

REPORT ON SCOR WORKING GROUP 21  
CONTINUOUS CURRENT VELOCITY MEASUREMENTS  
MEETING IN MOSCOW, 5, 7 and 9 AUGUST 1971

Working Group 21 met three times during the XV Assembly of the IUGG in Moscow. All members of the group were present for the first two days, and were joined by Dr. E. Francke from Warnemunde. Discussions were based on the following recommendation of the SCOR Executive Committee:

"... the group should consider how to complete and publish the results of the 1970 intercomparison experiment and should examine the need for further intercomparison of the Alexeev and Geodyne meters. The views of the group were also desired on the problem of undertaking intercomparisons of current meters in shallow water, of evaluating new types of current meters as they became available, and of interrelating WG 21 activities with those of WG 34."

The following conclusions were reached:

1. Completion of the report on the 1970 intercomparison experiment. Amendments to a draft version circulated by Dr. Webster in July 1971 were agreed, and, although some work on coherences remains to be done, no difficulties are foreseen in producing a final version in the near future.
2. The need for a further intercomparison. Two discrepancies revealed by the 1970 intercomparison remain unexplained. These are in the incremental responses to speed changes (that of the Alexeev being relatively high) and in the spectral energy levels at high frequency (that of the LSK being relatively low). The group agreed that there is an urgent need to clarify these discrepancies and unanimously supported Dr. Fofonoff's proposal that Alexeev, Geodyne and LSK meters should be compared on surface and subsurface moorings during a cruise from Woods Hole in May-June 1972. (Further support for this experiment is given in the appendix.)
3. Intercomparison of current meters in shallow water. It was recognized that the intercomparisons made and proposed by WG 21 were limited to deep water, and that further problems might arise in continental shelf depths and close to coasts. But the members of the group had little relevant experience, and thought that users of current meters in shallow water could better judge for themselves what was needed.
4. Evaluation of new types of current meters. The group's view was that users should in their own interests evaluate new instruments themselves. WG 21 had not attempted to evaluate all kinds of current meters and considered that its terms of reference will have been met by the completion of the proposed third intercomparison.
5. Interrelation of WG 21 activities with those of WG 34. Members of WG 21 expressed interest in problems of planning large array experiments, and any or all of the members would be willing to serve on a SCOR working group for that purpose, if required. It was recognized, however, that the range of experience within WG 21 was limited and that other specialists would doubtless be needed.

Appendix to WG 21 Report

Further support for the proposed intercomparison experiment is given in the following paragraphs from the draft report on the 1970 experiment:

"Conclusion 3. The agreement in estimates of mean velocities (noted in conclusion 2) is, however, largely fortuitous. The plots of speeds of paired instruments show that the incremental response in, for example, AK14 (Geodyne) was approximately half that of AK15 (Alexeev). A discrepancy in the same sense between other instruments and the Alexeev is less clearly indicated, due to lack of low speeds. Observed differences in vector variance and in spectral

distribution of kinetic energy are partly due to this unexplained discrepancy in speed response.

Conclusion 5. The relatively low estimates of energy density at high frequencies given by the LSK records seem unlikely to be wholly due to the response characteristics of the instrument or to smoothing during processing. The energy level corresponding to the speed digitizing interval in the curve follower used for reading the LSK records is at least an order of magnitude below the observed minimum values. One might speculate that the LSK was exposed to a lower amplitude of high frequency fluctuations due to its manner of mounting directly on the mooring line instead of being offset on a bracket, but we have no positive evidence of this and the effect remains unexplained.

Recommendation 1. Another intercomparison should be designed to resolve the discrepancies mentioned in conclusions 3 and 5 above. Comparison should be made on both surface and subsurface moorings and instruments should preferably be mounted in the manner in which they are most commonly used. Not all the types of instrument used in the 1970 experiment need be involved; it would be sufficient if Alexeev, LSK and Geodyne were used."

ANNEX V

REPORT ON SCOR WORKING GROUP 27  
TIDES OF THE OPEN SEA  
MEETING IN VENICE, 18-19 OCTOBER 1971

All members were present except Capurro, Eyries and Horn; Drs. J.L. Hyacinthe and F. Schott attended as observers. Dr. Cartwright served as secretary for the meeting.

1. Review of recent documents

The Chairman read out the following items, and recommended that they be reproduced in the minutes.

1.1 From SCOR Proceedings, Volume 7 (September 1971), p. 21, re WG 27

Terms of Reference: To encourage and assist with the design of instruments for measuring tides on the continental shelf and in the deep sea; to establish criteria concerning precision, sampling times and related considerations; to coordinate the observational programs and ultimately to bring about some uniform analyses of the deep sea data.

Members: Nominated by IAPSO: W.H. Munk, USA (Chairman);  
L.R.A. Capurro, Argentina; G.C. Dohler, Canada.

Nominated by SCOR: D.E. Cartwright, UK; J.R. Radok,  
Australia; T. Teramoto, Japan.

Nominated by UNESCO: W. Hansen, FRG; M. Eyries,  
France; S.S. Voit, USSR; W. Horn, FRG.

1.2 From SCOR Proceedings, Volume 6.2 (December 1970), pp. 72-73, Report on WG 27

There have been no formal meetings for the last two years, but the time may be ripe for a new review.

Theoretical efforts to compute the global tides by Pekeris in Israel, Hendershott in the United States, and Zehel in Germany have made considerable progress. I have not learned of the recent results in the Soviet Union where similar work is underway. It is my impression that a meaningful comparison between deep-sea calculations and deep-sea measurements is only a short time away. The boundary dissipation problem has not been solved, but it now looks as if the total energy in the oceans is rather larger than had been estimated; so the relative dissipation