

PREFACE

THE FIRST INTERNATIONAL CONFERENCE ON THE OCEAN OBSERVING SYSTEM FOR CLIMATE

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1 - INTRODUCTION

The Ocean Observations Panel for Climate (OOPC¹) and the World Climate Research Program's Climate Variability and Predictability Programme (CLIVAR) Upper Ocean Panel (UOP) jointly convened this First International Conference on the Ocean Observing System for Climate (OceanObs 99). The sponsors include all the relevant intergovernmental bodies and the leading national agencies involved with gathering and processing ocean data. The Conference is timely from the research and operational program point of view, and timely in terms of the developing commitment of nations to ocean observing systems.

The mission of the Conference is to define the optimum mix of measurements needed to meet the relevant goals of CLIVAR, the Global Ocean Observing System (GOOS) and the Climate Observing System (GCOS). While the primary focus is climate, due consideration is also given to relevant physical observations for operational oceanography and marine forecasting.

2 - BACKGROUND AND OBJECTIVES

2.1 - Why OceanObs 99?

OceanObs 99 is a Conference for all those with an interest in ocean observations and climate. Its audience includes those with technical and scientific interests in ocean observing systems as well as the community with an interest in analyzing, modeling and assimilating such data. There are many distinctive characteristics but perhaps the most important is that it focuses on *sustained observations*, be they for research or on-going applications (operational). This does not mean that we do not care about process-oriented observations, or new methods, but that for the first Conference a decision has been made to restrict our attention to established and proven approaches.

¹ The OOPC is sponsored by the Global Climate Observing System, the Global Ocean Observing System, and the World Climate Research Programme.

The Conference papers contained in Volumes I and II of the Proceedings review current scientific climate program priorities, and existing and planned operational efforts that address the priorities of GOOS and GCOS. Specifically, with the assistance of these papers, we aim to:

- (i) Build consensus on the blend of methods and their uses and value;
- (ii) Build an appreciation for how each component contributes and how the system considered as a single entity works;
- (iii) Document the techniques, the investment in particular elements, and the way data are used for research and routine applications; and
- (iv) Build the foundations for a new era in oceanography, one where research and operational systems are mutually supportive and beneficial, and one where the rapid and wide distribution of information (data, methods and products) is accepted as the preferred *modus operandi*. A new paradigm for oceanography.

The papers in these two volumes represent a substantial contribution toward these goals, particular toward (iii). To the extent that participants will read all the papers prior to the Conference, we will also have a substantial contribution to (ii). We will comment further on (i) and (iv) later.

The emphasis on useful products means that the Conference *is not* a forum for all topics related to oceanographic observation but will focus on those contributions that are regarded as fundamental and/or essential to the long-term prosperity of the ocean observing system for climate. The scientific objectives follow those of the Ocean Observing System Development Panel Report

<http://www.ocean.tamu.edu/OOSDP/oosdp.html>

and the CLIVAR Implementation Plan

<http://www.dkrz.de/clivar/hp.html>.

The objectives of GODAE are used as guidance for those observing elements with relevance beyond climate:

<http://WWW.BoM.GOV.AU/bmrc/mrlr/nrs/oopc/godae/homepage.html>.

2.2 - Consensus

What do we mean by forming a consensus in 2.1 (i)? Clearly, we do not have the luxury of time to work through all the distinct parts and construct a comprehensive, detailed forward plan. We are also going to be limited in terms of testing and consideration of recommendations. The building of consensus is going to require a measure of good will, good sense and pragmatism.

The existing plans (see the paper by Needler, this Conference) describe the requirements in very general terms and state that we should satisfy these requirements with a mix of “x”, “y” and “z”; they do not address the issue of the appropriate *mix* of observations, nor do they address the question of effectiveness versus needed investment. Through the agencies of the presentations and the Round Table discussions (see Section 3), we hope to move closer to an understanding and agreement on these issues. As far as it is possible, we hope to build an image of the global, sustained observing system and to provide specificity in terms of the preferred blend. That is, agree that contribution “x” is a useful

contribution to goals “X” and “Y” and that it should be implemented with sampling strategy “x1”.

Will we endorse certain elements and not others? Will we endorse some recommendations and not others? Again, we will have to approach these tasks aware that the Conference can only add a certain level of value. We cannot, and should not, be diverted into discussing detail of specific approaches. For example, the question of whether the preferred sampling for frequently-repeated lines is 75 km or 120 km is not an issue that can be usefully discussed at the Conference. However, the Conference might wish to endorse the general principle that XBT sampling focus on line rather than areal sampling. Similarly, we should not be developing recommendations or conclusions that deal with specific detail of remote sensing missions, but we should be seeking agreement on just what we believe is a warranted, minimum sustained remote sensing contribution.

For issues where it is clear that further research is required, we should be prepared to support a set of actions that might take the form of workshops and/or studies. Again, the Conference format will not permit us to develop detailed plans so we will need to be careful to target the highest priority issues. In some cases, the consensus we will be seeking is on whom will take responsibility to follow up on an issue. The presence of several of the scientific and implementation panels should help us in this regard.

Establishing community consensus on the most viable candidate technologies and implementation strategies for implementing a comprehensive, integrated, international observing system in support of research, forecasting, and climate assessment is the main task of the Conference. The participants in OceanObs 99 play a critical role in the search for this consensus.

We are fortunate in that, at this time, the interest in long-term ocean observations is high. This provides both the motivation and means to accomplish what we are setting out to do.

3 - PREPARATIONS AND THE WORK PLAN

The Scientific Organizing Committee (SOC) for OceanObs 99 invited broad input on all relevant aspects including both remote and direct sampling, data systems and management, processing and data assimilation, and the generation of useful products. The SOC encouraged broad participation as one way of moving toward consensus. The Conference Program was developed around a series of solicited papers, each with a particular perspective or theme to develop. The papers were intended to be comprehensive in terms of

- Why we wish to establish a sustained observing system (the rationale);
- What are the specific requirements implied by such a rationale;
- How we intend to meet these requirements;
- When we envisage implementing specific elements (the schedule); and
- The overall strategy for ensuring the system is sustained, including priorities and needed investment, with performance that meets the broad needs of the community, including those beyond oceanography.

The process for developing the papers was fashioned on that used for Intergovernmental Panel on Climate Change (IPCC) Assessment Reports. That is, a Convening Lead Author was invited to coordinate the drafting of the paper, with the assistance of a number of Lead authors. The intention was to take the papers through a review process not unlike that undertaken for the IPCC assessments. In practice, we allowed too little time to develop all papers according to this strategy. Some papers became single author papers while others had much broader participation. Time pressures also forced a compromise in the review process so that papers were simply made available for comment rather than subjected to an organized appraisal. While we have fallen short of our ideals, we do think the process constitutes an effective consensus building approach.

An important step in the preparations for the Conference was a review of the paper outlines at a joint meeting of the OOPC and UOP at Woods Hole 17-21 May 1999. Because of time and resource limitations, not all convening lead authors were present at the meeting. It did however provide an initial review of the outlines and examined any issues related to redundancy and/or gaps.

3.1 - The Papers

The solicited papers in Volume I vary in terms of the tasks being asked of the author teams. In some cases, reviewed reports were already available; in others studies are underway. For each paper:

- The SOC had chosen a well-defined subject area on behalf of the Conference. While some scientific discretion remained with the authors, it was emphasized that the goals of the Conference rely on each of the defined areas being adequately covered. While we encouraged some redundancy, we did want to avoid unexpected gaps.
- All authors were asked to directly address the question of needed investment. The bottom line for sustained and operational observing systems is that value is returned for investment. This is one consideration in determining the appropriate mix of methods. We did not seek detailed accounting but a solid guide as to the long-term investment needed in order to realize the cited benefits.
- All authors were asked to address the value returned, be it in terms of scientific impact (gained knowledge), influence in assimilation systems, or value to applied products/forecasts.
- All authors were requested to address the contribution to, and synergy with, the greater global observing system. Almost without exception, data streams are made more powerful, and hence more useful and cost-effective, when they can be interpreted and integrated with other data streams. The potential for scientific insight is greater. Knowing just where a particular contribution fits into the global perspective constitutes a powerful positive argument.

Each paper represents, in some sense, an advocacy for a particular approach, or perspective, be that a particular measurement method, a way of implementation or global application. The onus is on the advocates to make the case. The process of seeking external comment and review provides an important counterbalance to this advocacy. This is not so much peer scientific review, though that too is important, but permits others in the community and in particular "non-advocates" to provide comment and counter-arguments, as appropriate. Ultimately, the SOC is responsible for preparing a statement on those aspects for which consensus is reached, and those aspects/issues for which further research and discussion are needed.

3.2 - The Conference

The Conference is the venue for discussing paper conclusions and developing consensus. The solicited papers provide the overall perspective. The submitted papers provide the depth and detail.

The Conference Program is arranged so that we might conceptually construct the observing system as we move through the Conference.

The first session (day) focuses on remote sensing, though not exclusively, with a Round Table discussion to draw conclusions, particularly with respect to preferred missions. The second session focuses on specific elements of the *in situ* observing system, including potential new technologies. A Round Table discussion is scheduled to examine the mix of different techniques. The third day begins consideration of regional aspects but also continues discussion of particular approaches. A discussion of data and information management is also introduced concluding with a Round Table debate on what we envisage for this new era for oceanography. The fourth session continues some of the regional and phenomenological discussions of the third session but also looks at modelling and data assimilation. The Final session looks at the "big picture" and the various methods we use for integrating the various parts into a workable whole and ensuring a sustained effort. The final Round Table will be based on a Conference Statement (not available with this volume) that will be prepared on the basis of the discussions at the Conference and the conclusions of the submitted papers.

We greatly appreciate the considerable effort that individuals have put into the preparations for this Conference. The collection of papers in these volumes represents a well-informed résumé of where we are now and well-reasoned arguments for how, and where, we should proceed to in the future. The plenary sessions of the Conference provide an opportunity to further discuss these papers and to build an image of the integrated system. There will be a variety of views; the challenge that we must accept is to identify the commonalties and truly high-priority elements.

Our present expectation is that a revised set of papers will be published after the Conference. At a minimum, we are looking for rapid publication of the key conclusions. The OOPC, UOP, and associated groups will provide an avenue for following up on issues.

3.3 - The Round Table Discussions

We have identified three areas that warrant plenary discussion: the upper ocean network, operational remote sensing, and the "new" data and information exchange paradigm for oceanography. Each of these will be dealt with by a "Round Table" consisting of the principal authors and selected additional members. We aim to identify many of the major issues prior to the Conference but the SOC also intends collating input from the Conference itself.

The Round Tables are a critical part of the Conference, as noted above. While we do hope to draw out, and perhaps resolve, many issues prior to the Conference, there will also be some that arise out of the presentations and from the fact that the Conference will be the first display of how the components work together. We accept that in many cases resolution of the issue may not be possible, perhaps simply because not enough is known at this time. There may also be cases where consensus cannot be reached. In such cases, we will pass the issue back through the OOPC and UOP (or other relevant body) for further consideration. The Round Tables will at least allow us to say issues have been aired. They will also allow the authors to get feedback on their papers.

The Round Table on the final day will serve as a place to draw all the different threads and themes together. Again, the SOC hopes that much of this can be pre-empted by careful consideration of the conclusions of each paper prior to the Conference. However the consensus part can only happen at the Conference and the SOC will work hard through the Conference to identify where consensus is and is not emerging. As with the other Round Tables, a few issues are likely to be put onto the agenda to get things moving. However, the final Round Table is about fleshing out the consensus from the Conference, not among Round Table members. The moderator/chair will be tasked with eliminating detailed questions/statements in favor of those that address the Conference goals.

Each of the Round Tables will be immediately preceded by a presentation that attempts to draw some of the issues out and to identify areas where there does appear to be consensus. These presenters thus have a critical role and must be prepared for adjustments to their presentation as things proceed.

We will appoint a *Chair* and *Rapporteur* for each Round Table. The Chair will effectively be armed with the issues identified by the speakers and will be asked to direct the discussion of the Panel Members towards these issues. Ideally, we would like to have identified order 4-5 priority issues each of which will be discussed for 5-8 minutes, including interventions from the floor. The Rapporteur has the role of distilling the main messages from the discussion for the report of the Conference.

We aim to produce reports of the Round Table discussions at the Conference and to produce a draft of the Conference statement prior to the final Round Table.

3.4 - Participation

The active involvement of Conference participants is essential. This is not a passive Conference. Much work has been completed prior to the Conference and we hope to use

the Conference as a means of building appreciation and agreement on how all the components fit together – become a *system* if you like. Participants are strongly encouraged to read the proceedings early so that they can form opinions and contribute to the consensus process. With few exceptions, papers will be available via the Web prior to the Conference to assist this process. The posters are also critical since few of the solicited papers are able to discuss detail. We are looking toward the posters to foster discussion at the level of detail and for the participants to bring this knowledge to the various plenary discussions as background for the more general issues.

We cannot emphasize strongly enough the need for active involvement by all Conference participants. This can be done through written comments prior to, and during the Conference. It can also be done through off-line discussions with paper authors and members of Round Table panels. The Scientific Organizing Committee also welcomes input, either verbal or written at all times. It is only through the gathering of this information that we will be able to steer the appropriate path toward consensus and agreement.

4 - CONCLUDING REMARKS

The scientific organizing committee is extremely conscious of the onerous tasks we have asked of authors and Conference participants. However I think we can claim that the Conference has already been granted some stature by virtue of the support of the many agency and intergovernmental sponsors, all of whom have expressed keen interest in the outcome. We also believe you will agree that the papers contained in the two-volume Proceedings represent a substantial scientific contribution. It is an effort that will be appreciated by all those who have direct and indirect interests in the implementation and maintenance of a sustained ocean observing system for operational and climate applications.

For many of us, the work will not finish with the Conference. Indeed, for a sustained observing system in an environment of changing technology, improving scientific knowledge, and changing emphasis in applications, the tasks are never complete. The system must evolve in order to be efficient and appropriate for the high priority tasks at any particular time. We termed this the First International Conference for this reason. Our expectation is that this will be a continuing process of evaluation and refinement. We believe the First International Conference on the Ocean Observing System for Climate is timely and represents an appropriate process for developing and implementing the complex of elements that constitute a sustained ocean climate observing system.

We trust you will enjoy the papers contained in these Volumes and hope you will enjoy participating in the Conference.

Acknowledgments

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