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Intergovernmental Oceanographic Commission

PORT METEOROLOGICAL OFFICERS TRAINING WORKSHOP

SEVENTH SESSION

(PMO-7)

31 October – 02 November 2023

Nadi, Fiji

Pacific Community
Communauté du Pacifique

VOS
Voluntary Observing Ship Scheme

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NOTES

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7th PMO TRAINING WORKSHOP REPORT

SUMMARY

The seventh Port Meteorological Officers (PMO) training workshop was held at the Ramada Suites by Wyndham Hotel in Nadi, Fiji, from 31 October to 02 November 2023. PMO-7 Workshop was hosted by the Pacific Community (SPC) in collaboration with the Voluntary Observing Ship (VOS) Panel of the Ship Observations Team (SOT) and the World Meteorological Organization (WMO).

SOT chair Mr. Huai-min Zhang, Local host Mr. Zulfikar Begg from SPC, and Ms. Champika Gallage from the WMO secretariat delivered welcome speeches. All these speakers highlighted the importance of ocean observations and the work of Port Meteorological Officers (PMO) to improve weather and ocean predictions, climate monitoring and forecast, and research and applications that directly contribute to societal benefits.

Thirty-seven participants from twenty-four countries attended the workshop. There were six trainers and thirty-one trainees; fifteen trainees were financially supported through WMO funds, while SPC supported six participants. Seven out of thirty-one trainees joined the workshop remotely.

This workshop was targeted to train new PMO's primarily from the Pacific and surrounding regions where there is a gap in the PMO network. The agenda was developed allowing more practical training on software and hardware with the demonstration of equipment installation, maintenance, software installation, OceanOPS website use, and operation for data dissemination from ship to shore.

The first day of the workshop was dedicated to the high-level overview of Voluntary Observing Ships (VOS) and Port Meteorological Officers (PMO) activities. This included PMO responsibilities, ship recruitment, metadata, and PMO resources. In addition, the participants were also made aware of how the PMO work contributes to the high-level objectives of WMO and the Global Ocean Observing System (GOOS); the Global Basic Observing Network (GBON), Systematic Observations Financial Facility (SOFF), OceanOPS activities.

The second day of the workshop started with a slido quiz that included questions to refresh the information and discussions from day 1. Participants scored over 85% on the quiz, demonstrating their enthusiasm of the workshop activities. Day 2 was dedicated to discuss the Turbowin software, weather observing including equipment siting, visual observations, and data management.

SOT launched an instrument (mini–Automatic Weather Station (AWS)) donation programme at SOT-10, and three countries were selected to receive AWSs through an application process. Chile is one of the three recipients of the AWS. The AWS instrument package was officially handed over to Chilean participant at the workshop. It was also announced that twenty-four second-hand instruments donated by Australia and the United Kingdom are available to donate to the countries in need of instruments. Fourteen units donated by Australia will be distributed to the Pacific countries. The VOS chair will work with SPC to decide how and who will receive the donated instruments to start VOS programmes in their countries.

It was noted that the Pacific region will receive USD 170 million for the Weather-Ready Pacific Decadal Programme, and ocean observations will also receive investments. PMO-7 workshop serves as an initial step towards the weather-ready nation initiative.

The third day of the workshop focused on the ship inspections, including instrument calibration and performance checks, PMO ship inspections, delayed mode data collection, port security, safety, and Customs requirements. Participants completed a VOS recruitment simulation using the information received.

A number of stakeholders from Fiji, including the local shipping/port authority, the Fiji Meteorological Service, and the Government Shipping Service attended all three days of the workshop. The local shipping/port authority presented the information on port access, safety, and customs. A ship captain from the government shipping services indicated that funding and infrastructure are the primary limitations to initiating a VOS programme.

Participants identified telecommunication as a challenge for the region without reliable Internet for real-time data delivery. However, participants were requested to start small with a few ships recruited to VOS which can contribute through the Global System for Mobile Communication (GSM) network in coastal waters and delayed mode data collection when there are telecommunication issues to deliver real-time data.

All participants appreciated the workshop setup with presentations and practical exercises following each theory session, which made it easier to understand the content and retain the knowledge easily.

The SOT Chair appreciated the great efforts put into this successful workshop by the local organizer, Mr. Zulfikar Begg and Pacific Community (SPC), and the planning and training team, Joel Cabrie (Australia PMO), Champika Gallage (WMO), Martin Kramp (OceanOps), Steffen Steinmoeller (Germany PMO), Mardene de Villiers (South Africa PMO), and Huai-Min Zhang (USA NOAA), and congratulated the team for the successful workshop with certificates. All trainees were presented with training completion certificates.

A post-workshop survey was conducted to assess the success of the workshop. A summary of the post-workshop survey results is provided in Annex 4.

Annex 1

Programme of the workshop

7TH INTERNATIONAL PORT METEOROLOGICAL OFFICERS TRAINING WORKSHOP		
TUESDAY 31ST OCTOBER 2023 **DAY 1: 08:30 – 16:30**		**PRESENTER**
08:30-09:00	**1. REGISTRATION** • Check-in • Collect name tags	SPC
09:00-09:15	**2. OPENING DAY 1** • Opening Remarks from SOT Chair (*Huai-min Zhang*) • Welcome from the host (SPC) • Opening remarks from WMO and meeting instructions (*Champika Gallage*)	
VOS & PMO OVERVIEW		
09:15-09:45	**3. INTRODUCTIONS & WORKSHOP OVERVIEW** • Instructors and participants to introduce themselves • Overview of workshop	SPC
09:45-10:00	**4. GLOBAL OCEAN OBSERVING SYSTEM** • Introduce the GOOS networks • Introduce OceanOPS	Martin
20 MINUTE BREAK		
10:20-10:30	**5. WMO GLOBAL BASIC OBSERVING NETWORK (GBON) AND SOFF**	Champika
10:30-10:45	**6. VOS & PMO OVERVIEW** • History of the VOS Scheme • Details of the global fleet • Overview of PMO functions	Joel
SHIP RECRUITMENT		
10:45-11:00	**7. SHIP RECRUITMENT** • What makes a good VOS ship? • Identifying suitable ships • Useful tools • Checking OceanOPS for duplicate recruitment	Martin & Mardene
11:00-11:10	**8. LOCAL CONTACTS** • Harbour Master • Port Authority • Shipping Agents • Vessel Owners/Operators	Steffen
11:10-11:35	**9. MAKING CONTACT (PRACTICAL)** • Identify a shipping agent or other contact in your home port. • Send an introductory email to the agent (see example provided)	Joel
11:35-12:15	**10. RECRUITMENT PRACTICAL EXERCISE (SMALL GROUPS)** • Use available resources to find a ship frequently calling to your local port • Check OceanOPS for previous recruitment • Identify contact details • Identify schedule and next call to port • Discuss possible methods of communication • Send an introductory email to the Captain (see example provided) if possible	All

60 MINUTE LUNCH BREAK		
METADATA		
13:15-13:30	**11. WHY?** • The importance of collecting and recording accurate metadata • Who uses this data?	Huai-Min
13:30-13:45	**12. WHAT?** • WIGOS Metadata requirements • What to record and where to find it	Joel
13:45-14:10	**13. HOW & WHERE?** • Where to record VOS metadata • How to create an SOT-ID • How to maintain up-to-date records	Martin
14:10-15:30	**14. METADATA PRACTICAL EXERCISE (SMALL GROUPS)** • Gather metadata from ship's particulars, vessel diagrams and online resources. • Create new station and ship in OceanOPS and generate an SOT-ID. • Populate available metadata	All
15 MINUTE BREAK		
PMO SUPPORT		
15:45-15:55	**15. SUPPORT FOR PMOS** • OceanOPS Ship Technical Coordinator • PMO Buddies	Martin
15:55-16:15	**16. PMO RESOURCES** • VOS Website • Turbowin+ User Guide • Ocean Best Practices System (OBPS) • QC Tools	Joel
16:15-16:30	**OPEN DISCUSSION AND QUESTION TIME**	All
CLOSE OF DAY 1		
WEDNESDAY 1ST NOVEMBER 2023 **DAY 2: 09:00 – 16:30**		**PRESENTER**
TURBOWIN		
09:00 -09:20	**17. TURBOWIN** • Introduction • Download and installation. • Partner Board	Mardene
09:20-10:00	**18. TURBOWIN SETUP PRACTICAL (SMALL GROUPS)** • Install Turbowin+ • Configure Station Details using metadata collected on Day 1	All
20 MINUTE BREAK		
10:20-10:40	**19. COMMUNICATIONS** • Output options • Configure and test email settings (Practical)	Joel
10:40-11:15	**20. TURBOWIN ADDITIONAL FUNCTIONALITY** • INTERFACING SENSORS AND AUTOMATIC WEATHER STATIONS • DEMONSTRATION OF MINTAKA SYSTEM	Steffen, Joel & Mardene

WEATHER OBSERVING		
11:15-11:40	**21. EQUIPMENT SITING REQUIREMENTS** • Exposure • Sources of interference • Guidance documents	Joel
11:40-12:00	**22. MEASURED OBSERVATIONS** • Barometer • Thermometer types • Ship's anemometer • Best practices (i.e. parallax error, timing)	Mardene
12:00-12:30	**23. VISUAL OBSERVATIONS** • Estimating wind • Visibility • Waves and Swell • Significant Weather	Steffen
60 MINUTE LUNCH BREAK		
13:30-14:45	**24. WEATHER OBSERVATIONS PRACTICAL** **Small groups:** • Take a real observation of current conditions. • Discuss results. • Enter observations into Turbowin+. • Include Observer details • Send observation via email. **Whole group:** • Compare results and discuss differences.	All
DATA MANAGEMENT		
14:45-15:15	**25. PROCESSING DATA ASHORE** • Where to send real-time observations • Data format BBXX or BUFR • Support from neighbouring countries • GTS/WIS	Huai-min
15:15-15:30	**26. DATA QUALITY MONITORING** • QC Tools and reports	Joel
15 MINUTE BREAK		
15:45-16:00	**27. DATA QUALITY MONITORING (CONTINUED)** • Common quality issues	Joel
16:00-16:30	**OPEN DISCUSSION AND QUESTION TIME**	All
CLOSE OF DAY 2		
THURSDAY 2ND NOVEMBER 2023 **DAY 3: 09:00 – 16:30**		**PRESENTER**
SHIP INSPECTIONS		
09:00 -09:20	**28. INSTRUMENT CALIBRATION/PERFORMANCE CHECKS OVERVIEW** • Transfer standards • Comparison best practices	Joel

09:20-10:00	**29. Instrument Calibration/Performance Checks Practical (Small Groups)** • Perform a barometer comparison and record the results • Use both digital and aneroid • Complete VOSP01 • Discuss options to adjust ship's aneroid barometer or provide error correction	All
20 minute break		
10:20-11:00	**30. PMO Ship Inspections** • Outline common activities (e.g. cleaning, re-training) • Frequency of visits • Download IMMT files (Demonstration) • Discuss when metadata updates are required • VOSP001 FORM	Steffen
11:00-11:20	**31. Delayed-Mode Data** • Sending IMMT files to GCC	Huai-min
11:20-11:50	**32. Port Security, Safety and Customs Requirements** • Port access (ISPS) • Safety and risk assessments • Customs requirements for loading equipment	Samuela Bulimetuira
11:50-12:20	**33. Open Discussion**	All
60 Minute Lunch Break		
Review (Practical)		
13:20-15:00	**34. VOS Recruitment Simulation (real ship visit if possible)** Perform a simulated recruitment, installation and ship inspection in small groups: • Email Agent and ship's Captain • Discuss security, safety and customs requirements • Setup Turbowin+ • Install NMHS supplied equipment (if applicable) • Performance check ship's equipment (if applicable) • Train ship's officer • Perform test observation • Check quality of observations • Identify any quality issues • Suggest appropriate fix for any issues • Download IMMT log files • Update any metadata changes in OceanOPS	All
15 minute break		
Complementary Networks		
15:45-16:00	**35. Integrated Observing System** • Support from PMOs for buoy and float deployments • SOOP vessels activities • Other remaining items	Martin
16:00-16:30	**Open Discussion and Question Time**	All
Close of Workshop		
18:00-20:00	**Group Function hosted by SPC**	

Annex 2

List of Participants

	Name	Country	Email	Mode
1	Alan Ngwele	Vanuatu	angwele@vanuatu.gov.vu	inperson
2	Albertina Anderson	Namibia	albertina57@gmail.com	inperson
3	Anastasios Matsikaris	Cyprus	amatsikaris@dom.moa.goc.cy	inperson
4	C.H. Ong	Singapore	ONG_Chin_Hong@nea.gov.sg	remote
5	Champika Gallage	Switzerland	cgallage@wmo.int	in person
6	Chi Kin CHOW	Hong Kong	ckchow@hko.gov.hk	remote
7	De la Maza Alejandro	Chile	adelamazad@dgtm.cl	inperson
8	Ellen Luke	Vanuatu	eluke@meteo.gov.vu	inperson
9	Fulgence N'Guessan	Cote D'Ivoire	fulgence.nguessan@sodexam.ci	inperson
10	Hassan Ahmed	Kenya	noorhas@meteo.go.ke	inperson
11	Huai-min Zhang	USA	huai-min.zhang@noaa.gov	in person
12	Isreal Ndaendako Haindongo	Namibia	ndaendako@hotmail.com	remote
13	Joel Cabrie	Australia	joel.cabrie@bom.gov.au	in person
14	Jolame Niukavu	Fiji	Jolame@fijiports.com.fj	inperson
15	Joseph Basconcillo	Philippines	jbasconcillo@pagasa.dost.gov.ph	inperson
16	Maleli Turagabeci	Fiji	malelit@spc.int	inperson
17	Mardene de Villiers	South Africa	Mardene.deVilliers@weathersa.co.za	inperson
18	Martin Kramp	Germany	mkramp@ocean-ops.org	inperson
19	Max Norman Sitai	Solomon Islands	m.sitai@met.gov.sb	inperson
20	Mayu Yamamoto	Japan	mayu_yamamoto@met.kishou.go.jp	remote
21	Merana Kitione	Fiji	meranak@spc.int	inperson
22	Munokoatai Samuel NGA	Cook Islands	samuel.nga@cookislands.gov.ck	inperson
23	P. L. N. Murty	India	murty.iitd@gmail.com	remote
24	Peceli Derederenalagi	Fiji	peceli@fijiports.com.fj	inperson
25	Poate Degei	Fiji	poated@spc.int	inperson
26	Rahul Kumar	Fiji	ravineshravk@gmail.com	inperson
27	Raja Archarya	India	raja.acharya2011@gmail.com	remote
28	Risiate Temo	Fiji	risiate.temo@met.gov.fj	inperson
29	Sakeasi Rabitu Waibuta	Fiji	sakeasi.rabitu@met.gov.fj	inperson
30	Steffen Steinmoeller	Germany	Steffen.Steinmoeller@dwd.de	inperson
31	Sunil Kumar	Fiji	skumar@msaf.com.fj	inperson
32	Tebatibunga Kaongotao	Kiribati	smo@met.gov.ki	inperson
33	Teeratham Tepparaj	Thailand	teeratham2000@gmai.com	inperson
34	Thierry Derol Awoulmbang Sakpak	Cameroon	thierryderolsakpak@gmail.com	remote

35	Va'aua Wilson	Samoa	vaaua.wilson@mnre.gov.ws	inperson
36	Zhaobin Sun	China	sunzhaobinedu@163.com	inperson
37	Zulfikar Begg	Fiji	zulfikarb@spc.int	inperson

Annex 3

Recommendations and Action items arising from the workshop

RECOMMENDATIONS

1. Ports authorities can play a significant role in establishing and maintaining a VOS programme. Participants are suggested to strengthen relationships with national port authorities. These strengthened relationships will facilitate the port authorities to directly communicate with large shipping companies visiting their ports to contribute to the VOS programme. The SOT Technical Coordinator (TC) can arrange a generic letter of support upon request.

2. Awareness of the VOS programme and the importance of the PMO role is not familiar to the Pacific community. It was suggested that SPC will host a stakeholder discussion session for heads of Meteorological services with Heads of maritime transports and ports authorities in the region to better understand the deliverables under the number of UN conventions, i.e. SOLAS, UNCLOS.

3. Pacific countries are new to ship recruitment to obtain observations. Thus, participants requested assistance to identify possible ships with assistance from Australia BoM to initiate VOS programmes in their countries. (i.e. Kiribati)

4. Participants expressed their appreciation of the well-organized workshop. Most of the participants wanted to share the knowledge gathered at the workshop with their colleagues at their national institutions. Therefore, participants requested to create modules of this workshop to train others at their respective organizations.

5. It was mentioned that some countries experience issues (including geopolitical) when it comes to recruiting ships for the VOS programme. To assist the discussions with local authorities, ship owners and officers participants requested an information package/policy brief to assist with their discussions with authorities. The SOT Technical Coordinator proposed to issue SOT support letters if required.

6. Some participants raised concerns of their lack of experience to recruit the ships for VOS programme. To get some assistance with this, participants are invited to join the SOT Task Team on Recruitment, Promotion and Training (TT-RPT)

7. Pacific countries are advised to work through regional entities such as PI GOOS, Maritime transport, Fisheries, and Central Pacific shipping commission to approach the regional shipping companies to engage them in the VOS programme.

8. Number of participants raised the issue with a lack of reliable internet services in the region for real time data exchange. While acknowledging this challenge participants are encouraged to recruit ships from the region and collect data in delayed mode if real-time data delivery is a challenge.

9. Solomon Islands requested to have a similar workshop organized nationally with the attendance of national stakeholders. Engagement of stakeholders will make it easier to recruit new ships for VOS.

ACTIONS

1. Prepare PMO-7 training video and make them available to countries to assist new PMO recruitments. (TT- RPT, Dec 2024)

2. Gather regulatory information on VOS observations available from WMO, IMO and any other sources and make them available in a centrally accessible location for the PMOs to use in their discussions with authorities to recruit ships for VOS programme.(TT-RPT, SOT-TC with WMO Secretariat, Dec 2024)

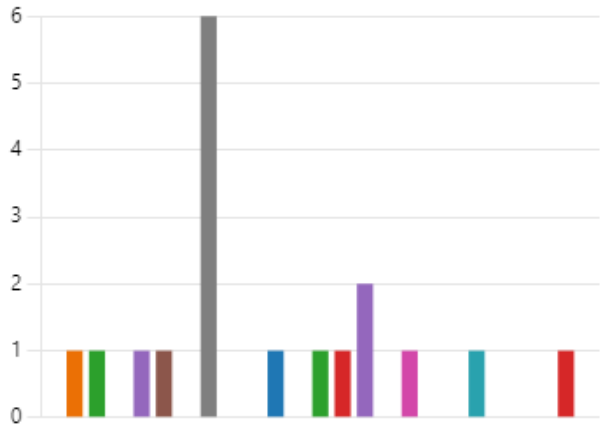
Annex 4

Post-workshop survey results summary

What country are you located in?

Plus de détails Aperçus

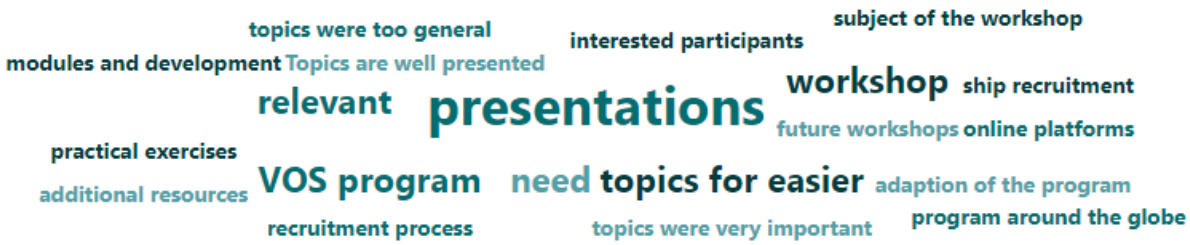
Australia	0
Cameroon	1
Chile	1
China	0
Cook Islands	1
Côte d'Ivoire	1
Cyprus	0
Fiji	6
Germany	0
Hong Kong (China)	0
India	1
Japan	0
Kenya	1
Kiribati	1
Namibia	2
New Zealand	0
Philippines	1
Samoa	0
Singapore	0
Solomon Islands	1
South Africa	0
Thailand	0
USA	0
Vanuatu	1
Autre	0



Were the topics and depth of presentation adequate for the audience?

Plus de détails Aperçus

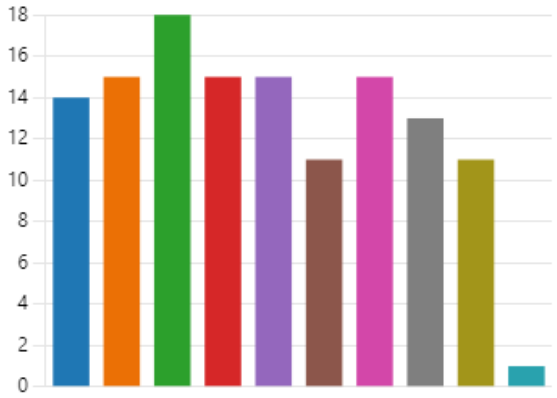
Yes	17
No	1



What were the most important topics for you in the workshop? (You may select more than one answer)

Plus de détails

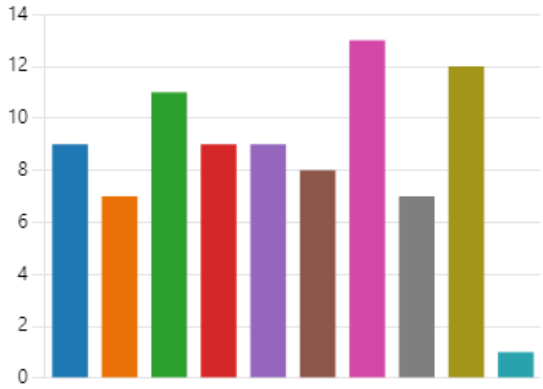
PMO Duties	14
VOS Overview	15
OceanOps	18
VOS Metadata	15
PMO Resources	15
SOT-ID	11
Turbowin+	15
Ship AWS	13
QC Tools	11
Autre	1



). Which of these topics would you like more information on or future follow-up sessions? (You may select more than one answer)

Plus de détails

PMO Duties	9
VOS Overview	7
OceanOps	11
VOS Metadata	9
PMO Resources	9
SOT-ID	8
Turbowin+	13
Ship AWS	7
QC Tools	12
Autre	1



Age Range

Plus de détails Aperçus

18-35	7
36-50	7
50+	3
Prefer not to say	1

Gender

Plus de détails Aperçus

Female	1
Male	17

. Would you be interested in participating in more frequent PMO workshops?

Plus de détails Aperçus

Yes	17
No	0

. If yes, how often?

Plus de détails Aperçus

6 months	3
Yearly	11
Biannual	3

. And should the workshop be:

Plus de détails Aperçus

In-Person	12
Virtual	1
Any one of the above options	5

. Do you have suggestions for any other topic to include in future workshops?

Plus de détails Aperçus

13
Réponses

Dernières réponses

"PMO selection and Ship Recruitment"

"relationship with IMO bodies"

"I would like to suggest adding saildrone as a topic which an support the PM...

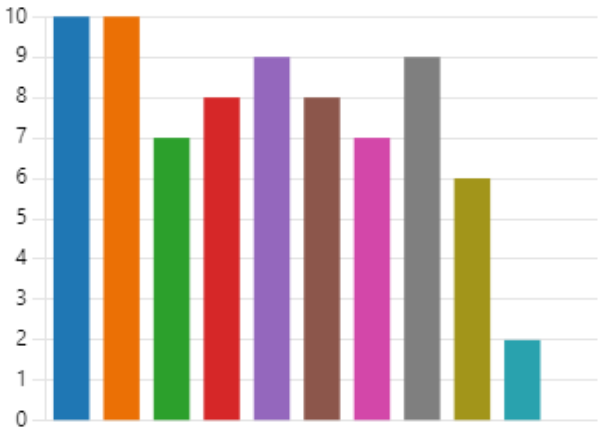
...

répondants (**15**%) répondu **PMO** pour cette question.

. Do you require assistance to (You may select more than one answer):

Plus de détails

Use Turbowin	10
Use or select AWS or sensors	10
Share your metadata	7
Set up SOT-ID	8
Share your data on the GTS	9
Find relevant information regar...	8
Share your delayed-mode (clim...	7
Help to establish a marine mete...	9
Have a translation of the VOS w...	6
None	2
Autre	0



. Do you have a national VOS program?

Plus de détails Aperçus

Yes	2
No	16

. If no, are you planning to establish a VOS program?

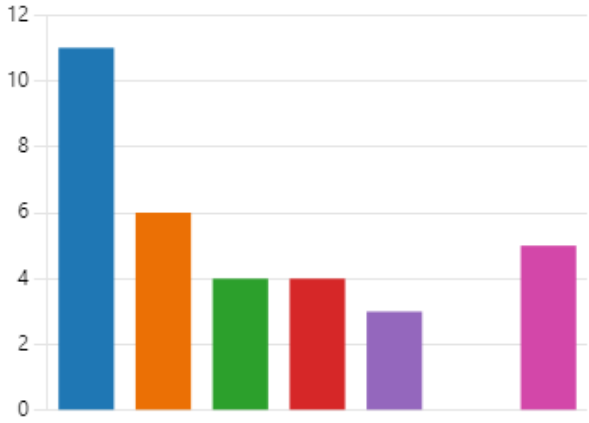
Plus de détails Aperçus

Yes	13
No	1
Autre	2

. Will you be willing to join a Task Team? If yes, which task teams?

Plus de détails

TT - Recruitment, Promotion, Tr...	11
TT - Metadata	6
TT - Expansion of Independent ...	4
TT - Instrument Standards and S...	4
TT - Key Performance Indicators	3
No	0
Not Yet	5



). Will you be interested in online PMO course?

Plus de détails

Yes	18
No	0

). Will you be interested in applying for the instrumentation donation program?

Plus de détails Aperçus

Yes	15
No	3

. Do you have any other relevant feedback or comments (on any of the above topics)?

Plus de détails Aperçus

Yes	7
No	11

. Comments on Question 21 (If no, enter 'no comment')

Plus de détails Aperçus

12
Réponses

Dernières réponses

"Met Officers are end user to the Metadata provided through the VOS progra..."

"WMO guidelines for Marine Meteorology Services was very useful too"

"Certificate of participation may kindly be issued for online participants also..."

répondants (**17**%) répondu **countries** pour cette question.