

Course Outline & Registration: USING HYDROACOUSTICS FOR FISHERIES ASSESSMENT



This highly acclaimed 2-day short course has been presented worldwide by HTI for over 20 years. It covers mobile and fixed-location survey techniques, and subjects include basic hydroacoustic theory, deployment logistics, data collection and processing, and typical results. Split-beam, dual-beam, and single-beam techniques are discussed in detail, and examples from completed and ongoing projects are used throughout. Optional visits to selected hydroacoustic study sites are available.

The course is invaluable for those who oversee or are contemplating conducting hydroacoustic studies, but have limited training in using hydroacoustics to monitor fish. The course has been attended by biologists, engineers, managers, and technicians from local, national and international fisheries agencies, private consulting firms, public and private power producers, native tribal organizations, and regulatory agencies. A team of four HTI *Senior Scientists* conduct the course, each with 25 years experience using and teaching fisheries acoustics. A detailed, 400-page short course instruction manual is provided, along with publications and reports from representative case studies.

COURSE OUTLINE

1.0 Introduction to Hydroacoustics

- 1.1 Advantages and Limitations of Hydroacoustics
- 1.2 HTI's Hydroacoustic Rules

2.0 Basic Hydroacoustic Theory

3.0 Hydroacoustic Equipment

- 3.1 Acoustic Transducers
- 3.2 Echo Sounders
- 3.3 Output and Recording Devices
- 3.4 Multiplexers
- 3.5 Acoustic Signal Processors

4.0 Calibration of Hydroacoustic Equipment

- 4.1 The Sonar Equation
- 4.2 Laboratory Calibration Procedures
- 4.3 In-Situ Field Calibration Procedures

5.0 Mobile Survey Techniques for Lakes, Rivers, and Marine Environment

- 5.1 Equipment and Deployment
- 5.2 Survey Design
- 5.3 Transect Allocation
- 5.4 Data Processing for Mobile Surveys

6.0 Fixed-Location Techniques for Hydropower Dams

- 6.1 Equipment and Deployment
- 6.2 Horizontal and Vertical Distributions of Fish Passage
- 6.3 Temporal Distributions of Fish Passage (Diel and Seasonal)
- 6.4 Fish Size Estimation (Target Strength)
- 6.5 Absolute Fish Passage Numbers
- 6.6 Fish Velocity and Trajectory

7.0 Fixed-Location Techniques for Rivers

- 7.1 Equipment
- 7.2 Site Selection and Deployment
- 7.3 Fish Behavior
- 7.4 Data Processing for Fixed Riverine Surveys

8.0 Data Processing Methods

- 8.1 Single Beam Data Processing
- 8.2 Size Estimation using Direct *In Situ* Methods
- 8.3 Dual-Beam Data Processing
- 8.4 Split-Beam Data Processing
- 8.5 Target Tracking
- 8.6 Echo Counting
- 8.7 Echo Integration
- 8.8 Post-Processing Software Tools

9.0 Statistical Analysis

- 9.1 Mobile Surveys
- 9.2 Fixed Location Surveys

10.0 Potential Sources of Error

- 10.1 Assumptions in Weighting for Time and Space
- 10.2 Target Detectability
- 10.3 Acoustic Interference
- 10.4 Identification of Fish Species
- 10.5 Use of Non-Scientific Hydroacoustic Equipment

11.0 Mobile Survey Results

- 11.1 Lakes
- 11.2 Rivers
- 11.3 Marine Environment

12.0 Fixed-Location Results for Hydropower Dams

13.0 Fixed-Location Results for Rivers

14.0 Acoustic Tags and Three-Dimensional Tracking

15.0 Advanced Hydroacoustic Techniques

- 15.1 FM Slide/Chirp Signals
- 15.2 Identification of Fish Species
- 15.3 Monitoring Plankton
- 15.4 Guiding Fish with Hydroacoustics
- 15.5 Bottom Typing

16.0 Attendees Applications, Questions, and Discussion

REGISTRATION FORM

I wish to attend HTI's 2-day short course **USING HYDROACOUSTICS FOR FISHERIES ASSESSMENT**.

Check items appropriately below:

Please reserve one space for me in the **10-11 February 2011** course in Seattle, WA USA.

- I will be paying by credit card or credit card check.
 I will be paying by government purchase order.
 I will be paying by check.
- Tell me how I could have an acoustic tag short course brought to my location.
 I cannot attend at this time, but please keep me in mind for future acoustic tag short courses.

Tuition for the 2-day short course is US\$ 300, and includes lunches and the instruction manual. Attendance is limited, and is available on a first-come, first-served basis. To reserve space, contact Caroline Mercado at (206) 633-3383 or cmercado@HTIsonar.com, and either email or fax to (206) 633-5912 the form below. A detailed outline and schedule for the workshop will be forwarded to registrants.

Name: _____
Organization: _____
Address: _____

E-mail: _____
Telephone: _____
Fax: _____

Email, Fax or Mail to:
HTI - Hydroacoustic Technology, Inc.
Attn: Caroline Mercado
715 NE Northlake Way, Seattle, WA 98105 USA
Tel (206) 633-3383 Fax (206) 633-5912
cmercado@HTIsonar.com www.HTIsonar.com