

**Work Package IV**  
**Integrated Margin-Exchange Product**  
**Management Report**

John M. Huthnance  
Proudman Oceanographic Laboratory, CCMS  
United Kingdom

Of the six scientific tasks of Work Package IV, tasks 4 and 5 only commence at month 13 or later and will not be commented on further. The others are discussed in turn hereafter.

**Task IV.1 Water budget and circulation**

The only year-1 deliverables (month 9) are current meter statistics from historical data. Partner 7 (UCG) has collected over 40 current meter - years of "historical" pre-OMEX data in the region of north-west Iberia and statistics have been calculated. However, these will be augmented on receipt of more data, eg. from MORENA. The report of these statistics is expected shortly but has been slightly held up by delayed data acquisition. Partner 8a (IH) has produced basic statistics at different time scales, and further analyses (dispersion diagrams for different bands of variability, spectra, coherences), for historical current meter data sets obtained by partner 8 (IH). These include data from (i) inner- shelf, mid-shelf and upper slope moorings off Oporto (41°05'N) for May-October 1987 and (ii) SEFOS moorings in 900m and 2300m off S. Pedro de Muel (39°45'N), May 1994 - September 1996. Statistics being assembled will be sent to partner 29 (BODC) soon.

Partner 17 (IfM) measurements of currents, temperature and salinity are available from five current meters deployed on the two sediment trap moorings near 42°39'N for August 1997 to March 1998.

Partner 5b (NIOZ) has assembled a historical set of hydrographic data with emphasis on the European ocean margin, specifically the area in 31° to 53°N and east of 21°W. Hydrographic data from OMEX II cruises have been processed and quality control has been performed. Based on the historical data set the applicability of quasi-conservative nutrient tracers for multi-parameter water mass analysis has been evaluated. Multi-parameter analysis of the deep and intermediate water masses in the north-eastern Atlantic Ocean has resulted in identification and description of the source water types which set up this water mass. Analysis of the central water in the permanent thermocline is ongoing.

**Task IV.2 Carbon sources, cycling and fates**

The year-1 deliverables are intercalibrations (month 6) and conclusions about the practical applications of techniques (month 12). In fact these are subsumed in the intercalibrations listed in task IV.3. Nevertheless, many measurements have been made on WP II and WP III cruises that will eventually contribute to this unifying task. These include Primary Production and Irradiance, phytoplankton, trap samples and POC.

**Task IV.3 Nutrients, trophodynamics and fertility**

*Nutrients (Partners 4c, 1b, 13; PML, ULB and IIM)*

Two nutrient intercalibration exercises have taken place. The first intercalibration took place in June 1997 and the data have been fully worked up. The second was in January 1998; some data are still preliminary and will be worked up in the coming months. In June 1997, water samples were taken at three stations in water depths of 90m, 200m and 2250m, and when the *RRS Charles Darwin* and the *RV Belgica* met on 20 June 1997 (CTD casts were done simultaneously by each ship). Both intercalibration exercises found excellent agreement in nitrate determinations made by the PML and the IIM; phosphate and silicate determinations are also good among PML, IIM and ULB-b. There appear to be no problems in precision of any of the determinations but accuracy could be improved. The ammonium determinations show wide variation between the PML and the IIM and will require further analysis at sea on fresh samples to resolve the observed differences.

### *DOC Methods Intercalibration*

[Note. Under 'Methodology' in the Technical Annex it is stated that intercalibrations for DOM will be carried out by Partners 4a, 19, 21 (PML-a, UOviedo and UVigo). This is not quite correct, as the only partners responsible for measurements of DOC using comparable techniques are actually IIM (WP1) and PML-a (WP2) (Task II.6, deliverable Item 1). DON (actually TDN) distributions will only be measured by PML-a (WP2) (Task II.4.1, deliverable Item 5). UVigo are measuring DOC production using radiochemical counting techniques: intercomparison of results is not possible for reasons of safety and instrument sensitivity.]

A revised manuscript "Simultaneous determination of dissolved organic carbon and total dissolved nitrogen in sea water by high temperature catalytic oxidation: conditions for precise shipboard measurements" has been accepted by *Marine Chemistry* for publication. This common experience from OMEX I in the analytical methodologies will be employed during OMEX II-II. Both partners 4a (PML) and 13 (IIM) are part of an on-going international DOC intercomparison programme, involving all registered members of the international community, with formal analytical and reporting protocols to be included at all stages of the OMEX DOC measurement programmes. Replicates of partner 13 (IIM) samples from Ria de Vigo, during September, 1997 have been passed to partners 4a (PML) and 1b (ULB) for subsequent DOC analysis. Samples from CD110B were analysed on-board and in the laboratory (partner 4a; PML), and preserved aliquots will subsequently be analysed in the home laboratories of partners 4a and 13 (PML, IIM) with further opportunity for participation by partner 1b (ULB). The combined results from these activities will result in repeatedly intercalibrated methodologies, producing data sets from WP1 and WP2.

### *Pigments and primary production*

With respect to chemotaxonomic chlorophyll and carotenoid pigment biomarkers, samples from two CTDs were collected for the determination of chlorophyll during the CD105 intercalibration exercise with Belgica. Sample analysis is complete with quality control currently being undertaken before data are banked. Due to the time constraint, it was not possible to conduct an intercalibration exercise on primary and new production when the *Belgica* and RRS *Charles Darwin* met in June 97. However, on the Belgica 97/14 cruise, primary production measurements were performed at certain stations by partners 1b (ULB) and 13 (IIM) using different methodologies; the results can be compared for intercalibration purposes.

### *Nutrient uptake, nutrient regeneration and grazing methodology*

These determination await a WPI cruise (August 1998) where rate process studies will be emphasised.

## **Conclusion**

Maximum advantage has been taken of cruise opportunities to date, but several intercomparisons await the opportunity of the WPI cruise in August 1998 (RRS *Charles Darwin* 114).

## **Task IV.6**

Partner 11 (IST) has continued model developments that will form a basis for the integrated model. The 3-D prognostic physics model has been used to investigate several physical processes. One-way nesting of a finer-resolution sub-area has been implemented. This nesting is available for partner 18 (SINTEF) to couple with a biochemical model. Coupling between hydrodynamics and biochemical models has also been investigated, implementing a biochemical module.

## **Task IV.7**

Coordination effort has concentrated on interaction with Work Packages I to III (WP I, II Paris workshops, November 1997 and WPIII Faro workshop, April 1998) and agreeing the sea-bed survey and distributions of stations to be worked at sea, including the station worked together by *Belgica* and RRS *Charles Darwin*. By assuming the principal scientist role on the first OMEX II-II cruise, an active part was played in putting these integrating aspects into effect. A workshop for all the physics partners is being planned for summer 1998, probably at POL or UWB, and is particularly relevant to the integration needed for task IV.1.