

WORLD METEOROLOGICAL ORGANIZATION

**INTERGOVERNMENTAL OCEANOGRAPHIC
COMMISSION (OF UNESCO)**

**JOINT WMO/IOC TECHNICAL COMMISSION FOR
OCEANOGRAPHY AND MARINE METEOROLOGY
(JCOMM)**

SHIP OBSERVATIONS TEAM (SOT)

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GLOBAL TEMPERATURE AND SALINITY PROFILE PROGRAMME (GTSP)

(Submitted by Charles Sun (USA), GTSP Chair)

Summary and purpose of the document

This document provides information on the development and activities of the Global Temperature and Salinity Profile Programme (GTSP) since the last SOT meeting, including the revision of the terms of reference and composition of the SG-GTSP, publishing of the first edition of the "Global Temperature and Salinity Profile Programme – Data User's Manual" and GTSP data formats.

ACTION PROPOSED

The Team will review the information contained in this report, and comment and make decisions or recommendations as appropriate.

Appendices: A. GTSP report to SOT-7

- A - DRAFT TEXT FOR INCLUSION IN THE FINAL REPORT

9.1.6.1 Dr Charles Sun (USA), Chairperson of the Global Temperature and Salinity Profile Programme (GTSP) submitted a written report on the development and activities of the GTSP, including the revision of the terms of reference and composition of the SG-GTSP, publishing of the first edition of the “Global Temperature and Salinity Profile Programme – Data User’s Manual” and GTSP data formats. He recalled that the GTSP was a joint program of the International Oceanographic Data and Information Exchange committee (IODE) and JCOMM.

9.1.6.2. GTSP continues to deal in greater volumes of data over past two year period (e.g. 11% increase between the periods 2009 – 2010 and 2011 – 2012); while the number of delayed-mode data added to the archive decreased about 19% to 89,912 by the end of 2012. The GTSP continues to improve its capabilities of serving the GTSP data for operations and climate research.

9.1.6.3. The Japan Meteorological Agency (JMA) became the GTSP Data Product Centre (GTSP-DPC¹) for the North Pacific Ocean in March 2011. With financial support from the IOC/IODE project office, the GTSP was able to publish the first edition of the “Global Temperature and Salinity Profile Programme – Data User’s Manual”² in November 2011. The First Session of the Joint IODE-JCOMM Steering Group for the GTSP was held at the IODE project office for IODE in Oostende, Belgium, 16 – 20 April 2012, and adopted the GTSP work plan for 2012–2013 (see report of the meeting on the web³). The Team noted that the GTSP is expected to continue its operation during the next inter-sessional period, 2013 - 2014.

9.1.6.4. The U.S. National Oceanographic Data Center (NODC) currently supports two separate profile database systems: the World Ocean Database (WOD), which manages research-quality historic data using a custom data file system; and the Continuously Managed Database (CMD) of the GTSP, which manages real-time data, and matches it to higher quality “delayed-mode” data to create a “Best Copy” product using the commercial Oracle RDBMS. The NODC is making plans for the future and preparing to operate with fewer resources, and is examining options for how they can continue to participate in the GTSP. The US NODC has been developing a single Integrated Ocean Profile System (IOPS) using an open-source RDBMS (i.e., PostGreSQL). It is expected that the new Integrated Ocean Profile System will improve efficiency while also enhancing the quality of the profile data products of both programs.

9.1.6.5. An ad hoc GTSP consultation meeting was held from 5 – 9 November 2012 in Tianjin, China. During the meeting, the National Marine Data and Information Service (NMDIS) of the State Oceanic Administration (SOA) agreed to allocate resources to implement a pilot project to demonstrate its capability of performing the role as a GTSP Global Data Products Center to produce monthly/seasonal optimal estimates of 3-D, global ocean temperature and salinity fields and provide facilities and funds for implementing training courses on the use of GTSP data at NMDIS.

9.1.6.6 The Team agreed with the following recommendations from the GTSP:

- [TBD]

Appendix: 1

¹ <http://goos.kishou.go.jp/GTSPDPC/index.html>

² IOC Manuals and Guides, 60, 50 pp, English - <http://www.nodc.noaa.gov/GTSP/document/datafmt/MG60.pdf>

³ http://www.nodc.noaa.gov/GTSP/document/reports/SG-GTSP-I_3.pdf

APPENDIX A

GLOBAL TEMPERATURE AND SALINITY PROFILE PROGRAMME (GTSP) REPORT TO SOT-7

(report prepared by Dr. Charles Sun, GTSP Chair)

1. GTSP continues to deal in greater volumes of data over past two year period. The number of real-time data handled was 5,045,420 covering the period of 2011 – 2012, an increase of about 11% from the period of 2009 – 2010; while the number of delayed-mode data added to the archive decreased about 19% to 89,912 by the end of 2012. The GTSP continues to improve its capabilities of serving the GTSP data for operations and climate research. The number of distinct hosts severed increased by 5% to 27,483, while the number of bytes transferred covering the period for 2011 and 2012 was 2.93 TB about the same as the period of 2009 – 2010.
2. The Japan Meteorological Agency (JMA) accepted Dr. Sun's invitation to join with the GTSP and became the GTSP Data Product Centre (GTSP-DPC) for the North Pacific Ocean in March 2011. Activities of the GTSP Data Product Centre include, but are not limited to, 1) Monitoring the most recent 30-day data collections made by the vessels traveling along the SOOP lines in the past few years and 2) Providing access to both in-situ observations along the SOOP lines, model simulations, and inter-comparisons between them. The details of the GTSP-DPC can be found at <http://goos.kishou.go.jp/GTSPDPC/index.html> .
3. With finical support from the IOC/IODE project office, the GTSP was able to publish the first edition of the "Global Temperature and Salinity Profile Programme – Data User's Manual" in November 2011 (IOC Manuals and Guides, 60, 50 pp, English.) The main purpose of this manual is to describe the GTSP data formats that are used to populate GTSP data for the public use and document the standard conventions used therein and the goal is to provide a format that contains everything necessary to evaluate data quality, data origins and data reliability. The manual can be downloaded at the GTSP's Web site at <http://www.nodc.noaa.gov/GTSP/document/datafmt/MG60.pdf>.
4. The First Session of the Joint IODE-JCOMM Steering Group for the GTSP was held at the IODE project office for IODE in Oostende, Belgium, 16 – 20 April 2012. The objectives of the meeting were to: (i) review GTSP data flow and operations; (ii) report on the status of the XBT BATHY to BUFR migration; (iii) revive the GTSP infrastructure, the terms of reference and composition of the Steering Group of GTSP; (v) develop a strategic frame work of the next generation of the GTSP netCDF format revision; (v) report on interaction with other projects; and (vi) adopt the work plan for 2012–2013. Report of the First Session of the Joint IODE-JCOMM Steering Group for the GTSP is available at the GTSP's Web site at http://www.nodc.noaa.gov/GTSP/document/reports/SG-GTSP-I_3.pdf .
5. The decision for the former joint IOC/IODE and WMO-IOC (IGOSS) GTSP Programme to become part of JCOMM was made at JCOMM-I in 2001. As such the Steering Group is now called the joint IODE-JCOMM Steering Group for the GTSP (SG-GTSP). The revised terms of reference and composition of the SG-GTSP are described in the meeting report of the First Session of the GTSP Steering Group.
6. The U.S. National Oceanographic Data Center (NODC) currently supports two separate profile database systems: the World Ocean Database (WOD), which manages research-quality

historic data using a custom data file system; and the Continuously Managed Database (CMD) of the GTSP, which manages real-time data, and matches it to higher quality “delayed-mode” data to create a “Best Copy” product using the commercial Oracle RDBMS. While making plans for the future and preparing to operate with fewer resources, the US NODC has been examining options for how they can continue to participate in the GTSP and has identified a proposed way forward to more efficiently manage GTSP data that leverages NODC’s recent technological advances in core IT infrastructure that provided enhanced data access services. The US NODC has been developing a single Integrated Ocean Profile System (IOPS) using an open-source RDBMS (i.e., PostgreSQL), which will incorporate both of these data sets to serve the data management needs of the two individual programs, while also achieving better integration and mutual support. It is anticipated that the advantages of this integration will include better ability to support and manage both systems, the elimination of redundant processing of incoming data by consolidating the processing of all “delayed-mode” data into the WOD system, and improvement of the function of the GTSP continuously managed database by making both the GTSP real-time and the complete WOD delayed-mode data sets available within a single system. It is expected that the new Integrated Ocean Profile System will improve efficiency while also enhancing the quality of the profile data products of both programs.

7. An ad hoc GTSP consultation meeting was held from 5 – 9 November 2012 in Tianjin, China. The purpose of the meeting was to discuss on the future engagement of the National Marine Data and Information Service (NMDIS) of the State Oceanic Administration (SOA) of China in the GTSP. Dr. Suixiang Shi, Deputy Director-General, NMDIS, opened the meeting and welcomed Dr. Charles Sun, GTSP Chair, to visit NMDIS. Dr. Shi further expressed NMDIS' support for GTSP and wishes to explore the approach that would, ultimately, prompt NMDIS to become a member of the newly re-assembled GTSP Steering Group (SG). At the end of the meeting, Dr. Shi, on behalf of the NMDIS' senior management, agreed to allocate resources to implement a pilot project to demonstrate its capability of performing the role as a GTSP Global Data Products Center to produce monthly/seasonal optimal estimates of 3-D, global ocean temperature and salinity fields and provide facilities and funds for implementing training courses on the use of GTSP data at NMDIS. He expressed that NMDIS supports the idea of conducting the GTSP training course in Tianjin and agreed that the training can be conducted in conjunction with the existing capacity building framework of ODINWESTPAC (Ocean Data and Information Network for the Western Pacific Region) and IOI (International Ocean Institute), which NMDIS is one of the IOI operation centers.

8. GTSP is expected to continue its operation during the next inter-session period, 2013 - 2014. The following tables show the tasks listed as continuing activities planned for the period from 2013 to 2014. The tasks listed for completion in 2013 may spill into 2014 depending on competing work pressures and resources. Tasks listed as ongoing are activities that are expected to continue into the future.

Task No.	Action item description	To be implemented by	Deadline date
2013			
1	Continue to acquire profiles and make real- time & delayed mode profile data available.	GTSP Steering Group	continuing
2	Submit the Cyclic redundancy check (CRC) calculation document to the JCOMM/IODE Ocean Data Standard Pilot Project for consideration of publishing in the IOC Manuals	US NODC	June 2013

	and Guides series as a best practice in real-time and delayed mode duplicates identification process		
3	Complete the GTSP training material for use in the IODE training/outreach programs	US NODC	September 2013
4	Conduct the performance review of the prototype GTSP Global Data Product Center	GTSP Data Experts	October 2013
5	conduct the first GTSP training course in conjunction with the existing capacity building framework of ODINWESTPAC and IOI in Tianjin	GTSP Data Experts, NMDIS	October 2013
6	Update the GTSP data user guide manual	US NODC	December 2013
<i>2014</i>			
1	Continue to acquire profiles and make real-time & delayed mode profile data available.	GTSP Steering Group	continuing
2	Complete the development of the Integrated Ocean Profile System	US NODC	March 2014
3	Convene a three-day GTSP bi-annual meeting at the IODE Project Office	GTSP Steering Group	April/May 2014
4	Conduct a training course on using the GTSP data in Oostende	US NODC	October 2014