

AOSN-II Numerical Modeling Group Meeting

A meeting of the AOSN-II Numerical Modeling Working Group (NMWG) was held at Harvard University on Wednesday 13 November 2002, with informal discussions continuing on Thursday 14 November. The agenda adopted and the meeting participants are listed in Appendix 1. The primary purpose of this meeting was to develop the details of the participation of the three physical modeling groups (HOPS, ICON, ROMS), to coordinate their contributions and facilitate the intercomparison of results. The HOPS and ROMS groups intend to provide results in real time during the AOSN-II field program and all three modeling groups will participate in the Observational System Simulation Experiments (OSSEs) prior to the field program.

Information on the three models and the plans for cooperation are to be found on the web site http://people.deas.harvard.edu/~leslie/AOSNII/nmwg_mtg_111302.html, which is to be developed and extended according to the accomplishments and action items summarized below. Most items on the meeting agenda were effectively discussed, although further work on the items “Specific scientific objectives”, “Coupled physical-ecosystem modeling” and “Real-time forecasting, protocol, products and dissemination” are necessary. The meeting of the AOSN-II NMWG was held the day after a meeting at Princeton University of the AOSN-II Adaptive Sampling Working Group. The outcomes and extension of these two meetings should provide the basis of the finalization of the real time plans for AOSN-II.

Allan Robinson, Working Group Chairman
Wayne Leslie, Working Group and Web Page Coordinator

Summary of accomplishments and action items:

- **HOPS, ICON, ROMS**
 - REPORTS ON MODEL AND SYSTEM STRUCTURES, CAPABILITIES, RELEVANT EXPERIENCE AND PLANS - reports were given on HOPS by Pat Haley (technical overview), Pierre Lermusiaux (coupled physical-biological ESSE) and Wayne Leslie (operational forecasting and adaptive sampling), on ICON by Igor Shulman, on ROMS by Yi Chao and on biological model inversion by Dennis McGillicuddy. Their reports are available in Powerpoint or PDF format on the web at http://people.deas.harvard.edu/~leslie/AOSNII/nmwg_mtg_111302.html. The information on this web site is considered to be an integral part of this report. Note that Yi Chao’s report is not available on-line. Use the “email” link to send a request to Wayne Leslie and the report will be sent to you in the format of your choice.
 - CONFIGURATION OF MODELS FOR AOSN-II STUDIES, FORECASTS AND SIMULATIONS – the baseline configuration of the models, including domain specification in three dimensions, bottom topography, parameterizations, initialization scheme and parameters, boundary conditions, assimilation scheme and parameters, nesting procedures, etc., should be made available to Wayne Leslie in order to be posted on the AOSN-II NMWG web site.
 - MODEL BOUNDARY CONDITIONS - working memos on the suite of boundary condition options available in the respective models must be created and made available to WGL.
- **Model/model intercomparisons**
 - The HOPS and ROMS modeling groups will run the June-August 2000 simulation already run by ICON

- A domain will be defined to be used for model/model comparisons which is contained within all three sets of modeling domains – the domain will be known as the Central California Coast (C³) Domain
- Y. Chao and I. Shulman should choose the location of comparison sections and comparison locations within the C³ domain
- **Dynamical and methodological issues**
 - FORCING FUNCTIONS - Y. Chao and I. Shulman need to locate databases for tidal and riverine forcing for the experiment region and identify any additional important forcings. Atmospheric forcing during the July-September 2003 time frame will be available from a 9km resolution version of COAMPS.
 - PASSIVE ADVECTION - The HOPS, ICON and ROMS groups must add a “pure passive scalar advected tracer” to their output in order to have the simplest 0th order biological model for bioluminescence. D. McGillicuddy has been tasked to develop a strawman recommendation for a passive tracer simulation (e.g. zero concentration outside the bay and unit concentration inside the bay?) – examine exchanges between bay and outside in order to address the question “Where does the upwelled water come from in Monterey Bay?”
- **Descriptive oceanography of Monterey Bay and the offshore California Current System**
 - A “Descriptive Oceanography” team was created to review the three-month long simulation for June-August 2000 from the ICON model and report on aspects of the growth, development and advection of upwelling plumes; including onset, variability, dissipation and downwelling. This will provide important and necessary input to specific scientific objectives and the design of OSSEs (see timeline below). Members of the team are: A. Robinson, W. Leslie, D. Fratantoni, Y. Chao, A. Gangopadhyay, I. Shulman, J. Paduan. This group will meet in January 2003.
- **Ensemble forecasting**
 - An “Ensemble” sub-committee was created to examine aspects of ensemble forecasting methodologies, to coordinate the adaptive sampling via ESSE/ETKF and carry out the physical-biogeochemical data assimilation via ESSE. Members of this sub-committee are: P. Lermusiaux, S. Majumdar, Y. Chao, I. Shulman.
- **Time-line for upcoming activities**
 - 20 Nov. 2002 – I. Shulman prepares/disseminates ICON fields on common levels (Levitus plus higher resolution in upper 100m) and other model parameters [meeting time discussion was for output on sigma levels, but additional reflection regarding velocity fields dictates output on flat levels]
 - 02 Jan. 2003 – I. Shulman distributes COAMP forcing fields for June-August 2000 hindcasts
 - (09 Jan. 2003 – Executive Team meeting, program review - Washington, DC)
 - 15 Jan. 2003 – descriptive oceanography team meeting
 - 14 Feb. 2003 – HOPS tuned
 - 15 Mar. 2003 – first inter-model comparison
 - 15 Mar. 2003 – descriptive oceanography team report
 - 01 Apr. 2003 – OSSE design complete
 - 01 Jun. 2003 – OSSEs complete

Appendix 1

Meeting Agenda

Wednesday 13 November

10:00 Opening remarks and adoption of agenda

10:15 Presentation on HOPS (computational issues, ESSE and ensemble forecasting, real-time operations)

10:45 Presentation on ICON

11:15 Presentation on ROMS

11:45 Discussion on above (Identify topics for 12:45)

12:00 Coupled physical-ecosystem modeling

12:30 Break: Bring lunch to table

12:45 Model set-ups, intercomparisons and collaborations

1:30 Specific scientific objectives

2:00 Break

2:15 OSSEs (definition and scheduling)

3:00 Real-time forecasting, protocol, products and dissemination

4:00 Additional discussion

5:00 Meeting ends

Thursday 14 November

9:00 - 12:00 Informal discussions to be arranged

In attendance: Allan Robinson (Harvard), Jim Bellingham (MBARI), Yi Chao (JPL-NASA), Igor Shulman (USM), Ralf Bachmeyer (Princeton), Paul Chandler (MBARI), Chad Coulliette (Cal-Tech), Eddie Fiorelli (Princeton), Avijit Gangopadhyay (UMass-Dartmouth), Pat Haley (Harvard), Pierre Lermusiaux (Harvard), Wayne Leslie (Harvard), X. San Liang (Harvard), Sharan Majumdar (Miami), Dennis McGillicuddy (WHOI), Patricia Moreno (Harvard), Clancy Rowley (Princeton), Shawn Shadden (Cal-Tech), Hans Thomas (MBARI), Rucheng Tian (Harvard)