

***The Second Hands-on CUAHSI/HMF
Workshop:
Fiber Optic Distributed
Temperature Sensing for
Ecological Characterization
June 2-7, 2008***



<http://bioe.oregonstate.edu/Faculty/selker/documents/FiberOpticsinEcologicalSensingWorkshop.doc>

Summary:

The temperature of standard fiber optic cables can be read each meter for up to 30 km as frequently as every 15 seconds. With longer integration times, readings can have precision of up to 0.01 deg C, and has been demonstrated in numerous ecological applications. The technology to make these readings has recently come to the marketplace, with no fewer than five instruments to choose from, with a wide range of prices and specifications. This workshop presents a complete introduction to the technique, including fiber and instrument selection, fiber placement, fiber repair, data acquisition, and data analysis. The workshop will be held at the [HJ Andrews experimental forest](#), and the participants will take part in the design, installation and analysis of installations to measure surface water-groundwater interactions and air-shed processes based on fiber optic temperature methods.

Instructors:

[John Selker](#) – Oregon State University (selkerj@engr.orst.edu)

[Scott Tyler](#) – University of Nevada, Reno

[Barry Freifeld](#) – Lawrence Berkeley National Laboratory

John Lane – [USGS, Office of Groundwater](#)

Sponsors:

The Consortium of Universities for the Advancement of Hydrologic Sciences ([CUAHSI](#)) Hydrologic Measurement Facility ([HMF](#)); The National Science Foundation; [Oregon State University](#); [University of Nevada Reno](#); [The US Geological Survey, office of Groundwater](#)

Participation: (Limited to 25 participants; by order of registration)

Registration: To reserve a space, contact Susan Dobbie (Susan.Dobbie@oregonstate.edu). Registration is not binding until payment is received. Please notify of dietary constraints.

Cost: \$750 per person including all meals, [housing](#), and materials. \$100 discount for poster presenters and additional \$300 discount for students. (scholarships available – contact [Selker](#)). Please make your checks, money orders payable to: OSU and remit to Susan Dobbie at 116 Gilmore Hall, Corvallis, OR 97331.

What to bring:

Boots, field clothing (plan on rain), laptop computers (ideally with MATLAB), **posters**

Tentative Program:

June 2, 2008-10 AM-4PM tour of Mackenzie 5 PM-6PM registration. 6:30 PM Dinner

June 3, 2008-Principles and Applications to date

7:30-8:30 breakfast, continued registration
8:30-8:45 Participant Introductions
8:45-9:15 Introduction to the Workshop (Selker)
9:15-10:00 Introduction to fiber-optic sensing - Part 1: The Physics (Industrial speaker)
10:00-11:00 Installations to date – part 1: streams (Selker, Lane - program)
11:00-12:00 Hiking the routes of proposed workshop installations
12:00-13:00 Lunch in the field
14:00-15:00 Installations to date – part 2: mines, lakes, glaciers, (Selker, Tyler, Freifeld)
15:00-16:00 Introduction to fiber optic sensing – part 2: instrumentation (Industrial speakers)
Coffee break
16:30-17:30 Introduction to fiber optic sensing – part 3: fiber selection (Selker, Tyler)
17:30-18:00 Introduction to fiber optic sensing – part 4: installation and power (Selker, Tyler, Freifeld)
18:00-22:00 Dinner and poster session: Installations to date (participants)

June 4, 2008-Practicum: installations in stream, soil, and air

7:30- 8:30 Breakfast
8:30-10:00 Objectives, experimental design, plan of action
10:00-10:30 Team briefings: cautions and activities
10:30-11:00 Team discussion of work plans
11:00-12:30 Installation of fibers
12:30-13:30 Lunch in the field
13:30-15:00 Installation of fibers
15:00-16:00 Connection of instrumentation and power-up
16:00-18:00 In-field validation
18:00-19:30 Dinner
19:30-22:00 Industrial demonstrations 1: hardware, software, and specifications

June 5, 2008-Practicum: Fiber repair, installation methods

7:30- 8:30 Breakfast
8:30-10:00 De-brief of field experiences
10:00-10:30 Repairing fiber: theory, practice
Coffee break
11:00-12:00 Repairing fiber: hands-on use of fusion welders
12:00-13:00 Lunch
13:00-16:30 Back to the field – Tours of installations
16:30-17:00 Care and maintenance, data QA/QC – Industrial discussion of long term performance
17:00-18:00 Industrial demonstrations 2: hardware, software, and specifications
18:00-22:00 Dinner and poster session: New ideas and planned installations with industrial demos.

June 6, 2008-Practicum: Data Analysis

7:30- 8:30 Breakfast
8:30-10:00 Teams visit installations, download data, peek at what it looks like
10:00-11:00 MATLAB code: intro to existing routines and pre-processing (Day-Lewis)
11:00-12:30 Teams take first look at their data
12:30-13:30 Working Lunch – sandwich bar
13:30-15:00 The data so far: presentation, discussion
15:00-17:00 Second round of data analysis
17:00-18:30 Team presentations
18:30-20:00 Dinner – workshop evaluation, no-host bar

June 7, 2008 7:30- 8:30 Light breakfast, departures.