

GREAT LAKES FISHERY COMMISSION

2001 Project Completion Report¹

Fishery Acoustics Technology Training Short Course

by:

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Ann Arbor, MI 48105-2807

September 2001

¹Project completion reports of Commission-sponsored research are made available to the Commission's Cooperators in the interest of rapid dissemination of information that may be useful in Great Lakes fishery management, research, or administration. The reader should be aware that project completion reports have not been through a peer review process and that sponsorship of the project by the Commission does not necessarily imply that the findings or conclusions are endorsed by the Commission.



United States Department of the Interior

U.S. GEOLOGICAL SURVEY

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November 13, 2001

Chris Goddard, Executive Secretary
Great Lakes Fishery Commission
Suite 209, 2100 Commonwealth Blvd.
Ann Arbor, MI 48105-1563

GLFC

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AD CO ES FB IS SL SS

Dear Dr. Goddard: *Chris*

On behalf of the Lake Michigan Technical Committee, I want to extend a large thank you for the Commission's support of the acoustics training short course. This course was conducted by professionals from BioSonics, Inc. and held at Sturgeon Bay, WI on 18-19 July 2001 in conjunction with the Lake Michigan Technical Committee meeting. This course was attended by a total of 21 participants from a variety of resource agency personnel and research partners. Feedback in the form of surveys revealed that the participants were very satisfied, in both the theory presented and in practical application.

As background, the Lake Michigan Technical Committee has recently developed a lake-wide assessment plan to apply acoustic assessment technologies and sampling designs to assess the status and trends of prey fish in Lake Michigan. Under this plan, the various agencies will conduct coordinated lake-wide acoustic surveys to quantitatively assess the status of the key, pelagic prey species. The plan was endorsed by the Lake Michigan Committee.

The opportunity to implement a lake wide acoustics survey was originally made possible by the granting of funds for acoustic equipment purchase by the Great Lakes Fishery Trust (Project #2000.1). With this acquisition, a coordinated, multi-agency approach will be realized by deployment of the acoustics gear from vessels specifically dedicated to this use from the Michigan Department of Natural Resources, the Wisconsin Department of Natural Resources, and the Illinois Department of Natural Resources in collaboration with USGS-Great Lakes Science Center vessels, as well as a commitment of manpower from these agencies and the Little Traverse Bay Band of Odawa Indians. Please note that the training the GLFC underwrote played a large part in the successful deployment and operation of the equipment by all participants in fall 2001.

In summary, based on the success of this initial course, the aforementioned feedback by the participants, and its immediate positive effect on this year's survey, I suggest this training be made available on a regular periodic basis and if practical, be expanded to include a wider group of interested participants in the Great Lakes.

Sincerely,

Guy W. Fleischer



PRINCIPALS OF UNDERWATER
ACOUSTICS: MOBILE SURVEYS
IN THE GREAT LAKES

Presented by BioSonics, Inc.
July 18-19, 2001
Sturgeon Bay, Wisconsin

SPONSORED BY
GREAT LAKES FISHERY COMMISSION
LAKE MICHIGAN COMMITTEE

AND ENDORSED BY THE

SULTANS
— OF —
PING

ACOUSTICS SHORT COURSE
Sturgeon Bay, WI 18-19 July 2001
Course Evaluation / Questionnaire

BioSonics® and the Great Lakes Fishery Commission would appreciate your completion of this questionnaire.

Evaluation:

Feel free to include brief comments or explanations.

1. Was there a good balance between the practical and theoretical? Yes No
FOR A SHORT COURSE SUCH AS THIS MORE PRACTICAL INFORMATION/APPLICATIONS WOULD BE MORE APPROPRIATE.
2. Did the presentations confuse you? Yes No
NOTES OR SHORT INSTRUCTIONS HIGHLIGHTING THE MAIN POINTS ON OPERATION OF THE PINGING GEAR AND ANALYSIS SOFTWARE WOULD BE HELPFUL
3. Based on what was presented in the course, do you feel comfortable with the technique? Yes No
4. Did you feel the course was well paced? Yes No

Questions:

What will your involvement with fishery acoustics be in the future? (e.g., doing surveys, managing and planning surveys, budget or project management)

CONDUCTING SURVEYS

What does / would make acoustics (more) attractive to your organization?

THIS PRICE OF A SYSTEM ~~IS~~ WILL MAKE PURCHASING A UNIT FOR OUR WORK UNIT VIRTUALLY IMPOSSIBLE; WE WILL HAVE TO RELY ON USING SOME OTHER ~~UNIT'S~~ AGENCY'S UNIT.

Would you be willing to take additional training?

POSSIBLY

Miscellaneous comments or suggestions:

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Evaluation:

Feel free to include brief comments or explanations.

1. Was there a good balance between the practical and theoretical? Yes No
2. Did the presentations confuse you? Yes No
3. Based on what was presented in the course, do you feel comfortable with the technique? Yes No
4. Did you feel the course was well paced? Yes No

Questions:

What will your involvement with fishery acoustics be in the future? (e.g., doing surveys, managing and planning surveys, budget or project management)

What does / would make acoustics (more) attractive to your organization?

Reduction in cost and better processing software.

Would you be willing to take additional training? *yes.*

Miscellaneous comments or suggestions:

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Evaluation:

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2. Did the presentations confuse you? Yes No
3. Based on what was presented in the course, do you feel comfortable with the technique? Yes No
4. Did you feel the course was well paced? Yes No

Questions:

What will your involvement with fishery acoustics be in the future? (e.g., doing surveys, managing and planning surveys, budget or project management)

Managing + planning; doing surveys

What does / would make acoustics (more) attractive to your organization?

speed; spatial coverage; flexibility

Would you be willing to take additional training? *YES!*

Miscellaneous comments or suggestions:

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Evaluation:

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2. Did the presentations confuse you? Yes No
3. Based on what was presented in the course, do you feel comfortable with the technique? Yes No
4. Did you feel the course was well paced? Yes No

Questions:

What will your involvement with fishery acoustics be in the future? (e.g., doing surveys, managing and planning surveys, budget or project management)

What does / would make acoustics (more) attractive to your organization?

Would you be willing to take additional training? *yes*

Miscellaneous comments or suggestions: *Really good*

*collecting our own data for use the next day
was good
It might be good to begin the second day with
quick demos of what can be done with the data
(i.e. change threshold, integration) along with
some interesting features - Then follow this
with the "formal" lectures - Then return to our
data as examples of different analyses
i. for discussion*

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Evaluation:

Feel free to include brief comments or explanations.

1. Was there a good balance between the practical and theoretical? Yes No
Maybe a little too much theoretical.
2. Did the presentations confuse you? Yes No
It would have been helpful to have a cheat sheet w/ short definitions of the equation abbreviations (greek letters, TS, SL, R, etc.)
3. Based on what was presented in the course, do you feel comfortable with the technique? Yes No
4. Did you feel the course was well paced? Yes No

Questions:

What will your involvement with fishery acoustics be in the future? (e.g., doing surveys, managing and planning surveys, budget or project management)

Conducting surveys

What does / would make acoustics (more) attractive to your organization?

It is cost prohibitive to buy a transducer - can equipment be rented?

Would you be willing to take additional training?

Yes

Miscellaneous comments or suggestions:

thanks!

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Evaluation:

Feel free to include brief comments or explanations.

1. Was there a good balance between the practical and theoretical? Yes No

2. Did the presentations confuse you? Yes No

3. Based on what was presented in the course, do you feel comfortable with the technique? Yes No

IT'S TOO TECHNICAL TO LEARN IN THAT
SHORT TIME.

4. Did you feel the course was well paced? Yes No

Questions:

What will your involvement with fishery acoustics be in the future? (e.g., doing surveys, managing and planning surveys, budget or project management)

SURVEYS

What does / would make acoustics (more) attractive to your organization?

Would you be willing to take additional training?

YES

Miscellaneous comments or suggestions:

GOOD COURSE

WELL WORTH ATTENDING.

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Evaluation:

Feel free to include brief comments or explanations.

1. Was there a good balance between the practical and theoretical? Yes No

Good amount on hands on how it works with knowing why it works.

2. Did the presentations confuse you? Yes No

3. Based on what was presented in the course, do you feel comfortable with the technique? Yes No

4. Did you feel the course was well paced? Yes No

Questions:

What will your involvement with fishery acoustics be in the future? (e.g., doing surveys, managing and planning surveys, budget or project management)

Most likely I will be collecting field data as part of the lake wide survey

What does / would make acoustics (more) attractive to your organization?

Ability to use equipment on inland lakes

Would you be willing to take additional training?

yes

Miscellaneous comments or suggestions:

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Evaluation:

Feel free to include brief comments or explanations.

1. Was there a good balance between the practical and theoretical? Yes No
2. Did the presentations confuse you? Yes No
3. Based on what was presented in the course, do you feel comfortable with the technique? Yes No
4. Did you feel the course was well paced? Yes No

Questions:

What will your involvement with fishery acoustics be in the future? (e.g., doing surveys, managing and planning surveys, budget or project management)

Bottom mapping, forage assessment surveys, Lake trout Spawning Reef Distribution & abundance Surveys.

What does / would make acoustics (more) attractive to your organization?

Ease of use, technical support.

Would you be willing to take additional training?

yes.

Miscellaneous comments or suggestions:

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Evaluation:

Feel free to include brief comments or explanations.

1. Was there a good balance between the practical and theoretical? Yes No
Jim did a good job with the time allotted, especially trying to give us a quick and dirty review of the mathematics and calculations being done internally.
2. Did the presentations confuse you? Yes No
- However, I wish there was more time to spend on data interpretation!
3. Based on what was presented in the course, do you feel comfortable with the technique? Yes No
Collecting data - yes
Interpretation - Not really - And - what do all the report output mean?
4. Did you feel the course was well paced? Yes No
There was a lot of info covered for just 2 days!

Questions:

What will your involvement with fishery acoustics be in the future? (e.g., doing surveys, managing and planning surveys, budget or project management)

WE ARE INTERESTED IN ASSISTING w/ the Northern Lk. Mi Fall Run. In addition, as nothing is being done in GT Bay, we may try to design a study which incorporates Hydro-A. for determining whitefish distribution + movement.

What does / would make acoustics (more) attractive to your organization?
Incorporating Hydro-A. into an over all study or long term study plan of Grand Traverse Bay.

Would you be willing to take additional training?

YES - especially in data interpretation! How to generate reports and what they mean.

Miscellaneous comments or suggestions:

Thanks for offering this type of training, as most of us have not been exposed to it in our everyday activities - so far!

Thank you - Guy, Jim, GLFC

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2. Did the presentations confuse you? Yes No
3. Based on what was presented in the course, do you feel comfortable with the technique? Yes No
4. Did you feel the course was well paced? Yes No

Questions:

What will your involvement with fishery acoustics be in the future? (e.g., doing surveys, managing and planning surveys, budget or project management)

PROJECT MANAGEMENT, ASSESSING FUTURE RESEARCH PROJECTS,
IMPLEMENTATION INTO FUTURE ASSESSMENT ACTIVITIES

What does / would make acoustics (more) attractive to your organization?

CONTINUED DEMONSTRATIONS OF ITS EFFECTIVENESS TO SAMPLE LARGE
VOLUME OF WATER COLUMN; VERSATILITY OF ~~ITS~~ CAPABILITY TO SAMPLE
~~A~~ VARIETY OF ORGANISMS & SUBSTRATE — COST EFFECTIVENESS

Would you be willing to take additional training?

YES; BUT MAY NOT BE NECESSARY FOR MY PARTICULAR NEEDS.

Miscellaneous comments or suggestions:

WELL ORGANIZED & EXCELLENT STRUCTURE TO COURSE
PRESENTERS DID EXCELLENT JOB PRESENTING COMPLEX MATERIAL

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Evaluation:

Feel free to include brief comments or explanations.

1. Was there a good balance between the practical and theoretical? Yes No

2. Did the presentations confuse you? Yes No

As always - acoustics at the basic level is basically confusing. Instructors did a decent job of trying to explain it, however

3. Based on what was presented in the course, do you feel comfortable with the technique? Yes No

4. Did you feel the course was well paced? Yes No

Questions:

What will your involvement with fishery acoustics be in the future? (e.g., doing surveys, managing and planning surveys, budget or project management)

Surveys, possibly long-term monitoring - both of fish & invertebrates
Possibly aquatic vegetation + substrates

What does / would make acoustics (more) attractive to your organization?

Large systems-acoustics practically only tool for working on pelagic systems.

Would you be willing to take additional training?

Yes, in some other applications

Miscellaneous comments or suggestions:

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Evaluation:

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1. Was there a good balance between the practical and theoretical? Yes No
2. Did the presentations confuse you? Yes No
3. Based on what was presented in the course, do you feel comfortable with the technique? Yes No
4. Did you feel the course was well paced? Yes No

Questions:

What will your involvement with fishery acoustics be in the future? (e.g., doing surveys, managing and planning surveys, budget or project management)

Doing Surveys

What does / would make acoustics (more) attractive to your organization?

Cheaper Price, examples of successful surveys (maybe shown on video), or the water demos. that can be sent to an office for others to see.

Would you be willing to take additional training?

Yes

Miscellaneous comments or suggestions:

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1. Was there a good balance between the practical and theoretical? Yes No
2. Did the presentations confuse you? Yes No
3. Based on what was presented in the course, do you feel comfortable with the technique? Yes No
4. Did you feel the course was well paced? Yes No

Questions:

What will your involvement with fishery acoustics be in the future? (e.g., doing surveys, managing and planning surveys, budget or project management)

Budget and project management

What does / would make acoustics (more) attractive to your organization?

Research verifying fish counts or biomass estimates using other, more traditional methods, such as mark-

Would you be willing to take additional training?

yes

and-recapture methods. Also, improved ability to distinguish species.

Miscellaneous comments or suggestions:

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Evaluation:

Feel free to include brief comments or explanations.

1. Was there a good balance between the practical and theoretical? Yes No

2. Did the presentations confuse you? Yes No

I was not confused, instead just a bit overwhelmed with a few Greek symbols and equations

3. Based on what was presented in the course, do you feel comfortable with the technique? Yes No

4. Did you feel the course was well paced? Yes No

Questions:

What will your involvement with fishery acoustics be in the future? (e.g., doing surveys, managing and planning surveys, budget or project management)

purchase of equipment; ^{project management} planning surveys; analyzing data; data synthesis & report preparation

What does / would make acoustics (more) attractive to your organization?

lower cost hardware systems

Would you be willing to take additional training?

yes

Miscellaneous comments or suggestions:

Jim Dawson is very knowledgeable, and presented the theory in a concise, understandable manner. The time aboard the R/V was a great way to gain experience operating the DT system.

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1. Was there a good balance between the practical and theoretical? Yes No

2. Did the presentations confuse you? Yes No

WHEN DIAGRAMS WERE NOT USED, PRESENTATIONS BECAME CONFUSING

3. Based on what was presented in the course, do you feel comfortable with the technique? Yes No

DATA COLLECTION - YES

DATA INTERPRETATION - NO

4. Did you feel the course was well paced? Yes No

Questions:

What will your involvement with fishery acoustics be in the future? (e.g., doing surveys, managing and planning surveys, budget or project management)

DOING SURVEYS

What does / would make acoustics (more) attractive to your organization?

Would you be willing to take additional training?

DEPENDING ON MY PARTICIPATION WITH THE PROJECT. THE MORE I'M INVOLVED THE MORE I'D WANT UNDERSTANDING

Miscellaneous comments or suggestions:

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Evaluation:

Feel free to include brief comments or explanations.

1. Was there a good balance between the practical and theoretical? Yes No

2. Did the presentations confuse you?

Yes No

Sometimes - but generally I think I followed along pretty well.

3. Based on what was presented in the course, do you feel comfortable with the technique? Yes No

I've gained some minimal understanding of the principles but feel like I need further experience and probably additional training.

4. Did you feel the course was well paced? Yes No

I have a better understanding of how hard it is to cram all the necessary info. into a short course.

Questions:

What will your involvement with fishery acoustics be in the future? (e.g., doing surveys, managing and planning surveys, budget or project management)

I will be involved in planning and conducting fishery surveys and also bottom and plant surveys as well.

What does / would make acoustics (more) attractive to your organization?

Acoustics are attractive in the ability to produce real biomass estimates and also the potential to characterize bottom and plants.

Would you be willing to take additional training?

I think it will be imperative.

Miscellaneous comments or suggestions:

The biosonics instructors (Tim and Colleen) did a great job - especially under the circumstances - lost luggage, etc.