

GODAE Status

OSEs/OSSEs meeting objectives

P.Y. le Traon, A. Fischer, E. Harrison, K. Wilmer Becker

Content



3. GODAE Status

- Achievements and successes
- Priorities
- GODAE in 2007/2008

5. Objectives of the OSEs/OSSEs meeting

- Background
- Meeting organization

The Global Ocean Data Assimilation Experiment

The Mission for GODAE

**A practical demonstration of the feasibility & utility of
high-resolution, global analyses & short-range forecasts of
3D temperatures, salinities and currents
Global operational oceanography**

Timetable

- 1997 – 1999** **Conceptual development**
- 2000 – 2003** **Prototype development**
- 2004 – 2008** **Operational demonstration & consolidation**

Achievements and Successes

- **Implementation of observing and data processing system**
 - **Argo, altimetry, GHRSSST-PP, in-situ**
- **Implementation of global modelling and data assimilation capabilities**
- **Implementation of data and product serving capabilities and standardization**
- **Intercomparison / validation, metrics and standardization**
- **Demonstrations of feasibility and utility**
 - **Mesoscale nowcasting and forecasting, ocean climate and research, marine pollution and safety, weather forecasting, marine resources, etc**
- **Scientific advances**
 - **Modelling, data assimilation, scientific validation**



- > Home
- > What is GODAE
- > Activities
- > Science
- > Data & Products
- > Special Issues
- > Related Websites
- > What's New
- > Calendar
- > Documents

► Your location: [Home](#) /

- Towards operational oceanography -

GODAE aims to make ocean monitoring and prediction a routine activity similar to weather forecasting. GODAE will contribute to an information system for the global ocean that will serve interests from climate change and coastal preservation through to fisheries and the off-shore industry.



More about GODAE efforts and links to [ocean forecasting centres](#) can be found [here](#).

Activities



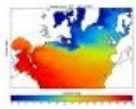
GODAE activities are of international dimension. Many projects and working groups have emerged. [more >](#)

Science



Observational networks, models and estimation tools are the essential elements of GODAE. [more >](#)

Data Products



GODAE partners produce distinctive and unique products for the research and user communities. [more >](#)

Special Issues



GODAE benefits climate research and supports the Global Ocean Observing System. [more >](#)

What's New

Added: 04-06-2007
SCS-IO Workshop postponed
[Read More](#)

Added: 30-05-2007
GODAE-OOPC Meeting on OSE-OSSE, IOC, Paris, 5-7 November 2007
[Read More](#)

Added: 21-05-2007
IGST XII Meeting, St John's, Newfoundland, Canada 7-9 August 2007
[Read More](#)

Added: 21-05-2007
GODAE Coastal and Shelf Seas Workshop, Liverpool, 10-11 October 2007
[Read More](#)



GODAE is sponsored by

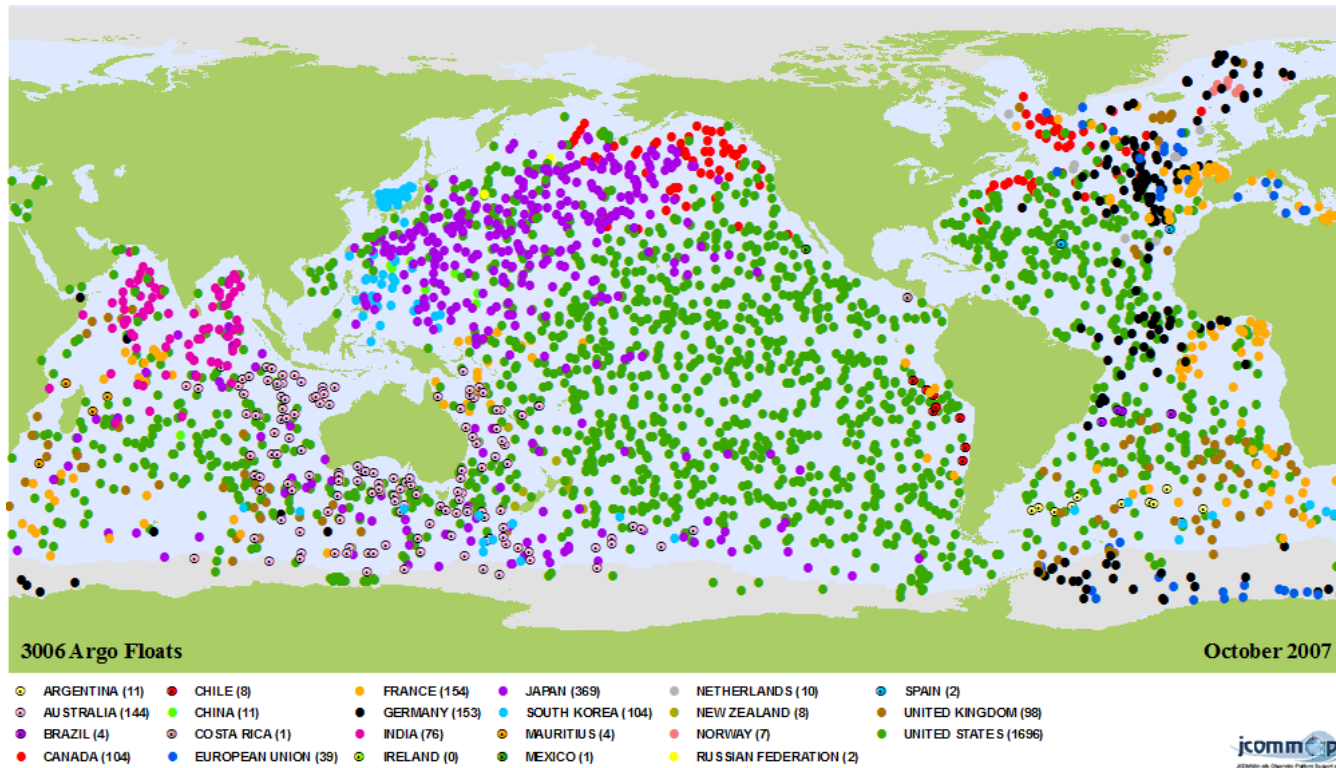


[More Sponsors >](#)

<http://www.godae.org>



The pre-GODAE in-situ ocean observing system was clearly inadequate for the global scope of GODAE => Argo : a joint GODAE/CLIVAR pilot project.



Outstanding progress thanks to international cooperation.

A global array (3000 floats) is now in place !

An efficient data management system is in place.

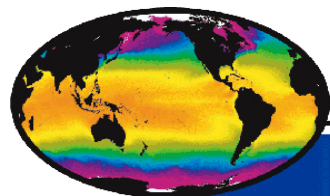
Main issue is long term sustainability

A specific focus for this workshop

<http://argo.jcommops.org>



GODAE SST need = Global high resolution in time (< 1 day) and space (<10 km) = A specific GODAE pilot project



GHRSSST-PP

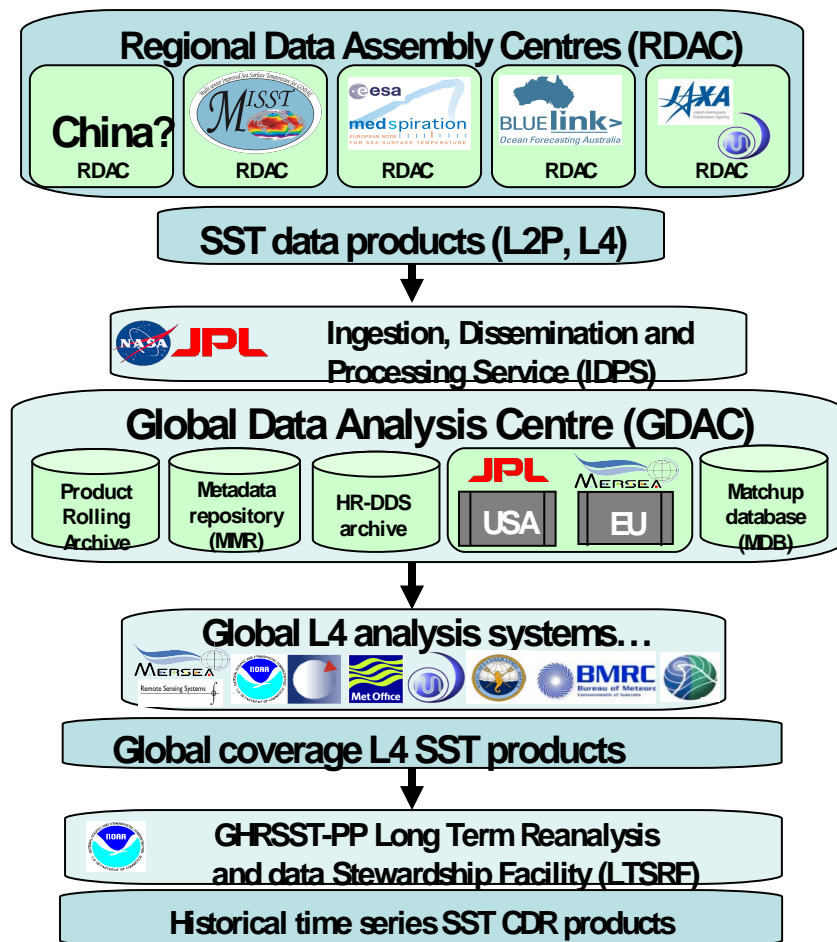
GODAE High Resolution Sea Surface Temperature Pilot Project

Global High Resolution SST pilot project (GHRSSST)

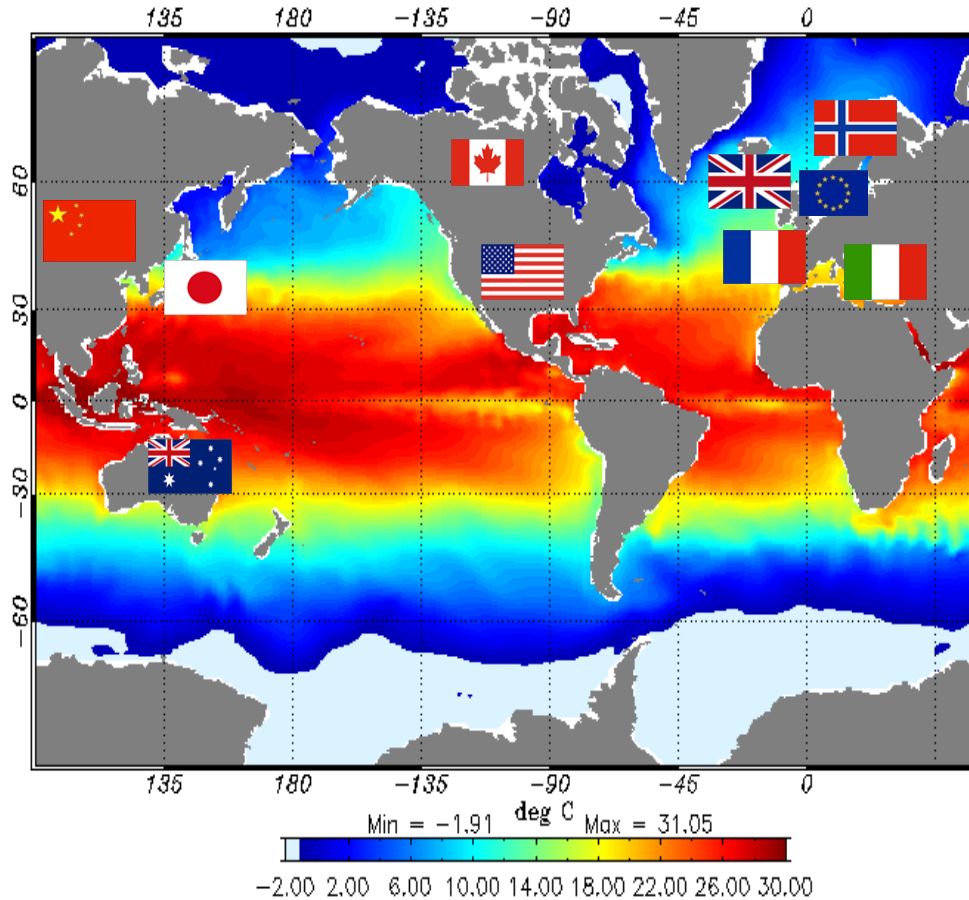
- combination of data from various sources
- modern data serving
- entrain scientific expertise for quality products

Excellent progress : efficient activation through regional data assembly centres (RDAC); international cooperation, new high resolution global and regional products (L2P, L4)

[http:// www.ghrsst-pp.org/](http://www.ghrsst-pp.org/)



Implementation: Forecast systems



- National systems involving research & operational institutes
 - BlueLink – Australia
 - Canadian consortium
 - NLOM and NCOM - USA
 - HYCOM consortium - USA
 - Move & COMPASS-K systems – Japan
 - MERCATOR – France
 - MFS - Italy
 - NCOF consortium (FOAM) – UK
 - TOPAZ - Norway
- European coordination
 - MERSEA consortium

GODAE Priorities 2006-2008



GODAE demonstration

Establish and consolidate base-line systems (GODAE standards).

Demonstrations of Impact/Utility = main focus of GODAE. Develop a series of « good » examples of GODAE successes (from observations to users).

GODAE products

Error characterisation: consolidate work on metrics and intercomparison (“GODAE label”). Make sure a minimum set is internationally implemented.

Develop product standardization. Ensure interoperability between systems.

Observing Systems

Use the experiment for an improved design of the observing system. Provide clear demonstration of added value and impact on applications. Promote results (space agencies, GMES, GEOSS).

Transition : from demonstration to operational systems

Work with JCOMM, IOC and GOOS on the transition

Promote examples of transition to operational systems for the different nations

Contribute to the definition of operational oceanography architecture

New projects/initiatives : coastal and ecosystems

Develop links with IMBER (ecosystems from low to high trophic levels).

Initiate a specific coastal project (downscaling).

The GODAE – IMBER initiative (Ecosystem modelling)



At the first GODAE-IMBER Meeting at CNRS (12-13 June 2007) a **new working group** has been formed to facilitate dialogue between those developing new ecosystem models and the developers of the operational systems.

Particular emphasis is given to:

3. Improvement of present GODAE systems for IMBER
 - ocean analysis / reanalysis products
 - intercomparisons (global & regional)
 - forcing fields
8. Improvement of the observing system
 - new sensors/measurements
 - joint physical/biological data assimilation
12. Use of GODAE products by IMBER
 - bio-ecosystem reanalysis
 - Multi model ensembles

Areas of importance

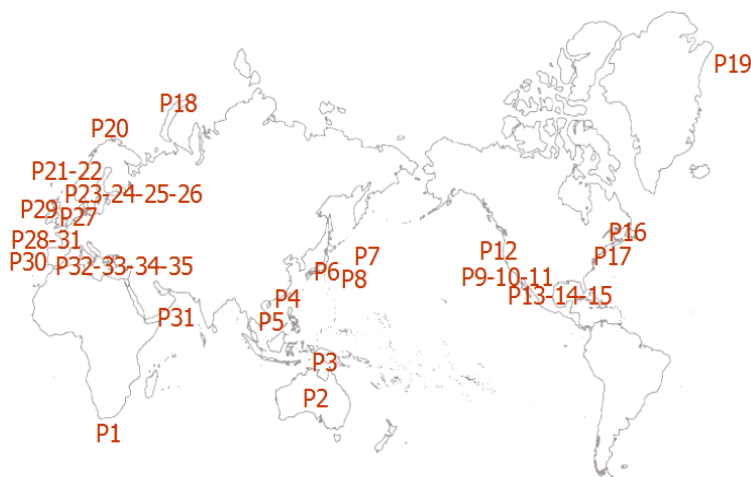
- Ecosystem modelling & data assimilation
 - Schemes for assimilation of biogeochemical data are under development
 - Current assimilation schemes degrade the biogeochemistry
 - Overall high horizontal and vertical resolution models for the upper ocean are needed.
 - Advanced schemes for a finer vertical structure are a key issue for nutrient transport.
- Interaction with coastal and shelf seas systems
- Support for B-Argo (see friends of Oxygen on Argo)
- Reanalysis

Meeting outcomes available on GODAE WWW site

Advance: The GODAE Coastal and Shelf Seas Working group (CSSWG)



- The usefulness of GODAE systems to coastal and shelf seas forecasting will be one of the measures of the success of GODAE.
- The mission of the GODAE CSSWG is to **define, monitor and promote actions**, within GODAE, aimed at the assessment and demonstration of the value of GODAE results for regional, coastal and shelf seas models and forecasting systems



- 35 projects
- Varied in objectives and methods
- Geographically clustered

- Africa: 1
- Australia: 2
- China Seas: 2
- Japan Seas: 3
- Indian Ocean: 1

- North America West Coast: 4
- Gulf of Mexico: 3
- North America East Coast: 2
- Arctic and Nordic Seas: 3
- Norwegian, Baltic, and North Seas: 7
- Northeast Atlantic: 4
- Mediterranean: 4

- Position paper *"Towards the assessment and demonstration of the value of GODAE results for coastal and shelf seas models and forecasting systems"* P. De Mey, ed., 74pp.
- 2007 GODAE Coastal workshop, Liverpool, UK, 10-11 October:
<http://cobs.pol.ac.uk/cobs/CSSWG>
- 2008 GODAE Coastal workshop, planned in Newfoundland, Canada

GODAE activities in 2007/2008

- Four workshops in 2007 (preparation of final conference)
 - IMBER/GODAE – Summer 2007 (done)
 - OSSEs/OSEs – Observing system (GODAE/OOPC)
 - GODAE Coastal workshop in Fall 2007 (done) and mid 2008
- Links with GSOP/CLIVAR (September 2007)
- Intercomparison experiment (Spring 2008)
- IGST meeting, Canada, August 2007 and June 2008
- Final conference in Fall 2008 jointly held with OSTM meeting + Argo
 - November 2nd week, Nice – TBC)
- Special journal issue on GODAE achievements
 - Oceanography Magazine – mid 2009
 - based on final conference synthesis papers
- 2nd summer school in Spring 2009 (Australia)
- Preparing the future of GODAE (IOC, GOOS, JCOMM) – to be defined
 - Technical issues – JCOMM (operation, standards, validation, metrics)
 - International coordination/science issues – ecosystem, coastal, observing system assessment and design (methodology, recommendations), ...

GODAE/OOPC OSEs/OSSEs meeting

Background



- The GODAE requirements for an initial global observing system have been described in the OceanObs99 conference book (updated in GCOS reports).
- Primarily designed for climate but also serves as the backbone for global operational oceanography.
- One of the aims of GODAE is to formulate more specific requirements on the basis of improved understanding of data utility
- Use of OSEs (Observing System Evaluations) or OSSEs (Observing System Simulation Experiments) .
- OSEs are flexible tools as they can be used to examine the impact of observations on a particular application or to give insight into the effectiveness of the data assimilation systems that are being used.

Workshop objectives

- Review work done on impact studies, OSEs and OSSEs over the past years
- Identify robust and common features
- Understand differences in assimilation systems
- Provide good examples of the contribution of observing systems
- Provide preliminary recommendations on observing system design
- Define and agree on activities to be carried out before the GODAE final symposium
- Develop new ideas on the way to assess and design the ocean observing systems and propose new experiments to be carried out in the coming years

GODAE-OOPC OSSE/OSE Workshop



Over-arching observing system questions:

- **Are there any clear redundancies in the present data set in any particular regions?**
- **Are there any clear shortcomings in the present data set that affect your ability to make fit-for-your-purpose outputs?**
- **Are there any 'supplemental' data set issues that limit the skill of your outputs, and how severe are the limits?**
- **Would any level of improved coverage and/or accuracy add value to you product(s) or is there need for a specific level of improvement?**

Main topics to be covered during the workshop

Observing system assessment and design methodologies: theory, use and limitations

Altimetry : impact of one to several altimeters, Mean Dynamic Topography issues

Argo (T and/or S) and in-situ observing system (XBT lines, tropical moorings, reference moorings, hydrography, transport monitoring)

Sea Surface Temperature/GHRSST- PP

Other observing systems (e.g. winds, sea surface salinity, velocity)

Synthesis of results, recommendations and work plan for 2008

13:45 *Speakers to transfer their talks onto conference room laptop*

14:00 Welcome - **Pierre-Yves Le Traon (Ifremer)**

14:05 Session 1 - Introduction

14:05 Pierre Yves Le Traon (Ifremer), Ed Harrison (NOAA) and Albert Fischer (IOC) - GODAE Status and workshop objectives

14:25 Albert Fischer, Ed Harrison and Pierre-Yves Le Tran - The global in-situ observing system, the satellite observing system and issues

14:50 Robert Molinari (University of Miami/CIMAS) - Status of the 1999 XBT Recommendations Made to the Ocean Obs99 Meeting

15:10 Eric Bayler (NOAA) - NOAA perspective/expectations

15:30 *Coffee/tea break & opportunity for personal discussion*

16:00 Session  - General multi-purpose and methods

16:00 Anthony Weaver (CERFACS) - Methods for computing analysis and forecasting sensitivity to observations: examples from NWP

16:30 Eric Dombrowsky (Mercator-Ocean) - Review of OSSE/OSE performed at Mercator-Ocean

17:00 Magdalena Balmaseda (ECMWF) - OSE's in the ECMWF operational ocean analysis: Impact on the ocean mean state, seasonal forecasts and climate variability

17:30 Yosuke Fujii (JMA/MRI) - OSSE/OSE activities with Multivariate Ocean Variational Estimation (MOVE) System.
I: Application of singular vector analysis to the Kuroshio large meander

18:00 End of Day 1

18:30 *Reception, Miollis Bar (-1 level)*



This is a workshop !

Leave time for discussion

Raise issues and ways to solve them

Stimulate discussion

Tuesday, 6 November 2007

8:30 Session 2 - General multi-purpose and methods (continued)

8:30 Pavel Sakov and Peter Oke (CSIRO) - Objective Array Design: Application to the tropical Indian Ocean

9:00 Peter Oke and Andreas Schiller - Impact of Argo, SST and altimeter data on an eddy-resolving ocean reanalysis

9:30 Pierre Brasseur (CNRS) - Optimal design of observing systems: review of methods based on assimilative systems

10:00 Jim Cummings (NRL) - Assessment of Observation Impact Using a Variational Assimilation Adjoint System

10:30 *Coffee/tea break & opportunity for personal discussion*

11:00 Tony Lee (JPL) - What do we gain having an additional SeaWinds-like scatterometer?

11:30 Session 3 - Altimetry

11:30 Gilles Larnicol (CLS) - Impact studies on the altimeter observing system: review of the work done by the SSALTO/DUACS center

12:00 Matt Martin (Met Office) - The impact of assimilating sea surface height data from one, two and three altimeters on the surface currents in the 1/9° North Atlantic FOAM system

12:30 *Lunch - Speakers to transfer their talks onto conference room laptop*

13:30 Daniel Lea and John Siddorn (Met Office) - Observations bias correction in altimeter ocean data assimilation in FOAM comparing two MDT's

14:00 Discussion

14:30 Session 4 - Argo (T and/or S) and in-situ observing system

14:30 Stephanie Guinehut (CLS) - Contributions of the ARGO array and complementarities with the altimeter observing system

15:00 Daniel Lea and John Siddorn (Met Office) - ARGO and other profile data assimilation on z and density levels in FOAM

15:30 *Coffee/tea break & opportunity for personal discussion*

16:00 Satoshi Matsumoto (MRI/JMA) - OSSE/OSE activities with Multivariate Ocean Variational Estimation (MOVE) System.

II: Impacts of salinity and TAO/TRITON

16:30 Gary Brassington and Nicholas Summons (BMRC) - Design of surface drifting buoys deployments using eddy-resolving reanalyses (presented by Peter Oke (CSIRO))

17:00 Session 5 - Ocean State Estimations (climate reanalysis)

17:00 Jim Carton (TBC) (Texas A&M University) - Feasibility of a 100-year long ocean reanalysis

17:30 Meeting with [rapporteurs](#) to prepare for the Synthesis of results, recommendations and work plan for 2008

End of Day 2

Dinner (tbd)

Wednesday, 7 November

9:00 Session 6 - Synthesis of results, missing studies, recommendations and work plan for 2008

9:00 Open discussion - summary by session (presentations by rapporteurs); outline of future work and other issues

10:30 *Coffee/tea break & opportunity for personal discussion*

11:00 Open discussion (continued)

12:30 Close

GODAE-OOPC OSE/OSSE Workshop



Rapporteurs per session/item(not only) + one “transverse” session

Item/session		Rapporteurs
1	Methodologies and issues	Jim Cummings (tbc), Pierre Brasseur
2	Altimetry and satellite observing system	Eric Dombrowsky, Peter Oke
3	Argo and in-situ observing system	Magdalena Balmaseda, Bob Molinari
4	Requirements for high resolution ocean forecasting vs ocean state estimation	Tony Lee, Matthew Martin

Objectives : summarize discussions, main results, identify main issues and collaborative work to be carried out before the symposium, longer term issues (what needs to be done ? how ?)

=> report at the end of the meeting (Wednesday) + write a one or two page summary of session and discussion (by next week!)

Meeting with rapporteurs tomorrow evening