FIVE-YEAR STRATEGY FOR THE WMO-CGMS VIRTUAL LABORATORY FOR EDUCATION AND TRAINING IN SATELLITE METEOROLOGY 2020-2024

Scope and Definition

The WMO-CGMS Virtual Laboratory for Education and Training in Satellite Meteorology (VLab) is an activity of the WMO Space Programme, based on a global network of specialized training centres, named Centres of Excellence (CoEs), that are supported by one or more CGMS satellite operators (see http://vlab.wmo.int).

The CoEs are established in the various WMO Regions to meet user needs for increased skills and knowledge in using satellite data within their region. They are often co-located with WMO Regional Training Centres (RTCs).

VLab activities are implemented by CoEs in cooperation with CGMS satellite operators.

Mission of VLab

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

Objectives of VLab

1. Achieve better exploitation of data from the space-based component of the WMO Integrated Global Observing System (WIGOS) for services that are increasingly reliant on satellite data;

2. Share globally knowledge, experience, methods, and tools related to access and usage of satellite data, especially in support of WMO Members that have limited resources.

Strategic Drivers and Challenges Outside VLab that we Seek to Support

The strategic drivers of VLab are:

- Need to address societal challenges and global development agendas such as the 2030 Agenda for Sustainable Development, the Sendai Framework for Disaster Risk Reduction and the Paris Climate Agreement;

- Responding to new and emerging service demands for weather, water and climate, such as in support of marine, land, impact-based decision support services (IDSS) and the applications in support of the Global Framework for Climate Services (GFCS);

- Improved scientific understanding and technological advances that can lead to enhanced services, and evolution in the provision of meteorological services;

- Increased diversity of services offered by WMO Member in line with the WMO Earth System approach and efforts to enhance the quality of these services;

- Improved availability of Earth Observing data to support operational service delivery in line with the expected growth of the space-based observing system component as outlined in the Vision for WIGOS in 2040;

- Increased range of resources available for user training, and the challenges users and trainers have in efficiently finding and repurposing these resources;

- Introductions of new satellites, with new data types and products, new data manipulation and handling technology, as well as new dissemination systems, including cloud hosted data sources;

- Continued need to support simple and “backup” data delivery for emergency preparedness and for WMO Members that have limited resources;

- Achieving the competence and quality control requirements, and professionalism within WMO Services, in particular noting the human resource management challenges facing many National Meteorological and Hydrological Services (NMHSs);

- Growth in social/crowd created projects and increased volume of co-creation content;

- Ideas for NMHS service improvement generated within the WMO bodies.

Status and Achievements of VLab for the Period 2015-2019

In its 20 years of existence, VLab has demonstrated its capability to deliver global scale events on training and education in satellite meteorology. In addition, all of the VLab activities support the objectives of the WMO Global Campus.

In the period 2015 to 2018, VLab conducted the following activities, implementing the VLab Strategy 2015-2019:

1) Training activities

   a. Hosted more than 120 Regional Focus Group discussions (RFGs) and 350 training courses, reaching 12,500 participants.

   b. Supported transition to new satellite systems in all WMO regions.

   c. Provided training materials created especially for identified gaps in content and data access, which included the Conceptual Models for the Southern Hemisphere

(CM4SH), ASMET modules, GEONETCast Americas broadcast, and ways to display the data through SIGMACast, McIDAS-V, and python scripting.

2) Collaboration and sharing

   a. Further developed the WMO SP-12 Guidelines on Satellite Skills and Knowledge for Operational Meteorologists.

   b. Participated and contributed to WMO Global Campus activities and collaboration mechanisms.

3) Management and oversight

   a. Held two face-to-face meetings of the VLab Management Group (VLMG) and 15 online meetings to plan and oversee VLab activities.

   b. Maintained good communication between training centres and satellite data providers around the globe, bringing research into training and operations.

   c. Accelerated new product development and implementation in operations, such as the RGBs and the development of quick guides.

Strategy for the Period 2020 to 2024

VLab will strive to meet the increasing demands of WMO Members in line with:

- WMO Strategic Priorities;
- WMO Education and Training Programme;
- CGMS High Level Priority Plan (HLPP 2018 - 2022);
- GFCS Priority Areas;
- Group on Earth Observations (GEO) Societal Benefit Areas.

VLab will work towards its objectives by:

- Developing and implementing training interventions, relating the intervention to the skills, competencies and qualification frameworks where they exist;

- Encouraging evaluation of the impact of the training for the use of satellite data and products and its long-term benefits;

- Encouraging the availability of more training material in WMO official languages other than English;

- Encouraging exchange of information between researchers and operational users in developing new products from current satellite data that can lead to improved meteorological services;

- Promoting the benefits of using new satellite-based products and providing technical support, where possible, to make them available to users;

- Promoting good practice in training within the WMO Global Campus network and growing relationships with other training centres in allied areas such as oceans, agriculture, and forestry to explore opportunities to collaborate and share tools and knowledge for the delivery of the VLab objectives; encouraging those programmes to use the WMO competency frameworks;

- Engaging directly with and reporting to its co-sponsors, which currently include the WMO Inter-Programme Expert Team on Satellite Utilization and Products (IPET-SUP) and the Coordination Group for Meteorological Satellites (CGMS);

- Engaging actively with the WMO Global Campus and contributing to the continuous development of WMOLearn;

- Increasing the coordination and collaboration between CoE's in order to maximise the efficiency of effort;

- Fostering the use of the User Centred Design framework of processes to maximise the discoverability and usability of resources.

- Fostering the co-creation of learning interventions utilising existing and emerging platforms, including social;

- Developing or exploring guidance for impact-based decision support services (IDSS) and Global Framework for Climate Services (GFCS) applications;

- Increasing efforts to engage with the next generation of young professionals in all fields related to the work of WMO and to create more opportunities for them to participate in and contribute to WMO activities; promoting mentoring and peer to peer learning opportunities for both students and instructors.

VLab will implement its overall strategy by:

- Developing and delivering training in the form of distance and face-to-face events, RFG discussions, and self-study resources; and by

- Supporting Regional and cross-Regional Satellite User Conferences.

- Contributing to the regional satellite data requirements dialogues, and providing briefing information on the regional data access to enable NMHS managers to ensure they have the right staff to support access and application of the satellite data;

- Providing feedback to satellite operators on the use of the available data, products, systems and services and challenges associated with full exploitation;

- Providing information using the WMO Space Programme databases, including the Observing Systems Capability Analysis and Review Tool for space-based capabilities (OSCAR/Space), the WMO Product Access Guide (PAG) for satellite products and the WMO-CGMS Satellite User Readiness Navigator (SATURN);

- Advertising training events in the VLab Calendar of Training Events and WMO Global Campus Events Calendar;

- Sharing training resources developed by VLab Members in the WMOLearn section of the WMO Global Campus E-Library.

The delivery of training will rely on:

- Use of digital technology where appropriate;

- Enhanced communication capabilities for data and training material;

- Classroom (face-to-face) and distance learning delivery of training where appropriate;

- Collaboration among CoEs;

- Cooperation with other entities providing training;

- Continued support from CGMS members.

In the period 2020 to 2024, VLab will pay particular attention to:

- Big data: noting that there are a number of cloud-based satellite access platforms, and anticipating a growth in cloud-based services, including hosted processing. This shall include exploiting such platforms to support application training, and training in the use of such systems.

- Impact-based forecasting and impact-based decision support services (IDSS): encourage NMHS personnel to continuously work with core partners, such as emergency personnel and public safety officials, on the production and dissemination of accurate and consistent forecast information for certain weather, water, and climate events that have a high impact, noting that not all forecasting services will adopt IDSS in the short-term.

- Kowledge transfer: acting as a bridge between the CoEs to support knowledge sharing related to new data applications, for example regarding SAR data or hydrological models.

- Technical capacity-building: supporting the technical staff involved in satellite data reception and processing, through training, provision of up to date information, and potentially a skills framework;

- Space weather: noting the growth in interest for space weather services around the world, VLab will engage and cooperate with relevant partners seeking to enhance the implementation of space weather services. To provide relevant training, a space weather competency framework needs to be developed, which will require working with partners, including the Committee on Space Research (COSPAR) and the WMO Inter-Programme Team on Space Weather Information, Systems and Services (IPT-SWeISS), that have the appropriate skills in this area.

Quality Control and Evaluation

To ensure quality of services provided by VLab, continuous internal quality evaluations will be conducted. These include undertaking evaluations of the training impact of its activities following the best available approaches, as well as establishing procedures to ensure that VLab expectations are being met. Annual reviews of achievements will be carried out to ensure focus is kept on the provision of training in the main priority areas established in this strategy.

Cooperation

The development and delivery of training, with particular emphasis on national and regional specific demands and requirements, relies on the strong collaboration between VLab CoEs and satellite operators. It is the VLab belief that a strong collaboration between CoEs and partner Satellite Operators will contribute to the economic benefit of the large investments in the space based observing system.

The continuation of VLab collaboration with other training and education programmes in the subject of meteorology, including CALMet, and the WMO Training and Education Programme is also essential for further success. VLab will further build on the partnership with the Committee on Space Research (COSPAR) and explore partnerships with the Working Group on Capacity Building and Data Democracy (WGCapD) of the Committee on Earth Observation Satellites (CEOS) and with other programmes in areas of common or complementary interest.

Resources

The VLab is an entity sustained by contributing CoEs and Satellite Operators. Technical support function is critical for the organization of online events and VLab coordination. Currently, VLab provides a broad support to CoEs activities with its central website (http://vlab.wmo.int) serving as a platform for collaboration and networking. The work of a dedicated Technical Support Officer (TSO), who also provides pedagogical advice to the VLab community, is mission-critical in this regard. VLab will seek to provide continuous instructional and technical support of its activities through the work of the TSO. However, this requires a long-term collaborative funding effort from CGMS Satellite Providers via the designated WMO VLab Trust Fund, as per section 5.2.3 of CGMS HLPP.