

**OBSERVATIONS COORDINATION GROUP  
THIRD SESSION**

Paris, France  
9-11 March 2009

***FINAL REPORT***

JCOMM Meeting Report No. 66

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## **NOTES**

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#### **Regulation 42**

Recommendations of working groups shall have no status within the Organization until they have been approved by the responsible constituent body. In the case of joint working groups the recommendations must be concurred with by the presidents of the constituent bodies concerned before being submitted to the designated constituent body.

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In the case of a recommendation made by a working group between sessions of the responsible constituent body, either in a session of a working group or by correspondence, the president of the body may, as an exceptional measure, approve the recommendation on behalf of the constituent body when the matter is, in his opinion, urgent, and does not appear to imply new obligations for Members. He may then submit this recommendation for adoption by the Executive Council or to the President of the Organization for action in accordance with Regulation 9(5).

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## PREFACE

This meeting report takes an abbreviated summary form, capturing the major decisions, recommendations, and actions that came out of meeting discussions. These are which are represented as bullet points in the report below. All preparatory documents and presentations given at the Third meeting of the JCOMM Observations Programme Area Coordination Group are available on the meeting web page: <http://www.jcomm.info/ocg3>

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## GENERAL SUMMARY OF THE WORK OF THE SESSION

### 1. Opening

The Coordinator of the JCOMM Observations Programme Area, Candyce Clark (USA), opened the meeting, and gave a [presentation](#)<sup>1</sup> with an introduction to the meeting and outlining the meeting goals. She emphasized the importance of building an integrated system, with a system perspective on issues and actions.

### 2. Requirements for the Observations Programme Area (OPA)

#### 2.1 Quick review of scientific requirements for climate, GCOS progress and update

Ed Harrison, chair of the GCOS-GOOS-WCRP Ocean Observations Panel for Climate (OOPC), gave a [presentation](#)<sup>2</sup> on requirements for climate observations of the OCG from an OOPC perspective, and a second [presentation](#)<sup>3</sup> from the Essential Climate Variable / Global Climate Observing System (GCOS) perspective.

- OCG priority remains on building and sustaining the current systems to agreed standards with near-real-time data reporting (see presentation for details), and broadening the national base of participation.

#### 2.2 Critical review of non-climate requirements and feasibility

Etienne Charpentier (WMO) gave a [presentation](#)<sup>4</sup> on a critical review of non-climate requirements for ocean observations that the OCG could fulfill.

- OCG emphasizes the importance of a dialogue between implementers and potential users asking for new capabilities based on their requirements, in order to find ways forward that balance technological capability, network optimization, and funding interest
- (see also item 4.2)

#### 2.3 Coordination and integration issues from the point of view of the JCOMM Data Management Programme Area (DMPA)

Robert Keeley, coordinator of the JCOMM DMPA, addressed the OCG members, highlighting key requests from the [working paper](#)<sup>5</sup> he had prepared for the meeting. He asked the OCG for help on ocean data standards, on building a 'cookbook' for new users to get oceanographic data into the real-time and delayed-mode data systems, with help on metadata and data acquisition system activities, and the elaboration and implementation of BUFR templates, to put these into action as soon as possible.

- Action: SOOPIP to verify BUFR templates for profile and underway data and feed back to Keeley
- Action: Panel Chairs to work with Keeley to ensure input into the process of harmonizing and finalizing BUFR templates
- Action: Panel Chairs and/or Technical Coordinators to ensure JCOMM catalog of standards and best/common practices document is populated with the formal and informal documents used by the panel (*and that these are submitted to the Ocean Data Standards portal*)

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- The OCG discussed ODAS and Meta-T for metadata, and more generally how to move forward on metadata, but did not agree on a recommendation or action on how to move forward.
- Action: Panel chairs to ensure contribution to Meta-T website
- (see also 4.4)

## 2.4 Coordination and integration issues from the point of view of the JCOMM Services Programme Area (SPA)

### 2.4.1 *Overview*

Albert Fischer spoke on behalf of Craig Donlon, chair of the JCOMM SPA, presenting the [working paper](#)<sup>1</sup> he had prepared for the OCG meeting.

### 2.4.2 *Requirements for Ocean Forecasting*

Gary Brassington, chair of the JCOMM Expert Team on Operational Ocean Forecast Systems (ET-OOFS) gave a [presentation](#)<sup>2</sup> on the development of requirements from ocean forecast systems for the observing system.

- Recommendation: SOOPIP to consider implementation of stricter real-time QC for profile data
- (see also 4.2)

## 3. **Review of status and challenges for each observing system component**

- for all teams, see also 4.2

### 3.2 JCOMM Ship Observations Team (SOT)

#### 3.1.1 *Overview of SOT, VOS, ASAP*

Graeme Ball, chair of the Ship Observations Team and of the Volunteer Observing Ship Panel gave a [presentation](#)<sup>3</sup> on the challenges and issues for VOS and ASAP.

- Action: for SOT and IOCCP to put together short information note/pamphlet for the carbon community on the PMO network, the SOT programmes and information useful to find ships
- Recommendation: SOT maintain contact with SCOR group on volunteer ship ocean observatories to avoid overlap/duplication and to align messages to both ship operators and the scientific community; Recommendation: JCOMM to make the case of climate VOS observations with shipping/maritime companies at Maritime events, drawing on research users to make the case
- Action: National Pub47 submissions to be forwarded by WMO Secretariat to JCOMMOPS for informal use in a database
- Recommendation: SOT to discuss management of Pub47 in view of making recommendation to JCOMM-III

#### 3.1.2 *SOOP*

Gustavo Goni, chair of the Ship of Opportunity Programme Implementation Panel gave a [presentation](#)<sup>1</sup> on the challenges and issues for SOOP.

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- (see 2.4.2)

### 3.2 JCOMM Data Buoy Cooperation Program (DBCP)

David Meldrum, chair of the Data Buoy Cooperation Panel, gave a [presentation](#)<sup>2</sup> on the status and challenges of the DBCP program.

- Action: DBCP Chair to contact Stan Wilson (NOAA NESDIS) regarding data availability delays due to the blind orbit issue
- Action: DBCP, with assistance of Keeley and the DBCP TC, to create a map of systematically undersampled areas
- Recommendation: Observing Panels should have a system approach to achieve coverage in data sparse areas (e.g. getting SST from cheap moorings in Gulf of Guinea instead of from drifters; or use longer drogues to limit drift out of area) Recommendation: transform this into a concrete plan for the next intersessional period for workshops that would address, variable by variable, a negotiation between user requirements, network optimization, funding sources, etc.
- (see also 7.4)
- Common issue for all panels to explore idea of tax to support coordination activities – scientific direction and technical support

### 3.3 JCOMM Global Sea Level Observing System (GLOSS)

Thorkild Aarup (IOC/UNESCO, GLOSS secretariat) gave a [presentation](#)<sup>3</sup> on behalf of Mark Merrifield, chair of the Global Sea Level Observing System, on status and challenges faced by the system.

- Recommendation: GLOSS should consider expanding core mission from global sea level rise to include higher time resolution and space resolution information about relative sea level change for other users (as they are already doing in part)

### 3.4 Argo

Dean Roemmich, chair of the Argo Steering Team (AST), gave a [presentation](#)<sup>4</sup> on status and challenges faced by the Argo program.

- Action: OCG implementation goals and JCOMMOPS to separate number of all active profiling floats from number of floats contributing to core Argo mission (providing good data 60°N to 60°S in open ocean)
- see also Argo to input into metrics discussion (below)
- Message to hydrographic community on ongoing need for near-real-time reference data for Argo – identifying available data for QC, from IOCCP hydrography lines and all other sources

### 3.5 OceanSITES

Uwe Send, chair of the OceanSITES Steering Committee, gave a [presentation](#)<sup>5</sup> on the status and challenges of the OceanSITES reference station network.

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- Action: OceanSITES/TC to provide status of surface flux reference stations for GCOS Progress Report by next week
- Action: OceanSITES/TC to provide OCG with updated inventory/maps and community plans for implementation (see also 4.2)
- Action: for the OceanSITES Steering Team to better define and explain the edges of the program, about which there is some confusion – is it restricted focus on deep-water Eulerian multi-disciplinary observations, or include all transport sites? GCOS defined ocean reference sites.

### 3.6 International Ocean Carbon Coordination Program (IOCCP)

Maria Hood, director of the International Ocean Carbon Coordination Program (IOCCP) gave a [presentation](#)<sup>1</sup> on IOCCP's status and challenges.

- Action: IOCCP and CLIVAR to work with hydrography community to develop and maintain a comprehensive cruise plans database, and to link this with JCOMMOPS so that deployment opportunities can be taken advantage of (goal to have info 6 months before cruise opportunity)

### 3.7 Satellites

Eric Lindstrom, JCOMM satellite coordinator, gave a [presentation](#)<sup>2</sup> on the status of the satellite observing system for ocean variables, and some commentary on a strategy for JCOMM definition of requirements.

- Action: OCG to produce 1-pager / annotated ppt slide (variable by variable) about in situ data available for validation of satellite missions with prominent JCOMM (*and other?*) logos, distribute to satellite community (*via CEOS*) – have OOPC work with OCG to do this, via NASA support to OOPC, within 6 mo.
- OCG to raise requirement for intergovernmental solutions to data access solutions, rather than bilateral negotiations, with JCOMM, WMO, IOC, and any other intergovernmental venue.
- Recommendation: SOT to take note of ships using radiometers for calibration of satellite SST IR and ocean colour missions (funded directly by satellite agencies) – contact Peter Minnet, RSMAS. Refresh of infrastructure is needed – good to have link to SOT.
- Recommendation: ask Jordi Font or Gary Lagerloef to organize a small workshop on sea surface salinity validation requirements with in situ and satellite representatives

## 4. **Issues and synergies for cross-component integration and coordination**

### 4.1 JCOMM OPA Metrics

Clark and Keeley gave a joint [presentation](#)<sup>3</sup> on the current metrics for Essential Climate Variables (ECVs) maintained by JCOMM, looking at coverage.

- Recommendation – should have a metric for every ECV
- Recommendation – wide review by OCG of the metric - Other groups/panels are invited to comment on the metrics – process to consider these – Working Group composed of those producing these metrics now, plus Lindstrom, by JCOMM-III

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- Recommendation: to look at using different grid boxes sizes for addressing horizontal resolution coverage (e.g. Argo uses 9 deg x9 deg boxes – a smoothed metric based on same requirement) (Action for Roemmich/Belbeoch and Keeley)
- Recommendation: separate animal profile CTDs and Argo data (both reporting in TESAC)
- Recommendation: non-GTS data must be included (e.g. Coriolis XBT data)
- Recommendation: To include a paragraph or two of interpretation of the graphs (see also 3.7)
- Recommendation: start a discussion with the Aquarius team on the salinity metric – what is their sampling requirement? (see also 3.7)

#### 4.2 Are requirements being met?

The coordination group held a discussion, organized by observing network and source of requirements, on key needs to meet the stated JCOMM goals.

- GLOSS: OCG implementation goals should be aligned with GLOSS Manual Appendix 1 – goal: research quality stations 290, GPS/DORIS-equipped stations 170, real-time reporting (1-minute sampling) 290. These satisfy the RRR requirements as well as GCOS-92.
- DBCP goals should be: all surface drifting buoys 1250, including SLP 1250, salinity sensors should be deleted as a target for OCG.  
DBCP believes it is ready to provide additional capacity in measuring ice thickness and pCO<sub>2</sub>, should resources be identified to support this.
- TIP / tropical moored buoys – *outstanding discussion on implementation goal number for OCG (including RAMA calls for 132) vs. GCOS-92 (which called for ~120)*
- SOT has provided updated implementation numbers.
- Argo implementation goals should identify core mission (see 3.4)  
As more floats move to Iridium or Argos-3 communications, the timeliness (requirement for ocean forecasting) will be improved (slow transition).  
*Action:* Roemmich to bring this request from ET-OOFS (improved timeliness) to the upcoming AST meeting  
Argo has left shallow/marginal seas strategies to regional groups.  
Expectation that an international target for the high-latitude oceans may be part of the Argo CWP for OceanObs'09.  
*Recommendation:* that minimum depth on Argo profiles be brought to 3 m from 5 m.  
*Action for Roemmich and Lindstrom:* to bring sea surface salinity calibration need to the AST again.
- OceanSITES:  
surface flux implementation goal should appear once under OceanSITES and not again under the tropical moorings  
*Action:* Best practice for the surface flux reference sites should be documented by OceanSITES  
OceanSITES will revise implementation goals for:
  1. surface flux reference sites
  2. water column reference sites (physical, biogeochemical, etc.)
  3. transport sites (including trans-oceanic sections, straights/passages, boundary currents) (see action re: clarification above)*Action:* OceanSITES to contact IOCCG regarding the role it can play in providing in situ optical properties, chlorophyll and productivity data
- Hydrography numbers to be clarified with GO-SHIP, OCO/NOAA

#### Non-climate requirements brought by WMO/CBS RRR

- *High time and space resolution, high precision and accuracy (better thermometer) SST:*  
DBCP has been in contact with GHRSSST – GHRSSST members invited to write proposal to their funding agencies for ... of SST in specific area as a research experiment, based on cost information provided by DBCP
- *Wave measurements:*  
Needs: better wave spectral measurements from moored buoys for intercomparison and validation of wave models. Pilot project WET.  
Looking at new ways of deriving wave parameters from drifters. Pilot project WMD.  
But, still a need for a specific request from ETWS to OceanSITES, dialogue on costing, as a first step to discuss with potential funding agencies,
- Action for OCG: to continue to identify potential first steps, talk to potential funders about whether these align with their interest
- *Surface pressure:*  
OCG suggests a working group should consider how to best provide SLP information. Goal should be to develop an implementation strategy based on optimization between different systems (SLP on buoys vs. integration of SVW remote sensing products). Group should include representation from ET-EGOS/CBS, AOPC, OOPC, DBCP, satellite community
- *precipitation:*  
OceanSITES will bring this request to its members and believes it can make progress (surface reference flux sites already measure precipitation).  
SOT has only 8 ships with rain gauges (7 of which are research) and feels it would be impossible to ask this of the VOS fleet due to reliability of measurements (exposure on ships). Technologically impractical.  
Argo has some pilot acoustic precipitation sensors deployed  
*Recommendation* – small working group to consider optimization between systems to identify a plan for a global ocean precipitation array.including consideration of satellite missions.
- *horizontal visibility:*  
SOT encourages this as part of normal observations. But SOT notes there are better ways of doing this.
- *Snow (precipitation) from ice buoys:*  
DBCP believes more research is needed into sensors to accurately provide this variable.  
Open to dialogue on technology development.
- *ASAP:*  
Ask CBS to help SOT quantify the need for ASAP observations, as part of the overall observing system.

#### 4.3 Instrument best practices and standards (contribution to WIGOS pilot project, JCOMM Catalogue)

Charpentier gave a [presentation](#)<sup>1</sup> on Best Practices and the WIGOS pilot project.

- OCG notes that in some observing networks with rapidly evolving technology ‘common practice’ is easier to identify than ‘best practice’
- Recommendation: catalog database should include a ‘last updated by Panel’ date, in addition to publication date
- (see also 2.3)

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#### 4.4 Common capacity-building requirements and how to effectively implement the PANGEA concept

Charpentier gave a [presentation](#)<sup>1</sup> on WMO Capacity Building and the PANGEA concept.

- Recommendation: suggest to Members/Member States that a percentage of the platforms being purchased can be reserved for donation purposes; joint initiatives to be promoted with DBCP, Argo, etc.
- Recommendation: PMOs can be a useful entry point for Pangea-concept endeavors (identifying reliable partners)
- Action: Panel Chairs or their nominated person to look at the cookbook sections that are relevant to their Panel and provide input to Bob Keeley, by end of September
- Recommendation: cookbook to include basic information or links to Quality Control procedures
- Action: Section on JCOMMOPS to be added in the cookbook, provided by TCs

#### 4.5 Common strategy to move forward including cross-coordination and synergies

- OCG notes need to identify deployment opportunities not currently known about; as well as need to charter ship time for specific deployments in undersampled / undertransited regions.
- OCG notes that benefit of time spent on coordination in improving maximization of ship deployment should be balanced with cost of chartering ship time.
- OCG to highlight difficulties with deployment opportunities and dedicated ship time for undersampled regions with governing bodies so awareness is raised at governmental level
- (see also 2.4)

### 5. **Technical coordination**

Mathieu Belbeoch, JCOMMOPS, gave a [presentation](#) on behalf of himself and Hester Viola on the operations and development of JCOMMOPS.

#### 5.1 Status of JCOMMOPS

- OCG expressed its appreciation of the work of the two technical coordinators
- Action: JCOMMOPS to work with wider JCOMM community (incl. ISDM and AOML for metrics), GCOS, GOOS, OSMC in getting feedback for their website. (see also 4.1)
- Recommendation: JCOMMOPS to work with wider community in distributed approach to providing some information (i.e. metrics) as links from their website
- Add OceanSITES to ToRs of JCOMMOPS for adoption by JCOMM-III

#### 5.2 JCOMM OPA Network Status Reporting, including JCOMMOPS and the Observing System Monitoring Center (OSMC)

Candyce Clark gave a brief update on the US Observing System Monitoring Center (OSMC) effort and its contribution to JCOMM.

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### 5.3 Report from the secretariat on process for Observing Program Support Centre (OPSC) expansion

Etienne Charpentier gave an oral report on the process of soliciting bids and evaluating them for an expansion of JCOMMOPS into the Observing Program Support Centre concept.

- OCG was grateful for efforts of JCOMM and the evaluation committee, nevertheless OCG disappointed in lack of significant new resources identified to supporting the centre.
- OCG re-emphasized importance of scientific director(s) as part of the concept of the center, and that the link to a scientific institution was important
- Action for OCG: work offline to construct Terms of Reference that include scientific direction element to OPSC. If recommended outcome cannot fulfill the ToRs, OCG will have basis to continue searching while maintaining status quo. ToRs should fully reflect vision outlined at OCG 2 years ago.
- Recommendation: Evaluation committee to negotiate leading offer, including asking for staff to help for the project office function and clarifying role of all partners (2 week delay for starting negotiations)
- Recommendation: Other agencies to be approached in the country of the host as potential supporters of the center
- Action: secretariat to organize a teleconference of the evaluation committee after the results of the negotiation

### 5.4 Guidance from the Observing Networks

A generalized discussion amongst the observing networks represented was held on the performance of JCOMMOPS.

- Recommendation: OCG chair, and the Panel Chairs that contribute to JCOMMOPS, the funding countries, the IOC and WMO, to regularly review and revise the JCOMMOPS workplan from overall system perspective

## 6. **OceanObs'09**

Harrison gave a [presentation](#)<sup>1</sup> on the status of planning for the OceanObs'09 conference, which had as its goals to celebrate progress in implementing the existing initial ocean observing system, realizing societal benefits from it, and highlighting its potential; and to develop a process for building consensus for sustaining and evolving systematic and routine global ocean observations over the next 10 years in support of societal benefits. More information about the conference can be found at [www.oceanobs09.net](http://www.oceanobs09.net).

## 7. **JCOMM-III and parent body (WMO + IOC) reporting and recommendations**

### 7.1 What needs to be raised at the cross-programme area technical level?

- to SPA: advocacy for the observing system from the teams in the SPA is needed in order to support their objectives and the OCG's objectives.  
(see also messages in 4.2)
- (see also 2.3 and 4.4 for DMPA)

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## 7.2 What needs to be raised at the intergovernmental level?

- Action: OPA coordinator to consult with the OCG to finalize the list of decisions to be brought to the WMO and IOC governing bodies (immediate)

## 7.3 OPA Drafting operating plan

- Action: OPA coordinator in consultation with OCG by e-mail to finalize draft workplan for the next 4 years for consideration by JCOMM-III (by mid-April)

## 8. **New business**

- OCG welcomes inclusion of tsunameter group as action group of DBCP if tsunami community accepts, sees scope for coordination
- OCG welcomes animal oceanographer group(s) for interaction and coordination of CTD data in terms of common standards/intercomparison, QC, data distribution and exchange, data management. (sensibilities on both WMO and IOC sides)
- OCG welcomes continued dialogue with SAON on interoperability of the observing system

## 9. **Closing**

Clark closed the meeting at 17:00 on 11 March 2009.

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## ANNEX I

### LIST OF PARTICIPANTS

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## ANNEX II

### AGENDA

#### 1. Opening

#### 2. Requirements for the Observations Programme Area (OPA)

- 2.1 Quick review of scientific requirements for climate, GCOS progress and update (*Harrison, 20 min +10 min discussion*)
- 2.2 Critical review of non-climate requirements and feasibility (Statements of Guidance as part of CBS rolling review, including SPA requirements) (*Charpentier, 20 min, disc under 3.9*)
- 2.3 Coordination and integration issues from the point of view of the JCOMM Data Management Programme Area (DMPA) (*Keeley, 20 min +20 min disc*)
- 2.4 Coordination and integration issues from the point of view of the JCOMM Services Programme Area (SPA) (*2 presentations, followed by 20 min discussion*)
  - 2.4.1 Overview (*Donlon, 20 min*)
  - 2.4.2 Requirements for Ocean Forecasting (*Brassington, 10 min*)

#### 3. Review of status and challenges for each observing system component

*Outline of reports from each in situ system (3.1-3.6 below)*

- *performance measured against requirements*
- *delivery of raw data (data collection and exchange)*
- *measurement standards and quality control issues*
- *logistics and resources*
- *costs of the system and benefits (how information is used and identifying data users)*
- *capacity-building requirements*
- *potential new technology: instrumentation, communications, platforms*
- *ideas for the way forward*

##### 3.1 JCOMM Ship Observations Team (SOT)

- 3.1.1 Overview of SOT, VOS, ASAP (*Ball, 20 min +10 min disc*)
- 3.1.2 SOOP (*Goni, 15 min + 5 min disc*)

##### 3.2 JCOMM Data Buoy Cooperation Program (DBCP) (*Meldrum, 30 min +15 min disc*)

##### 3.3 JCOMM Global Sea Level Observing System (GLOSS) (*Aarup/Merrifield, 30 min + 15 min disc*)

##### 3.4 Argo (*Roemmich, 30 min + 15 min disc*)

##### 3.5 OceanSITES (*Send, 30 min + 15 min disc*)

##### 3.6 International Ocean Carbon Coordination Program (IOCCP) (*Hood/Tedesco, 30 min + 15 min disc*)

##### 3.7 Satellites (*Lindstrom, 40 min + 20 min disc*)

#### 4. Issues and synergies for cross-component integration and coordination

4.1 JCOMM OPA Metrics (Clark, 10 min intro + 30 min disc)

*Review of the metrics in place for each variable, discussion on how to improve, identification of actions.*

4.2 Are requirements being met? (led by Clark, 60 min disc)

*Discussion of implications of meeting the full set of requirements laid out in Agenda Item 2, actions for meeting them, and connections that need to be made in order to move forward. Update to the JCOMM OPA Observing System Implementation Goals.*

4.3 Instrument best practices and standards (contribution to WIGOS pilot project, JCOMM Catalogue) (introduction by Clark (catalogue) Charpentier (WIGOS), 10 min +20 min disc)

*Compilation (and gap analysis?) of JCOMM standards (JCOMM Catalogue) – how to contribute from each observing network, the start of a gap analysis, and subsequent actions to take within each observing network.*

4.4 Common capacity-building requirements and how to effectively implement the PANGEA concept (introduction by Charpentier, 10 min + 20 min disc)

*Identify common actions if needed.*

4.5 Common strategy to move forward including cross-coordination and synergies (led by Clark, 60 min disc)

*Identification of actions for the observing networks, with an emphasis on the ones shared across the networks. Discussion will be used to update the JCOMM OPA Draft Operating Plan (agenda # 7.3).*

## **5. Technical coordination**

5.1 Status of JCOMMOPS (Belbeoch / Viola, 30 min + 30 min disc)

*Report from the Technical Coordinators. Specific feedback from the Observing Networks, the OPA coordinator, and the observing networks (GCOS, GOOS, WWW).*

5.2 JCOMM OPA Network Status Reporting, including JCOMMOPS and the Observing System Monitoring Center (OSMC) (Clark, 10 min + 30 min)

*Discussion on complementarity of network status reporting from JCOMMOPS, the OSMC, panel meeting reports, etc...*

5.3 Report from the secretariat on process for Observing Program Support Centre (OPSC) expansion (Lee, 15 min)

5.4 Guidance from the Observing Networks (discussion led by Clark, 45 min)

*Discussion of overall strategy for technical coordination, and of the draft terms of reference for the OPSC.*

## **6. OceanObs'09**

6.1 Status of planning for OceanObs'09 (Harrison/Fischer, 15 min)

6.2 Review of the Community White Papers from the OPA (introduction by Harrison/Fischer 10 min + 30 min disc)

6.3 Identification of the common issues to be raised in Plenary Papers (60 min)

## **7. JCOMM-III and parent body (WMO + IOC) reporting and recommendations**

7.1 What needs to be raised at the cross-programme area technical level? (30 min disc)

*Consideration of list of actions and recommendations from previous 2 days of discussions*

7.2 What needs to be raised at the intergovernmental level? (40 min disc)

*Consideration of list of actions and recommendations from previous 2 days of discussions for consideration by WMO and IOC Executive Councils.*

7.3 OPA Drafting operating plan

*Consideration of list of actions and recommendations from previous 2 days of discussions for consideration by JCOMM-III (including documentation and terms of reference for OPA); guidance from the Management Committee on WMO and IOC strategic planning; update OPA draft operating plan (30 min disc)*

## **8. Closing**

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