

REPORT OF ADVISORY PANEL ON MICRONEKTON SAMPLING INTERCALIBRATION EXPERIMENT

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The meeting/workshop of the Advisory Panel on *Micronekton sampling inter-calibration experiment* (MIE-AP) was held from 09:00-15:30 hours on October 14, 2004, and brought together the Advisory Panel members and the participants on the first MIE cruise conducted off Hawaii (*MIE-AP Endnote 1*). After the opening of the meeting by Dr. Michael P. Seki, MIE-AP Co-Chairman, and short introductions by attendees, a background overview of MIE-AP and review of the project to date ensued. The discussion then focused on the activities, preliminary results, lessons learned from the cruise and next steps (*MIE-AP Endnote 2*).

Meeting/workshop summary

The MIE-AP was established at PICES XI (2002) to evaluate the efficacy of sampling gears and the procedures employed by different investigators to sample micronekton in the North Pacific and other parts of the world's oceans (*MIE-AP Endnote 3*). An initial field effort involved an 8-day (October 6-13, 2004) research cruise in Hawaiian waters just prior to PICES XIII, herein referred to as MIE-I. This cruise served two purposes: (1) to compare the performances of different types of sampling gears in an oligotrophic subtropical gyre area to see how the choice of gear affects our perspective of the micronekton community; and (2) to use the relatively benign weather and sea conditions to evaluate and refine the protocols, logistics and design of the sampling. The workshop reviewed preliminary data and findings from the cruise, and the MIE-AP meeting that followed discussed the goals, objectives and status of the future field program.

MIE-I was conducted aboard the NOAA ship *Oscar Elton Sette* in Central North Pacific waters off the west side of Oahu Island. Participants on the cruise included: Michael P. Seki (Chief Scientist), Richard D. Brodeur,

Daniel Curran, Reka Domokos and Donald Hawn (U.S.A.); Douglas Yelland, Evgeny Pakhomov and Larissa Pakhomova (Canada); Masayuki Abe and Hiroki Yasuma (Japan); and Andrei Suntsov (Russia).

Three gear-types were employed in the comparison: a dual trawl warp 140 m² Stauffer modified Cobb trawl, the single warp 1.8 m Isaacs-Kidd mid-water trawl, and the single warp 2 m variety of Hokkaido University's Rectangular Frame trawl. During all tows, acoustic backscatter was monitored and data recorded with a Simrad EK-60 echosounder equipped with 38 kHz and 120 kHz transducers. For daytime tows, trawls were dropped to the target depth (550 m) and towed horizontally for 1 hour (contamination by animals in the catch on the ascent and descent to depth was assumed to be minimal). For nighttime tows, trawls were dropped to the desired depth as defined by acoustic scattering (*ca.* 120 m), and retrieved obliquely through the water column for a 1-hour duration, and the tow ending with the net at the surface. Since only a fraction of the sound scattering layer (SSL) was observed to migrate to shallow waters at night, a series of tows were also conducted at depth (*ca.* 550 m) during the night, to acquire information of the non-migrants and composition of the SSL with respect to acoustic measurements. The real-time net depths during the tows were monitored with a Northstar NETMIND net mensuration system.

A variety of topics were addressed during discussion, and some of the highlights and recommendations follow.

Lessons learned from MIE-I

- The Panel deemed that it was important to note that MIE-I was accomplished without financial support; all support for the successful execution of the cruise was furnished by the participating agencies.

- The cruise was fortunate to have had specialists for each faunal group among the participating scientific field party. When planning future cruises, having this expertise is strongly recommended and needs to be considered at the planning stages.
- The leads for various aspects of the cruise data (*e.g.*, biological specimen detailed processing – species identification and measurements for faunal groups) were identified. These include fishes (Suntsov), crustaceans (Pakhomov), cephalopods (Seki), and acoustics (Yelland).
- Preliminary analysis from MIE-I indicated that individual gears sampled different, often non-overlapping, size groups of plankton and micronekton. It points out that successful inter-comparison during future cruises requires a closer scrutiny of gear-types and net mesh sizes prior the experiment.
- The Panel agreed that “what one defines as micronekton may not be the same definition as someone else”. MIE-I planning encouraged participants to bring their micronekton sampling gear which resulted in a range of mesh sizes and abilities to sample. On the positive side, the ability of the cumulative gears to sample the full range from mesozooplankton to micronekton enhanced the ability to interpret the data acquired from the multiple acoustic frequencies.
- The Panel suggested the adoption of a “standard” sampling gear (*e.g.*, RMT 1+8 or a 3-m IKMT) and mesh sizes to allow and guide comparisons for future efforts. For higher acoustic frequencies, a towed transducer to access the deeper depths was recommended.

Plans for MIE-II

- Based on the success and preliminary findings of the first cruise, MIE-AP recommended conducting a second experiment within the subarctic North Pacific using a larger variety of micronektonic sampling gears. This cruise is tentatively planned for the summer of 2005 or 2006, depending on ship time availability, in the Bering Sea (or possibly

the Gulf of Alaska or the western North Pacific). This leg will sample a much more productive regime and a faunal community of great interest to many in the PICES member countries. Upon completion, an unprecedented attempt should be made to compare the performance of gears within and between the contrasting environments. This will highlight the MIE-AP effort.

- Dr. Orio Yamamura has requested shiptime aboard the Japan Fisheries Agency research ship *Kaiyo Maru* for conducting MIE-II during the summer of 2005. A decision is expected by the end of the current calendar year on whether the ship time will be awarded.
- The Panel suggested exploring the possibility of joining one of the BASIS cruises to the Bering Sea to accommodate the MIE-II sampling.
- The Panel also recommended pursuing shiptime aboard the NOAA ships *Oscar Dyson* or *Miller Freeman* or Hokkaido University research vessel *Oshoro Maru*. Since most of the sailing schedules for these ships are already set for 2005, any cruise aboard these ships would target the summer of 2006.
- The Advisory Panel discussed using large opening/closing type nets such as the RMT1+8 and the 4 m² MOCNESS, or some other similar gear so that vertically stratified tows can be made during MIE-II.

Publications

- A brief report on MIE-AP activities will be published in the next issue of PICES Press (January 2005).
- A data report containing the detailed processed results from MIE-I will be prepared and a draft completed in time for review at PICES XIV (Vladivostok, Russia). Dr. Seki will take the lead in compiling the information from all contributors. The targeted outlet will be the PICES Scientific Report Series.
- Several formal publications will evolve from MIE-I, but until the detailed processing is completed, a timetable for primary products is very difficult to assemble and will be deferred until better assessment of processing

requirements can be accomplished. This will be revisited at PICES XIV.

Proposals

- Another attempt will be made at obtaining financial support for MIE activities from the North Pacific Research Board through the 2004-05 request for proposals process. Dr. Pakhomov will take the lead in preparing the proposal package seeking support for MIE-II either in the summer of 2005 or 2006, depending on platform availability.

MIE-AP Endnote 1

Participation List

Members

Richard D. Brodeur (U.S.A.)
Kazushi Miyashita (Japan)
Evgeny A. Pakhomov (Canada, Co-Chairman)
Vadim Savinykh (Russia)
Michael P. Seki (U.S.A., Co-Chairman))

Observers

Masayuki Abe (Japan)
Reka Domokos (U.S.A.)
R. Ian Perry (Science Board Chairman)
Andrei Suntsov (Russia)
Hiroki Yasuma (Japan)
Douglas Yelland (Canada)

MIE-AP Endnote 2

Workshop Agenda

1. Welcome and introductions
2. Background and Terms of Reference for the Advisory Panel on *Micronekton sampling gear inter-calibration experiment*
3. Review of cruise activities, sampling, and status of the data and analysis
4. Discussion on the second MIE-AP cruise logistics, including possible platform(s), dates, participants, region of experiment, sampling gears, sampling protocols, sample analysis and disposition
5. Status of financial support status including discussion of scenarios in the absence of funding
6. Summary wrap-up and report write-up

MIE-AP Endnote 3

Terms of Reference for Advisory Panel on *Micronekton sampling inter-calibration experiment*

1. Develop a proposal for a micronekton sampling inter-calibration experiment, arising from the work of PICES WG 14 on *Effective sampling of micronekton*. Advise on appropriate locations as well as identify micronekton sampling gears and other quantifying technologies for inclusion in the inter-calibration experiment.
2. Facilitate the experiment by identifying and securing commitments for resources (personnel and ships) to ensure success of the experiment; provide technical advice in development of sampling protocols and experimental design.
3. Oversee post-survey analysis of samples and data; provide guidance in preparation of results for final report and publication(s).