Annual Report on SCOR/IAPSO WG 133 'OceanScope' Activities

The OceanScope working group has now met twice, first in connection with the Montreal IAPSO meeting July 17-19, 2009, and second in London April 12-14, 2010 at the headquarters of the International Chamber of Shipping (ICS). This spring's meeting was to follow up on the work of developing the terms of reference that had become the charge of the SCOR/IAPSO working group. Much of the first draft of these had been completed by then, so the WG took time to read and discuss these, and make suggestions for their completion. These, together with an executive summary, are about to be reviewed by an independent science copywriter. Thus, we are close to assembling a complete draft Implementation Plan, the intended outcome of the second WG meeting. After the science copywriter completes her work the the ToRs and Executive Summary will be posted to the attendees of the London WG meeting so they may review the entire document for completeness and balance, and above all to make sure it makes a clear and persuasive case for the OceanScope paradigm. One question we have to the SCOR executive committee is to whom we address the Plan for this may influence how it is shaped: Is the audience SCOR who gave us our charge and supported our work, or is it really the wider marine community (ocean observing scientists, maritime industries and marine research and development industries) who have contributed to the Plan report and we hope will actually participate in its implementation.

The terms of reference chapters comprise:

1. The Scientific Basis
2. Ocean observation and scientific needs…
3. Vessel Types and Their Potential as OceanScope Platforms
4. Identify available technologies that can enhance vessel capability for ocean observation
5. Identify and Prioritize Instrument needs to meet future mission requirements
6. Communications Issues
7. Data Management Issues
8. Legal issues (Exclusive Economic Zone questions)
9. Organizational issues (the structure of an operational OceanScope)
10. Phasing in: The transition to OceanScope

With the completion of the above chapters in a sense the easy part has been completed. Briefly, the case for a sustained and systematic ocean observation program has been made by so many for so long it hardly needs to be restated, but that is the principal objective of the first chapter: 'The Scientific Basis for OceanScope'. The second chapter: 'Ocean observation and scientific needs' addresses several inter-related topics. First, it emphasizes working with the shipping industry to build into vessels at construction time the capability to serve as OceanScope platforms if/when needed. Second, it identifies routes of particular interest, such as chokes points for inter-basin exchange, zonal sections to monitor meridional fluxes, and western boundary currents. Third, it emphasizes the need for a truly interdisciplinary approach, i.e. simultaneous observation of physical, chemical and biological parameters. The third chapter discusses vessels and identifies some important challenges that need to be addressed for vessels to meet OceanScope needs. In particular it discusses the serious issue of bubble drawdown that impacts acoustic remote sensing from hull-based instrumentation and offers some potential solutions. Chapters four and five

address instrumentation needs, present and near future (4), and those in the more distant future that will require significant targeted development (5). Chapter six addresses communications needs, an evolving topic given the rapid developments in digital communications (satellite and shore-based). Chapter seven addresses data management issues and recommends that OceanScope should team up with and enhance existing data handling, archiving and distribution activities rather than reinventing the wheel. Chapter 8 addresses the legal issue of collecting data while vessels are transiting exclusive economic zones (EEZ) as they approach/leave ports of call. Chapter 9 is appropriately less detailed at this juncture. It examines what might the best way to organize OceanScope. It assumes that OceanScope will operate in a top-down mode because there is almost universal agreement that not only will the maritime industries much prefer this approach, but that only a central organization can ensure quality control, broad consistency of instrumentation needs, and a uniformity of sampling methods. That said, questions remain about how it might best be organized, as an intergovernmental or non-governmental organization (an IGO or an NGO). These questions go beyond the immediate charge given to the working group, but we thought it essential to begin to consider them. The last chapter offers a conceptual plan forward, how we might implement the OceanScope paradigm through a gradual or staged three phase process.

The most challenging issues are covered in the last three chapters. We believe that the EEZ issues (chapter 8) will be primarily technical, and not fundamental. Assuming broad interest in and cooperation in the development of OceanScope as an operational activity, one would look for a correspondingly broad agreement to collect and disseminate data in real-time. Exactly how that general agreement will be realized and maintained will need further study, and will very likely depend upon how, indeed, it may even influence the decision as to whether OceanScope is to be organized as an NGO or an IGO.

The next steps will be critically important. A closer dialogue with the maritime industries is essential. For example, a meeting with a few principals in the industry leading to an acknowledgement from their representative organizations that OceanScope is something in which they are willing to play an active role in could greatly strengthen the prospects for success and the reception of the draft Implementation Plan when it is sent out for public comment after our internal process is complete. The public service value of the maritime shipping industry helping the ocean observing community gain access to the global ocean water column cannot be underestimated.

A global ocean water column observing system is sorely needed. Planet Ocean is under serious stress, physically, chemically and biologically. We see evidence of this in ocean circulation changes, increasing temperatures and ocean acidity, and in the incredible impoverishment of marine life. Satellites do a terrific job of scanning the oceans, but their vision stops at the surface. The global Argo array operates in all ocean basins, but it is sparse and limited in what in can sample. Enormous resources are committed to ocean modeling and developing future scenarios, but woefully inadequate resources are committed to fact-finding or ground-truthing these activities. We continue to be completely handicapped just to describe the present state of the global ocean water column, let alone its future development. A partnership between the global maritime industries and the ocean observing community could tip the scales in developing a capability for scanning the global ocean on a systematic, repeat and sustained basis. How can

we work together to develop this possibility? When all is said and done this will be the real challenge.

Appendix: Participants at the London Working Group Meeting

SCOR/IAPSO
Peter Hinchliffe, Marine Director, International Chamber of Shipping, London
David Hydes, Scientist, National Oceanographic Centre, Southampton, UK
Markku Kanerva, Director, Deltamarin, Turku, Finland
Kuh Kim, Professor, Seoul National University, Seoul, Korea
Peter Ortner, Professor, University of Miami, USA
Chris Reid, Senior Fellow, SAHFOS, Plymouth, UK
Tom Rossby, Professor, University of Rhode Island, USA
Ute Schuster, Senior Research Associate, University of East Anglia, UK
Fred Soons, Professor, Utrecht University, The Netherlands
Yasuo Yoshimura, Professor, Hokkaido University, Japan
Not able to attend:
Javier Valladares, Navy officer (ret.) and Science advisor, Argentina

Associate Participants
Richard Burt, Dir. Chelsea Technologies Group Ltd
Rich Findley, Director, Marine operations, Fort Pierce, FL, USA
Charlie Flagg, Professor, Stony Brook University, Stony Brook, NY, USA
Boris Kelly-Gerreyn, Scientist, National Oceanographic Centre, Southampton, UK
Bev MacKenzie, Manager, IMarEST, London (April 14 only)
Wolfgang Schlegel, Lockheed-Martin-Sippican, Marion, MA, USA
Jerry Mullison, Engineer, Teledyne-RDInstruments, San Diego, CA, USA
Steve Piotrowicz, Argo Program Manager, NOAA, Washington DC, USA
Corinna Schrum, Professor, University of Bergen, Norway
Denise Smythe-Wright, Scientist, National Oceanographic Centre, Southampton, UK