NETLAKE Training School 2014
Automated Monitoring and High-Frequency Data Analysis

Course period: 12 to 17 June 2014 (6 days)
Course location: Erken Laboratory, EBC, Uppsala University, Sweden

Draft program schedule

Wednesday 11 June: arrival and informal mixer after 18.00

Thursday 12 June: Focus on Sensors

9:00 -9:30 Introduction to the Erken Laboratory (Kurt Pettersson)
Role of NETLAKE purpose of workshop (Eleanor Jennings)
Workshop Goals and Topics to be covered (Don Pierson)

9:30-10;30 What can be done with automated lake monitoring and examples of how data are used.
Lake Erken – Water temp and ice monitoring - (Don Pierson)
Lake Feeagh (Eleanor Jennings/ Liz Ryder)
Lake Võrtsjärv – Metabolism studies (Alo Laas)

10:30-11:00 Coffee break

11:00-12:00 Overview of New Erken Buoy (Niklas Strömbeck)

12:00-13:00 Lunch

13:00-14:30 Environmental measurement – from electrical signal to environmental data – (Don Pierson)
Types of signals voltage/current/resistance/frequency
- Introduction to Ohm's Law
- From signal to sensor some examples
- Sensing Physical variables

14:30-15:00 Coffee Break

15:00-17:00 Introduction to the YSI EXO Sonde (Niklas Strömbeck)
- Sensors
- Measurement and data storage
- Bio-fouling
- Calibration (including lab demo?)

17:00-18:00 Deploy Sonde from Erken dock for high frequency single depth measurements

18:00-19:00 Dinner

19:00-20:00 Participant presentations of their monitoring and how it could benefit from this course

Friday 13 June – Focus on Data Loggers

9:00-10:30 Introduction to data logger programming – Cambell loggers (Don Pierson)
Overview of data logger functions
- How to connect sensors to loggers
- Overview of programming software
- Programming measurements
- Storing data
- Using measurements to provide feedback to program
- Using data logger to control devices

10:30-11:00 Coffee break

11:00-12:00 Collection of YSI Sonde Down loading of data. (Niklas Strömbeck or other lab staff)

12:00-13:00 Lunch

13:00-14:00 Buoy detail winch control and programing (Niklas Strömbeck)

14:00- 18:00 Group project – Surface water heat flux measurements
- Build thermistor chain (12 sensors 3m)
- Develop logger program
- Bench test system
- Prepare system and buoy for deployment.

18:00-19:00 Dinner

19:00-20:00 Deploy surface temperature measurement system

Saturday 14 June – Deployment of Buoy (If needed, schedule adjusted to get best weather)

9:00 -12:00 Deployment of buoy
12:00-13:00 Lunch
13:00-18:00 Deployment and testing of buoy continued

18:00-19:00 Dinner

19:00-20:00 Participant presentations of their monitoring and how it could benefit from this course

Sunday 15 June – Focus on data analysis and processing

9:00-10:00 Water temperature processing at Lake Erken (Don Pierson)
- Suggested best practices
- Tools at your disposal – spreadsheets, application, custom programs

10:00 -10:30 Coffee break

11:00 12:00 Using R to process and understand automated monitoring data (Eleanor Jennings)

12:00-13:00 Lunch

13:00-14:00 Estimation of Lake Metabolism using automated monitoring data (Alo Laas)

14:00-14:30 Buoy detail telecomunications (Niklas Strömbeck)

15:00-18:00 Collection and processing of surface temperature and profiling buoy data.
Group 1 surface heat flux measurements
Group 2 profiling buoy data

18:00-19:00 Dinner

19:00-20:00 Participant presentations of their monitoring and how it could benefit from this course

Monday 16 June – Focus on data analysis and processing

9:00- 10:00 Use of B3 and other programmes to clean and quality control data sets (Liz Ryder)
10:00-10:30 Coffee Break

10:30 -12:00 Using Lake Analyzer with lake temperature profile data (Yang Yang & Eleanor Jennings)

12:00-13:00 Lunch

13:00-14:00 Processing Environmental Data with JMP (Anders Hasselrot?)

15:00-17:00 Processing of group data. Formation of groups discussion of strategy
Group 1 surface heat flux measurements
Group 2 profiling buoy data
Group 3 long term data records from Lake Erken
18:00-19:00 Dinner

19:00-20:00 Participant presentations of their monitoring and how it could benefit from this course

Tuesday 17 June – Focus on Data analysis and processing

9:00-12:00 Work on data processing in groups

12:00-13:00 Lunch

13:00-15:00 Complete group project and develop a presentation.

15:00- 16:00 Presentations of group projects

16:00-17:00 Planning of future data exchange, co-operation and future project applications

18:00-19:00 Barbeque and End of Course Party

Wednesday 18 June: Departure