

User benefits from VLab

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VLab TSO

Focal Point of Satellite Data Requirements
RA-IV / Co-chair of the SDRG



WMO OMM

World Meteorological Organization

Organisation météorologique mondiale



Thank you CGMS and WMO!

- The WMO Space Programme promotes **availability and utilization of satellite data and products** for weather, climate, water and related applications of WMO Members. Supporting the SDRGs participation during the ET-SSU is great!

Space-based
observing system

Access to satellite
data and products

Awareness and
training

Space Weather
Coordination

Frequency
Coordination

Regional Activities
Coordination

OSCAR/SPACE

Global Space-based
Inter-**Calibration**
System (GSICS)

Space-based Weather
and Climate Extremes
Monitoring (SWCEM)



Thank you VLab Co-Chairs!

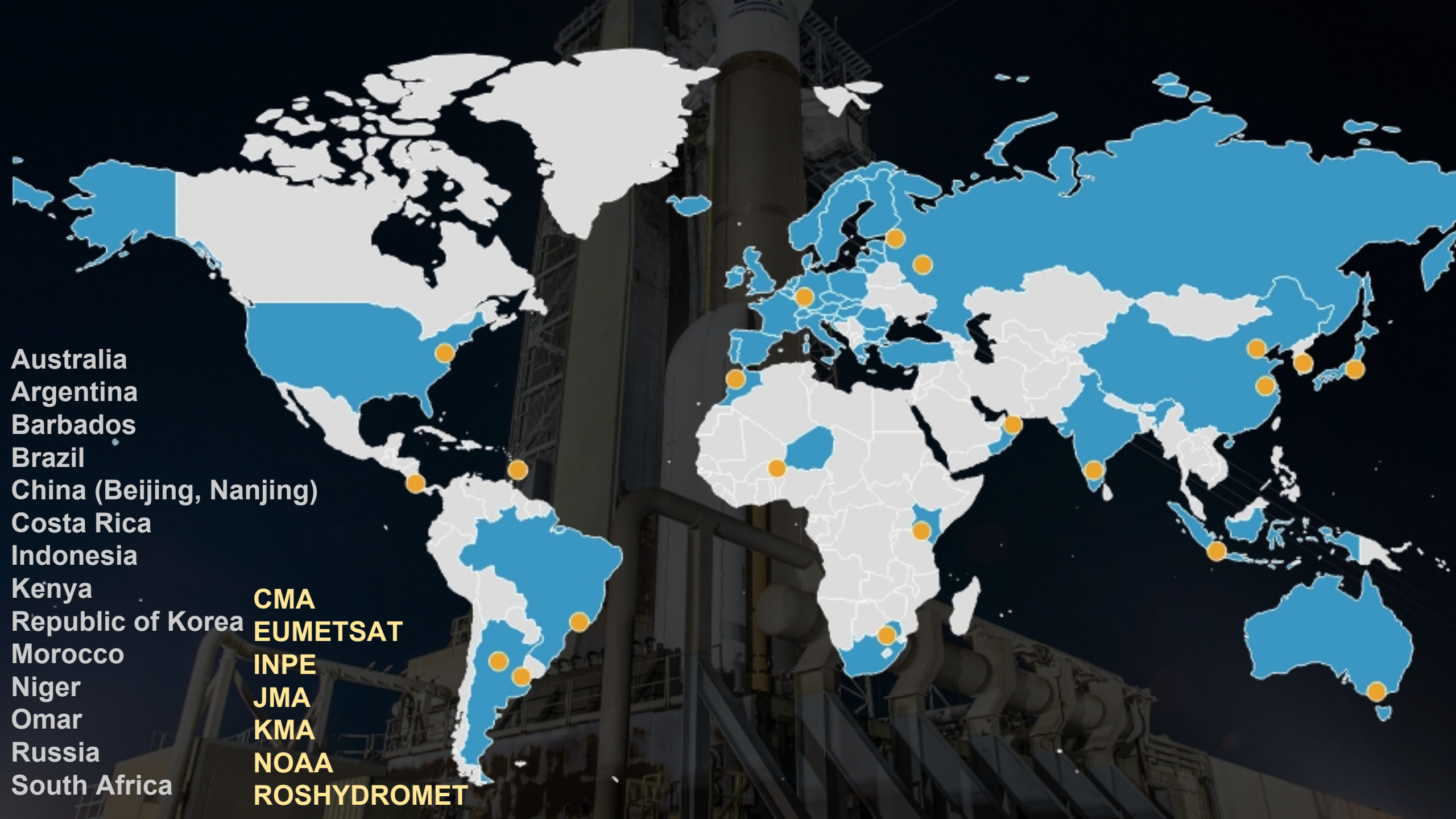
- VLab co-chairs are the leaders and guidance of the group. Bernie and Bo host the regular Eastern and Western meetings and participate actively of the discussions online, email and during all VLab related events (and much more!).



VLab



VLab is a global network of specialized training centers (CoEs) and meteorological satellite operators (Sat Ops) working together to improve the use of data and products from meteorological and environmental satellites throughout WMO member countries.



- Australia
- Argentina
- Barbados
- Brazil
- China (Beijing, Nanjing)
- Costa Rica
- Indonesia
- Kenya
- Republic of Korea
- Morocco
- Niger
- Omar
- Russia
- South Africa

- CMA
- EUMETSAT
- INPE
- JMA
- KMA
- NOAA
- ROSHYDROMET

VLab benefits for members



VLab, with the support of CGMS and WMO, serves as **the bridge to the regions**. It is an ideal platform to provide support and training of new satellite generations, product innovations, and their applications.

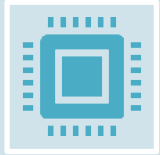


VLab connects the **satellite meteorology training community!** By observing how others train, learn, and interact, we continually improve ourselves and remain open to innovation. In the Americas, we actively follow the Australia RFG, watching their processes and techniques to enhance our own practices.



VLab enables members to engage at a higher level, not merely as small contributors but as **equal collaborators** in larger projects. We don't just deliver training; we co-design it with satellite operators and deliver it together.

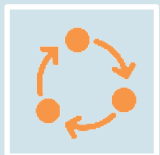
VLab innovation and improvement



VLab needs to delve deeper into new technologies. Years ago, we pioneered the use of the internet for training and team building, doing so 20 years before it became widespread. By leveraging AI, augmented reality, and other cutting-edge technologies, we can continue to innovate and stay ahead of the curve.



We can evolve from the traditional concept of websites that merely hold information to a **VLab customized, multi-site AI assistant** (both online and offline) that actively manages users and delivers tailored, relevant information to meet their needs.



CGMS and WMO should further support VLab and its collaboration with the SDRGs by providing resources for pilot programs, training events, materials, and courses. This additional support will help us achieve our goals and make a significant impact.

Example of a customized AI

ChatGPT 4o

- GeoXO (Geostationary Extended Observations) is NOAA's next-generation geostationary satellite program, set to succeed the GOES-R series. Scheduled for launch in the early 2030s, GeoXO aims to provide advanced weather forecasting, environmental monitoring, and hazard detection capabilities. The program will feature improved imaging, atmospheric measurements, and ocean and coastal observations. GeoXO is designed to support NOAA's mission of protecting life and property and enhancing the economy by providing critical data for weather prediction and climate monitoring.

Prompt: Give me a brief description of GeoXO. Please be brief but completely accurate, don't make up any information unless it is obtained from official documents.

ChatGPT 4o extended with GeoXO public technical documents

- The Geostationary Extended Observations (GeoXO) satellite system is a next-generation mission by NOAA aimed at advancing Earth observations from geostationary orbit. GeoXO will continue and enhance the capabilities of the current GOES-R series, providing vital information to support U.S. weather, ocean, and climate operations. Scheduled to launch in the early 2030s, GeoXO will ensure the continuity of critical geostationary observations through 2055.
- Key features and benefits of GeoXO include:
 1. **High-Resolution Imagery:** Real-time, high-resolution visible and infrared imagery for monitoring extreme weather and environmental hazards like wildfires, smoke, dust, fog, volcanic ash, drought, and flooding.
 2. **Lightning Detection:** Advanced lightning detection for analyzing severe storms, predicting hurricane intensity, responding to wildfires, estimating precipitation, and mitigating aviation hazards.
 3. **Atmospheric Measurements:** Real-time data on atmospheric moisture, winds, and temperature to improve weather predictions and severe weather forecasts.
 4. **Air Quality Monitoring:** Observations of air pollutants to enhance air quality monitoring and mitigate health impacts from pollution and smoke.
 5. **Ocean Observations:** Measurements of ocean biology, chemistry, and ecology to assess ocean productivity, ecosystem changes, coastal water quality, and hazards like harmful algal blooms.
- GeoXO will also incorporate new capabilities such as day/night visible imagery, infrared sounding, and improved lightning mapping to address emerging environmental challenges and user needs.

1. Direct, no-translation delivery of information.
2. Follow-up on the learning process.
3. Train-the-trainer AI models.
4. AI-assisted development of training materials.

The engine behind utilization

1

The interaction and collaboration of SatOps – VLab CoEs (RTCs) – SDRs is the **engine behind readiness and utilization.**

2

Sat Ops
Launch Satellites,
Create products,
Facilitate
distribution, High
Level Training.

3

VLab CoEs (RTCs)
Local Experts and
Trainers, Local
Facilities, Custom
Data and Products.

4

SDRs
They know each
other, the needs and
capacities, the
strengths of each
member.

Satellite Training

Every year hundreds of training events are carried out around the planet by CoEs and Sat Ops, tailored to the needs identified by the regions, fostering utilization of instruments and products or as preparation for a new generation of satellites.



Kenya



China



Costa Rica

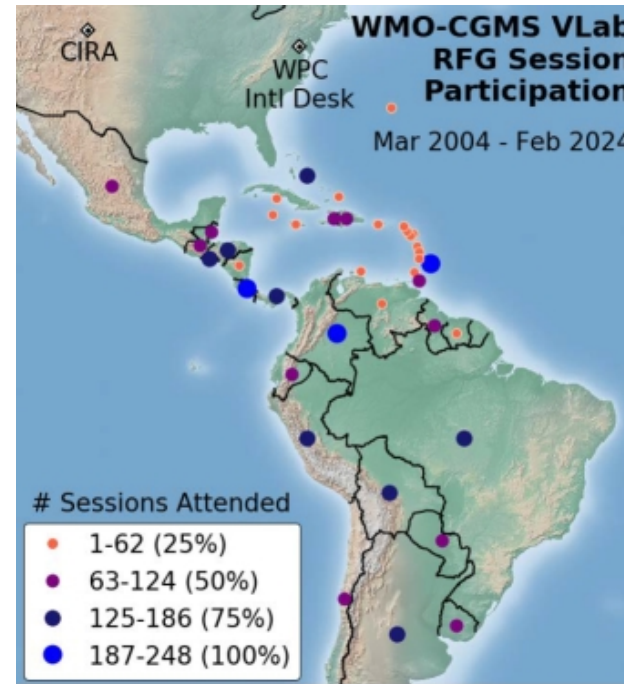
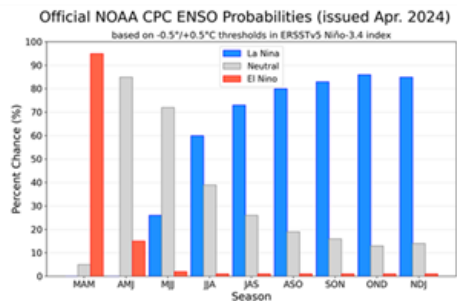
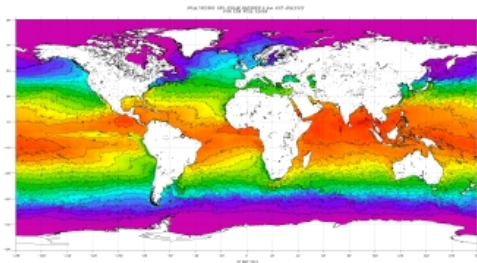


Brazil



Regional Focus Groups

- Americas over 20 years
- Australia – Indonesia over 10 years
- Other RFGs are growing in Africa, Oman, Morocco and more!



WPC International Desks Barbados Costa Rica Brazil Argentina Collaboration

WEATHER CLIMATE WATER

COMMISSION FOR OBSERVATION, INFRASTRUCTURE AND INFORMATION SYSTEMS (INFCOM)
Coordination Group on

Satellite Data Requirements

for RA III and RA IV (RA-III-IV-SDR-Group)

Developing Support for NMHSs in Satellite Data, Products and Training



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SDRG

It is a group that links the members in the Americas to the satellite data providers. It communicates users facilitating interaction, helping with **requests and support**, going from **top level** interaction with space agencies to **technical aspects** of obtaining and processing satellite data.

SDR TIMELINE



2009 - 2011		2012		2013		2014		2015	
Task Team on Satellite Data Requirements (TT-SDR)		WMO 2012 Survey on the Use of Satellite Data		Preparatory Meeting of the SDR-Group 8 April 2013 College Park, MD, USA		WMO 2014 Survey on the Use of Satellite Data		1st Meeting of the SDR-Group 27 - 28 April 2015 Greenbelt, MD, USA	
Main Achievements: <ul style="list-style-type: none"> - Development of an initial set of requirements - Its work led to improved & tailored dissemination of satellite data products in RA-III and RA-IV 		Key issues identified: <ul style="list-style-type: none"> - Resource constraints - Limited access to NRT Data - Data Processing issues - The overall use of satellite data was increasing over time for most users, requiring user readiness 		Main Achievements: <ul style="list-style-type: none"> - The meeting recommended that future sessions of RA-III and RA-IV endorse the establishment of the SDR-Group. - Future working arrangements - Several recommendations 		Key aspects identified: <ul style="list-style-type: none"> - Overview of how users receive and access satellite data - How users would like to receive satellite data in the future - Data latency requirements - Future data access and distribution mechanisms 		Main Achievements: <ul style="list-style-type: none"> - GOES-13 preferred scanning options - Evolution of user requirements - Framework for user provider interaction - Clear training needs (especially regarding the new generation of satellites) - Definition of tasks and several actions / recommendations 	
6 Teleconferences		3 Teleconferences		4 Teleconferences		4 Teleconferences		4 Teleconferences	
2015		2016		2017		2019		2022	
WMO 2015 Survey on the Use of Satellite Data		2nd Meeting of the SDR-Group 8 - 5 September 2016 Willemstad, Curaçao		3rd Meeting of the SDR-Group 16 and 19 July 2017 New York City, NY, USA		4th Meeting of the SDR-Group 29 September and 3 October 2019 Boston, MA, USA		WMO 2022 Survey on the Use of Satellite Data & 5th Meeting of the SDR-G	
Key aspects identified: <ul style="list-style-type: none"> - Priorities in satellite data types to be disseminated - Capacity building and training needs. - The Regional Survey results have been useful for NOAA briefings 		Main Achievements: <ul style="list-style-type: none"> - Preparation to GOES-R and JPSS - Roadmap for Regional Satellite Data Distribution - Associated priorities for GNC-A extra bandwidth use - Switch-over from EUMETCast-Americas to GNC-A - Other data types required by users 		Main Achievements: <ul style="list-style-type: none"> - Several actions to support the transition to GOES-16, which was recently launched at the time. - Review the SDR requirements list in light of forthcoming JPSS data and products 		Main Achievements: <ul style="list-style-type: none"> - Follow-up on previous actions - Assess the status of satellite data and utilization in the Region - Updates on GNC-A data dissemination plans - GOES-R and JPSS updates - Approaches for future updates of user requirements 		Main Achievements: <ul style="list-style-type: none"> - 16 countries presented their requirements, challenges and needs - Regional survey results served as reference for NOAA - Follow-up on GeoXO communication service plans - Several actions and recommendations 	



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Actions and Recommendations resulting from

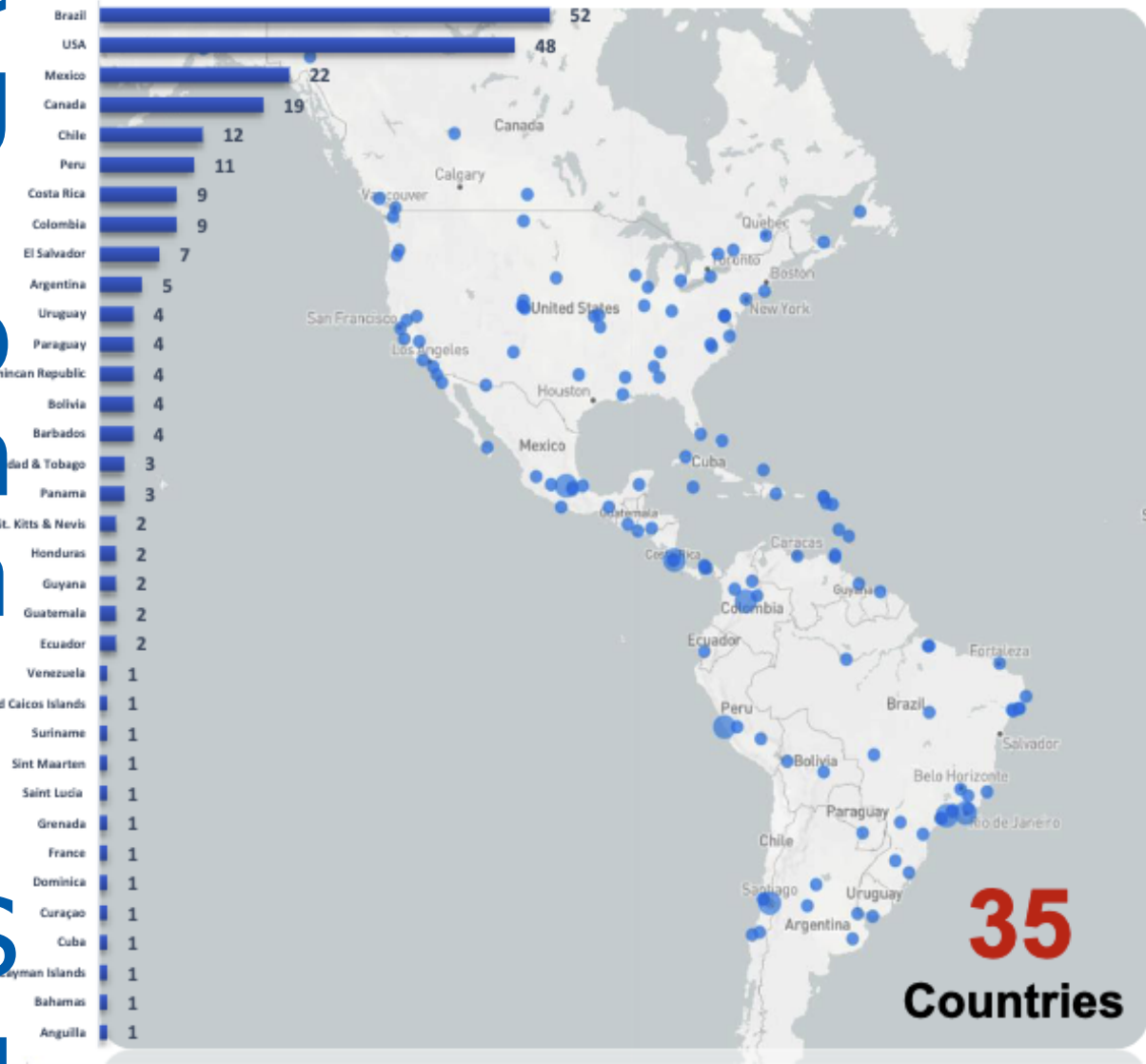
5
Face-to-Face Meetings and discussed in

34
Teleconferences analyzing up-to-date information from

4
Regional Surveys

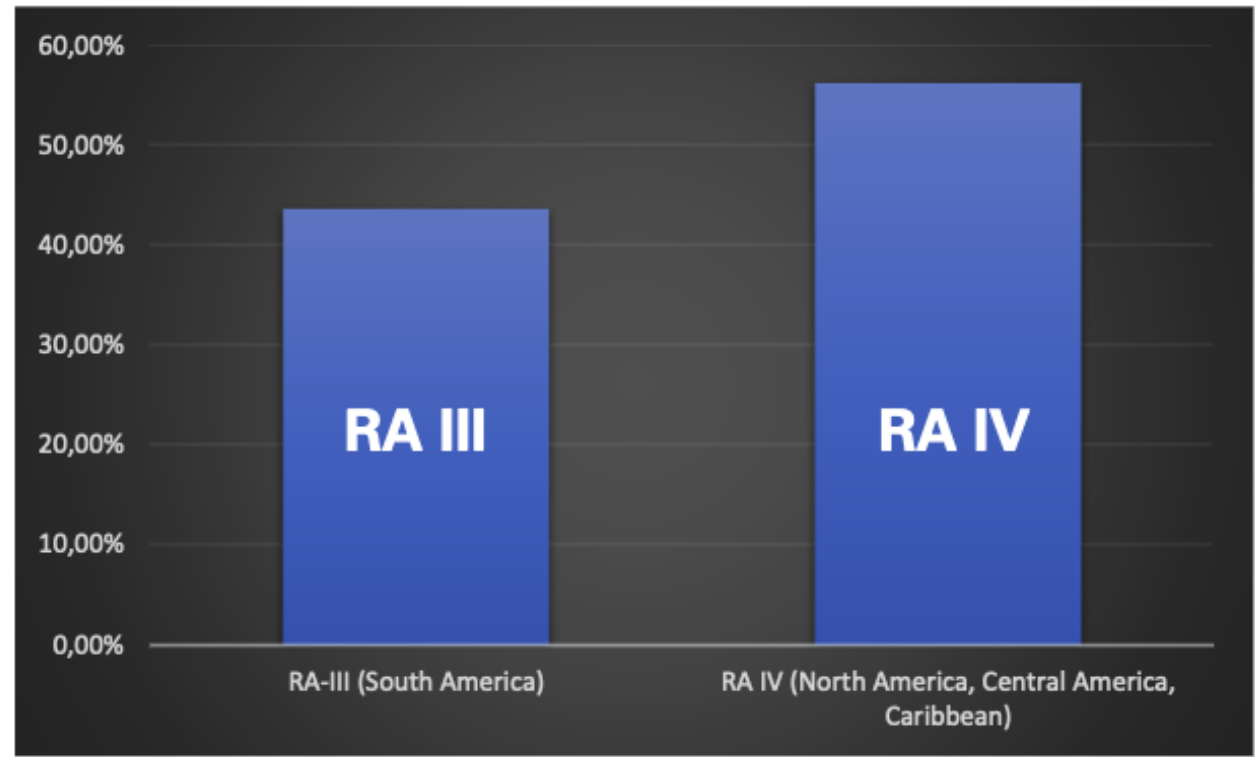
Key Satellite Launches

				
GOES-16 Launched November 19 2016	NOAA-20 Launched November 18 2017	GOES-17 Launched 1 March 2018	GOES-18 Launched March 1 2022	JPSS-2 Launch Coming November 1 2022



Q4. 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)

Answer Choices	Responses	
RA-III (South America)	43,70%	111
RA IV (North America, Central America, Caribbean)	56,30%	143
Answered		254
Skipped		5





Satellite Data Requirements

Quick Guide



What is the WMO Coordination Group on Satellite Data Requirements (SDR) for RA-III and RA-IV?

The **Coordination Group on Satellite Data Requirements** links users of meteorological satellites in the Americas (**WMO Regional Associations III and IV**) to the satellite providers. The Group consists of a representative number of members from the satellite data user community in the Region, joined, as associate members, by satellite data providers and WMO.

WMO Regional Associations

WMO Regional Associations are a coordination mechanism for meteorological, hydrological and related activities by Members of WMO.



Fourth face-to-face meeting of the RA-III and RA-IV SDR Group (Boston, USA - 2019)

Teleconferences and Face-to-Face Meetings

The SDR Group meets in person at least every two years, and, to ensure continuity, works through collaborative tools during the intersessional period.

SDR RA-III and RA-IV Members

The current SDR Members are (Jan 2022):

Argentina, Belize, Brazil, British Caribbean Territories (BCT), Canada, Chile, Colombia, Costa Rica, Ecuador, Peru, Saint Lucia, Trinidad and Tobago and USA.

Centres of Excellence (CoE) for training in Satellite Meteorology
Barbados (CIMH), Costa Rica (UCR), Brazil (INPE)



Do you have a nominated representative / point of contact for the WMO Coordination Group on SDR?

If you want to become a member of the SDR Group, please contact the SDR Co-Chairs.

EXPECTED BENEFITS OF THE SDR GROUP

- **Identify** and synthesize user needs for satellite data, products and associated training.
- **Ensure** an effective user-provider dialogue towards meeting these requirements.
- **Find** user-friendly and affordable cost-sharing arrangements for data access and distribution.
- **Prepare** for new generations of meteorological satellites.
- **Support** operational services, application development, and capacity building in meteorology and related fields in the Region.
- **Exploit** synergy through links with other users, applications and GEO Societal Benefit Areas (SBA's).



Satellite Data Requirements

Quick Guide



ROADMAP: FROM DATA REQUIREMENTS TO DATA UTILIZATION

The following questions are expected to be clarified through the work of the SDR Group:

MONITORING FROM SPACE



- What satellites are operational or planned?
- What are the goals of the instrument / sensors?
- What scientific or operational questions need to be answered with these new satellites / instruments / sensors?

DATA DISTRIBUTION



- What / when the datasets are available?
- How do I get it?
- What is needed to get it?
- What technical training is needed for those gathering the data?

DATA PROCESSING



- How can I process the data?
- What products can I get out of the data?
- What technical / professional training is needed to process the data?
- What software / hardware is needed?
- What should be saved and what should not?

PRODUCT INTERPRETATION



- How do I interpret the products?
- Who will interpret the products?
- What training is needed to interpret the products?

IMPACT AND UTILIZATION



- How can I efficiently communicate the analysis?
- When new information will be available?
- What are the requirements of those using interpreted products?

SDR GROUP TERMS OF REFERENCE

• **1-)** The Group consists of a representative number of members from the satellite data user community in the Region, joined, as associate members, by satellite data providers and WMO. The Group is chaired by one or two representatives from key satellite data user organizations of the Region.

• **2-)** The Group maintains an updated list of satellite data and products available to the Region through existing dissemination services. Data and products shall be classified by categories of variables and derived

• **3-)** The Groups regularly reviews sources of regional needs and undertakes, as needed, further information gathering, such as surveys, to ensure that views of WMO Members in the Region are adequately represented.

• **4-)** The Group analyzes the requirements for each relevant category of product, and identifies which requirements are not adequately met by existing services.

• **5-)** The Group formulates actions and recommendations.

• **6-)** The Group maintains a dialogue with satellite data providers of relevance to the Region, and other partners as needed, to ensure that its recommendations are implemented.

• **7-)** The Group uses the WMO Procedure for Documenting Regional Requirements for Satellite Data Access and Exchange for guidance.

• **8-)** The Group meets in person at least every two years, and, to ensure continuity, works through collaborative tools during the intersessional period.

RESOURCES AND CONTACT

SDR Group Webpage:

SDR Co-Chairs:

Teleconferences:

Diego Souza

Face-to-Face Meetings:

Marcial Garbanzo





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Welcome to WMO Coordination Group on Satellite Data Requirements for RA III and RA IV

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WMO Regional Associations are a coordination mechanism for meteorological, hydrological and related activities by Members of WMO.

Expected benefits of the Group are to:

- Identify and synthesize user needs for satellite data, products and associated training
- Ensure an effective user-provider dialogue towards meeting these requirements
- Find user-friendly and affordable cost-sharing arrangements for data access and distribution
- Prepare for the new generation of meteorological satellites
- Support operational services, application development, and capacity building in meteorology (weather and climate) in the Region
- Exploit synergy through links with other users, applications and GEO Societal Benefit Areas (SBA's)

Search



Tools

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Taller Virtual SDR #1

Las nubes en la nube: Métodos de obtención de datos de satélite y sus características

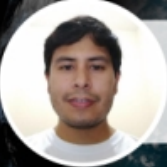
16 de Mayo de 2024 - 17 ~ 19 UTC



Marcial Garbanzo (UCR - Costa Rica) Diego Souza (INPE - Brasil)
Introducción al taller y visión general de algunos de los mecanismos disponibles



Joel Ixcaparij (INSIVUMEH - Guatemala)
Maximizando el uso operacional de datos en la nube (AWS): lecciones de INSIVUMEH



Joao Huamán (SENAMHI - Perú)
Descarga y Procesamiento de datos del GOES-16/17/18 disponibles en la nube



Alejandro Aguilar (LANOT / UNAM - México)
Uso de AWS como fuente de datos históricos



Jean Carlo Rodriguez (UCR - Costa Rica)
Análisis de latencia para tres métodos de descarga de datos satelitales



Amides Figueroa (MARN - El Salvador)
Acceso a datos satelitales usando servidores ADDE de McIDAS-V

¡COMPLETAMENTE EN ESPAÑOL!

Review of data dissemination methods using the Internet (AWS, Unidata, Web and others).

Utilization of AWS for GOES ABI and Volcano Real Time Monitoring Dashboard in Guatemala. Process the data locally!

GOES Library developed in Peru to gather and process ABI and GLM data.

Utilization of Python for Satellite Data Processing in LANOT, Mexico. Utilization of GOES Library from Peru!

Latency of AWS, Unidata Idm and GNC-A for downloading GOES GLM data for nowcasting products. Study from Costa Rica.

Using McIDAS-V to get image sectors and create operational products for El Salvador.

Thank you! ¡Gracias!