

*Coop Sep 93*

**MASTER  
MEMORANDUM OF UNDERSTANDING 93-SMU-198  
BETWEEN**

**THE U.S. DEPARTMENT OF AGRICULTURE  
FOREST SERVICE,**

**AND**

**THE U.S. ARMY CORPS OF ENGINEERS  
COLD REGIONS RESEARCH AND ENGINEERING LABORATORY**

**Article I - PURPOSE AND AUTHORITY**

This Memorandum of Understanding(MOU) is entered into pursuant to the authority of Title 10 United States Code 3036(d) (Economy Act) which provides that the Chief of Engineers may accept orders to provide services to another department or agency of the United States.

The purpose of this MOU is to outline, in general terms, the agreed upon cooperative relationship between the USDA Forest Service and the U.S. Army Cold Regions Research and Engineering Laboratory(CRREL). This agreement will establish a framework upon which Forest Service and CRREL officials may cooperatively plan and accomplish work when such cooperation is to the mutual benefit of both parties and is in the best interests of the public.

**Article II - SUBJECTS OF COOPERATION**

The Forest Service manages public lands, resources, and facilities for public use and benefit. This management includes the design, construction, operation, and maintenance of asphalt, aggregate, and native soil surfaced roads for the purpose of public and timber transport. This management also includes the planning and implementation of activities to accomplish the goals established by the various individual forest plans. These facilities and activities occur across a wide range of climatic and geologic environments. Environments including high precipitation rates and/or freezing and thawing temperatures are common. These climatic conditions have a recognized potential for producing adverse impacts to the land resources and facilities managed by the Forest Service.

The CRREL is a recognized leader in the field of environmental effects to engineered facilities including paved and unpaved roadways. The CRREL also has an extensive experience and knowledge base in the area of temperature and moisture effects on natural soil deposits. The CRREL continues with the research and development of new methodologies and technology for predicting and monitoring the effects on natural resources and engineered structures of variations in moisture and temperature.

### **1. Potential Benefits to the Forest Service:**

The MOU provides a vehicle for accessing CRREL's knowledge, experience, and tools for predicting and monitoring seasonal variations in soil moisture and temperature and the effects these variations have on roads and slope stability. Specific areas of current interest include: Measurement of soil moisture using time domain reflectometry (TDR) and radio frequency (RF) technologies to manage traffic loadings on roads during thaw-weakened conditions, calculating the cumulative damage effects of various wheel loads and tire pressures on thaw-weakened and/or moisture weakened roadway structures, and monitoring the changes in soil moisture dynamics on forested slopes due to various management practices.

Joint projects resulting in papers for publication will receive technical review by CRREL thus adding creditability to project findings.

### **2. Potential Benefits to CRREL**

The MOU provides for access to a large land base spanning a wide variation in climatic and geologic conditions. It also provides for an opportunity to jointly plan, implement, and carryout field studies on subjects of mutual interest such as the TDR/RF technologies, the effects of load and tire pressure on thawing soils, validation of frost prediction models, and the effect of management activities on soil moisture regimes. In addition it provides for possible Forest Service logistical support at field study sites remote from CRREL facilities and urban areas.

### **3. Potential Mutual Benefits:**

The MOU provides for reduced overall project costs through the sharing of each agency's resources. It also provides an opportunity to reduce project equipment costs through the sharing of investments in equipment.

## **Article III - DESIGNATED REPRESENTATIVES**

a. To provide for consistent and effective communication between CRREL and the USFS, the MOU representatives for coordinating and facilitating this agreement are as follows:

#### **Forest Service:**

U.S. Department of Agriculture Forest Service - Engineering  
ATTN. John Steward  
201 14th Street, SW  
Washington, DC. 20250  
Telephone: 202-205-1448  
Fax: 202-205-0861

**CRREL:**

U.S. Army Cold Regions Research and Engineering Laboratory  
ATTN.: Dr. Richard Berg  
72 Lyme Road  
Hanover, NH 03755-1290  
Phone: 603-646-4335  
FAX: 603-646-4640

b. CRREL and the Forest Service representatives shall coordinate all requests for cooperation under this MOU and shall serve as the points of contact between CRREL and the Forest Service on all matters relating to this MOU.

**Article IV - PROVISIONS** Now therefore, it is mutually agreed and understood by and between the parties that:

1. They agree to cooperate in the use of equipment and personnel, subject to the conditions established herein.
2. Respective representatives shall meet periodically to review current activities, propose modifications to existing projects, and identify potential new projects.
3. Work projects or activities which involve transfer of money, services or property between the parties under this MOU will require execution of a separate agreement authorized by appropriate statutory authority.
4. If specific projects are authorized under separate agreement:
  - a. A CRREL staff person will be assigned the lead to work in cooperation with the lead USFS project person.
  - b. Equipment and/or contract expenses may be shared at an agreed upon ratio based upon each respective agency's benefit.
  - c. Existing equipment within each agency may be offered for use on a project at the discretion of the owner agency.
  - d. A joint final project report will be written with the cooperation of each participating agency.

**Article V - FUNDING**

Salary and travel expenses for each agency's personnel shall be paid by the respective employee's agency, unless otherwise agreed.

Nothing in this MOU or any subsequent agreements on a work schedule shall be construed to require CRREL to request, budget, or obligate funds for the purposes of this MOU, nor to obligate any funds that have not been authorized and appropriated for this purpose.

**Article VI - AMENDMENT, EFFECTIVE DATE, AND TERMINATION**

This MOU may be modified or amended upon written consent of both parties or may be terminated with 180-day written notice of either party.. Unless otherwise agreed, such termination shall not affect the validity of any arrangements made under this MOU.

Unless terminated, this MOU will remain in full force and effective until September 1998, at which time it will be subjected to review, renewal, or expiration.

In witness whereof, the parties hereto have executed the MOU as of the date written below.

U.S. Army Cold Regions Research  
and Engineering Laboratory  
Hanover, New Hampshire

U.S. Department of Agriculture Forest  
Service



Name: LEWIS E. LINK, JR.  
Title: Director



Name: H. M. MONTREY  
Title: Associate Deputy Chief

Date: 9/27/93

Date: 23 Sep 93

