkin@fs.fed.us.

Figure 1—North French Creek diversion, Medicine Bow NF, Wyoming.

Remote Sensing for Improved Smoke Forecasting and Nitrogen Deposition Assessment

Proposed by: Rich Fisher (WO)

Andy Trent (Missoula Technology and Development Center [MTDC]) and Rich Fisher (WO/Air Program Manager) are working together to bring weather remote sensing technology to bear on two problems facing the Forest Service. One is better smoke forecasting. Near-surface upper-air observations are essential to better characterize winds in complex terrain. Their hypothesis is that these observations used in forecast models will improve predictions of smoke movement and particle concentrations. The second problem is to better understand atmospheric nitrate and ammonia transport in the vicinity of the continental divide of Colorado near the Rawah Wilderness and the Rocky Mountain National Park. These pollutants adversely affect visibility and, when deposited, high mountain lakes and streams. A study is underway together with the National Park Service, NOAA, and Colorado State University to investigate this problem.

The remote sending tool being used for these projects is the Remtech phased array SODAR, an acoustic device which uses Doppler technology to compute horizontal and vertical wind speed and direction at several heights up to several hundred meters above the surface. The data are averaged once an hour and automatically transmitted via satellite to a public Web site where it is immediately posted. The data are being ingested at the Rocky Mountain Center (a fire weather forecast service at the Rocky Mountain Research Station) for use in the weather forecast modeling evaluation.

The SODAR has been deployed since early April 2006 at Granby, CO. It will operate for one month and then return to a nearby site for a summer 2006 campaign supporting the same projects. If smoke observing and forecasting can be shown to be significantly enhanced with SODAR data, this and other similar devices may be deployed on fires soon.

For more information, contact Rich Fisher by phone: (970) 295-5981 or e-mail: rwfisher@fs.fed.us, or Andy Trent by phone: (406) 329-3912, or e-mail: atrent@fs.fed.us.

Figure 2—Andy Trent adjusts the SODAR antennae at the Granby, CO, airport. The white trailer houses the SODAR electronics, satellite communications, and instruments to measure surface weather, ozone, and oxides of nitrogen.

The Burned Area Emergency Response Treatment Catalog (BAERCAT)

Proposed by: National BAER Team

"BAERCAT" provides information for both assessment and implementation teams on all BAER treatments including land, channel, roads and trails, and safety and protection. The catalog has treatment information for the assessment team including: objectives, site-selection criteria, cost information, and known effectiveness monitoring. The "BAERCAT" provides implementation teams with photographs, diagrams, equipment lists, and monitoring questions for both implementation and effectiveness. Sample contracts for all treatments including helimulching are in the appendix. Look for the "BAERCAT" on SDTDC's Web site this fire season. For further information, contact SDTDC project leader Carolyn Napper by phone: (909) 599-1267, ext. 229, or e-mail: cnapper@fs.fed.us.

Figure 3—Hydromulch application on the Cedar fire in southern California.

Smoke Monitoring Training Aids

Proposed by: Pete Lahm, WO Fire

MTDC was tasked to develop Web-based operation manuals for several smoke monitors. These will include ThermoElectron's DataRam 4 and Met One Instrument's EBAM. MTDC will be looking at different methods to best present the information. For more information, contact MTDC project leader Mary Ann Davies by phone: (406) 329-3981, or e-mail: mdavies@fs.fed.us.

Erosion Control for Roads

Proposed by: Jennie Fischer, Boise National Forest (Region 4)

Erosion control for roads identifies the effectiveness of erosion and sediment control best management practices on forest roads. A synthesis of existing published literature including techniques, treatments, and practices to minimize erosion and sediment delivery from roads is included. This information provides earth scientists with references on treatment effectiveness for NEPA documentation and analysis. The document will be available on the SDTDC Web site in early 2007. For further information, contact SDTDC project leader Carolyn Napper by phone: (909) 599-1267, ext. 229, or e-mail: cnapper@fs.fed.us.

Figure 4—Erosion control for roads identifies effective best management practices and treatments to reduce the adverse effects of roads.

Low-Water Crossings Guide

Proposed by: Gary Harris and Rick Patten, Idaho Panhandle National Forest (Region 1)

"Low-Water Crossings: Geomorphic, Biological, and Engineering Design Considerations," is a guide to low-water crossing structure selection and design. It focuses on low-water crossings' effects on streams, floodplains, fish and fish habitats while addressing all engineering road design issues. It should be useful to engineers, road managers, and resource specialists working together on crossing projects. The draft is in the final stages of preparation, and will be posted on SDTDC's Watershed Web page when finalized. For additional information, contact SDTDC project leader Kim Clarkin by phone: (909) 599-1267, ext. 209, or e-mail: kclarkin@fs.fed.us.

Figure 5—20-Mile Creek Road, Okanagan NF, Washington.

Watersource Toolkit

Proposed by: Greg Napper, SDTDC

The watersource toolkit is a resource for soil scientists, hydrologists, engineers, and fire planners involved in the planning and/or use of watersource-drafting sites. The toolkit includes background information on how to select a watersource-drafting location that meets best management practices and provides a suitable site for fire suppression or road maintenance needs. The toolkit contains references and examples of ways to reduce adverse impacts of drafting through equipment or site modification. The toolkit will be available on SDTDC's Web site by the end of fiscal year 2006. For additional information, contact SDTDC project leader Carolyn Napper by phone: (909) 599-1267, ext. 229, or e-mail: cnapper@fs.fed.us.

Figure 6—Standpipe used to fill water truck.

Collocation Study of Smoke Monitors with Different Fuels

Proposed by: Trent Wickman, Superior National Forest (Region 9)

In early May, MTDC will be testing several smoke monitors to determine their accuracy when compared to a gravimetric standard. Tests will be conducted at the Missoula Fire Laboratory's smoke chamber using fuels from the Pacific Northwest, Minnesota, and the Southwest. Smoke monitors will include the MIE DataRam 4, Met One Instrument'sEBAM and E-sampler, and the TSI DustTrak. For more information, contact MTDC project leader Andy Trent by phone: (406) 329-3912, or e-mail: atrent@fs.fed.us.

Soil, Water, Road Condition Index (SWRCI)

Proposed by: John Bell, WO Engineering, and Keith Simila, Alaska Region Engineering

SWRCI focuses on identifying a standardized methodology for evaluating the effect of roads on soil and water resources. Thanks to the help of many soil scientists and hydrologists, an extensive compilation of current road-condition inventories has been completed. Key indicators most commonly used are: road location, hydrologic connectivity, road drainage features, road prism template, slope, and erosion. The next step is to develop a SWRCI for field testing this summer throughout the country. If you are interested in helping to field test the SWRCI on your forest contact SDTDC project leader Carolyn Napper by phone: (909) 599-1267, ext 229, or e-mail: cnapper@fs.fed.us.

• NEWS FROM THE WSA T&D STEERING COMMITTEE

On February 28 through March 1, 2006, the WSA technology and development steering committee met at SDTDC. The committee reviewed FY 2007 project proposals and conducted other business. This year the committee had 14 proposals for consideration and chose 5 to pursue. The criteria for selection included an expectation that the product have national application and that the Centers could accomplish the project in a reasonable amount of time.

The Centers will scope the proposals and develop cost estimates. The scoped proposals will be presented to the committee in early December 2006 for discussion. The committee, the Centers' program leaders, and the project leaders will decide together how to proceed with each of the projects.

Finally, the committee made a number of business decisions that they expect will make the coordination between the Centers and the steering committee more effective. Most of these decisions address improved communication and include the committee's work with the Centers and the clientele represented. The committee is seeking representation from each region.

A revised charter is being prepared. The next WSA steering committee face-to-face meeting is scheduled for February 27 and 28, 2007, in Denver, Colorado. Please send comments or questions about this committee to Rich Fisher by phone: (970) 295-5981, or e-mail: rwfisher@fs.fed.us.

Figure 7—2006 Watershed, Soil, and Air steering committee.

The following projects were selected by the WSA steering committee for FY 2007.

• NEW PROJECTS

Measuring Soil Moisture to Lower Risk of Compaction from Equipment Operations

Proposed by: Wayne Johannson, Plumas National Forest (Region 5)

This project will review and test soil water content measuring devices. Soil water content tools can help prevent adverse soil impacts caused by mechanized equipment. If you have examples of equipment or protocols, please contact SDTDC project leader Carolyn Napper by phone: (909) 599-1267, ext. 229, or e-mail: cnapper@fs.fed.us.

Compaction Monitoring Technologies

Proposed by: Edward Huffman, Allegheny National Forest (Region 9)

Compaction monitoring techniques are a recurring question for field personnel. Equipment limitations and time constraints affect the amount of data to evaluate soil conditions. This project will build on existing techniques and recent studies on soil compaction. Soil-disturbance classes may be incorporated to assist soil scientists in evaluating the change in conditions over time. If you have a successful compaction monitoring methodology or are interested in field testing different equipment,

please contact SDTDC project leader Carolyn Napper by phone: (909)599-1267, ext. 229, or e-mail: cnapper@fs.fed.us.

Low Impact Prescribed Fire Plow Line Sweeper/ Blower

Proposed by: Allen Nicholas and Kara Kleinschmidt, Shawnee National Forest (Region 9)

This project will develop an attachment for a low ground-pressure implement to remove organic litter off the fireline and reduce adverse impacts to soils from repeated plowing. If you have a tool that removes organic litter without displacing soil, please contact SDTDC project leader Carolyn Napper by phone: (909)599-1267, ext. 229, or e-mail: cnapper@fs.fed.us.

Training for Wetland Restoration

Proposed by: Tom Biegibhauser, Daniel Boone National Forest (Region 8)

Wetlands that were drained before being incorporated in the National Forest System, as well as other wetland areas affected by forest management, are candidates for restoration. This project will produce a guide to wetland construction in book and DVD format. We anticipate involving several cooperators in project implementation. Contact SDTDC project leader Ellen Eubanks by phone: (909) 599-1267, ext. 225, or e-mail: eeubanks@fs.fed.us.

Restoration of User-Created Trails through Wetlands

Proposed by: Randy Foltz, Rocky Mountain Research, and Dexter Meadows, SDTDC

This project designs new techniques that restore OHV trails and discourage further use. Contact SDTDC project leader Dexter Meadows by phone: (909) 599-1267, ext. 276, or e-mail: dmeadows@fs.fed.us.

• FOREST HIGHLIGHTS

The Plumas National Forest (Region 5) developed a soil monitoring tool that uses global positioning systems (GPS) to measure a "footprint" of harvest operations. A component of the Herger-Feinstein Quincy Library Group (HFQLG), soil monitoring uses GPS technology to document the aerial extent of skid trails, landings, and nonsystem roads contained within the boundary of harvest units. The aerial extent, or "footprint," is characterized as disturbance showing where equipment operated during harvest operations. The data were downloaded to a geographic information system (GIS) for data analysis. The desire was to gain perspective on the size of the footprint in relation to the amount of detrimental compaction. For more information visit the Plumas National Forest intranet Web site at http://fsweb.plumas.r5.fs.fed.us/staffs/hfqlg/index.shtml.

• PUBLICATIONS AND VIDEOS

MTDC

"Hand-Held Electronic Cone Penetrometers for Measuring Soil Strength," by Gary Kees, MTDC, discusses evaluations of three hand-held penetrometers. The document is available at the following Web site http://fsweb.mtdc.wo.fs.fed.us/pubs/htmlpubs/htm05242837.

SDTDC

"Road Decommissioning on National Forests," available in DVD or VHS format, discusses various road decommissioning objectives and levels (full or partial decommissioning, entrance closure). It describes onsite planning and logistics for road decommissioning projects, illustrates implementation, and provides tips on how to handle difficult situations such as groundwater seeps and removing stream crossings. The video uses expertise developed in the Northern Region during extensive efforts to reduce extreme road densities from mid-twentieth century jammer logging. Copies of the video will be sent to forest and regional watershed program managers.

"The Roads Riparian Restoration Field Guide" will be available this summer. For additional information on the roads riparian restoration project, visit http://fsweb.sdtdc.wo.fs.fed.us/programs/eng/RRR

Figure 8—Road riparian restoration techniques use a permeable fill with culverts to cross a meadow.

BAERCAT will be available on the SDTDC Web site this fire season.

If you are interested in receiving any of these SDTDC publications, please send your name and address to jybarra@fs.fed.us.

• LINKS OF INTEREST

EPA

Draft Handbook for Developing Watershed Plans to Restore and Protect Our Waters, EPA 841-B-05-005, October 2005. This draft handbook is intended to help Federal, State, tribal, and local environmental agencies as well as communities and watershed organizations develop and implement watershed plans to meet water quality standards and protect water resources. The Handbook is currently available online in portable document format (pdf). A free printed copy can be ordered at www.epa.gov/owow/nps/watershed_handbook/.

Visit the National Technology and Development Centers' intranet Web sites:

Missoula Technology and Development Center:
http://fsweb.mtdc.wo.fs.fed.us/

San Dimas Technology and Development Center:
http://fsweb.sdtdc.wo.fs.fed.us/

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