

REPORT FROM THE SECRETARIAT

(Submitted by the Secretariat)

Summary and purpose of the document

This document provides information on actions taken since the seventh session of the SOT, and on decisions and priorities by both WMO and IOC executive bodies and emerging topics that SOT should be aware related to JCOMM activities.

ACTION PROPOSED

The Team will review the information contained in this report, and comment and make decisions or recommendations as appropriate. See part A for the details of recommended actions.

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- Appendices:**
- A.** Proposed text for inclusion in the manual on WIGOS regarding WIGOS station identifiers
 - B.** Proposed Structure of WIGOS station identifiers.
 - C.** Recommendations of the *ad hoc* Satcom Forum
 - D.** Updated Workplan Leading to the Formal Establishment of the Satcom Forum
 - E.** CBS Ext. (2014) Resolution 2.3(1)/6, Establishment of a Satcom Users Forum
 - F.** Proposed SOT contribution to the WIGOS key activity areas

- A - DRAFT TEXT FOR INCLUSION IN THE FINAL REPORT***Forty-seventh Session of the IOC Executive Council***

3.1.1 The IOC Secretariat representative reported on the proceedings of the forty-seventh IOC Executive Council (IOC-XXXVII, Paris, France, 1-4 July 2014). The Team noted with appreciation the EC-XLVII, Decision 3.1 which recognized the Australian Integrated Marine Observing System (IMOS) as a GOOS Regional Alliance. The Team also noted the significance of the IOC Executive Council Decision EC-XLVII 3.2.2 regarding the Renewal of the JCOMMOPS Hosting Agreement. The Executive Council expressed their gratitude to CLS and the government of France for their contributions to the institutional arrangement for JCOMMOPS through the years and noted the value of the IOC-WMO partnership arrangement of support for the JCOMMOPS. To encourage sustainable Member State support of JCOMMOPS the EC requested:

- IOC in cooperation with the WMO Secretariat, to clarify IOC/UNESCO and WMO's responsibilities for JCOMMOPS with a view to improving its sustainability, and report on the outcome to the IOC Assembly at its 28th session in 2015. (**action; IOC/WMO Secretariats and JCOMMOPS staff; May 2015**):

Sixty-sixth Session of the WMO Executive Council

3.1.2 The WMO Secretariat representative reported on the outcome of the sixty-sixth Session of the WMO Executive Council (WMO EC-66, Geneva, Switzerland, 18-27 June 2014). In particular, the Team noted the following decision of EC-66 and urged its members to take it into account when developing their activities in support of the Team (**action; Team members; ongoing**):

- *The Council recognized the difficulties that JCOMM is facing with regard to the implementation of marine meteorological and oceanographic observing systems. In particular, noting the on-going development of the Tropical Pacific Observing System (TPOS) and related observing system network design activities, the Council urged Members to enhance their contributions in support of the implementation and operations of the tropical moored buoy arrays, in particular in the Tropical Pacific Ocean, where data availability has dropped substantially in the last two years. Of particular interest is the provision of ship time to assist in the deployment and servicing of tropical moored buoys.*

CBS Ext.(2014)

3.1.3 The Team noted the outcome of the 2014 Extraordinary Session of the WMO Commission for Basic Systems (CBS Ext. (2014), Asuncion, Paraguay, 8 - 12 September 2014). The Team noted in particular that the Commission had noted with concern that the completion of the initial composite ocean observing system has not progressed substantially in the last few years, and remained at a level of about 62%. The CBS requested its Members to contribute to the JCOMM Observations Programme Area Implementation Goals and to sustain the marine meteorological and oceanographic observing system as a top priority. Accordingly the Commission adopted Recommendation 18 (CBS-Ext.(2014)) – Support of Members to the implementation of the marine meteorological and oceanographic observing system in support of NWP. The Recommendation is provided in Appendix C of SOT-8 Doc. 5.

WMO Integrated Global Observing System (WIGOS)***WIGOS Framework Implementation***

3.1.4 The Secretariat reported on the recent development with regard to the implementation of the WMO Integrated Global Observing System (WIGOS). The Team noted that the WIGOS

framework Implementation Plan (WIP) has been updated (see website¹) by the Inter Commission Coordination Group on WIGOS (ICG-WIGOS) at its third meeting (Geneva, Switzerland, February 2014), and noted by the Sixty-Sixth Session of the WMO Executive Council (Geneva, Switzerland, 18-27 June 2014). It was then further updated by the ICG-WIGOS at its fourth Session (Geneva, 17-20 February 2015). The Team agreed on its contribution to the ten WIGOS framework implementation Key Activity Areas (KAAs) as reflected in Appendix F. The Team also agreed to record such contribution in the SOT Implementation Strategy.

JCOMM Pilot Project for WIGOS legacy recommendations

3.1.5 The Team also recalled its response made at SOT-6 to the legacy recommendations of the JCOMM Pilot Project for WIGOS, which provided an excellent contribution of the Team to WIGOS implementation (see JCOMM MR No. 84², SOT-6 final report, paragraph 10.2). These are also reflected in section 2.3 of the SOT Implementation Strategy (JCOMM TR No. 61).

OSCAR Platform developments

3.1.6 The Team agreed that ship metadata from the WMO Publication 47 should be integrated in the Observing Systems Capability Analysis and Review tool (OSCAR³) as soon as possible. It requested the WMO Secretariat to discuss the issue with JCOMMOPS, E-SURFMAR, and MeteoSwiss in the view to undertake the necessary developments in this regard (**action; WMO Secretariat; ongoing**).

International Forum of Users of Satellite Data Telecommunication Systems

3.1.7 The Team noted that the *ad hoc* International Forum of users of satellite data telecommunication systems (Satcom Forum⁴) was held in Paris, from 3 to 4 October 2013 and has made a number of recommendations, which the Team also supported (Appendix C). The Team noted that EC-66 requested CBS to review the reports of the initial *ad hoc* Satcom meetings, for consideration by Cg-17, including assessment of budget implications associated with the organizational and operating practices should a Forum be established. Per EC-66 guidance, CBS Ext. (2014) (Asuncion, Paraguay, 8 - 12 September 2014) adopted Resolution 9 - Establishment of a Satcom Users Forum (Appendix E).

Observing station Identifiers

3.1.8 The Commission had noted that all stations, platforms and instruments contributing to WIGOS will need identifiers in order for them to be properly referenced in the observational data records themselves, in the associated WIGOS metadata, and for the purpose of managing and planning the networks. CBS stressed that providing identifiers for any observing station or platform known to Members, regardless of the commitment of the operator regarding data quality or sustained operation, is essential for WIGOS. Potential issues regarding data quality and sustainability will be documented in the associated WIGOS metadata records. The Commission noted the structure for WIGOS identifiers and recommended that this structure be included in the Manual on WIGOS. The latest version of the WIGOS identifier scheme as approved by ICG.WIGOS-4 and to be submitted to the 17th Congress for approval is provided in Appendices A and B.

3.1.9 The Team noted that according to the proposal for WIGOS station identifiers, the current structure of ship identifiers would be reflected in the so called "Local Identifier" part of the WIGOS station identifiers, while a specific value (yet to be decided) would be provided to the "Issuer Identifier" part of the WIGOS station identifiers in order to indicate that the "Local Identifier" is dealing with the ship identifiers used under the SOT.

1 <http://www.wmo.int/pages/prog/www/wigos/documents.html>

2 http://www.jcomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=8228

3 <http://www.wmo-sat.info/oscar/>

4 <http://www.jcomm.info/SatCom1>

WMO Commission for Instruments and Methods of Observation (CIMO)

CIMO Guide update

3.1.10 The Team recalled that the SOT, through its Task Team on Instrument Standards (TT-IS), had provided input for updating the WMO Publication No. 8, WMO Guide to Meteorological Instruments and Methods of Observation (CIMO Guide). In particular, the Team noted with appreciation that the SOT proposed changes were submitted to, and approved by the 16th Session of the WMO Commission for Instruments and Methods of Observation (St.-Petersburg, Russian Federation, 10 - 16 July 2014) (see paragraph 6.20 and 6.21 of the CIMO-16 Session report, WMO No. 1138⁵ for details). These changes refer essentially to Chapter 4, Marine Observations, of Part II, Observing Systems of the Guide (see the WMO Website for the provisional 2014 edition⁶ approved by CIMO-16). The 2008 Version of the CIMO Guide (updated in 2010), is now available on the WMO website⁷ also in French, Spanish and Russian.

Minamata Convention on Mercury

3.1.11 The Team recalled that the UNEP Minamata Convention on Mercury, which introduces a ban on the manufacture, import and export of products containing mercury, will enter into force in 2020 and could have significant consequences for Members still using these types of instruments on VOS. Additionally, a new European Union regulation totally bans sales of these products in Europe as of April 2014. CIMO-16 requested the WMO Secretariat to inform Members of the possible impact of this Convention and requested the CIMO Management Group to ensure that appropriate outreach material was developed and shared with all WMO Members to enable them to adapt to the new situation, while minimizing the possible impact on data quality and data compatibility.

-B- BACKGROUND INFORMATION

1. Forty-seventh Session of the IOC Executive Council

1.1 The forty-seventh Session of the IOC Executive Council (IOC EC-47) was held in Paris, France, at UNESCO Headquarters, from 1 to 4 July 2014. The Session was concerned with the continuing financial difficulties of UNESCO, and also the nomination of candidates for the IOC Executive Secretary position. In addition substantive discussions on "The Future of IOC" were reported, which included acknowledgement of the continued role of observational oceanography in the IOC's future.

2. WMO Integrated Global Observing System (WIGOS)

WIGOS Framework Implementation Plan (WIP)

2.1. The WIP¹ addresses the necessary activities to establish an operational WIGOS by the end of the period 2012-2015, as per the direction of WMO Congress. To migrate the existing observing systems (GOS⁸, GAW⁹, WMO Hydrological Observing System (WHOS), and the GCW¹⁰, including surface-based and space-based components and all WMO contributions to the GFCS¹¹, the GCOS¹², the GOOS¹³, the GTOS¹⁴ and the GEOSS¹⁵) into a more integrated single system that is

5 http://library.wmo.int/opac/index.php?lvl=notice_display&id=16780#.VPXRp2NRopo

6 <http://www.wmo.int/pages/prog/www/IMOP/publications/CIMO-Guide/Provisional2014Edition.html>

7 <http://www.wmo.int/pages/prog/www/IMOP/IMOP-home.html>

8 Global Observing System – <http://www.wmo.int/pages/prog/www/OSY/GOS.html>

9 Global Atmosphere Watch – http://www.wmo.int/pages/prog/arep/gaw/gaw_home_en.html

10 Global Cryosphere Watch – http://www.wmo.int/pages/prog/www/polar/index_en.html

11 Global Framework for Climate Services – <http://www.gfcs-climate.org/>

12 WMO-IOC-UEP-ICSU Global Climate Observing System – <http://gcos.wmo.int/>

13 IOC-WMO-UNEP-ICSU Global Ocean Observing System – <http://www.ioc-goos.org/>

WIGOS, focused effort is required in the following Key Activity Areas (KAAs) identified and described in the WIP¹:

- 1) Management of WIGOS implementation;
- 2) Collaboration with WMO and co-sponsored observing systems;
- 3) Design, planning and optimized evolution;
- 4) Integrated Observing System operation and maintenance;
- 5) Integrated Quality Management;
- 6) Standardization, system interoperability and data compatibility;
- 7) The WIGOS Operational Information Resource;
- 8) Data and metadata management, delivery and archival;
- 9) Capacity development;
- 10) Communication and outreach.

2.2. The sixty-sixth Session of the WMO Executive Council (EC-66, Geneva, Switzerland, 18-27 June 2014) acknowledged that ICG-WIGOS had updated the WIGOS Framework Implementation Plan (WIP¹), adjusted target dates for tasks' completion. EC-66 agreed that the implementation of the WIGOS Framework is approaching a point of maturity where WIGOS is now enabling the development and deployment of its components. With the key initial building blocks of the WIGOS Framework in place by Cg-17, the prerequisites are available for a Preoperational Phase of WIGOS from 2016 to 2019. The Council noted the updated version of WIP, which is now provided on the WMO website¹.

2.3. JCOMM's contribution to the ten WIGOS framework implementation Key Activity Areas (KAAs), and the proposed SOT response is provided in Appendix F.

Regional WIGOS Implementation Plans

2.4. EC-66 appreciated the further progress achieved in the Regional WIGOS Implementation Plans (R-WIP). Four regional associations (RAs II, IV, V and VI) already endorsed their R-WIP, the other two (RAs I and III) are expected to do so at their forthcoming sessions this year.

Data management and exchange

2.5. EC-66 agreed that the overall issue of WIGOS Data Management needs focus and attention. This covers issues such as storage and archival methods and responsibilities, reprocessing, discoverability and data access. This should be considered in the broader WMO context and should, in due course, be adequately reflected in the WMO Technical Regulations (WMO-No. 49), Vol. I, with clearly defined areas of responsibilities of all concerned (WIGOS, WIS, DPFS, etc.). Close collaboration and cooperation of all relevant technical commissions is needed. The Executive Council requested further guidance to the Members on how to address this matter and referred it to the WMO Commission for Climatology (CCI) and the WMO Commission for Basic Systems (CBS) for further study.

2.6. Recognizing the importance of the free and unrestricted exchange of data and products necessary for the effective implementation of WIGOS, and the need to integrate observations supporting a broad range of application areas from a large and heterogeneous variety of sources, both NMHS and non-NMHS owned, into the WIGOS framework, EC-66 requests ICG-WIGOS to investigate whether the existing data policies and protocols in place for the Global Observing System and other WIGOS components adequately covers the requirements for WIGOS, and that the Group provide a report to Cg-17 on this issue.

Vision for the WIGOS in 2040

¹⁴ Global Terrestrial Observing System – <http://www.fao.org/gtos/>

¹⁵ Global Earth Observing System of Systems – <http://www.earthobservations.org>

2.7. EC-66 stressed the importance of an early development of a “Vision for WIGOS in 2040” and requested CBS to lead this development, with involvement of the other technical commissions. A draft Vision should be submitted to Cg-18 in 2019 for endorsement.

WIGOS Regulatory Material and Guidance

2.8. EC-66 noted that the development of the WMO Technical Regulations (WMO-No. 49), Vol. I, Part I – WIGOS, as requested by EC-64, was proceeding ahead of the Parts II – VI of this Volume. EC-66 requested the technical commissions to accelerate the development of the other Parts of Vol. I to ensure a comprehensive approach leading to all parts being consistent with each other. EC-66 agreed that the Vol. I, Part I - WIGOS could be approved and promulgated effectively by Cg-17.

WIGOS Partnerships

2.9. EC-66 highlighted the importance of third-party (non-NMHS) observations for Members to provide enhanced services and noted that the WIGOS integration of these data is a critical contribution to WMO, its Members and its application areas. EC-66 agreed that the WIGOS Framework already provides a mechanism for NMHSs and their national partners to share observations, while recognizing that policies regarding these data normally fall outside of the NMHSs.

2.10. EC-66 further urged the Secretariat to actively reach out to and establish agreements with partner organizations with observing systems activities (e.g. the Copernicus marine monitoring service), with the particular goal of establishing common terminology regarding metadata standards and, whenever possible, common vocabularies. EC-66 recommended looking into the possibility of holding joint Conferences or Workshops as a way to facilitate the dialogue and achieve agreements on this important issue.

2.11. At this stage, WIGOS is ready to fully support and contribute to the implementation of the Global Framework for Climate Services (GFCS). However, it was noted that better understanding and more concrete specification of the WIGOS role to the Observation and Monitoring Pillar, and contribution from ICG-WIGOS is needed from the GFCS community.

The WIGOS Information Resource (WIR)

2.12. The WIGOS Information Resources (WIR) is a network platform and tool designed to provide WIGOS stakeholders with all relevant information on the operational status and evolution of WIGOS and its component observing systems, the operational requirements of WIGOS, including standard and recommended practices and procedures used in the WIGOS framework, and their capabilities to meet observational user requirements of all WMO Application Areas. The comprehensive information collected for the globe on both requirements and capabilities is quantitatively recorded in a database accessible through the Observing Systems Capability Analysis and Review tool (OSCAR¹⁶) of the WIR. While observational user requirements, and space-based observing system capabilities are operational within OSCAR, a Memorandum of Understanding (MoU) was signed between WMO and MeteoSwiss for the migration of this two components from the WMO to the MeteoSwiss IT infrastructure, and the development of surface-based capabilities. JCOMMOPS is expected to collaborate with this development project in order to reflect the marine observing systems capabilities in OSCAR.

2.13. EC-66 stressed the importance of the WIR; it was noticed that the launch of OSCAR tool would, for the first time, make all the information regarding observational requirements and observing systems capabilities available in the same place. However, EC-66 noted that the remaining parts of the WIR are yet to be developed and that substantial resources for their

¹⁶ <http://www.wmo-sat.info/oscar/>

development and subsequent operation are required. It therefore urged Members to consider providing assistance for their development and/or future operations.

International forum of Users of Satellite Data Telecommunication

2.14. The World Meteorological Organization (WMO) Sixteenth Congress (Cg-16, Geneva, Switzerland, 16 May – 3 June 2011) supported the establishment of an International Forum of Users of Satellite Data Telecommunication Systems (Satcom Forum) covering a wide user basis, and to address remote data communication requirements - including tariff negotiations as needed - for automatic environment observing systems coordinated through WMO and partner organizations such as IOC.

2.15. The Satcom Forum is meant to be an entirely self-funded body jointly sponsored by the WMO and the Intergovernmental Oceanographic Commission (IOC) of UNESCO in the view to address the requirements of these two Organizations for the timely collection of environment data from observing platforms.

2.16. The main goals are (i) to ensure proper coordination amongst the users of satellite data telecommunication systems and to represent their collective interests in working with the satellite telecommunication service providers in order to advance the awareness and understanding of user requirements; (ii) to advance the awareness and understanding of available and planned capabilities; (iii) to facilitate adoption of interoperability and quality standards and principles; and (iv) to provide guidance to best meet user needs of each considered application. The forum is expected to allow the reduction of satellite data telecommunication costs for the transmission of observations from observational platforms to data processing centres on land, and to better address user requirements for high temporal and vertical resolution data, and improved timelines.

2.17. The preparatory workshop for the establishment of an International Forum of Users of Satellite Data Telecommunication Systems (Satcom Forum) (Toulouse, France, 23-27 April 2012) recommended organizing an ad hoc Satcom Forum in 2013 to prove concept, and established an organizing committee.

2.18. The *ad hoc* International Forum of users of satellite data telecommunication systems (Satcom Forum) was held at the headquarters of the Intergovernmental Oceanographic Commission (IOC) of UNESCO in Paris, France, from 3 to 4 October 2013, and was chaired by Mr David Meldrum (United Kingdom). 33 participants from 12 countries, and representatives of the satellite data telecommunication service providers, and the satellite equipment manufacturers also attended the meeting.

2.19. The objective was to build on the previous session (Toulouse, April 2012) to determine whether the Forum should become an established expert group, meeting on a regular basis. The future Forum is meant to provide an international mechanism, covering the wide user base that exists within the co-sponsoring Organizations, to address remote data communication requirements – including tariff negotiations as needed – for automatic environment observing systems using satellite data telecommunication systems (Satcom systems).

2.20. The meeting reviewed the World Meteorological Organization (WMO) and IOC user requirements for the collection of meteorological data from remote areas (including buoys, ship-based observing systems, seal level observing stations, Automatic Weather Stations, Polar Observations, profiling floats, and animal tracking). It reviewed the capabilities and the tariff schemes of the satellite data telecommunication systems that are mostly being used for the collection of environmental data from remote areas, and discussed the role that they could play in the future Forum. The meeting noted that the future Forum is meant to provide guidance to the WMO and IOC users on the use of Satcom systems, including guiding them on how to make the best arrangements for the purchase of airtime. The Forum will provide detailed information on satellite systems capabilities so that users will be able to make informed decisions on which system to use.

2.21. Regarding tariff negotiation issues, the meeting agreed that the current Argos Joint Tariff Agreement (JTA) should eventually operate as an independent programme of the future Forum.

2.22. The meeting established an interim Executive Committee for the Satcom Forum to drive the workplan, which should lead to the formal establishment of the Forum by the sponsoring Organizations. The meeting reviewed the draft Terms of Reference of the Satcom Forum, proposed some changes to reflect the proposed reporting of the future Forum to the Executive Bodies of WMO and IOC through the Commission for Basic Systems (CBS) Management Group, and the GOOS Steering Committee respectively.

2.23. The meeting issued ten recommendations listed in Appendix C. The updated workplan leading to the establishment of the Forum is provided in Appendix D.

2.24. EC-66 requested CBS to review the reports of the initial ad hoc Satcom meetings, for consideration by Cg-17, including assessment of budget implications associated with the organizational and operating practices should a Forum be established. Per EC-66 guidance, CBS Ext. (2014) (Asuncion, Paraguay, 8 - 12 September 2014) adopted Resolution 9 - Establishment of a Satcom Users Forum (Appendix E). CBS Ext. (2014 also noted the potential benefits to Members of establishing a close alliance between the Satcom forum and the Argos Joint Tariff Agreement and encouraged earlier dialogue amongst the various stakeholders to consider how such an alliance could be developed.

*WMO-IOC Regional Marine Instrument Centres (RMICs)*¹⁷

2.25. Two Regional Marine Instrumentation Centres (RMICs) have been established in USA (RMIC/RA-IV for WMO Regional Association IV) and in China (RMIC/AP for the Asia Pacific region). One JCOMM Marine Instrument Workshop was organized for WMO Regional Association IV in 2010 in Mississippi, USA, and 3 such workshops for the Asia Pacific region from 2011 to 2013 (see JCOMM Meeting Reports No.87, 95 and 108) in Tianjin, China. A fourth workshop for the Asia Pacific region was organized in Weihai, China, from 21-23 October 2014.

2.26. Efforts to establish another RMIC for the Regional Association I (Africa) in Casablanca, Morocco, are well underway, and a JCOMM Marine Instrumentation Workshop was organized in Casablanca from 21 to 22 November 2013.

2.27. The RMIC/AP is also leading the JCOMM Salinity Measurement Intercomparison Pilot Project. The purpose of this pilot project is to ascertain the overall proficiency of the agencies or institutes participating in the project for measuring seawater salinity. The pilot project is particularly targeting laboratories involved in JCOMM global marine/ocean observation programmes. It is also expected that experiences obtained from this activity will be useful for establishing common JCOMM marine/ocean observation standards in the future. 22 laboratories from 17 countries and one manufacturer are participating in the pilot project. The experiment consists essentially in China sending two standard seawater samples to the participants. The salinity of these unknown standards is then to be determined by the participants. Results will then be compared, and a report produced. Details about the activity are provided on the JCOMM website¹⁸.

2.27. Team members are invited to use the existing RMIC facilities to ensure traceability of data buoy observations.

3. *Global Framework for Climate Services (GFCS)*¹⁹

17 http://www.jcomm.info/index.php?option=com_content&view=article&id=335:rmics&catid=34:capacity-building

18 www.jcomm.info/ic1

19 <http://gfcs.wmo.int/>

3.1 The decisions of the first session of the Intergovernmental Board on Climate Services (IBCS-1) held in Geneva, Switzerland in July 2013 include: (a) adoption of the Implementation Plan of the GFCS (with its Annexes and Exemplars), and projects and activities contained in the Compendium of initial GFCS projects for immediate implementation; (b) establishment of a Partners Advisory Committee (PAC) as a stakeholder engagement mechanism; and (c) establishment of the Management Committee of the IBCS.

3.2 Partner agencies were invited to join the PAC. So far the partners who have joined the PAC include European Commission (EC), the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT), the Food and Agriculture Organization of the United Nations (FAO), the Global Water Partnership (GWP), the International Union of Geodesy and Geophysics (IUGG), the United Nations Environment Programme (UNEP), the United Nations Institute for Training and Research (UNITAR), the World Business Council for Sustainable Development (WBCSD), the World Food Programme (WFP), the World Meteorological Organization (WMO) and the International Federation of Red Cross and Red Crescent Societies (IFRC). Efforts to mobilize the support of partners for the implementation of specific activities in support of Members are underway. Specific support is being provided to the World Bank (WB) and the United Nations Development Programme (UNDP) to inform the design of their support to National Meteorological and Hydrological Services of Member countries. Efforts are also underway to reflect GFCS priorities under eligible activities of entities such as the European Commission through Copernicus and Horizon 2020, the Green Climate Fund and others. Some Members have established frameworks for climate services at national level. Belize, China, Germany, Nigeria, Senegal, South Africa, Spain, Switzerland and the United Kingdom have launched their initiatives. In some cases the process is initiated with national consultations supported by the GFCS Office that enable the identification of key gaps and needs and provide lessons which are being used for the development of guidelines to support countries in establishing their frameworks. EC-66 urged Members to establish their frameworks for climate services and to communicate to the GFCS Office whenever these are established.

3.3 Efforts are also underway to support climate services at the regional level with the organization of regional consultations that facilitate the development of concrete action plans. Regional consultations were held for the Least Developed Countries in Asia, Caribbean, Latin America, Pacific Islands and South Eastern Europe. Additional consultations are planned for the Middle East (TBD).

3.4 Efforts are underway to implement activities contained in the GFCS Implementation Plan, through specific projects. Projects in Tanzania and Malawi, Small Island Developing States (SIDS) in the Indian Ocean, Caribbean and Pacific regions, as well as Central and South-East Asia and Polar Regions. In this regard, EC-66 acknowledged the contributions of Members that are allowing the implementation of these activities, including Norway, Canada and Australia. In addition, in order to optimize NMHSs participation in the implementation of GFCS-related projects and activities, EC-66 requested that where possible, this should be done in conjunction with WMO projects e.g. WIGOS implementation. Furthermore, EC-66 emphasized the importance of ensuring the visibility and the role of NMHSs in providing climate services under the GFCS. In this regard, EC-66 stressed the need to enhance the capacity of NMHSs so as to allow them to effectively contribute to the development and application of climate services. A meeting²⁰ on the Implementation Coordination of the GFCS is planned in Geneva, from 29 September to 1 October 2014, and will focus on the role of WMO bodies in country-specific GFCS project implementation.

3.5 EC-66 adopted Resolution 3.1/1 (EC-66) on the outcome of the first Session of the IBCS. The Resolution is particularly requesting Members to provide resources to the GFCS Trust Fund to support the preparation of the second session of the IBCS and the implementation of GFCS activities; to support the GFCS Office through secondment of experts to the GFCS Office to enable effective support to the implementation of GFCS; and to report to the GFCS office activities that are contributing to advance the GFCS when requested. The secretary General of WMO is

20 <http://gfcs.wmo.int/node/573>

requested to continue efforts in supporting the GFCS, while also exploring and advancing working relationships between IBCS and relevant constituent bodies of the WMO; and to encourage Members to provide resources for GFCS activities and its governance.

3.6 The EC Working Group on Climate and related Weather, Water and Environmental Matters (ECWG-CWE) considered important overarching issues relevant to the GFCS. EC-66 noted that the ECWG-CWE had emphasized the importance in integrating and coordinating climate relevant activities across the Programmes in WMO. EC-66 noted with appreciation that the Secretary-General had strengthened such coordination to address relevant climate matters including WMO contributions to the implementation of GFCS.

3.7 The Task Team on the WMO Policy for International Exchange of Climate Data and Products met in Geneva from 12-14 November 2013 and prepared a draft resolution on the WMO Policy for International Exchange of Climate Data and Products to Support the Implementation of the GFCS for consideration by EC-66, prior to submission to Cg-17. EC-66 noted that the Task Team had identified a number of issues that required further discussion in the report of its meeting.

3.8 EC-66 further noted that there had been an opportunity for the draft resolution to be examined by the EC Working Group on Strategic and Operational Planning (EC WG SOP) in February 2014. The EC WG SOP was, in general, pleased with the directions taken and output from the EC Task Team. Based on their discussion of the documents (including the draft resolution and its Annex) the Group raised an additional number of topics that should be taken into consideration by EC during its deliberations.

3.9 A value proposition on the benefits to be obtained from the International Exchange of Climate Data and Products to Support the Implementation of the GFCS was prepared in support of the draft resolution (see Annex to this paragraph). EC-66 examined the value proposition document and gave the following guidance:

- (a) The benefits realized from climate data and products are greatly enhanced when combined with socio-economic information. Linking physical and social science information enables a wide range of societal benefits and enhances decision support. Sources of this socio-economic information may be from other UN-sponsored or –related programmes. Furthermore, countries possess considerable visualization, forecast, and decision-support capabilities that could be shared to the benefit of all. The value of these tools and capabilities is traceable directly to practices of free and open data and products exchange. The greater the availability and sharing of the data, then the greater the applicability and accuracy of these tools and capabilities, which for society supports ready, responsive, and resilient communities;
- (b) The issue of investments in long-term infrastructure and sustainability of observation systems remains of considerable concern to a number of Members and guidance on mechanisms by which NMHSs can address such issues while implementing the resolution will be required.

3.10 EC-66 also reviewed and revised the draft resolution for Cg-17 on the WMO Policy for International Exchange of Climate Data and Products to Support the Implementation of the GFCS.

3.11 The Second meeting of the IBCS took place in Geneva, Switzerland from 10 to 13 November 2014, and reviewed progress and provided guidance to enhance implementation of the GFCS. The meeting highlighted the need for more partnerships and coordination among various actors to achieve the overall goals of helping communities to adapt to extreme climate events to boost disaster resilience. Following the decisions taken at the extraordinary session of the World Meteorological Congress (Cg-Ext.2012) and the First Session of the Intergovernmental Board on Climate Services (IBCS-1), the Second Session:

- Approved the revised terms of reference of the Partner Advisory Committee (PAC) of the IBCS, which specify functions, responsibilities, membership, mode of operation and financing of the PAC;
- Agreed on the means through which GFCS Partners and Stakeholders with technical capability can play a role in the implementation of GFCS, specifically through participation in technical committees established for specific questions as might be required, as per practice of WMO Technical Commissions;
- Agreed on the interaction between the IBCS and the constituent bodies of WMO;
- Approved revised Committee, to strengthen the interface and linkages with the PAC;
- Agreed that urban activities related to climate be included as a specific cross-cutting element within the priority areas of the GFCS;
- Agreed on the further development of the Energy exemplar and on presenting a proposal to the Seventeenth World Meteorological Congress for consideration of Energy as an additional priority sector for GFCS;
- Agreed on the creation of an *ad hoc* Task Force or Working Group on Monitoring and Evaluation;
- Considered GFCS budget for 2015 and the Operational and Resource plan for 2016-2018 and recognized the need for providing resources to support implementation of project and activities, the governance structure of the GFCS and the GFCS Office;
- Requested the IBCS Committee to incorporate gender-related recommendations into the GFCS;
- Elected the Chair, two Co-Vice-Chairs and kept the membership and composition of the Management Committee of the Board as approved by IBCS-1;
- Agreed to have ordinary plenary meetings of the IBCS only once in the intersessional period prior to WMO Congress sessions and for the Management Committee to meet once a year to provide advice, oversight and management of implementation of the GFCS in the intersessional period.

Appendices: 6

APPENDIX A

PROPOSED TEXT FOR INCLUSION IN THE MANUAL ON THE WMO INTEGRATED GLOBAL OBSERVING SYSTEM REGARDING WIGOS STATION IDENTIFIERS

(Excerpt from the draft WIGOS Manual as Submitted to Cg-17)

2. COMMON ATTRIBUTES OF WIGOS COMPONENT SYSTEMS

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2.4 Operations

2.4.1 General Requirements

Note: Provision 2.4.1.1, Volume I, Part I of the *Technical Regulations* (WMO-No. 49) applies.

2.4.1.1 WMO observing stations and platforms shall be uniquely identified by a WIGOS station identifier.

Note: The structure of WIGOS station identifiers is specified in Attachment 2.1

2.4.1.2 Members shall issue WIGOS station identifiers for observing stations and platforms within their geographic area of responsibility that contribute to a WMO or co-sponsored programme and shall ensure that no WIGOS station identifier is issued to more than one station.

Note: Members may issue WIGOS station identifiers for observing stations and platforms within their geographic area of responsibility that do not contribute to a WMO or co-sponsored programme, provided that the operator has committed to providing and maintaining WIGOS metadata.

2.4.1.3 Before issuing a station identifier, Members should ensure that the operator of a station or platform has committed to providing and maintaining WIGOS metadata for that station or platform.

Note 1: In circumstances when a WIGOS identifier is required for a station or platform to support a WMO or co-sponsored programme and no Member is in a position to issue one (e.g. Antarctica), the Secretary-General may issue a WIGOS station identifier for that station or platform provided that its operator has committed to:

- (a) Providing WIGOS metadata; and
- (b) Conforming to relevant Technical Regulations.

Note 2: In circumstances where a WIGOS identifier is required for a station or platform to support a WMO or co-sponsored programme and a Member is not able to issue a WIGOS identifier, the Secretary-General will work with the Member concerned to issue a WIGOS station identifier for that station or platform provided that its operator has committed to:

- (a) Providing WIGOS metadata; and
- (b) Conforming to relevant Technical Regulations.

2.4.1.4 Members shall make available to WMO the updated metadata each time a new station identifier is issued.

2.4.1.5 Members shall operate their observing systems with properly calibrated instruments and adequate observing and measuring techniques.

Note 1: Detailed guidance on observing practices of meteorological observing systems and instruments is given in the *Guide to Meteorological Instruments and Methods of Observation* (WMO-No. 8).

Note 2: Detailed guidance on observing practices of hydrological observing systems and instruments is given in the *Guide to Hydrological Practices* (WMO-No. 168); the *Manual on Flood Forecasting and Warning* (WMO-No. 1072), and the *Manual on Stream Gauging* (WMO-No. 519).

Note 3: Detailed guidance on observing practices of GAW observing systems and instruments is given in the *Guide to Meteorological Instruments and Methods of Observation* (WMO-No. 8).

2.4.1.6 Members should address the requirements for uncertainty, timeliness, temporal resolution, spatial resolution, and coverage which result from the RRR process specified in section 2.2.4 and in accordance with the details provided by other sections as appropriate.

2.4.1.7 Members shall ensure that proper safety procedures are specified, documented and utilized in all its operations.

Note: Safety practices and procedures are those that are concerned with assuring the welfare of staff while promoting overall efficiency and effectiveness of the NMHS and responding to national laws, regulations and requirements for occupational health and safety.

Note: Attachment 2.1 referred in the text above is reproduced in Appendix B below.

APPENDIX B

STRUCTURE OF WIGOS STATION IDENTIFIERS

(Attachment 2.1 of draft Manual on WIGOS as submitted to Cg-17)

The structure of the WIGOS Identifier is shown in Figure 1. The meaning of the components of the WIGOS identifier is given in Table 1.

WIGOS Identifier series	Issuer of Identifier	Issue Number	Local Identifier
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Figure 1. Structure of WIGOS identifier

Table 1. Allocating the component parts of a WIGOS station identifier

Component	Description	Initial Range – series 0 (Stations)
WIGOS Identifier Series	This is used to distinguish between different systems for allocating identifiers. It allows future expansion of the system so that entities do not have to be issued with new identifiers if the structure of the WIGOS identifiers proves unable to meet future requirements. Different values of the WIGOS Identifier Series may correspond to different structures of the WIGOS identifier. Initial permitted range: 0-14	0
Issuer of Identifier	A number that is used to distinguish between identifiers issued by different organizations. It is allocated by WMO to ensure that only one organization can create a given WIGOS station identifier.	0-65534
Issue Number	An identifier that an organization responsible for issuing an identifier may use to ensure global uniqueness of its identifiers. For example, allocating one issue number for hydrological stations and another for voluntary climate observing stations would enable the managers of the two networks to issue Local Identifiers independently without needing to check with each other that they were not duplicating identifiers.	0-65534
Local Identifier	This is the individual identifier issued for each entity. An organization issuing identifiers must ensure that the combination of Issue Number and Local Identifier is unique; in that way global uniqueness is guaranteed.	16 characters

Notes:

- (1) The structure of WIGOS station identifiers has been designed to be general enough to identify other entities, such as individual instruments; however, this has not yet been implemented.
- (2) Although the table proposes initial ranges of permitted values of the components that make up a WIGOS identifier, future changes in requirements may result in these ranges being increased. IT systems must, therefore, be designed to process identifiers whose components are of arbitrary length. BUFR encodings will need to be prepared for WIGOS identifiers to allow efficient representation and these may use code lists to represent components of the WIGOS identifier that are shared by many entities. Currently, station identifier = 0.

Notation for the WIGOS identifier

The convention for writing the WIGOS identifier (in the context of WIGOS) is:

<WIGOS Identifier series>-<Issuer of Identifier>-<Issue Number>-<Local Identifier>

Note: as an example the WIGOS Identifier

WIGOS Identifier series	Issuer of Identifier	Issue Number	Local Identifier
0	513	215	5678

would be written as 0-513-215-5678.

Representing the WIGOS identifier in contexts outside WIGOS

The following conventions should be used to represent the WIGOS identifier in contexts outside WIGOS or to show the relationship between the WIGOS identifier and an identifier that has been defined in a different context.

int.wmo.wigos	WIGOS identifier	WIGOS supplementary identifier
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Figure 2. Structure of an extended WIGOS identifier. Both the int.wmo.wigos and the WIGOS supplementary identifier elements are optional.

int.wmo.wigos

The first component of the extended WIGOS identifier (int.wmo.wigos) allows the identifier to be recognized as a WIGOS identifier when used in contexts where it may be ambiguous as to what type of identifier is being used. This is optional and need not be represented in BUFR, because the entries for the WIGOS identifier provide this information.

WIGOS identifier

The second component (WIGOS identifier) is defined above. Within a WIGOS context it is the only component of the WIGOS identifier that is always required.

WIGOS supplementary identifier

The final component of the extended WIGOS identifier (WIGOS supplementary identifier) is optional and is used to associate identifiers issued using other systems to be associated with the WIGOS unique identifier. A single WIGOS identifier may be associated with many WIGOS supplementary identifiers (such as an observing site that is used for both synoptic and aviation reporting), and a WIGOS supplementary identifier may be associated with many WIGOS unique identifiers (such as a World Weather Watch drifting buoy identifier that has been issued to many drifting buoys). In BUFR, this would be specified through a specific table entry (such as IIIii for World Weather Watch station identifier).

Note: if above example of a WIGOS identifier (0-513-215-5678) was also associated with an identifier (MYLOCATION) issued by another authority, a valid extended WIGOS identifier would be int.wmo.wigos-0-513-215-5678-MYLOCATION.

APPENDIX C

RECOMMENDATIONS OF THE *AD HOC* SATCOM FORUM

(Paris, France, 3-4 October 2014)

The ad hoc International Forum of Users of Satellite Data Telecommunication Systems (Satcom Forum, Paris, France, 3-4 October 2013) made the following recommendations:

- (1) Recommendations regarding the use of the Inmarsat satellite data telecommunication system:
 - (i) Inmarsat is used for moored data buoys and tsunami buoys for the transmission of data terminal to terminal and terminal to server. For many countries including India, Inmarsat is a Government approved satellite telecommunication system and is critical for data transfer applications. All buoy systems have been developed with suitable hardware and software capability and the meeting stressed that Inmarsat should continue services of SAT C transmitter which is suitable for buoy applications, and thus Inmarsat may appreciate this societal need. This technology is well accepted and proven and hence should be retained and not withdrawn;
 - (ii) Inmarsat charges vary between Land Earth Station (LES) and there would be value in establishing a common tariff arrangement among all LES operators / Service providers;
 - (iii) Efforts should be made to prioritize data transmission according to applications, and give high priority to disaster risk reduction applications so that tsunami buoys would transmit their data as quickly as possible. Inmarsat can propose specific serial numbers, and the LES should ensure transfer within 3 minutes of the data required for tsunami early warning;
 - (iv) As there are many Government approved satellite communication, Inmarsat should not withdraw SAT C unless an alternative plan is made available for the scientific community;
 - (v) On technological improvisation, transceiver manufacturers could be asked to provide Inmarsat transceiver to have additional USB based connectivity port to interface with desktop PC / Laptop PC, since PCs with serial ports are becoming obsolete;
 - (vi) Inmarsat LES provides a very good service and are available for support. However at times, when faced with specific issues, a working mechanism with Inmarsat HQ/LES and Buoy operators could be developed to address transmission issues faced by Buoy operators;
 - (vii) Inmarsat can consider providing data transfer as free a service because they are linked to societal application as weather services are being provided to Ships. Moored buoy data would also be made available to the global community in GTS.
- (2) For operational systems (and in particular for disaster risk reduction purposes), any GPRS/GSM telemetry solution should be supported by a backup Satcom system, and Satcom service providers need to recognize their importance in this regard and not impose punitive fixed charges for a backup service;
- (3) A certification process should be established for companies providing GTS data distribution service on the basis of environmental data collected via satellite;
- (4) To develop guiding materials with inclusion of synthetic description of the capabilities of the relevant Satcom systems, using metrics to be agreed upon;
- (5) To establish a mechanism to allow for a useful dialogue to take place between the users and the Satcom service providers in particular for (i) informing Satcom providers about the user requirements; and (ii) informing users about the Satcom capabilities. Appropriate metrics should be developed for both aspects;

- (6) In order to facilitate communication between Satcom users, Satcom service providers, and equipment manufacturers, explore the use of (i) conferences and expositions where users would make scientific and technical presentation, and vendors would be offered table to display their equipment; (ii) social media (explore existing sites, and define #hashtags), and (iii) Internet forums like Wikipedia;
 - (7) Investigate whether tariff for low data rate applications could be negotiated with the Satcom service providers;
 - (8) To consider placing the Satcom Forum not only under the umbrella of the CBS, but also of JCOMM, so that the Satcom Forum becomes a joint JCOMM-CBS body;
 - (9) To widen the scope of the Forum as much as possible in terms of the user communities represented, and to approach organizations such as the World Wildlife Fund (WWF²¹), Movebank²², and Bio-Logging²³ in the view to invite them to join the Forum as co-sponsors;
 - (10) To analyse six months of traffic from Argos JTA platforms by platform class in the view to highlight actual use of the system and to do a comparison with the Argos charges paid by the users of each class.
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²¹ <http://www.wwf.org/>

²² <https://www.movebank.org/>

²³ <http://bls5.sciencesconf.org/>

APPENDIX D

UPDATED WORKPLAN LEADING TO THE FORMAL ESTABLISHMENT OF
THE SATCOM FORUM

Step	Action	Date / Deadline	By
1	Approach Co-sponsors in the view to agree on the draft Terms of Reference for the Forum; and plan/organize an preparatory workshop for the establishment of the informal Forum.	Done	IOC, WMO Secretariats
2	Approach operators of satellite data telecommunication systems and platform transmitter terminal, identify contact points, and discuss/negotiate the level of their contributions/participation	Done	Secretariats ²⁴
3	Approach users of satellite data telecommunication, inform them about the Forum, and seek their participation in the Forum and the <i>ad hoc</i> [informal] Forum workshop	Done	Secretariats ²⁴
4	Setup an organizing committee of the <i>ad hoc</i> [informal] Forum workshop with Terms of Reference and membership (see draft below)	Done	Preparatory workshop
5	Negotiate with potential hosts, and propose a venue for the <i>ad hoc</i> [informal] Forum workshop	Done	Organizing Committee
6	Inform the joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) about developments regarding the Forum, and seek further guidance	Done	Secretariats of WMO and IOC
7	Issue invitation letters for the <i>ad hoc</i> [informal] Forum workshop	Done	Secretariats ²⁴
8	Inform the WMO Commission for Basic Systems (CBS) Implementation Coordination Team on Integrated Observing Systems (ICT IOS) about developments regarding the Forum, and seek further guidance	Done	Secretariats ²⁴
9	Inform the Implementation Coordination Team on Information Systems and Services (ICT-ISS) about developments regarding the Forum, and seek further guidance	Done	Secretariats ²⁴
10	Coordinate documentation plan with contributors	Done	Secretariats ²⁴
11	Inform the CBS about developments regarding the Forum, and seek further guidance	Done	WMO Secretariat
12	Propose agenda and documentation plan for the <i>ad hoc</i> [informal] Forum workshop	Done	Organizing Committee
13	Issue invitation letters for the <i>ad hoc</i> [informal] Forum workshop	Done	Secretariats ²⁴
14	Seek documents from contributors to the documentation plan	Done	Secretariats ²⁴
15	the <i>ad hoc</i> [informal] Forum workshop is tasked to: <ul style="list-style-type: none"> • Review current satellite data telecommunication issues, • Identify areas where progress/proposals can be made • Review and adjust as needed the draft Terms of Reference of the Forum, • Review the proposed operating principles of the Forum, including Terms of Reference of the Forum's Executive Committee • Elect an Interim Executive Committee for the Forum, Refine the workplan for formal adoption of the Forum by the Executive Bodies of the co-sponsor Organizations	Done	Organizing Committee and the Secretariats ²⁴
16	Interim Executive Committee to investigate widening the scope of the Satcom Forum (e.g. with WWF, Movebank, Bio-Logging)	ASAP	Interim Executive Committee
17	Review draft Terms of Reference of the Satcom Forum, and provide comments to the interim Executive Committee	Done	<i>Ad hoc</i> Satcom Forum participants
18	Review the draft Operating Principles of the Satcom Forum, and provide comments to the Interim Executive Committee	Done	<i>Ad hoc</i> Satcom Forum participants
19	Update the workplan on the basis of the <i>ad hoc</i> Satcom Forum outcome	Done	Interim Executive

24: Secretariats of WMO, IOC

			Committee
20	Submit draft Terms of Reference of the Satcom Forum to CBS Management Group	Done	WMO Secretariat
21	Submit draft Terms of Reference of the Satcom Forum to the GOOS Steering Committee (GSC) for approval	15/11/2013	IOC Secretariat
22	Report on the Satcom establishment process to the sixty-sixth Session of the WMO Executive Council (EC-66) for further guidance	Done	CBS Management Group
23	Satcom1 participants at 5 th International Bio-Logging Science Symposium (22-26 September 2014, Strasbourg, France) to promote formation of a group at this event to represent the collective interests of the marine animal tracking community with regard to Satcom (Bernie McConnell to lead, assisted by Kim Holland and Melinda Holland)	Done	Bernie McConnell
24	CBS Extraordinary Session in 2014 to review the proposed Terms of Reference for the Satcom Forum, and propose a WMO coordination mechanism under CBS	Done	CBS Ext (2014)
25	Initiate Pilot Project to explore the use of social media and internet forums to support the activities of the Satcom Forum, and optimize communication	2014	Andy Sybrandy
26	Plan for the first meeting of the Forum	2014	Interim Executive Committee, and the Secretariats ²⁴
27	Report of the CBS Extraordinary Session in 2014 approved by WMO Congress	Mid-2015	WMO Congress
28	First official meeting of the Forum	2015	Interim Executive Committee, and the Secretariats ²⁴
29	to discuss the issue with the SOT in the view to propose a fair long term tariff scheme solution regarding the use of the Inmarsat system for the collection of ship-based observations	2015	Interim Executive Committee
30	To address the issues outlined in paragraph 3.3 of the <i>ad hoc</i> Satcom Forum (Paris, Oct. 2013) final report in order to demonstrate that the Forum could make a positive difference.	2015	Interim Executive Committee
31	JCOMM-5 invited to co-sponsor the Satcom Forum, and endorse its Terms of Reference if needed	2017	JCOMM

APPENDIX E

Recommendation 9 (CBS-Ext.(2014))

ESTABLISHMENT OF A SATCOM USERS FORUM

THE COMMISSION FOR BASIC SYSTEMS,

Noting the important role of satellite Data Collection Systems (DCS) in making available data and observations from remote and mobile observation platforms operating within both WMO and IOC programmes,

Noting further:

- (1) That the Commission has been working with JCOMM, bringing together experts from the satellite Data Collection Systems user and supplier community (Ad hoc Satcom meetings), to investigate the establishment of an international mechanism, covering the wide user base that exists within the co-sponsoring organizations, to address remote data communication requirements including tariff negotiations as needed, for automatic environment observing systems using satellite data telecommunication systems,
- (2) The recommendations of the ad hoc meetings on how a Satcom Forum may choose to operate, in particular:
 - (a) Membership from co-sponsoring organizations and user forums,
 - (b) Observers, including representatives from Satcom system operators, service providers and equipment manufacturers,
 - (c) Governance, office bearers, secretariat support and frequency of meetings,

Recommends:

- (1) That Cg-XVII approve a WMO-IOC international forum of users of satellite data telecommunication systems (Satcom) with terms of reference as given in the Annex to this recommendation;
- (2) That the Commission for Basic Systems, as the lead technical commission, in collaboration with the Joint Commission on Oceanography and Marine Meteorology (JCOMM) proceed to establish the Satcom Forum, taking into consideration the recommendations of the initial Satcom meetings;

Requests the Secretary-General to continue to support this development activity, including consideration of budget implications associated with the organizational and operating practices to establish and maintain the forum.

Annex 1 to Recommendation 9 (CBS-Ext.(2014))

TERMS OF REFERENCE FOR A WMO-IOC INTERNATIONAL FORUM OF USERS OF SATELLITE DATA TELECOMMUNICATION SYSTEMS (Satcom)

The International Forum of users of satellite data telecommunication systems is an entirely self-funded body jointly sponsored by the World Meteorological Organization (WMO) and the Intergovernmental Oceanographic Commission (IOC) of UNESCO, of the United Nations in the

view to address the requirements of these two organizations for the timely collection via satellite of environmental data from observing platforms.

The forum shall:

- (a) Provide coordination amongst the users of satellite data telecommunication systems (SDTS) and represent their collective interests in working with the satellite telecommunication service providers and the industry in order to advance the awareness and understanding of the user requirements;
- (b) Advance the awareness and understanding of available and planned capabilities;
- (c) Facilitate adoption of interoperability and quality standards and principles as needed;
- (d) Investigate and propose as needed cooperative tariff negotiation mechanisms on the use of satellite data telecommunication systems;
- (e) Facilitate the preparation of technical advice and guidance that will optimize STDS choices for each considered application;
- (f) Report to the executive bodies of WMO and IOC through the Commission for Basic Systems (CBS), the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM), and the Global Ocean Observing System (GOOS) Steering Committee respectively.

Membership is open to all representatives of the co-sponsors stakeholders, that is:

- Representatives of the co-sponsoring Organizations Members/Member States,
- Representative of a User Group,
- Satcom system providers,
- Representatives of the satellite equipment manufacturers.

APPENDIX F

PROPOSED SOT CONTRIBUTION TO THE WIGOS KEY ACTIVITY AREAS

WIP KAA No.	WIP Key Activity Area (KAA)	Proposed SOT response
1	Management of WIGOS implementation	<ul style="list-style-type: none"> SOT, VOSP, and SOOPIP Chair, and SOT Technical Coordinator to provide SOT input to the ICG-WIGOS and its Task Teams through the JCOMM representatives in those groups.
2	Collaboration with the WMO co-sponsored observing systems & international partner organizations & programmes	<ul style="list-style-type: none"> Strong collaboration established between WMO and IOC for the SOT since its establishment in 2001, and for the SOOPIP since 1995 under the former IGOSS.
3	Design, planning & optimized evolution	<ul style="list-style-type: none"> SOT Contribution to JCOMM OPA Implementation Goals for ship-based observations (VOSclim, SOOPIP, GO-SHIP)
4	Observing System operation & maintenance	<ul style="list-style-type: none"> SOT to continue contributing to JCOMMOPS SOT to contribute to the Satcom Forum through its Task Team on Satellite Telecommunication Systems SOT to continue pilot activities (e.g. VOS Ancillary)
5	Quality Management	<ul style="list-style-type: none"> Continue quality control activities through motoring centres (e.g. RSMC Exeter, RTMC, VOSclim DAC, GCCs), and feedback of quality information to ship operators Promoting quality information feedback mechanisms between ocean in situ & satellite observation communities (e.g. link with GHRSSST)
6	Standardization, system interoperability & data compatibility	<ul style="list-style-type: none"> SOT TT-IS to continue providing guidance on instrument standards. SOT contribution to updating of the CIMO Guide. To consider migrating some of the SOT ongoing activities of the SOT Implementation Strategy to the WIGOS Technical Regulations
7	WIGOS Operational Information Resource (WIR ²⁵)	<ul style="list-style-type: none"> See item 7 below.
8	Data & metadata management, delivery & archival	<ul style="list-style-type: none"> Ship-based observation operators to make sure that ship metadata are made available via Pub47 (and E-SURFMAR, JCOMMOPS, then OSCAR) on a routine basis.
9	Capacity development	<ul style="list-style-type: none"> SOT to continue supporting Capacity Building activities (VOS donation programme, Task Team on Training)
10	Communications & outreach	<ul style="list-style-type: none"> SOT to continue to be informed about WIGOS implementation at regular SOT sessions.

²⁵ <http://www.wmo.int/wigos/wir>