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OCEANOGRAPHIC COMMISSION (OF
UNESCO)

**RECOMMENDATIONS OF THE SIXTH
INTERNATIONAL PORT METEOROLOGICAL
OFFICERS (PMO-6) WORKSHOP**

16 and 18 March 2021

Virtual Meeting

FINAL REPORT

NOTES

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Chairperson, Publications Board

World Meteorological Organization (WMO)

7 bis, avenue de la Paix

Tel.: +41 (0) 22 730 84 03

P.O. Box 2300

Fax: +41 (0) 22 730 80 40

CH-1211 Geneva 2, Switzerland

E-mail: publications@wmo.int

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SUMMARY

WMO maintains an international network of Port Meteorological Officers (PMO) as a liaison between National Meteorological and Hydrological Services (NMHS) and the Maritime Industry on weather and related maritime safety issues, to recruit vessels for the Voluntary Observing Ship Scheme (VOS) and to assist with coordinating instrument deployments.

As part of the activities of the Ship Observations Team (SOT), the PMO network provides a way to ensure that standard procedures proposed by WMO are followed throughout the whole Voluntary Observing Ship (VOS) fleet in every country, and that the data produced are homogenous and comply with WMO standards. PMOs also provide marine meteorological services, or information on such services, to shipping companies and port authorities.

At its tenth session, Hong Kong, China, April 2019, the SOT had reinforced the view that the work of PMOs was crucial for voluntary ship observations and VOS Panel. The sixth International PMO workshop (PMO-6) was therefore organized on the 16th and 18th of March 2021 as a virtual session due to COVID-19 pandemic-related global travel restrictions. About 200 people from 57 countries registered for the session.

The role of PMOs is a very important one that contributes directly to the effectiveness and efficiency of the VOS Scheme. PMOs represent not only National Meteorological Services (NMSs), but are focal points for ship-based observing operations. VOS observations often depend on the initiative displayed by these officers. For example, PMOs play a key role in the day-to-day operations of the VOS Scheme at the national level through (i) ship recruitment, (ii) training provided to marine observers on VOS, (iii) checking and calibrating the instruments, (iv) collecting metadata and delayed mode data (e.g. from e-logbooks), (v) advising or assisting in meteorological matters upon request by the master of any ship, (vi) providing feedback to the master of the ship on data quality and use, and (vii) coordinating instrument deployments from ships.

WMO regularly organizes international PMO workshops as a way to make sure the standard procedures proposed by WMO are followed throughout the whole VOS fleet in every country, and the data produced are homogenous and comply with WMO standards. The workshop provides the opportunity to strengthen relationships in a role, which relies heavily on international co-operation and is becoming more complex and requiring new skills such as computer and IT related skills, deploying satellite-tracked drifters and Argo floats, using e-logbooks, retrieving delayed mode data, installing AWS instruments and providing information on marine meteorological services to shipping companies and port authorities.

Major aims of the PMO-6 were to get more countries involved in PMO activities, update the PMOs with recent developments in standard reporting software (TurboWin), VOS metadata protocols, station identifiers, and new developments on the VOS website.

PMO-6 workshop was attended by about 110 participants from 57 countries. The workshop programme is provided in Annex I, the list of participants is provided in Annex II, the list of actions in Annex III and the links to the meeting documents and videos are in Annex IV. The workshop proposed eight recommendations. These recommendations covered a wide range of topics, i.e. standards and best practices, metadata, SOT unique identifiers, and sea ice observations, to list a few. This workshop was a great success with broader participation made possible due to the virtual nature of the workshop. Future workshops will be organized in a hybrid mode with in-person and virtual sessions.

RECOMMENDATIONS OF THE SIXTH INTERNATIONAL PORT METEOROLOGICAL OFFICERS (PMO-6) WORKSHOP

Ref.: 10423/2021-1.0 WESM

- VOS has developed best practices on PMO ship recruitments. The Ship of Opportunity Programme Implementation Panel (SOOPIP) is in the process of developing the guidelines on ship recruitment for vessels undertaking XBT deployments and underway measurements. There are commonalities in these two processes. It was suggested that SOOPIP leverages the work already completed by VOS and harmonize the information.
- There have been many developments in VOS metadata primarily to harmonize the WMO Integrated Global Information System (WIGOS) metadata format, replace the WMO Publication No.47 (PUB 47) and to integrate this information into OceanOPS web services which is the primary location for all ocean observing system metadata. There is a need for a user manual for recoding metadata. It was recommended to the Task Team on VOS Metadata to develop a user manual in this regard.
- To better assist with newcomers and other members of the VOS community in providing metadata to the OceanOPS, participants suggested to create short YouTube videos demonstrating metadata submission and obtaining Ship Observations Team unique identifiers (SOT-IDs) through the OceanOPS web system.
- This virtual session provided the opportunity for many new members to join the sessions who otherwise would not have had the opportunity to join. VOS was requested to arrange similar focused virtual session on PMO activities on a more frequent basis (i.e. every 6 months).
- SOT Task Teams are setup to achieve specific activities of the group and are open for anyone to join and contribute to the activities as well as to learn from the work they do. All newcomers were requested to consider joining the TTs based on their areas of interest.
- TurboWin is the VOS recommended logbook software to collect and provide the observation data from VOS. KNMI is managing the developments of the software in collaboration with E-SURFMAR. All participants are requested to provide any comments, upgrades, issues with TurboWin to the focal point (email: turbowin@knmi.nl) in order to make it more user-friendly for all users.
- Global Cryosphere Watch (GCW) is a WMO programme that coordinates all cryosphere related activities. TurboWin software provides the capability to report on sea ice observations. This information has not been reviewed previously by the GCW experts to align them with GCW observing requirements. Initial review by GCW experts identified that TurboWin only covers rudimentary sea-ice information and includes "icing" (of the vessel) as a sea-ice observation. Therefore, it was recommended that GCW in collaboration with VOS:
 - Decide/Approve to revise sea-ice observations obtained with TurboWin
 - Derive shortlist of critical sea-ice variables for TurboWin
 - Set up backend to harvest sea-ice observations from TurboWin
 - Test rollout
- VOS and GCW are requested to investigate the feasibility of automated sea ice observations from ships.

ANNEX I

Workshop Programme

Day 1 (16th March 2021)

1 Opening and Welcome

Opening remarks from SOT Chairperson and WMO Secretariat

2 VOS Overview

History of the VOS scheme; Details of the current fleet; Users of the data

3 PMO Duties

Overview of the role; Best practices guides; Remote barometer checks

4 OceanOPS

OceanOPS Dashboard (demonstration); VOS Metadata database (demonstration)

5 VOS Metadata Requirements

5.1 Why?

The importance of collecting and recording accurate metadata; Who uses this data?

5.2 What?

WIGOS Metadata requirements; What to record and where to find it; VOS Classes

5.3 How & Where?

Where to record VOS metadata; How to maintain up-to-date records

6 SOT IDs

7 PMO Resources

VOS Website ; TurboWin+ User Guide ; Ocean Best Practices System (OBPS) ; QC Tools / QC Relay

8 Other Programme Activities

8.1 DBCP Activities

Support from PMOs

8.2 SOOP Activities

Overview of SOOP activities, objectives, requirements, etc.

Day 2 (18th March 2021)

9 Opening of Day 2

10 TurboWin Overview

Introduction to TurboWin+; Summary of functions

11 TurboWin + User Cases

11.1 Manual Observations (UK VOS Fleet)

Basic operation of TurboWin+ with ship's-own or NMHS-supplied instrumentation

11.2 Automated Pressure/Temperature Reports (APTR) (Australian VOS Fleet)

TurboWin+ interfaced with Vaisala instrumentation and configured to automatically output observations via email

11.3 Auto-EMOS (US VOS Fleet)

TurboWin+ interfaced with Mintaka instrumentation

11.4 European Common AWS (EUCAWS)

TurboWin+ interfaced with EUCAWS Automatic Weather Station

12 Sea Ice Observations

12.1 Ocean Prediction Center (NOAA)

Services

12.2 Global Cryosphere Watch (GCW)

Sea Ice observations and IceWatch

12.3 Reporting Sea Ice with TurboWin

How to report sea ice observations

13 Closing Remarks

Support for PMOs (PMO Buddies, Ship-TC, VOS Chair)

ANNEX II

List of participants

Name	Country	Name	Country
Adam RYAN	United Kingdom	Claudia PINCHEIRA	Chile
Aditya PAMUNGKAS	Indonesia	Columba CREAMER	Ireland
Adriana GAMBOA	Venezuela (Bolivarian Republic of)	Cristian ARANGO	Colombia
Aidan MCMAHON	Australia	Cristina GARILAO	Germany
Aizat YELTAY	Kazakhstan	Daniel SOLE	Australia
Alejandro DE LA MAZA	Chile	Daniel USECHE ZAMUELIA	Colombia
Alvaro SCARDILLI	Argentina	Darin FIGURSKEY	USA
Alya ABDULLA	Qatar	David BERRY	United Kingdom
Alya ALABDULLA	Qatar	David DELLINGER	USA
Anabela CARVALHO	Portugal	David KNOTT	United Kingdom
Anas YASSIR	Morocco	Diana GUZMAN LUGO	Colombia
Andres CAMPUSANO	Dominican Republic	Diego SUÁREZ VARGAS	Colombia
Andres CAMPUSANO	Dominican Republic	Dimuthu WICKRAMASINGHE	Sri Lanka
Annie MAUA	Samoa	Dinu PREPELITA	Moldova Republic of
Annina KROLL	Germany	Dionysia KOTTA	Greece
Anucha SRERURNGLA	Thailand	Dumrong EKSINIKUL	Thailand
Archontia CHATZISPYROU	Greece	Dwikorita KARNAWATI	Indonesia
Ariane ALVAREZ	Spain	Edoh EKLOU	Côte d'Ivoire
Arjan KRAMER	Netherlands	Emau TOLUONO	Samoa
Badee KHAYYAT	Saudi Arabia	Emilie DORGEVILLE	Norway
Bagus PRAMUJO	Indonesia	Emma STEVENTON	United Kingdom
Bayu Edo PRATAMA	Indonesia	Enmanuel ALVAREZ	Dominican Republic
Bobadilla MENDOZA	Chile	Eric FREEMAN	USA
Bortu MAVRIC	Slovenia	Erika MONTOYA-CADAVID	Colombia
Brindusa Cristina CHIOTOROIU	Romania	Fang HOU	China
Brisneve EDULLANTES	Philippines	Filippo BARGNESI	Italy
Cai JINGJIU	China	Fulgence NGUESSAN	Côte d'Ivoire
Camilo ARÁNGUIZ	Chile	Ganesh Kumar DAS	India
Carolina VALENCIA MONROY	Colombia	Gao SHAN	China
Carrie WOLFE	USA	Gary Philipp BUELOW VITE	Tonga
Chaitra ARAKESHA	India	Ge YONG	China
Charles BAUBION	France	Giulia SECCI	Portugal
Chi-Kin CHOW	Hong Kong	Hassan AHMED	Kenya
Chris HARVEY	USA	Hermenegildo HOUANE	Mozambique
Chris VAN ARUM	Netherlands	Hermínio ANTÓNIO	Mozambique
Cláudia MOREIRA	Portugal	Honghua ZHANG	China
		Henry Kleta	Germany
		Huang SHAN	China

Name	Country	Name	Country
Hussein GADALLA	Sudan	Maccarios Samuelu AUVAE	Samoa
Ian CHARLESWORTH	Australia	Manu Jr SOLOMONA	Samoa
Imke PODBIELSKI	Germany	Magrun Fadzli MOHD FAHMI	Malaysia
James LUCIANI	USA	Maria NALETAKI	Greece
Jaruwat NATTAYARUK	Thailand	Maria PUREZA	Brazil
Jean-Baptiste COHUET	France	Mark JOHNSON	Ireland
Jennifer STRAHL	USA	Martha CADENA	Colombia
Jerry BARBER	USA	Martin GRAASKOV	Thailand
Jing MA	China	Martin KRAMP	France
Jing-Ming DONG	China	Mardené DE VILLIERS	South Africa
Jingze CAI	China	Maulid MACHANO	Republic of Tanzania
Joao FRANCO	Portugal	Mayu YAMAMOTO	Japan
Joel CABRIE	Australia	Michael POTOCHNEY	USA
Jonathan VERA CARIBE	Venezuela (Bolivarian Republic of)	Michail MYRSILIDIS	Greece
Jorge SANTAMARÍA PÉREZ	Spain	Miguel MIRANDA	Portugal
Józef WIKTOR	Poland	Mikael STENSTRÖM	Sweden
Juan GONZÁLEZ	Dominican Republic	Mike FUNNELL	Australia
Juan MORENO RINCON	Colombia	Minhao CHEN	China
Juan SALADO	Dominican Republic	Mohamed Adnan MISRAN	Singapore
Julian RODRIGUEZ	Australia	Mohammed AL-BORSHID	Qatar
Jun YOSHIMURA	Japan	Mohan DAS	Bangladesh
Justin TIANO	Netherlands	Mónica VÉLEZ RODRÍGUEZ	Colombia
Justine PARKS	USA	Narong WANGDEE	Thailand
Kamal Aldien ALAWAD	Sudan	Narongdet BOONSUKVEERAWAT	Thailand
Karl SHEPHERDSON	United Kingdom	Natali Gisel ARANDA	Argentina
Karla RINCONES	Mexico	Natthanathorn SINGTOTHONG	Thailand
Karolin EICHLER	Germany	Natthaphon SUWANNACHAK	Thailand
Kevin BERBERICH	USA	Naurozbayeva ZHANAR	Kazakhstan
Kirsten STOKES	United Kingdom	Nick ASHTON	United Kingdom
Laitia FIFITA	Tonga	Nurshat BUKHARBAYEVA	Kazakhstan
Leonardo MORENO	Ecuador	Omar Gaye CHAM	Gambia
Liang GUAN	China	Ong Chin HONG	Singapore
Lixin WEI	China	Pedro ROCA	Chile
Loes VANDECASTEELE	Belgium	Petra Heil	Australia
Long JIANG	Switzerland	Philippe GAUTIER	France
Lori EVANS	USA	Phillip Okello OCHIENG	Kenya
Lotfi KHAMMARI	Tunisia	Pichitpol SUPHALUCKSANA	Thailand
Luis LOPEZ ALVAREZ	Colombia	Pier MAQUILÓN LÍPARI	Ecuador
Luis ROMERO ABARCA	Chile		
Luz MOJICA	Colombia		
Maccarios AUVAE	Samoa		

Name	Country	Name	Country
Pitak WATTANAPONGPISAL	Thailand	Tharkoon SITTIBUD	Thailand
Puneet JASWAL	Canada	Timothy HARRIS	USA
Raja ACHARYA	India	Tina NINGBO	China
Randolfo JORQUERA	Chile	Tumain LABAN	United Republic of Tanzania
Rene ROZEBOOM	Netherlands	Ulyana SIMAKOVA	Russian Federation
Ricardo UNZUETA	Peru	Vaaua WILSON	Samoa
Richard LOMIRE	USA	Vaiola VAINIKOLO	Tonga
Rick LUMPKIN	USA	Wagner E. RIVERA ESTEVEZ	Dominican Republic
Robert NIEMEYER	USA	Wang DEWANG	China
Rodica Nitu	Switzerland	Wattana KANBUA	Thailand
Rosa SIMBINE	Mozambique	Wattana SINGTUY	Thailand
Said HASHIM	Kenya	Wei PENG	China
Sai-Tick CHAN	Hong Kong	Wilberforce KIKWASI	United Republic of Tanzania
Salman TARIQ	Pakistan	Wittaya KASAMSAWART	Thailand
Sandhya Devi DINDYAL	Mauritius	Wittaya RUGKID	Thailand
Saoussen CHERIAA	Tunisia	Xianqiao WANG	China
Shouhong LI	China	Xiaojie Cai	China
Shuang LIU	China	Xiaotian YU	China
Silipa MULITALO	Samoa	Xie XIAO	China
Simon CLEGG	United Kingdom	Yang YANG	China
Siriyotha PAWAT	Thailand	Yira FONSECA PARGA	Colombia
Solène ROUTABOUL	France	Yu BO	China
Songwuth KAWMEK	Thailand	Yutthaphum PHUMSAN	Thailand
Steve KNOWLES	New Zealand	Zhengquan CHEN	China
Steven CARRION	United Kingdom	Zongtao LI	China
Stuart HERRIDGE	United Kingdom		
Surat LAUNGAROON	Thailand		
Suwat CHUANAK	Thailand		
Tawatchai MANANG	Thailand		
Teeratham TEPPARAJ	Thailand		
Teodoro OVIEDO ALDANA	Colombia		
Thanaphong JAEMSAKIOL	Thailand		

ANNEX III

Action items arising from the workshop

PMO-6 New Actions

No.	Action Item	By whom	Deadline
1	Develop a user manual on VOS metadata submission to OceanOPS webservice	VOS Task Team on Metadata	SOT-12
2	Create short YouTube videos demonstrating metadata submission and obtaining Ship Observations Team (SOT) unique identifiers (IDs) through the OceanOPS web system	SOT Task Team on Recruitment, Promotion and Training	SOT-12
3	Arrange focused sessions on PMO activities on a more frequent basis for the PMO community	SOT Task Team on Recruitment, Promotion and Training	end of 2021
4	Continue efforts in harmonizing and collaborating with regards to sea ice observations with the Global Cryosphere Watch (GCW) programme	VOS chair and Other SOT members as appropriate - in collaborating with GCW's sea-ice obs experts.	On-going

ANNEX IV

Links to videos and documents

Link to video Day 1 and Day 2 :

https://drive.google.com/drive/folders/1cBHM-8-2LwL6_6Tzs-vaRpxWC-I57w8U

Links to the PMO-6 documents:

https://www.goosocean.org/index.php?option=com_oe&task=viewEventDocs&eventID=2610