WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

WMO OMM
World Meteorological Organization
Organisation météorologique mondiale
Organización Meteorológica Mundial
Всемирная метеорологическая организация
المنظمة العالمية للأرصاد الجوية
世界气象组织

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Ref.: 10280/2022-L3 SSU

Our ref.: 10280/2022/I/SSU 11 May 2022

Annex: 1

Subject: Global Survey on Satellite Data Utilization - 2022

Action required: Response before **1 July 2022**

Dear Sir/Madam,

I am writing in support of the 2022 Global Survey on Satellite Data Utilization carried out by the WMO Space Programme. One of the strategic goals of the WMO Space Programme is to improve the utilization of satellite data and services by WMO Members, with emphasis on less advanced and developing countries. This effort is supported by surveys, conducted on a periodic basis, on the availability of satellite data and products and on their use by WMO Members. The purpose of the survey is to collect feedback from all WMO Members on progress and achievements as well as on challenges and deficiencies as regards the use of satellite data, satellite data applications and training needs.

The most recent Global Survey on Satellite Data Utilization was conducted in 2016. It is, therefore, necessary to collect up-to-date information on the status of satellite data utilization and user needs for training to help bridge the gaps between the large amount of satellite data available, and the considerable need for increased access to those data, information, products and training.

Your responses on status, progress, and challenges in using satellites as an information resource will also shape international actions by WMO and its Members in responding to your needs. We will do our best to strengthen and leverage your contributions internationally.

Consequently, I encourage you to distribute the questionnaire as widely as possible among satellite data users in your region. It would be appreciated if you could provide the required information on the use of satellite data, by completing the electronic form through the GLOBAL SURVEY ON SATELLITE DATA UTILIZATION - 2022 (available in six UN languages). The survey contains 29 questions, which you can read in the attached hard copy. You may contact Ms Zoya Andreeva, Scientific Officer, Space Systems and Utilization Division, WMO Space Programme Office at zandreeva@wmo.int, if you have any difficulty in submitting the form.

I take this opportunity to thank you for your cooperation and would be pleased if the required information could be sent as soon as possible, but not later than **1 July 2022,** to allow ample time for an analysis and publication of the results of the survey.

Yours faithfully,

Dr Wenjian Zhang
for the Secretary-General

To: Permanent Representatives of Members with WMO

cc: Hydrological Advisers

GLOBAL SURVEY ON SATELLITE DATA UTILIZATION - 2022

PERSONAL INFORMATION

1. Are you completing this survey as an individual, on behalf of your organization, or on behalf of the Permanent Representative of your country with WMO?

   a) I am completing this survey as an individual
   b) I am completing this survey on behalf of my organization
   c) I am completing this survey on behalf of the Permanent Representative of my country with WMO

2. Please tell us about yourself (Note that your personal information will be treated as confidential, in line with the WMO and SurveyMonkey privacy policies and will only be used for the purposes of this survey.)

   Name
   Organization
   Position
   Country
   City/Town
   Email Address

3. Please select the type of your organization

   (a) National Meteorological/Hydrological Service (NMHS)
   (b) Other operational governmental agency
   (c) Regional / International organization
   (d) Research / Academic institution
   (e) Other (please specify)

4. What is the main focus of your organization?

5. Please provide the information on existing partnerships with academia, private sector or international organizations (if any)

6. Please select your geographic region (if your organization is active in more than one WMO Region, please choose the region for which you wish to submit this survey)

   RA I (Africa)
   RA II (Asia)
   RA III (South America)
   RA IV (North America, Central America, Caribbean)
   RA V (South-West Pacific)
   RA VI (Europe)

7. Are you aware of the WMO Coordination Group on Satellite Data Requirements in your region?

Yes
No
Comments

USE OF GEOSTATIONARY SATELLITE DATA

8A. Please indicate your use of the following GEOSTATIONARY imagery data

	USED	PLANNED TO BE USED	NOT USED
GOES-EAST (ABI)			
GOES-WEST (ABI)			
METEOSAT 0 degree (SEVIRI)			
METEOSAT Indian Ocean (SEVIRI)			
INSAT (IMAGER)			
FY-2 (S-VISSR)			
FY-4 (AGRI)			
HIMAWARI (AHI)			
GEO-KOMPSAT-2A (AMI)			
ELECTRO-L (MSU-GS)			

8B. Please indicate your use of the following GEOSTATIONARY sounding data

	USED	PLANNED TO BE USED	NOT USED
FY-4 (GIIRS)			

8C. Please indicate your use of the following GEOSTATIONARY lightning data

	USED	PLANNED TO BE USED	NOT USED
GOES-EAST (GLM)			
GOES-WEST (GLM)			
FY-4A (LMI)			

8D. Please indicate your use of the following GEOSTATIONARY space weather data

	USED	PLANNED TO BE USED	NOT USED
GOES-EAST			
GOES-WEST			
METEOSAT 0 degree			
METEOSAT-Indian Ocean			
FY-2			
FY-4			
HIMAWARI			
GEO-KOMPSAT-2A			
ELECTRO-L			

8E. Other GEOSTATIONARY missions (please specify)

9A. Please indicate your data access mechanisms for GEOSTATIONARY satellite data and indicate how satisfied you are with these mechanisms. If an option is not used or not applicable, please leave it blank

	Internet	Satellite rebroadcast	Terrestrial rebroadcast	Direct reception	GTS
GOES-EAST	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
GOES-WEST	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
METEOSAT 0 degree	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
METEOSAT-Indian Ocean	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
INSAT	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
FY-2	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
FY-4	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
HIMAWARI	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
GEO-KOMPSAT	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
ELECTRO-L	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access

Other data access mechanisms or any issues with data access to these satellites (please specify)

9B. If you chose “Internet”, please indicate what website(s) are used

10. Please indicate the degree of challenges you experience with access, processing and visualizing GEOSTATIONARY data, the extent to which your training needs are met. If an option is not used or not applicable, please leave it blank

	Challenges with access	Challenges with processing	Challenges with visualization	My training needs are …
GOES-EAST	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
GOES-WEST	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
METEOSAT 0 degree	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
METEOSAT Indian Ocean	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
INSAT	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
FY-2	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
FY-4	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
HIMAWARI	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
GEO-KOMPSAT	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
ELECTRO-L	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met

Any challenges you experience with access, processing and visualizing geostationary data (please specify)

11. Please indicate the frequency of utilization of the following GEOSTATIONARY information

	Daily	Weekly	Seasonally	Special Events	Not used
Individual Bands (VIS, IR)					
RGBs					
Derived Products					

USE OF LOW-EARTH ORBIT SATELLITE DATA

12A. Please indicate the use of the following LOW-EARTH ORBIT satellite data

	USED	PLANNED TO BE USED	NOT USED
Metop-B, C	[ ]	[ ]	[ ]
NOAA-15, 18, 19	[ ]	[ ]	[ ]
NOAA-20	[ ]	[ ]	[ ]
SNPP	[ ]	[ ]	[ ]
FY-3C, D, E	[ ]	[ ]	[ ]
HY-1	[ ]	[ ]	[ ]
HY-2	[ ]	[ ]	[ ]
Meteor-M	[ ]	[ ]	[ ]
Aqua	[ ]	[ ]	[ ]
Terra	[ ]	[ ]	[ ]
Aura	[ ]	[ ]	[ ]
Jason-3	[ ]	[ ]	[ ]
Landsat	[ ]	[ ]	[ ]
Sentinel-1	[ ]	[ ]	[ ]
Sentinel-2	[ ]	[ ]	[ ]
Sentinel-3	[ ]	[ ]	[ ]
Sentinel-5P	[ ]	[ ]	[ ]
Sentinel-6 MF	[ ]	[ ]	[ ]
GPM Core Observatory	[ ]	[ ]	[ ]
DMSP-F17, F18	[ ]	[ ]	[ ]
GCOM-W	[ ]	[ ]	[ ]
GCOM-C	[ ]	[ ]	[ ]
CALIPSO	[ ]	[ ]	[ ]
CloudSat	[ ]	[ ]	[ ]
OCO-2	[ ]	[ ]	[ ]
SMAP	[ ]	[ ]	[ ]
SMOS	[ ]	[ ]	[ ]
GRACE-FO	[ ]	[ ]	[ ]
ICESat-2	[ ]	[ ]	[ ]
Megha-Tropiques	[ ]	[ ]	[ ]
Aeolus	[ ]	[ ]	[ ]
CryoSat-2	[ ]	[ ]	[ ]
GOSAT	[ ]	[ ]	[ ]
SARAL	[ ]	[ ]	[ ]
CFOSAT	[ ]	[ ]	[ ]
FORMOSAT-5	[ ]	[ ]	[ ]
KOMPSAT-3, 3A, 5	[ ]	[ ]	[ ]
Solar-B (Hinode)	[ ]	[ ]	[ ]
PROBA-1, 2	[ ]	[ ]	[ ]
SWARM-A, B, C	[ ]	[ ]	[ ]
Galileo	[ ]	[ ]	[ ]
XMM-Newton	[ ]	[ ]	[ ]
ICON	[ ]	[ ]	[ ]
TIMED	[ ]	[ ]	[ ]
COSMIC-2	[ ]	[ ]	[ ]
ISS SAGE-III	[ ]	[ ]	[ ]
ISS LIS	[ ]	[ ]	[ ]
ISS OCO-3	[ ]	[ ]	[ ]

Other LOW-EARTH ORBIT missions (please specify)

12B. Please specify the instruments you use from the following multi-purpose LOW-EARTH ORBIT satellites (the lists of instruments are available via the links to the dedicated pages of the WMO OSCAR database). If an option is not used or not applicable, please leave it blank

	INSTRUMENTS
Metop-B, C	
NOAA-15, 18, 19	
NOAA-20	
SNPP	
FY-3C, D, E	
HY-1	
HY-2	
Meteor-M	
Aqua	
Terra	
Aura	
Jason-3	
Sentinel-3	
Sentinel-6 MF	
GPM Core Observatory	
DMSP-F17, F18	
Megha-Tropiques	
SARAL	
CFOSAT	
FORMOSAT-5	
KOMPSAT-3, 3A, 5	
COSMIC-2	

13A. Please indicate your data access mechanisms for LOW-EARTH ORBIT satellite data and indicate how satisfied you are with these mechanisms. If an option is not used or not applicable, please leave it blank

	Internet	Satellite rebroadcast	Terrestrial rebroadcast	Direct reception	GTS
Metop-B, C	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
NOAA-15, 18, 19	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
NOAA-20	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
SNPP	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
FY-3C, D, E	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
HY-1	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
HY-2	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
Meteor-M	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
Aqua	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
Terra	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
Aura	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
Jason-3	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
Landsat	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
Sentinel-1	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
Sentinel-2	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access

	Internet	Satellite rebroadcast	Terrestrial rebroadcast	Direct reception	GTS
Sentinel-3	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
Sentinel-5P	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
Sentinel-6 MF	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
GPM Core Observatory	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
DMSP-F17, F18	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
GCOM-W	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
GCOM-C	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
CALIPSO	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
CloudSat	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
OCO-2	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
SMAP	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
SMOS	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
GRACE-FO	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
ICESat-2	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
Megha-Tropiques	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
Aeolus	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
CryoSat-2	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access

	Internet	Satellite rebroadcast	Terrestrial rebroadcast	Direct reception	GTS
GOSAT	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
SARAL	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
CFOSAT	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
FORMOSAT-5	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
KOMPSAT-3, 3A, 5	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
Solar-B (Hinode)	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
PROBA-1, 2	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
SWARM-A, B, C	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
Galileo	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
XMM-Newton	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
ICON	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
TIMED	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
COSMIC-2	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
ISS SAGE-III	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
ISS LIS	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access
ISS OCO-3	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access	Good access Fair access Poor access

Other LOW-EARTH ORBIT missions or other data access mechanisms (please specify)

13B. If you chose “Internet”, please indicate what website(s) are used

14. Please indicate the degree of challenges you experience with access, processing and visualizing LOW-EARTH ORBIT satellite data and the extent to which your training needs are met. If an option is not used or not applicable, please leave it blank

	Challenges with access	**Challenges with processing**	**Challenges with visualization**	**My training needs are …**
Metop-B, C	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
NOAA-15, 18, 19	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
NOAA-20	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
SNPP	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
FY-3C, D, E	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
HY-1	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
HY-2	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
Meteor-M	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
Aqua	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
Terra	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
Aura	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met

	Challenges with access	**Challenges with processing**	**Challenges with visualization**	**My training needs are …**
Jason-3	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
Landsat	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
Sentinel-1	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
Sentinel-2	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
Sentinel-3	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
Sentinel-5P	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
Sentinel-6 MF	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
GPM Core Observatory	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
DMSP-F17, F18	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
GCOM-W	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
GCOM-C	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
CALIPSO	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
CloudSat	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met

	Challenges with access	Challenges with processing	Challenges with visualization	My training needs are …
OCO-2	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
SMAP	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
SMOS	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
GRACE-FO	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
ICESat-2	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
Megha-Tropiques	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
Aeolus	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
CryoSat-2	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
GOSAT	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
SARAL	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
CFOSAT	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
FORMOSAT-5	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
KOMPSAT-3, 3A, 5	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met

	Challenges with access	**Challenges with processing**	**Challenges with visualization**	**My training needs are …**
Solar-B (Hinode)	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
PROBA-1, 2	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
SWARM-A, B, C	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
Galileo	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
XMM-Newton	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
ICON	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
TIMED	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
COSMIC-2	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
ISS SAGE-III	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
ISS LIS	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met
ISS OCO-3	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	no challenges at all low challenge moderate challenge high challenge	met partially met not met

Other LOW-EARTH ORBIT missions and/or any challenges you experience with access, processing and visualizing data from these satellites (please specify)

15. Please indicate your frequency of utilization of the following LOW-EARTH-ORBIT information

	Daily	Weekly	Seasonally	Special Events	Not used
Individual Bands (VIS, IR, MW)					
RGBs					
Derived Products					

16. Do you use data from commercial meteorological and environmental satellites to address your needs? If an option is not used or not applicable, please leave it blank

	Daily	Weekly	Seasonally	Special Events
Capella (Capella)				
CICERO (GeoOptics)				
FLOCK (Planet)				
ICEYE (ICEYE, ESA)				
SuperView (SpacEyes, CAST)				
SkySat (Terra Bella, Planet)				
Lemur-2 (Spire)				
SSTL-S1 (SSTL, UKSA, 21AT)				
WorldView (Maxar, DigitalGlobe)				
Pléiades-Neo (Airbus)				
BlackSky (BSG)				
GNOMES (PlanetIQ)				

Please specify other commercial satellites used and the need(s) it/they satisfy

SATELLITE DATA APPLICATIONS AND TRAINING NEEDS

17. Please state your use of satellite data for each application area in terms of whether it is essential or not essential to your application, used or not used and indicate if there is a need for people working in each application area to receive training in the use of satellite data

Application area	Satellite Data Use	Satellite Data Importance	Need for Training
Nowcasting & Very Short-Range Forecasting	**Used** **Not used**	**Essential** **Valuable** **Nice to have** **Non needed**	**Needed and delivered** **Needed, but not delivered** **Not needed**
Synoptic Meteorology	**Used** **Not used**	**Essential** **Valuable** **Nice to have** **Non needed**	**Needed and delivered** **Needed, but not delivered** **Not needed**
NWP	**Used** **Not used**	**Essential** **Valuable** **Nice to have** **Non needed**	**Needed and delivered** **Needed, but not delivered** **Not needed**
Aeronautical Meteorology	**Used** **Not used**	**Essential** **Valuable** **Nice to have** **Non needed**	**Needed and delivered** **Needed, but not delivered** **Not needed**
Agricultural Meteorology	**Used** **Not used**	**Essential** **Valuable** **Nice to have** **Non needed**	**Needed and delivered** **Needed, but not delivered** **Not needed**
Climate	**Used** **Not used**	**Essential** **Valuable** **Nice to have** **Non needed**	**Needed and delivered** **Needed, but not delivered** **Not needed**
Hydrology	**Used** **Not used**	**Essential** **Valuable** **Nice to have** **Non needed**	**Needed and delivered** **Needed, but not delivered** **Not needed**
Environmental applications	**Used** **Not used**	**Essential** **Valuable** **Nice to have** **Non needed**	**Needed and delivered** **Needed, but not delivered** **Not needed**
Air Quality	**Used** **Not used**	**Essential** **Valuable** **Nice to have** **Non needed**	**Needed and delivered** **Needed, but not delivered** **Not needed**
Cryosphere	**Used** **Not used**	**Essential** **Valuable** **Nice to have** **Non needed**	**Needed and delivered** **Needed, but not delivered** **Not needed**
Marine Meteorology and Oceanography	**Used** **Not used**	**Essential** **Valuable** **Nice to have** **Non needed**	**Needed and delivered** **Needed, but not delivered** **Not needed**

Application area	Satellite Data Use	Satellite Data Importance	Need for Training
Disaster Monitoring and Security	**Used** **Not used**	**Essential** **Valuable** **Nice to have** **Non needed**	**Needed and delivered** **Needed, but not delivered** **Not needed**
Space Weather	**Used** **Not used**	**Essential** **Valuable** **Nice to have** **Non needed**	**Needed and delivered** **Needed, but not delivered** **Not needed**
Research applications	**Used** **Not used**	**Essential** **Valuable** **Nice to have** **Non needed**	**Needed and delivered** **Needed, but not delivered** **Not needed**
Urban Management	**Used** **Not used**	**Essential** **Valuable** **Nice to have** **Non needed**	**Needed and delivered** **Needed, but not delivered** **Not needed**

Other application areas (please specify)

18. Please specify what would help you improve your services for each application area with respect to utilization of satellite data and products. If an option is not used or not applicable, please leave it blank

Application area	Training	Faster or more reliable data access	Data processing software and / or visualization tools
Nowcasting & Very Short-Range Forecasting	[ ]	[ ]	[ ]
Synoptic Meteorology	[ ]	[ ]	[ ]
NWP	[ ]	[ ]	[ ]
Aeronautical Meteorology	[ ]	[ ]	[ ]
Agricultural Meteorology	[ ]	[ ]	[ ]
Climate	[ ]	[ ]	[ ]
Hydrology	[ ]	[ ]	[ ]
Environmental applications	[ ]	[ ]	[ ]
Air quality	[ ]	[ ]	[ ]
Cryosphere	[ ]	[ ]	[ ]
Marine Meteorology and Oceanography	[ ]	[ ]	[ ]
Disaster Monitoring and Security	[ ]	[ ]	[ ]
Space Weather	[ ]	[ ]	[ ]
Research applications	[ ]	[ ]	[ ]
Urban Management	[ ]	[ ]	[ ]

Other application areas (please specify)

19. The annual Gap Analysis performed by WMO allowed to identify the following gap areas related to space-based observation systems (please see the details in the working paper CGMS-50-WMO-WP-08). Please indicate the importance of those gaps, i.e. how critical they are for you. If an option is not used or not applicable, please leave it blank

Gap areas identified	How critical these gaps are for you
Trace gas, including greenhouse gas (GHG)	Highly critical Quite critical Not critical
Earth Radiation Budget	Highly critical Quite critical Not critical
Aerosol	Highly critical Quite critical Not critical
Precipitation	Highly critical Quite critical Not critical
Sea-surface wind	Highly critical Quite critical Not critical
Wind profile	Highly critical Quite critical Not critical
Ocean altimetry	Highly critical Quite critical Not critical
Sea surface temperature	Highly critical Quite critical Not critical
Ocean colour	Highly critical Quite critical Not critical
Soil moisture	Highly critical Quite critical Not critical
Snow cover	Highly critical Quite critical Not critical
Sea-surface salinity	Highly critical Quite critical Not critical
Sea ice	Highly critical Quite critical Not critical
Space weather	Highly critical Quite critical Not critical

20. Please indicate your training needs and your training status for the following areas

Operation and maintenance of satellite data reception equipment	Needed and delivered Needed, but not delivered Not needed
Access to satellite data and products	Needed and delivered Needed, but not delivered Not needed
Satellite data processing and visualization	Needed and delivered Needed, but not delivered Not needed
Satellite RGBs utilization and interpretation	Needed and delivered Needed, but not delivered Not needed
Satellite derived products utilization and interpretation	Needed and delivered Needed, but not delivered Not needed
Physical basis of remote sensing	Needed and delivered Needed, but not delivered Not needed
Preparation and effective utilization of new generation satellites	Needed and delivered Needed, but not delivered Not needed

Other training needs (please specify)

21. Please state your level of awareness of the following distance-learning resources and other information sources. State whether you use these resources for staying abreast of new developments in satellite systems and applications

	Level of awareness	**Level of use**
WMO Space Programme website	Aware Unaware	Frequently Used Rarely Used Not used
WMO-CGMS VLab	Aware Unaware	Frequently Used Rarely Used Not used
WMO OSCAR/Space	Aware Unaware	Frequently Used Rarely Used Not used
Satellite operator websites	Aware Unaware	Frequently Used Rarely Used Not used
CGMS website	Aware Unaware	Frequently Used Rarely Used Not used
CEOS website	Aware Unaware	Frequently Used Rarely Used Not used
WMO Product Access Guide (PAG)	Aware Unaware	Frequently Used Rarely Used Not used
WMO-CGMS Satellite User Readiness Navigator (SATURN)	Aware Unaware	Frequently Used Rarely Used

	Level of awareness	Level of use
		Not used
EUMeTrain	Aware Unaware	Frequently Used Rarely Used Not used
Eumetcal	Aware Unaware	Frequently Used Rarely Used Not used
WMO VLab RFG of the Americas and Caribbean	Aware Unaware	Frequently Used Rarely Used Not used
Australian VLab CoE RFG	Aware Unaware	Frequently Used Rarely Used Not used
COMET/MetEd	Aware Unaware	Frequently Used Rarely Used Not used
ARSET website	Aware Unaware	Frequently Used Rarely Used Not used

Other online training resources used (please specify)

22. Please provide any other comments, questions or concerns regarding your use of satellite data

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