

# **Deployment of an acoustic data logger on commercial fishing vessels to evaluate the potential of fishing-induced declines in local pollock abundance**

Terry Quinn, University of Alaska  
Vidar Wespestad, Pacific Whiting Conservation Cooperative  
Martin Dorn, Alaska Fisheries Science Center  
James Ianelli, Alaska Fisheries Science Center

## **ANNUAL REPORT**

### **Original Project Overview**

A “proof of concept” project is proposed to evaluate the feasibility of installing acoustic data loggers on catcher/processors in the EBS pollock fishery to study localized depletion of pollock. The project will develop a prototype data logger that will interface with the ship’s 38 kHz echo sounder and capture the acoustic backscatter returns. For the proof of concept phase of the project, our objective is to develop the logger system and install the system on three catcher/processors. The system will be tested for logging the acoustic backscatter onboard the vessel during the 2001 B and 2002 A seasons for walleye pollock in the Eastern Bering Sea. The backscatter data will post-processed, and integrated with observer and logbook data. A preliminary analysis will be conducted, including classifying the searching behavior of the vessel, identifying pollock aggregations detected while searching, and evaluating what inferences, if any, can be made concerning the rate at which those aggregations are reduced in abundance. Successful implementation of the proof of concept project will provide the basis for a second phase in which the system will be installed on multiple fishing vessels, and development of more sophisticated analytical tools for inferring the temporal dynamics of pollock spatial pattern using multiple data sources.

### **Project Objectives for Year 1**

1. Install new equipment and upgrades on test vessels
2. Calibrate systems among vessels
3. Develop data storage and retrieval protocols
4. Test post processing quality of data.

### **Year 1 Accomplishments**

This project was approved for partial funding in January, 2001, contingent on the P.I.’s finding an alternate source of funding for the equipment related to the project. The apparent reason for not funding the equipment was because it was unclear who would own the equipment. We were able to find funding for equipment from a NMFS cooperative technology research fund from which the Alaska Fisheries Science Center (AFSC) had \$50,000 available for use when the funds were released. As of early January

2002, the funds have just been released, and we are working with Bill Karp and Martin Dorn of the AFSC to proceed as effectively as possible. Therefore, most of our work in year one was devoted to obtaining equipment funding and exploring alternative methods of data collection. The delay in equipment funding has meant that our timeline for the project has also been delayed, and therefore, we have submitted a proposal for extension of this project into 2002.

As an interim step, we identified three vessels that would need minimum expenditures to initiate data collection. These were the *Island Enterprise*, *Kodiak Enterprise*, and *Alaska Ocean*. These vessels have Simrad ES60 sounders, which have the capability to store downloadable echo sounder data. The plan was to install some software upgrades and a data storage device on these machines. We attempted to do the installations in mid December, and discovered that the systems did not have the required operating systems and all needed upgrades. In the case of the *Alaska Ocean*, the ES 60 computer was too old to be compatible with the data storage device and needs a computer upgrade. It would be beneficial to do the same on the other 2 boats. The total cost would be about \$12,000 to \$13,000.

At the time of writing this report, January 2, 2001, we have just obtained the additional funds for the computer upgrades. The acoustic equipment is available and will be installed this month if all goes well. We are hopeful that the installation can take place without any problems and be tested on the 3 vessels before they sail for the 2002 fishery in late January. It is fairly common to have to deal with glitches with high-tech equipment. Fortunately, the solutions in this case are simple and inexpensive.

#### International Collaboration:

Dr. Ian Higgenbottom, Echoview, Pty, Hobart, Australia has been interested in this project since its conception and has expressed interest in possible active collaboration when the project reaches the stage of developing analytical tools for viewing analysis of collected data.

We have also had enquiries from the Norwegian Institute of Marine Research and from researchers in New Zealand about how we were establishing our data collection. These institutions are starting similar programs and want to establish similar protocols.

#### Graduate Student

Because of the delays in obtaining equipment, we have put off the hiring of a graduate student until Quinn returns from sabbatical leave in May. Presuming that these equipment issues are resolved, we believe it would be possible to hire a student in Summer, 2002. Because the 1<sup>st</sup> year of the proposal only had one month of student funding, the ability to hire a student will require approval of the 2<sup>nd</sup> year budget for this proposal. We also request that PCC consider committing at least two years of funding for a student, so that we can attract a high-quality student. If the student funding is only for one year, it may not be wise or even possible to find a suitable student.

Papers:

We intend to present the following paper at ICES International Acoustics Symposium, Montpellier, France, June 2002:

Dorn, M. W. Karp, J. Ianelli, T. Quinn, and V. Wespestad. Using fishing vessels to collect acoustic data for scientific purposes: preliminary results from midwater trawlers in the Eastern Bering Sea walleye pollock fishery.



# **Deployment of an acoustic data logger on commercial fishing vessels to evaluate the potential of fishing-induced declines in local pollock abundance**

Terry Quinn, University of Alaska  
Vidar Weststad, Pacific Whiting Conservation Cooperative  
Martin Dorn, Alaska Fisheries Science Center  
James Ianelli, Alaska Fisheries Science Center

## **ANNUAL REPORT**

### **Original Project Overview**

A “proof of concept” project is proposed to evaluate the feasibility of installing acoustic data loggers on catcher/processors in the EBS pollock fishery to study localized depletion of pollock. The project will develop a prototype data logger that will interface with the ship’s 38 kHz echo sounder and capture the acoustic backscatter returns. For the proof of concept phase of the project, our objective is to develop the logger system and install the system on three catcher/processors. The system will be tested for logging the acoustic backscatter onboard the vessel during the 2001 B and 2002 A seasons for walleye pollock in the Eastern Bering Sea. The backscatter data will post-processed, and integrated with observer and logbook data. A preliminary analysis will be conducted, including classifying the searching behavior of the vessel, identifying pollock aggregations detected while searching, and evaluating what inferences, if any, can be made concerning the rate at which those aggregations are reduced in abundance. Successful implementation of the proof of concept project will provide the basis for a second phase in which the system will be installed on multiple fishing vessels, and development of more sophisticated analytical tools for inferring the temporal dynamics of pollock spatial pattern using multiple data sources.

### **Project Objectives for Year 1**

1. Install new equipment and upgrades on test vessels
2. Calibrate systems among vessels
3. Develop data storage and retrieval protocols
4. Test post processing quality of data.

### **Year 1 Accomplishments**

This project was approved for partial funding in January, 2001, contingent on the P.I.’s finding an alternate source of funding for the equipment related to the project. The apparent reason for not funding the equipment was because it was unclear who would own the equipment. We were able to find funding for equipment from a NMFS cooperative technology research fund from which the Alaska Fisheries Science Center (AFSC) had \$50,000 available for use when the funds were released. As of early January

2002, the funds have just been released, and we are working with Bill Karp and Martin Dorn of the AFSC to proceed as effectively as possible. Therefore, most of our work in year one was devoted to obtaining equipment funding and exploring alternative methods of data collection. The delay in equipment funding has meant that our timeline for the project has also been delayed, and therefore, we have submitted a proposal for extension of this project into 2002.

As an interim step, we identified three vessels that would need minimum expenditures to initiate data collection. These were the *Island Enterprise*, *Kodiak Enterprise*, and *Alaska Ocean*. These vessels have Simrad ES60 sounders, which have the capability to store downloadable echo sounder data. The plan was to install some software upgrades and a data storage device on these machines. We attempted to do the installations in mid December, and discovered that the systems did not have the required operating systems and all needed upgrades. In the case of the *Alaska Ocean*, the ES 60 computer was too old to be compatible with the data storage device and needs a computer upgrade. It would be beneficial to do the same on the other 2 boats. The total cost would be about \$12,000 to \$13,000.

At the time of writing this report, January 2, 2001, we have just obtained the additional funds for the computer upgrades. The acoustic equipment is available and will be installed this month if all goes well. We are hopeful that the installation can take place without any problems and be tested on the 3 vessels before they sail for the 2002 fishery in late January. It is fairly common to have to deal with glitches with high-tech equipment. Fortunately, the solutions in this case are simple and inexpensive.

#### International Collaboration:

Dr. Ian Higgenbottom, Echoview, Pty, Hobart, Australia has been interested in this project since its conception and has expressed interest in possible active collaboration when the project reaches the stage of developing analytical tools for viewing analysis of collected data.

We have also had enquiries from the Norwegian Institute of Marine Research and from researchers in New Zealand about how we were establishing our data collection. These institutions are starting similar programs and want to establish similar protocols.

#### Graduate Student

Because of the delays in obtaining equipment, we have put off the hiring of a graduate student until Quinn returns from sabbatical leave in May. Presuming that these equipment issues are resolved, we believe it would be possible to hire a student in Summer, 2002. Because the 1<sup>st</sup> year of the proposal only had one month of student funding, the ability to hire a student will require approval of the 2<sup>nd</sup> year budget for this proposal. We also request that PCC consider committing at least two years of funding for a student, so that we can attract a high-quality student. If the student funding is only for one year, it may not be wise or even possible to find a suitable student.

Papers:

We intend to present the following paper at ICES International Acoustics Symposium, Montpellier, France, June 2002:

Dorn, M. W. Karp, J. Ianelli, T. Quinn, and V. Wespestad. Using fishing vessels to collect acoustic data for scientific purposes: preliminary results from midwater trawlers in the Eastern Bering Sea walleye pollock fishery.

