

First Comprehensive Training

Environmental Training and Research Institute (EnTRI) Uttarakhand, India



This Training is planned to be conducted at the EnTRI facility in Rani Pokhri, near Dehradun Airport, Uttarakhand, India 248145.

It is tentatively planned to cover various needs, requirements, and development focused on water, environment, rivers, life, and health on **February 4th, 2016** at **Environmental Training and Research Institute (EnTRI)**, Uttarakhand, India. There will be a short field visits with demonstration of

water testing and Monitoring with Tracer portable water testing system on Feb 5th morning, between 9:30 to 11:30 AM. The participants may attend this field event.

Training Sessions:

- The The Training Session will be conducted by the **Rivers of the World Foundation** (<http://www.rowfoundation.org/>), by eminent Scientists and Engineers (Professors) from the US Academia and Industries in collaboration with the **Rishikesh School of Yoga and Ayurveda** (www.rishikeshschoolofyoga.com) of Swami Umesh Yogi.
- The training participants will have to pay a fee to cover the cost borne by the ROW Foundation in providing this service. The Rivers of the World Foundation¹ is a Tax-exempt, charitable organization.
- The registration cost/Fee for this comprehensive, **one-day training will be Rs.5,000**. The total cost of the Training is estimated at Rs.10,000 per participant. **The Rivers of the World Foundation will cover the remaining Rs5,000 per participant** for this first Training event at the EnTRI

¹ Rivers of the World (ROW) Foundation is a Tax-Exempt(501(c)3) Organization. All contributions to the ROW Foundation (Fed. Tax ID 26-062-3120) qualify to be deductible from U.S. income taxes. All Rivers of the world foundation team members are participating in the Rivers/Stream restoration and protection activities on their personal time and contributing their personal funds. Not a single volunteer of the Foundation is receiving any compensation, rather they are paying towards the cause. They are conducting the activities in compliance with applicable regulations (US 18 U.S.C. 207, 5 CFR 2635, and others; India - IPC for Ethics) in their respective countries. They are dedicated to Restore/Protect Rivers/Streams of the World and provide clean water for the poor and needy.

- A maximum of 10 trainees will be accepted for the one day (8 hrs) comprehensive classroom training followed by site visits (optional) and hands-on Remote sensing/GIS Field-Truthing, Water testing and monitoring on the next day.
- The training Topics will include:
 - Remote Sensing Technologies/GIS – Dr. William E. Roper, Prof. The George Mason University (www.gmu.edu) (Summary of a paper on Remote Sensing in [Appendix 1 below](#))
 - Wastewater and water treatment technologies (Long-term, Low-maintenance systems that are suitable for local applications) – Dr. Tata Prakasam, Subijoy Dutta (<http://snmengineering.com>), and Mr. Krishnan (STP builder in India, www.watersystemsindia.com)
 - Municipal Solid Waste management – Landfill Siting criteria, design, and installations – Economic feasibility, available financing/grant options -Summary. Subijoy Dutta and Subi Subramanian (Ex- Asia Program Director USAID; www.consultsubi.com)
 - River, Life, and Health – Swami Umesh Yogi (www.rishikeshschoolofyoga.com)
- At the end of the training, a short test will be given to the participants. Similar to the standard testing procedure of the Johns Hopkins University and/or the George Mason University (GMU). Dr. William E. Roper and Mr. Subijoy Dutta, P.E. will conduct these tests.

A few highlights of this training course -

- ◆ This course should benefit greatly if there is a wide range of disciplinary backgrounds and perspective of the participants. The class typically consists of students who have completed their undergraduate work. Each student views the course content and its application through a unique lens. This variety of perspectives creates a dynamic and intellectually rich learning environment.
- ◆ Because of the small size of the class, we are often able to tailor the content to mesh with particular interests and concerns of the group. The use of discussion has facilitated the sharing of information among participants and has added significantly to the course in recent years.
- ◆ The biggest challenge with this course is finding reading material that is appropriate in both amount and level. We assume that as mature and committed learners, participants will pick, read, and save articles and resources according to their individual interests.

- ◆ We believe it is important to build in a significant amount of active learning exercises (e.g., pair-share, think-write, etc.) into the training class.
- ◆ This course will also cover some of the principles of infrastructure planning in developing countries, with a focus on appropriate and sustainable technologies for water and sanitation. It also incorporates technical, socio-cultural, public health, and economic factors into the planning and design of water and sanitation systems.

Expected Outcome of the Training:

1. Upon completion, students will be able to plan simple, yet reliable, water supply and sanitation systems for their own areas (community/municipality/states) that are compatible with local customs and with available human and material resources. Graduate students and other professionals from any departments/agencies who are interested in development at the grassroots level are encouraged to participate in this interdisciplinary training.
2. Upon **successful** completion of the Training the participants will be provided with Completion Certificates by the Rivers of the World Foundation in collaboration with the United Nations Environmental Program (UNEP). In addition an ongoing discussion is underway with the George Mason University/Johns Hopkins University for future collaboration and certification.

The ROW Foundation's local training coordinators for the Registered Trainees is tentatively assigned to Mr. Sucharit Dutta (sucharit2011@gmail.com) and Mr. Sudhir Nautiyal (sudhir_nautiyal@yahoo.co.uk).

APPENDIX 1

Oil Spill and Pipeline Condition Assessment Using Remote Sensing and Data Visualization Management Systems

William E. Roper¹ and Subijoy Dutta²

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Biographical Sketch

Dr. Roper is a registered professional engineer and Research Professor with the College of Science at George Mason University in Fairfax, Virginia. He joined George Mason following an academic appointment as Professor and Chair of the Department of Civil and Environmental Engineering at George Washington University. His research interests include environmental engineering, remote sensing, infrastructure security, sustainable development and geospatial informatics applications. Prior to joining academia, he was a career member of the Federal Senior Executive Service for over twenty years as Director of the Army's Topographic Engineering Center and Director of the Corps of Engineers World-Wide Civil Works R&D Program.

Mr. Subijoy Dutta is a registered professional engineer (P.E.) in several States. He has recently authored a book, "Environmental Treatment Technologies for Hazardous and Medical Wastes – Remedial Scope and Efficacy", published in March 2002 by Tata McGraw Hill Company. Mr. Dutta has over 15 years of experience in Remedial Investigations, Feasibility Studies (RI/FS), Remedial Design, and Remedial Actions (RD/RA) pertaining to the RCRA and CERCLA regulations. He also provides expertise in the treatment, storage and disposal aspects of medical waste.

Key Words: Remote sensing, satellite imagery, pipeline monitoring, oil spill, hyperspectral imagery, water pollution, emergency response, environmental risk assessment, waste management, GIS and GPS

1. Introduction

Advances in geospatial sensors, data analysis methods and communication technology present new opportunities for users to increase productivity, reduce costs, facilitate innovation and create virtual collaborative environments for addressing the challenges of security improvement and risk reduction. Sensor developments include a new generation of high-resolution commercial satellites that will provide unique levels of accuracy in spatial, spectral and temporal attributes.

In addition to the high resolution panchromatic imagery illustrated in figure 1, there are a number of other commercial imagery products that are potentially applicable to pipeline transportation and power industry infrastructure. They include air borne and satellite radar, LIDAR, multi-spectral, and hyper-spectral sensors. Part of the challenge is matching the best sensor to the specific transportation related application. Visualization and advanced data analysis methods are also important capabilities. Automated change detection within a defined sector is one example of analysis capability that will assist in detection of unauthorized intrusion events. A specific application of these techniques to power distribution security is the detection of unauthorized intrusion onto pipeline right

of ways. Pipelines often cover thousands of miles and are located in remote areas that are difficult and expensive to monitor. In one case study satellite imagery and target identification analysis is used to detect unauthorized intrusion onto a pipeline right-of-way in a remote area of Canada.

There are also challenges that may slow or impede the application of geospatial technologies to the electric utility sector. These include the need for improved methods and authorities for better data sharing across institutional boundaries. The developers and user communities need to communicate better and overcome some significant disciplinary differences. There are also challenging technical issues in the multi-sensor data fusion area to be overcome. Finally, there is a need for a focused interdisciplinary effort to match geospatial capabilities with specific user requirements.

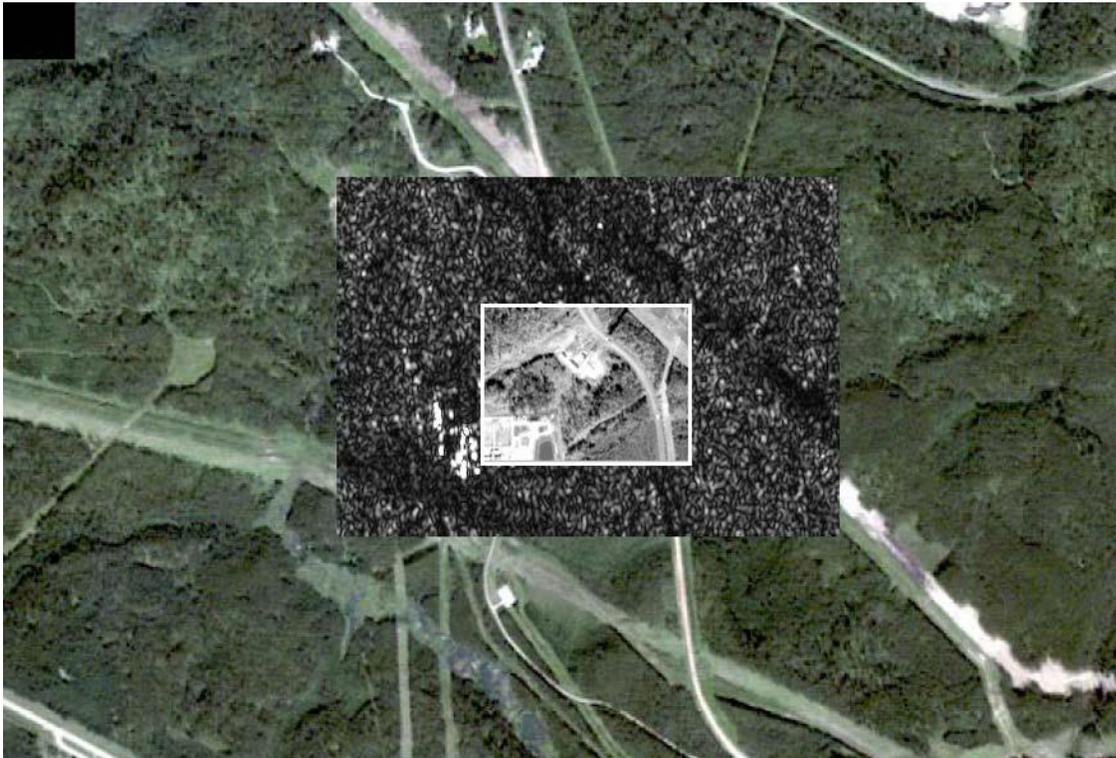


Figure - Hyperspectral image of pipeline leaks