



# VLab strategy 2024-2027 and New Centre of Excellence for endorsement; 2022 Progress Report

B. Connell, CIRA/NOAA, VLab Co-Chair

Presented to CGMS-50 Working Group IV, agenda item 5.1

## Executive summary of the WP from the Virtual Laboratory for Education and Training in Satellite Meteorology (VLab)

The VLab Strategy (2024–2027) was updated by the VLab Management Group (VLMG) and adopted by the WMO Executive Council at its 76th session. CGMS Plenary are invited to endorse the updated VLab Strategy (**Action 1**).

The Indonesia Agency for Meteorology Climatology and Geophysics (BMKG) proposed to establish a VLab Centre of Excellence (CoE). It was supported by JMA and endorsed by WMO SC-ON. CGMS Plenary are invited to endorse the new CoE (**Action 2**).

The VLab Management Group (VLMG) held quarterly online meetings. The Tenth meeting of VLMG was hosted by EUMETSAT at EUMETSAT HQ during September 26-30, 2022.

Since CGMS-50, VLab members have offered a variety of training opportunities. The training topics address both current and new generation of satellites. Strong collaboration and coordination among VLab members builds capacity regionally.

The VLab Trust Fund receives yearly contributions from NOAA/NWS, EUMETSAT, and KMA. Regular and increased contributions from CGMS agencies is required to expand VLab activities to meet WMO-CGMS Members' requirements and user needs and to improve the long-term sustainability of VLab activities.

## WMO-CGMS VLab Strategy 2024-2027

*To improve weather, water, climate and environmental services by enabling WMO Members to utilize satellite data.*



### Long-term Goals of VLab:

1. Continuously improve the utilization of data from the space-based component of WIGOS for services that are increasingly reliant on satellite data;
2. Globally share knowledge, experience, methods, and tools related to access and usage of satellite data, especially in support of WMO Members that have limited resources.

## VLab Strategy: Objectives

- 1.1 Improve the availability of Earth Observing data to support operational service delivery..
- 1.2 Provide support to achieve readiness for the next generation of satellites
- 1.3 Continue to support primary and “backup” data delivery for emergency preparedness..
  
- 2.1 Transfer the improved scientific understanding and technological advances .. to .. NMHSs ..
- 2.2 Respond to new and emerging service demands for weather, water and climate.
  - ... impact-based decision support services (IDSS) and ...
  - ... the Global Framework for Climate Services (GFCS) ...
- 2.3 Increase the diversity and quality of services offered by WMO Members in line with the WMO Earth System approach ...
- 2.4 Achieve the competence, quality control requirements, and professionalism within WMO Services ...
- 2.5 Work with WMO Education and Training Programme (ETR) to maintain and increase content and usage of the ... satellite training resources
- 2.6 Grow social community projects to increase public user trust and confidence ...

## VLab Strategy: Work Towards and Implement Objectives by

### 1. Promoting initiatives

- CoE Courses
- Themed events
- Internships
- Regional Workshops
- Hackathons
- Regional Focus Groups

Training addresses CGMS High Level Priority Plan Sections 7.2 & 7.3

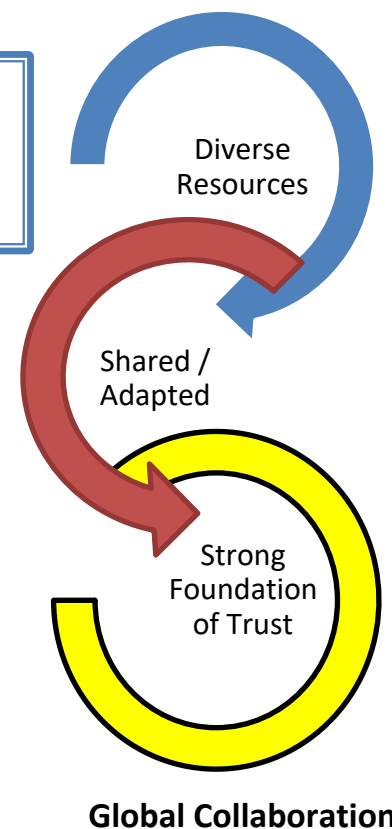
### 2. Training the Trainers and Gathering Input and Feedback

- Offer regional training of trainers
- User Conferences & Surveys
- Adopt WMO Education & Training guidelines

### 3. Collaborating with WMO ETR

Sharing of

- Training materials
- Instructional innovations
- Assessment methods



# VLab strategy

CGMS Plenary are invited to endorse the updated Strategy for the Virtual Laboratory for Education and Training in Satellite Meteorology (2024–2027)

## BMKG: a new Vlab Centre of Excellence

Who?	What?	When?
Step 1		At discretion of CoE
Candidate CoE nominated by the Permanent Representative	Letter of intent from a CoE to the Head of WMO Space System and Utilization Division (WMO SSU), stating readiness to become a CoE and providing supporting elements regarding compliance with the expectations. Includes letter(s) from satellite sponsor(s) supporting the new CoE.	
Step 2		ASAP
VLMG and WMO SSU	VLMG and WMO SSU will review the CoE application, to assure that the CoE is sponsored by a Satellite Operator, that the CoE has the appropriate facilities and agrees to VLab expectations regarding the responsibilities of a CoE.	
Step 3		ASAP
WMO ETFD	The WMO Education, Training and Fellowship Division (WMO ETFD) will review the CoE application, assessing the linkage between the new CoE and existing WMO Regional Training Center for increased collaboration, as well as the exchange of information on satellite based training in the Region.	
Step 4		ET-SSU
ET-SSU (through VLMG)	VLMG reports to ET-SSU with a recommendation and solicits their vote. ET-SSU can request further clarifications to be provided by WMO SSU and/or candidate CoE before final decision on recommendation of acceptance.	
Step 5		SC-ON
SC-ON/INFCOM (through WMO SSU)	WMO SSU presents the recommendation from ET-SSU to SC-ON for endorsement.	
Step 6		CGMS Plenary
WMO delegation to CGMS	WMO delegation to CGMS presents the proposal for a new CoE, with the endorsement by SC-ON, to CGMS annual plenary.	
CGMS plenary	CGMS endorses the application.	
Step 7		ASAP
WMO SSU	WMO SSU notifies the new CoE of the approval by SC-ON/INFCOM and CGMS	





**BMKG** CORPORATE  
UNIVERSITY



WORLD  
METEOROLOGICAL  
ORGANIZATION

Regional Training Centre - Indonesia



**OceanTeacher**  
GLOBAL ACADEMY

Specialized Training Centre - Indonesia

## Indonesia WMO Regional Centers and VLab CoE in RA-V

- The BMKG Education and Training Center was recognized as WMO RTC for RA-V in 2012.
- In 2020, hosted the Ocean Teacher Global Academy (OTGA) Specialized Training Center
- Around 40 courses is conducted per year. E-learning had been implemented since 2014 and became more intensive after pandemic in early 2020.
- Actively participating in global capacity development programs and initiatives (i.e. WMO - CDP, CALMet, WMO Training the Trainers, WMO Vlab)
- BMKG has close cooperation with other institutions such as BoM-Australia, CMA-China, JMA-Japan, KMA-Korea, NOAA both in multilateral and Bilateral mechanism



Profile Indonesia  
Vlab :

<https://bit.ly/ProfileInaRTC>







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## Previous Training Projects ( 2022

- Online Phase of Group Fellowship Training on Numerical Weather Prediction - 2019
- On the Job training of satellite data product analysis and interpretation (2019 - Jambi, Sintang, 2020 – Semarang, 2021 – East Nusa Tenggara)
- Online Training of Impact Based Forecast for RA V Member Countries – 2020, 2021, 2022
- Online Training on Strengthening the Capacity and Performance of Hydrometeorological Observation and Warning Dissemination of Timor Leste Post Seroja Tropical Cyclone and Flood for DNMG Timor Leste (2021)
- Training on BIP-MT for Timor Leste (in collaboration with UNEP) – 2023



WMO OMM

**Coordination Group for  
Meteorological Satellites**

## Upcoming Training Projects 2023



- **Online Training of the Trainers on Satellite-derived Flood Product and Its Implementation on Impact Based Forecast and Warning Services** – 19 to 23 June 2023 (*in collaboration with NOAA*)
- **Training of Forecaster Competency (RA – V)** – 1 to 25 August 2023 (*supported by WMO*)
- **Training on WIS 2.0 Implementation (RA – V)** - 9 to 13 October 2023 (*supported by WMO*)
- **Training on Satellite Utilization for Marine Services (RA – V)** – 27 Nov to 2 Dec 2023 (*supported by WMO*)
- **Training on GHG Monitoring (RA V)** – 4 – 8 December 2023 (*supported by WMO*)



**CGMS**

# BMKG as a new VLab CoE

CGMS Plenary are invited to endorse the application of Indonesia  
Agency for Meteorology Climatology and Geophysics (BMKG)  
as a new VLab Centre of Excellence

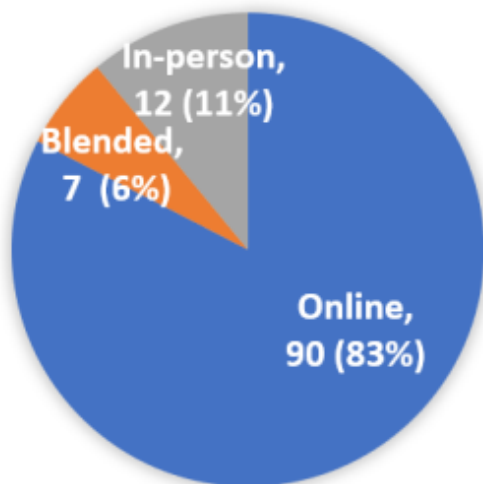
## It Takes a Community to Improve Training Impact



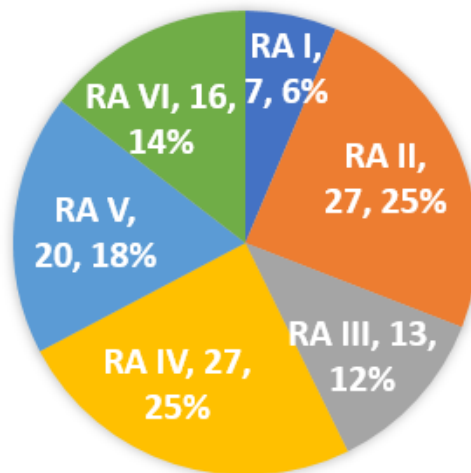
## Overview of Training in 2022 as reported by members\*

- **109 training events** were organized by VLab partners in 2022.
  - > **2700 learners** participated in VLab training events
- Training was offered in 7 languages; some events were bilingual, some had interpreters.

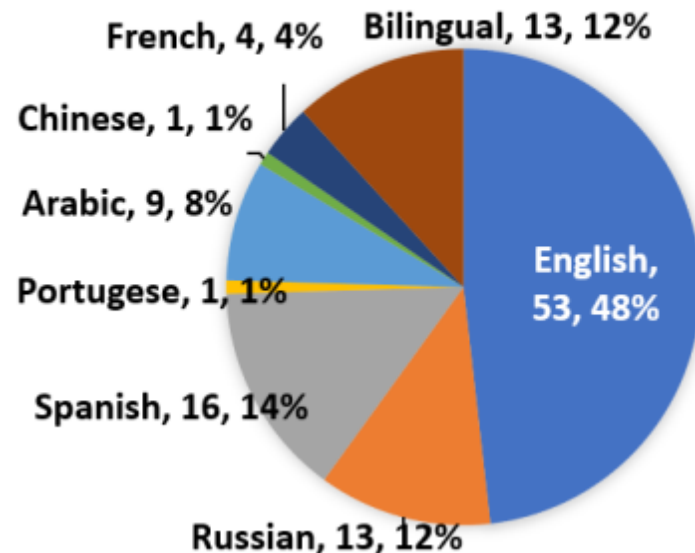
TRAINING DELIVERY MODE



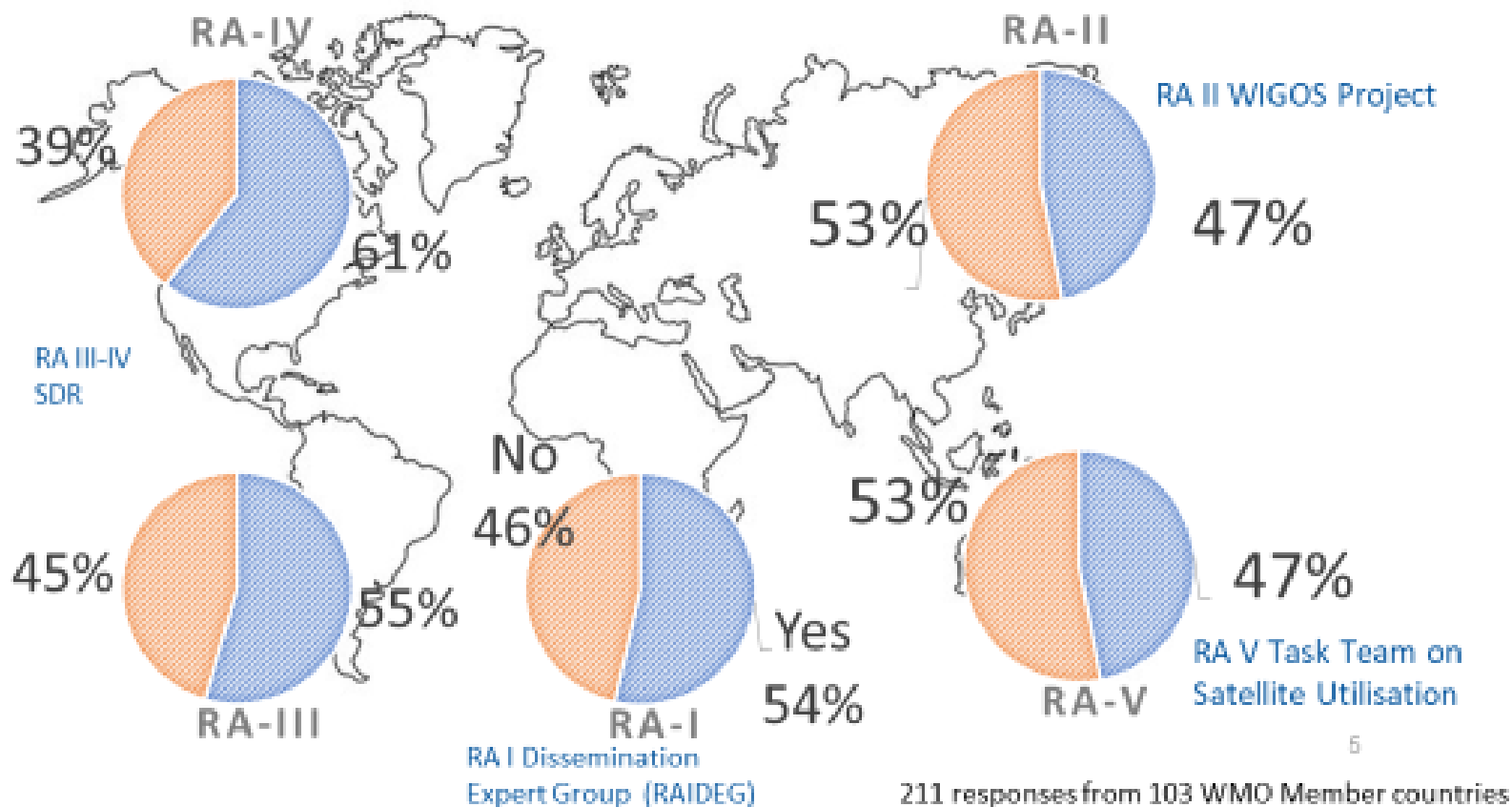
TRAINING DELIVERED BY



TRAINING LANGUAGES



- ✓ WMO Global Survey on Satellite Data Use: Are you aware of the WMO Coordination Group on Satellite Data Requirements in your region?



## STRENGTHS of Various Satellite Data Requirements Groups (at CoEs)

- Active and increased participation from ~3 years ago
- Long-term interaction with Satellite Operators
- Data access mechanisms for members are well known and documented
- Existence of “Data Processing and Visualization Task Force
- Constant interaction with WMO regional and global initiatives that foster the SDR goals
- Availability and sharing of training resources produced by VLab members
- Availability of multi-satellite, multi-sensor, and multi-product data
- New-generation GEO data enhance forecasting capabilities
- Strong community connections through Regional User Conferences, Monthly VLab Regional Focus Group Sessions, Expert Teams, and Workshops

## Ongoing Challenges of Various Satellite Data Requirements Groups (at CoEs)

- Shortages of both trainers and operational staff due to retirement, leaving for other employment, or lack of funding
- In many countries, very few resources are allocated for professional training & collaboration on the technical aspects of hardware/software setup, data access, processing, and display.
- Faster and reliable internet and communications
- Limited available resources for organizing and participating in the capacity building activities
- Lack of expertise in various satellite focus areas
- Language barriers
- Single band imagery are still widely used over Red/Green/Blue image composites and derived products.
- More application training at basic and advanced levels is desired for climate, public weather services, aeronautical and marine services, flooding, hailstorms, strong winds, fires, thunderstorms, lightning, and heatwaves.



# A glimpse at member contributions

# Coordination Group for Meteorological Satellites - CGMS

## CoE Morocco + EUMETSAT



## CoE Argentina



CoE Oman  
EUMETSAT

The Seventeenth EUMETSAT Satellite Application Course Earth Observation by Low Orbiting Satellites 20-24 March 2022 - Muscat				
Date\Time(UTC)	06:30-07:30	5 Minutes Break	07:35-08:15	5 Minutes Break
20/03/2022 Sunday	Course Overview <b>Humaid / Ivan</b> Introduction to Earth Observation Satellites <b>Humaid</b>		Introduction to Microwave Remote Sensing <b>Ibrahim Al Abdulsalam</b>	
21/03/2022 Monday	Case Studies (CALIPSO Satellite) <b>Ibrahim Al Abdulsalam</b>		Tropical Cyclone Shaheen By LEO Satellite <b>Zamzam</b>	
22/03/2022 Tuesday	Working with soil moisture data from SMAP <b>Ebrahim Assadi/Iran</b>		Working with soil moisture data from SMAP <b>Ebrahim Assadi/ Iran</b>	
23/03/2022 Wednesday	Open Sources Marine Applications <b>Gerd Bruss / SQU</b>		Marine Applications <b>Hayley / Eumetsat</b>	
24/03/2022 Thursday	Open Sources Marine Applications <b>Gerd Bruss / SQU</b>		Atmospheric Applications <b>Humaid</b>	



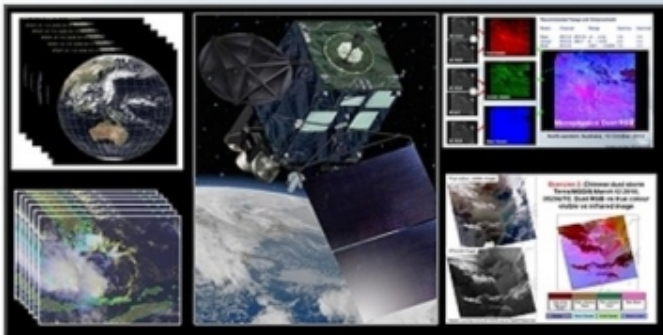
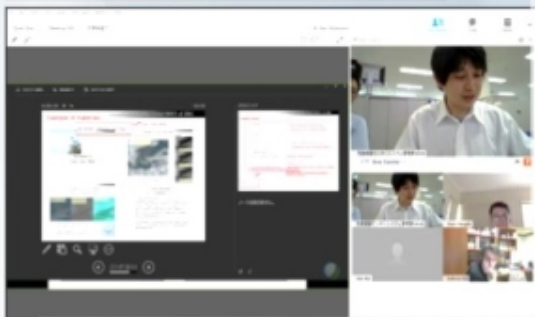
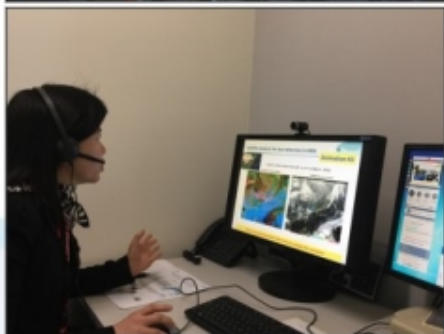
## - Aplicações

## CoE Brazil

- ✓ *Ciclo do carbono: fontes e sumidouros de CO<sub>2</sub>;*
- ✓ *Ecossistemas marinhos: províncias biogeoquímicas, habitats bentônicos, recifes de corais;*
- ✓ *Pesca e aquicultura*
- ✓ *Floração de algas;*
- ✓ *Plumas de rios: fluxo de sedimentos e de matéria orgânica,*
- ✓ *Monitoramento de mudanças climáticas e antropogênicas.*
- ✓ *Qualidade da água*
- ✓ ...

curso: Produtos de Oceanografia por Satélite - Conceitos, Acesso e Processamento | satellite.cptec.inpe.br





Australian Government  
Bureau of Meteorology

Australian VLab Centre  
of Excellence

100

9 years +

Regional Focus Group  
meetings





## Asia Oceania Meteorological Satellite Users' Conference – JMA + CMA, KMA, NOAA +CoEs



## RGB Developers and Users Workshop

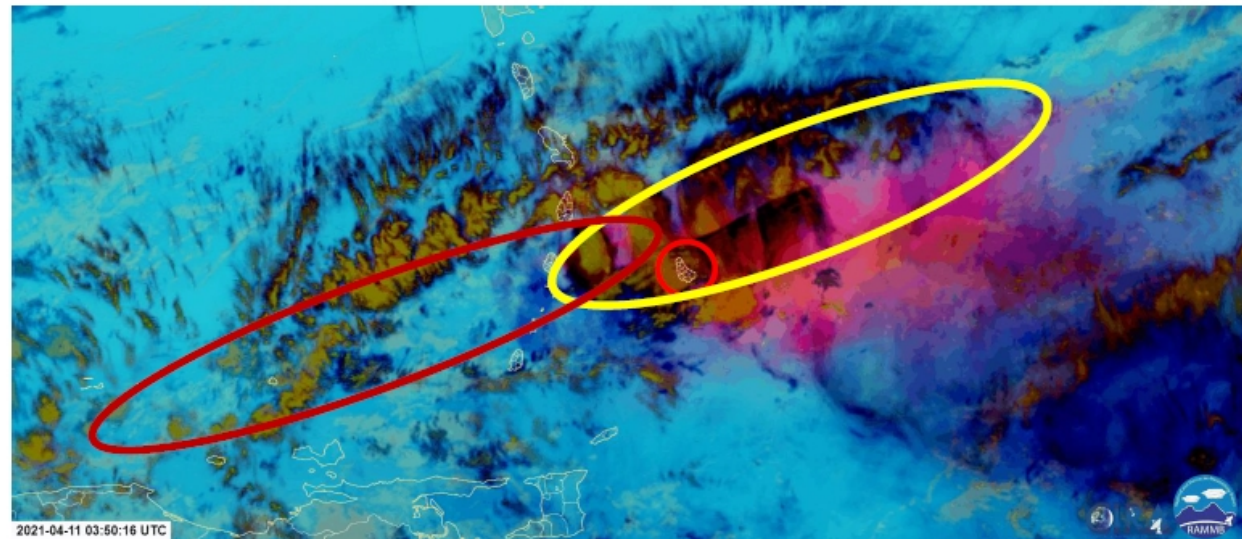


**NOAA/WMO RA IV**  
**Satellite Applications Workshop**  
**Caribbean Weather Forecasting Initiative**  
**2022**  
**Hosted by CIMH**  
December 5-8, 2022



**CoE Barbados**

**Study of the  
La Soufriere Volcano**

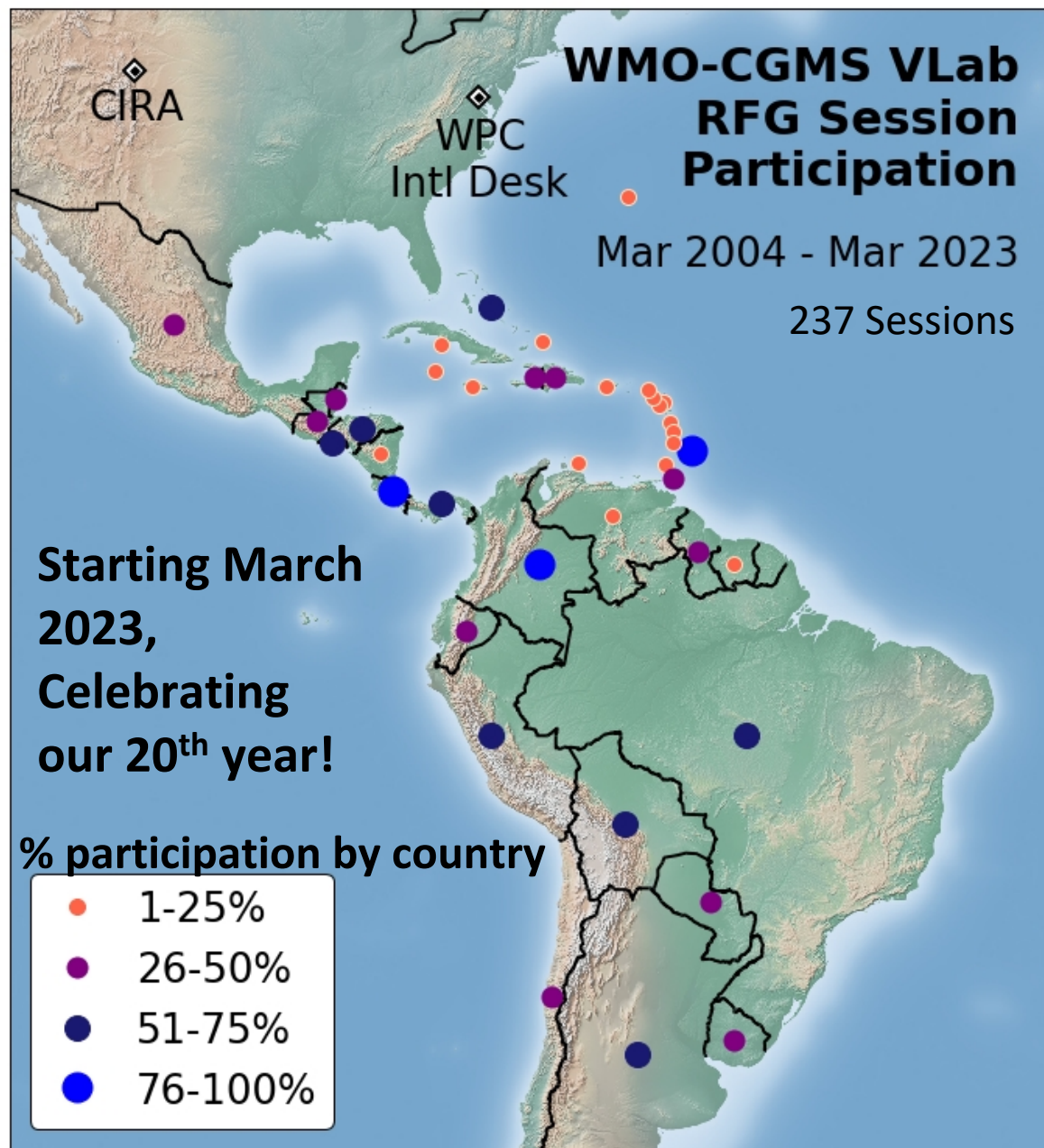




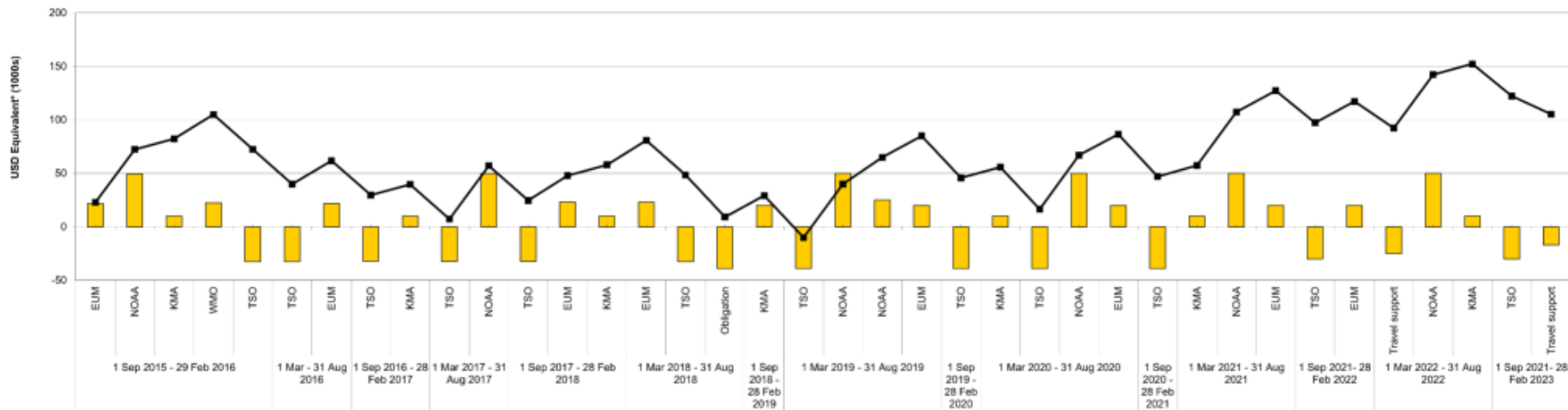
Increased Country and Individual Participation  
= Community of Practice

Students and early career professionals have moved into forecaster, instructor/trainer, researcher, manager, and senior professional roles.

Colleagues and Previous Participants become Facilitators and Instructors of sessions.







- In 2022 the WMO VLab Trust Fund received contributions from NOAA/NWS, EUMETSAT, and KMA.
- Regular financial contributions from CGMS Members are critical to maintain and enhance technical support to the expanding range of VLab activities.

## Actions to be considered by CGMS:

- CGMS Plenary are invited to endorse the updated Strategy for the Virtual Laboratory for Education and Training in Satellite Meteorology (2024–2027)
- CGMS Plenary are invited to endorse the application of Indonesia Agency for Meteorology Climatology and Geophysics (BMKG) as a new VLab Centre of Excellence
- CGMS members are invited to contact WMO to provide contributions to the WMO VLab Trust Fund to ensure the continuation of technical support to the VLab through the VLab Technical Support Officer as well as to the implementation of VLab projects.
- VLab training activities support HLPP 7.1, 7.2, and 7.3
  - CGMS members are invited to contact their supported VLab Centres of Excellence to discuss training needs and requirements