



**WMO-CGMS Virtual Laboratory**  
for Education and Training in Satellite Meteorology

VIRTUAL LABORATORY MANAGEMENT GROUP  
Ninth session - VLMG-9  
Fort Collins, USA  
16 – 20 July 2018



Front row, from left: Bernie Connell, Natalia Rudorff Oliveira, Nancy Searby, Meihua Wang, Hyesook Park, Luciane Veeck, Marinés Campos, Kathy-Ann Caesar, JI Wenbin.

Second row, from left: Mark Higgins, LIU Jian, Vesa Nietosvaara, Duncan Tippins, Humaid Al Badi, David Russi, Winifred Jordaan, Brock Blevins, Werner Balogh, Dan Linsey.

## 1. Opening Remarks

On behalf of the World Meteorological Organization (WMO), the Ninth Meeting of the WMO-CGMS Virtual Laboratory Management Group (VLMG-9) was hosted by the Cooperative Institute for Research in the Atmosphere (CIRA) in Fort Collins, United States of America. The meeting was held at the premises of Colorado State University (CSU), from 16-20 July 2018.

Professor Christian Kummerow, director of CIRA, welcomed all participants to VLMG-9 in Fort Collins, and thanked the organising committee for all the arrangements in preparing and running this biennial meeting.

The meeting was conducted mainly in plenary format, but also contained small group discussions and poster presentations. Working documents were made available in electronic form prior the meeting. All relevant documents and online resources used, as well as documents written during the meeting, can be accessed via the VLMG-9 website at <https://training.eumetsat.int/course/view.php?id=295>

While VLMG-9 encouraged representation from all WMO Regional Associations (WMO RA), about one third ( $\frac{1}{3}$ ) of VLMG Members did not attend this meeting. Nevertheless, VLab Co-Chairs Kathy-Ann Caesar (CIMH) and Mark Higgins (EUMETSAT) expressed their confidence in the attending Group to take the decisions shaping the future years of collaborations between VLab members and partners. A complete list of attendees appears in Annex I.

## 2. VLab Centres of Excellence (CoEs) involvement in regional Satellite Data Requirement Groups (SDR)

Each WMO Regional Association (RA) has a designated group that deals with satellite data requirements (SDR). These groups have different names in different regions, and also have varying degrees of maturity. Many of the VLab Centres of Excellence (CoEs) are involved in these groups. The CoEs add an awareness of the actual use of data in the region to inform data requirements as well as to determine training interventions required by changes in data availability.

The SDR meetings for the Americas (RA III & IV) are often held alongside the NOAA satellite conference and training. The Group has been a force in encouraging growing collaborations between regional NMHSs and NOAA as the satellite operator. The four VLab CoEs in the Americas and Caribbean are all involved in this SDR.

The emerging Asia / Oceania SDR group seems less formal, perhaps as a result of the regions being served by multiple satellite providers. Meetings are held alongside the AOMSUC conference and training. These are joint meetings of RA II WMO Integrated Global Observing System (WIGOS) Project and RA V TT-SU (Task Team on Satellite Utilization) for RA II and RA V NMHSs. VLab members from these regions were not completely aware of

their organisations participation in these meetings, showing less VLab involvement in SDR discussions in these regions.

SDR discussions in RA I are held by the RA I Dissemination Expert Group (RAIDEG). The group performs a regular review of the EUMETCast-Africa Dissemination Baseline compared with the needs expressed by RA I users, and formulates recommendations to EUMETSAT. It also discusses other technical matters regarding satellite data utilization in Africa. The four VLab CoEs in RA I are all involved in this SDR group.

There is a benefit in having VLab CoEs involved in the design of training events, where these are held in association with SDR group meetings and conferences.

**Action 1:** WMO-SP engage RA II WIGOS coordination group chair to investigate the benefits for VLab involvement in the RAI/II/V “Satellite Data Requirements” process, with the aim to encourage VLab participation in the meeting, noting that training is part of the meeting purpose

([http://www.jma.go.jp/jma/jma-eng/satellite/ra2wigosproject/ra2wigosproject-intro\\_en\\_jma.html#workplan](http://www.jma.go.jp/jma/jma-eng/satellite/ra2wigosproject/ra2wigosproject-intro_en_jma.html#workplan) )

Regional VLab members to also brief their representatives who could be at the meeting

**Deadline:** Next WIGOS meeting

**Actionee(s):** Werner B. and VLMG members from RA II&V

**Action 2:** VLab Co-Chairs to contact the Chair of the International Conference Steering Committee of AOMSUC, Dr. Jim Purdom, to invite the training event organisers to involve VLab in the design of the training event associated with the Conference (looking to 2019 and beyond) - contact BOM/KMA.

**Deadline:** 20 October 2018

**Actionee(s):** VLab Co-Chairs

### 3. VLab action review and current strategy

#### a. Action review

Open VLab actions from VLMG-8, CGMS-46, IPET- SUP-4 were reviewed and discussed by the Group. Only two actions from VLMG-8 were still opened and updates are as follow:

VLMG-8 Action 8: VLab to organise a Global Train the Trainer event in RGBs. This should be a series of online events.

Updates: A training development plan was drafted and is in discussion. The working group tasked with this action aims to meet online for final discussions and approval of the plan. This action remains open.

VLMG-8 Action 12: CoE Barbados to finalize the informative presentation (Climate) and coordinate translation and presentation with volunteers from VLab.

Updates: This action was derived from a proposal to run a Virtual Round Table Event on the “use of satellite data to monitor climate, climate change and climate variability”, approved in VLMG-7. Since then, the project has been coordinated by CoE Barbados and a set of slides has been drafted. However, while the slides do adequately cover the required definitions and content related to climate, the goals of the GFCS and aspects of climate monitoring by satellite still need to be added. Kathy-Ann is tasked with working with Christine Traeger of EUMETSAT to complement the content of this material, and then pass it to the VLab TSO to coordinate translation. This action was revised and renumbered as VLMG-9 Action 3.

**Action 3:** VLab to organise an informative online presentation (or another training solution) to provide awareness on the use of satellite data in climate monitoring. This should be translated to the 7 languages used within VLab. (this was originally VLMG-8 Action 12).

**Deadline:** 2019

**Actionee(s):** Kathy-Ann to form a working group and coordinate the progress of this action. WG members: Kathy-Ann C., Christine Traeger (EUMETSAT). Nancy S. and Bernie C. to possibly indicate people from their contacts to collaborate in this WG.

**Action 4:** Mark H. to invite Christine Traeger (EUMETSAT) to present EUMETSAT’s work on training for the use of satellite data on climate services. This should be an online presentation to VLMG.

**Deadline:** Dependant on Christine’s availability

**Actionee(s):** Mark H. and Lu V.

#### **b. Current VLab Strategy**

The existing VLab strategy runs until the end of 2019. During 2019, VLab shall seek the approval of a new strategy to run from 2020 to 2024.

The Group discussed ways in which VLab could demonstrate it is implementing the actual strategy. One suggestion was for members to add stories in their VLab reports, showing the impact of their work that relates to the strategy. These stories could then be transferred to VLab reports to IPET-SUP, CGMS, WMO Bulletin, and could also be told in the VLab website.

**Action 5:** Add a new question to the reporting template, requesting a statement describing a situation where VLab members’ activities resulted in impact related to aspects in the VLab Strategy document.

**Deadline:** Nov/2018

**Actionee(s):** Lu V.

#### **4. Knowing and Communicating VLab achievements**

Similarly to the discussion related to demonstrating achievement of the VLab strategy, the Group identified the need to communicate VLab achievements more efficiently to the VLab

stakeholders. Thus, it was decided that a more visually attractive Annual Summary Report of VLab activities should be designed and disseminated to the national and regional WMO Education and Training focal points. This Summary Report should also be annexed to the formal reports submitted to CGMS and IPET-SUP.

In order to achieve this, there is a need to change the VLab reporting period, as to allow time for preparation prior the annual IPET-SUP report is due (every February).

In addition, there is a need to update and translate the VLab factsheet.

**Action 6:** VLab reporting period to be changed to Dec/year“n” to Nov/year“n+1”. Deadline to submit reports to TSO is Dec/year“n+1”.

**Deadline:** Nov/2018 (to circulate the template). Submit reports Dec/2018

**Actionee(s):** Lu V. to adapt template. VLMG to adopt new reporting period

**Action 7:** Updating and translating the VLab Factsheet. Include benefits of being part of VLab Network.

**Deadline:** December 2018

**Actionee(s):** Lu V., Bernie C. and Marcial G.

**Action 8:** Disseminate VLab Summary of annual report to WMO-ETR for transmission to National Focal Points.

**Permanent action**

**Actionee(s):** TSO

In addition, VLMG members reported they would like to receive training information that is destined for the WMO RTC focal points. This request was discussed with WMO-ETR and a decision was made that the VLab TSO will receive and forward such messages to VLMG when appropriate.

With regards to communication of VLab achievements during this meeting, all VLMG-9 were invited to prepare and present posters communicating their main achievements, challenges and interests for further collaboration. Time for poster presentations was made available through 5 sessions taking place within the first three days of the meeting. All posters are also available online in the meeting website at <https://training.eumetsat.int/course/view.php?id=295>

## **5. Self-assessment of VLab CoEs & Satellite Operators**

VLab continues to perform the self-assessment exercise biennially. VLMG received well the additions to the assessment template for 2018, noting the comments received about the length of time needed to complete the exercise. Nevertheless, it was a common agreement that the comments sections provided opportunity for explanations on the reasons for the rates given in each descriptor, helping to keep track of progress when repeating the exercise.

The results of the self-assessment done in 2018 are available from [https://www.dropbox.com/s/jda8z8btrp036pz/VLab%20Self-Assessment\\_2018.pdf?dl=0](https://www.dropbox.com/s/jda8z8btrp036pz/VLab%20Self-Assessment_2018.pdf?dl=0) Results show that VLab aspirations of CoEs and satellite operators for 2018 (as reported in 2016) were greater than the real achievements reported in 2018. Nevertheless, apart from the RFG descriptor, it is possible to note growth in all descriptors that have been assessed by CoEs since this exercise started in 2014. Long term comparisons on the assessments done by satellite operators do not show a clear pattern. In addition, the comments added in the assessment 2018 show that some questions have been interpreted in unintended ways. This affected the overall result for satellite operators in 2018, and possibly previous assessments too. Changes will be made in the template in order to clarify the questions.

In addition, as the VLab expectations for CoEs and satellite operators are under revision, modification on these will likely require changes in the questions asked in future assessments.

## **6. VLab Training Events**

### **a. Advertising**

Since 2012, advertising training events in the VLab online Calendar of Events has been part of the expectations for CoEs and satellite operators. Whilst the level of use of the VLab Calendar to advertise its events has varied throughout the years, adoption of this practice is still far lower than expected. As an example, from all events being reported as “planned to take place from January to June 2018, only 56% were advertised in the Calendar.

VLMG members were reminded of the advantages of advertising their training events in the VLab Calendar. An additional advantage highlighted was that all training events submitted to the VLab Calendar are also shown in the WMOLearn Events Calendar, which was built based on this VLab tool. This is thought to greatly increase the visibility of events worldwide.

VLab partners, including the various working groups of CEOS and GEO, are also encouraged to use either calendar to reach wider audiences. NASA/ARSET reported that advertising their events in the VLab Calendar has been valuable to the programme.

The VLab online Calendar of Events is developed, maintained and hosted by EUMETSAT. The further development of the calendar, which is underway, includes capabilities such as the possibility to embed a view of the calendar in users own websites, using their own branding.

**Action 9:** Mark to contact the Training Calendar developers and inquire, as a priority request, the enabling of satellite training events that are submitted via WMOLearn Calendar, to also show in the EUMETSAT Calendar front end (and all the members calendars).

**Deadline:** November 2018

**Actionee(s):** Mark H.

**Action 10:** Mark to send appropriate instructions and Code to display the Training calendar on VLab members' and partners' websites. Bernie C., Winifred J., Marines C., Brock B., Marcial G., Natalia R., Lu V., Nancy S., and Humaid A. voiced interest on receiving the instructions.

**Deadline:** December 2018

**Actionee(s):** Mark H.

**Action 11:** EUMETSAT is further developing the Calendar, and intends to involve VLab members, in order to make sure their needs are addressed. Volunteers are needed from VLab members and partners to take part in the pre-release development testing.

**Start:** August 2018 to February 2019

**Actionee(s):** Mark H. Volunteers: CoE Australia, CMATC, ARSET, and maybe CoE South Africa.

### **b. Planning and pedagogy**

VLMG reported appreciation for the WMO-ETR facilitated training of trainers event, which is offered online every year. This is considered an essential course that VLab recommends to all trainers and training managers working in education and training in meteorology, hydrology and related fields.

VLMG recommends all training organisers to:

1. Design courses following the WMO Guidelines for Trainers in Meteorological, Hydrological and Climate Services (WMO-No. 1114), available at [http://www.wmo.int/pages/prog/dra/documents/wmo\\_1114\\_en.pdf](http://www.wmo.int/pages/prog/dra/documents/wmo_1114_en.pdf)
2. Link courses to the relevant WMO skills / competencies frameworks (see WMO Guide to Competency – WMO-No 1205 at [https://library.wmo.int/doc\\_num.php?explnum\\_id=4237](https://library.wmo.int/doc_num.php?explnum_id=4237) and more information on the Competency Frameworks at <http://www.wmo.int/pages/prog/dra/etrp/competencies.php>).

### **c. Using technology in training**

The use of simulators in training was briefly discussed, with Centres of Excellence reporting on the interest to use them more often. It was also identified that for more frequent use of this technology, technical support and training of trainers would be necessary.

## **7. Training cooperation, WMO Global Campus & VLab**

### **a. Dealing with external training requests (From CGMS partners, WMO bodies, other international partnerships or agencies)**

In order to manage training requests arising from outside VLab usual processes to identify training needs, VLab will undertake the following actions. These are intended to facilitate the communication of requests received via CGMS and provide opportunity for other programmes to make formal requests.



**Action 12:** Add to VLab Terms of Reference that the Co-Chair representing Satellite Operators will check the Annual CGMS final meeting report for actions involving the VLab.

**Permanent Action**

**Actionee(s):** Co-Chair representing Satellite Operators

**Action 13:** VLab Co-Chair to contact CGMS secretariat to request that CGMS meeting actions and recommendations that involve VLab are communicated to VLab Co-Chairs for acceptance **prior to publishing of the** final report.

**Deadline:** Before CGMS-47

**Actionee(s):** Mark H.

**Action 14:** VLMG to discuss and propose a process to ensure Co-Chairs attendance to IPET-SUP and CGMS meetings.

**Deadline:** December 2018

**Actionee(s):** VLMG

**Action 15:** Design and implement a training request form to be available in the VLab website. This should allow users to send requests directly to their selected CoE, using the language the training is requested. A disclaimer should be used in order to clearly inform that making a request does not guarantee the training will be offered by VLab.

**Deadline:** December 2018

**Actionee(s):** Lu to draft. VLMG to revise, test and approve the form.

#### **b. MoU with COSPAR**

COSPAR representatives, Mr. Jean-Louis Fellous and Mr. Carlos Gabriel, joined online for this discussion with VLMG. They explained the importance of this MoU for COSPAR (for details, please check the COSPAR report to IPET-SUP, available in VLMG-9 website), clarifying that the main support COSPAR seeks from VLab is in-kind contributions by the provision of trainers for COSPAR training events.

It was agreed that COSPAR will request any assistance they may require for their training activities (taking place in 2020) by January 2019. VLab was also invited to suggested future training interventions that may be implemented with COSPAR support.

#### **c. Relationship of VLab to Global Campus**

VLab is an active partner in the WMO Global Campus, and intends to continue contributing to its various initiatives. An example of such partnership is the continuous sharing of information about training events available in the subject of satellites, as all events advertised using the VLab Online Calendar of Events also show in the WMO Learn Events Calendar (<http://learningevents.wmo.int/#/> ).

A new WMO Global Campus resource presented during the meeting is the WMO Learn Library. The WMO Learn Library, whilst not yet fully functional, can already be accessed at [https://library.wmo.int/index.php?lvl=etagere\\_see&id=157#.W6onpy-ZNTY](https://library.wmo.int/index.php?lvl=etagere_see&id=157#.W6onpy-ZNTY) This library is a section of the existing WMO E-Library, and provides a searchable collection of educational

resources, including: WMO publications and education and training materials from various contributing organisations and individuals. The collection can be searched by WMO competency framework, Main Topics, Region and Country, and/or Nature of Information to find materials useful for training or self-directed learning.

VLab members welcomed this new resource and will aim to share their training resources using the WMO Learn Library. The “WMO Global Campus Copyright Practice Standards” were noted with interest, and discussions lead to the following recommendation and action:

**VLMG and Partners Joint Recommendation:** VLMG and Partners recommend that satellite training providers use Creative Commons License by attribution (CC BY) to provide clear identification of copyrights license in their training resources (see <https://creativecommons.org/licenses/by/4.0/> ). This is an effort to improve sharing of resources, and is also part of adapting to the standards for submission of resources to the WMO Learn Library. NOTE: VLMG Partners attending VLMG-9 will further discuss this recommendation within their members for ratification).

**Action 16:** VLMG to disseminate the recommendation via CGMS, IPET-SUP, WMO-ETR, and other networks

**Deadline:** July 2019

**Actionee(s):** VLMG

## 8. Training resources

### a. Sharing of training resources produced by VLab members

A list of training resources produced by VLab members in 2017 was provided (available in the meeting website). This gave continuation to discussions regarding the importance of providing clear indication of copyrights, and also initiated a conversation about practices that can help to reuse and adapt shared resources, for example: adapting content to include some local case studies. A good list of some general good practices is available at [https://courses.comet.ucar.edu/pluginfile.php/27090/mod\\_resource/content/7/Writing%20for%20future%20adaptation%20and%20translation.pdf](https://courses.comet.ucar.edu/pluginfile.php/27090/mod_resource/content/7/Writing%20for%20future%20adaptation%20and%20translation.pdf)

### b. Good practices in translation

The COMET Translation Resource Centre was presented to the Group. The resources in the website (<https://courses.comet.ucar.edu/course/view.php?id=181#section-6>) support the effort to increase the availability of training materials through translation.

David Russi (COMET, Spanish translator), explained the website contains resources to guide the translation efforts and a forum to exchange ideas and resources. VLab members were encouraged to consult the resources before attempting translations, as planning is essential for effective translation projects.

### c. Accessing VLab training resources

The importance of listing VLab training materials in searchable libraries like the WMO Learn Library was discussed, as it was a consensus that they are very good tools to facilitate the discovery and increase visibility of training materials. Nevertheless, it was clarified to the

Group that the WMO Learn library can only link to the material if the original files are made available from a website.

A good example of this situation is the training material produced by the Australian VLab Centre of Excellence. The recording of the RFG sessions can be found via the WMO Learn Library (see [https://library.wmo.int/index.php?lvl=categ\\_see&id=11243&main=1#.W6PrGi-ZNTY](https://library.wmo.int/index.php?lvl=categ_see&id=11243&main=1#.W6PrGi-ZNTY)) and this is because it is available at the Australian VLab CoE website at <http://www.virtuallab.bom.gov.au/archive/regional-focus-group-recordings/>

## 9. Regional discussions

Participants were split into various working groups for the discussions, depending on their geographical locations. Each Group had its own set of notes as presented in Annex II. Main topics suggested for discussion were:

1. Implementing VLab strategy in the region
2. Using the SDR processes
3. Gathering training needs
4. Coordinating training events and resources creation,
5. Managing translation needs of the region
6. Managing/ contribution to / coordination training events alongside satellite user conferences
7. Coordinating regional training of trainers in training skills and in satellite applications

De-briefing of the work done into groups was done afterwards, with some resulting actions as follows:

**Action 17:** VLMG and partners to investigate and identify where duplication efforts occur in training for the utilisation of data and products from meteorological and environmental satellites. All to report back in the VLMG online meeting in a year time.

**Deadline:** June 2019

**Actionee(s):** VLMG and partners

**Action 18:** Werner to share the links to Regional Centres for Space Science and Technology Education (affiliated to the UN). VLab members to check these links with the aim to identify opportunities for collaboration and the existence of duplication of efforts.

**Deadline:** July 2018

**Actionee(s):** Werner B. and Lu V. provide links in the VLMG-9 meeting website. VLMG and partners to investigate opportunities.

## 10. Guidelines on satellite skills and knowledge for operational meteorologists

### a. Updates on the publication of revised version

The 2018 updates were proposed to IPET-SUP. These should be discussed during their next online meeting (2nd August 2018) for final approval. The approved version of this document will then be presented to CBS for publication (update of WMO publication SP-12).

**b. Revisiting suggestions to add climate and agriculture related skills**

The Group revisited the suggestions to include climate and agriculture related skills in the document and decided that these are not yet ready for inclusion. Nevertheless, VLab shall extend the framework as required, and as competencies are better defined.

In addition, the Group agreed that a briefing on the Global Framework for Climate Services (GFCS) and Impact-Based Decision Support Services (IDSS), was required in order to support future decisions related to the evolution of the framework.

**Action 19: VLab to invite** Adrian T. and Rich J. to make presentations on GFCS and IDSS to inform VLMG.

**Deadline:** Aim October 2018

**Actionee(s):** Kathy-Ann to invite Dr. Rich Jeffries, Senior Advisor to UCAR Community Programs to present on the topics of IDSS and Weather Ready Nation (WRN) and Mr. Adrian Trotman to present on Climate Services and TSO to organise the online presentations.

**Action 20:** Werner to contact WMO-ETR to find out how other skills set are being handled to assure the “Guidelines on Satellite Skills and Knowledge for operational meteorologists” are handled in the most appropriate way.

**Deadline:** September 2018

**Actionee(s):** Werner B.

**Action 21: VLab to** Investigate if there is an “agriculture competency” within WMO.

**Deadline:** September 2018

**Actionee(s):** Mark H.

**c. Discussions on how the guidelines have been used**

It was agreed that consulting the guidelines can greatly support the writing of effective learning outcomes for training interventions.

Suggestions were also made to use this document more often when planning the continuous professional development of operational meteorologists. A poster identifying each of the 7 skills and related performance components, was proposed. It was suggested that this is widely distributed by VLab members and partners, in order to raise awareness of the existence of this important document. Poster and updated document are available from <https://www.wmo-sat.info/vlab/satellite-skills/>

**Action 22:** New training resources created from now on, should include identification of the satellite skills and knowledge addressed (up to level 3).

**Permanent action**

**Actionee(s): All VLab Members**

**Recommendation:** Whenever appropriate, the satellite skills and knowledge addressed in a training event should be identified in the certificate of participation.

## 11. Day at CIRA

On Thursday, the fourth day of the VLab meeting, members enjoyed a day of presentations, demonstrations and discussions at CIRA. Presentations were aimed to provide an insight on how NOAA prepared for GOES-R and JPSS, as well as presenting the new satellite training from the perspective of those organising it and those receiving the training.

An outline of key points made (from the perspective of users of training materials) for training designers to keep in mind:

1. Quality of training matters - *"it must be good!"*
2. Time estimations should be accurate - *"don't lie to us"*
3. Let people navigate material at their own pace
4. In YouTube videos, provide links to original images / loops, so people can see them at a good resolution
5. Design for a small screen, two screens, old eyes and young eyes.

All presentations and most posters from the "Day at CIRA" are available in the meeting website.

Discussions about the next generation of satellites also took place and the most important topics follow below:

- How is it being integrated operationally?

The GOES-16 foundation course was mentioned by VLMG as essential to preparing personnel. Some CoEs reported the course is being used as prerequisite for staff intending to request more advanced training. Others mentioned that universities are preparing students to use the new generation of satellites, but staff at the met services are not receiving as much training.

VLMG noted the essential contribution of the CIRA Slider tool in helping users get ready and access images. The Group was informed that 50% of users of Slider are from outside US.

- Are the training priorities attended? - quick guides / videos, reusing others' resources.

VLMG expressed great interest in the "Quick Guides" available. A discussion of how the quick guides are designed followed, and it was noted that these guides should be produced for their specific regions.

The use of videos was also mentioned, but it was noted they are best used to increase awareness.

**Action 23:** VLab members who produced Quick Guides to investigate the copyrights license of these resources and share the original template (if

appropriate). Existing Quick Guides to be listed and files (pdf and original design format, when possible) to be provided to VLab TSO. Files to be made available in the VLab Central Website (and submitted to WMO Learn Resources Library).

**Deadline:** October 2018

**Actionee(s):** Bernie C., Vesa N., Lu V.

## 12. Implementation of VLab projects

### a. RGB Course for Trainers

The RGB Experts and Developers Workshop 2017 was held at the headquarters of JMA in Tokyo, in November 2017. The discussions produced recommendations for the modification of current RGB recipes and ideas for new RGB recipes in consideration of sulfur dioxide, fire intensity, smoke and other variables. The meeting documents are available at <http://www.wmo.int/pages/prog/sat/meetings/RGB-WS-2017.php> The final report will be added to the meeting website when finalised.

VLMG Identified a need to raise awareness around the benefits of tuning RGBs. There is also a need to train forecasters to tune RGBs.

### b. CM4SH - how to continue

CoEs reported CM4SH was a very important project for them, and highlighted that the material produced is highly used in training. The need for updates and new conceptual models was identified.

**Action 24:** Write a white paper to propose the continuation of projects in the creation of CM4SH. White paper to be submitted to the agencies supporting the CoEs involved in the project.

**Deadline:** November 2018

**Actionee(s):** Natalia R., Marines C., Bernie C., Lee-ann S.

**Action 25:** VLMG members to identify what is happening within their regions in terms of co-creation of content related to satellite meteorology.

**Deadline:** Next VLMG online September 2018

**Actionee(s):** All VLMG members and partners

## 13. Discussion of next VLab Strategy - 2020-2024

VLMG reviewed the current VLab strategy taking into account new challenges NMHSs will be facing, new sources of data that are available, and the need for greater cooperation in order to enhance the impact of VLab activities. Ideas for the new VLab strategy (2020-2024) were outlined. A formal draft of the new VLab strategy will be prepared by a working group, and should be revised and approved by VLMG by the end of 2018. The strategy shall be presented to WMO and CGMS bodies for approval during 2019.

**Action 26:** Final drafting of the New VLab Strategy document (2020-2024) to be concluded by a strategy WG.

**Deadline:** 31 August 2018

**Actionee(s):** Duncan T., Humaid A., Bernie C., Werner B. and Kathy-Ann C.

**Action 27:** VLMG to revise the final draft of the New VLab Strategy document 2020-2024 (provided by the WG at the end of August), and be ready to discuss and approve the text.

**Deadline:** VLMG online meeting - beginning of September 2018

**Actionee(s):** VLMG

#### 14. AOB & Next meeting

Offers were made to have the next face to face meeting of VLMG in Darmstadt (VLMG-10, 2020), the following meeting in Australia (VLMG-11, 2022), and the next in Costa Rica (VLMG-12, 2024).

A request was made for the exact dates of the meeting in Darmstadt to be established in the VLMG online meeting in November 2018, as this should give VLab members appropriate time to include the dates in future plans.

In addition, it was reported by members that July can be a difficult meeting time within the year. The Group anticipated August as an appropriate time of the year to have these meetings.

The VLab Co-Chair representing the CoEs, Kathy-Ann Caesar (CIMH), communicated the need to step down from this role by November 2018.

**Action 28:** CoEs to consider the possibility to nominate a candidate to act as VLab Co-Chair for the next 3 years (starting November 2018), and or a designate co-chair (to assume in 3 years-time).

**Deadline:** VLMG online meeting in September 2018

**Actionee(s):** VLMG

**Action 29:** VLMG to revise the VLab expectations documents after the new VLab Strategy is finalised.

**Deadline:** Revision to start in September

**Actionee(s):** VLMG

**Action 30:** EUMETSAT to organise VLMG-10 (August 2020). BoM to explore the possibility of organising VLMG-11 (2022), and CoE Costa Rica VLMG-12 (2024). Other VLMG members interested in hosting the meeting are welcome to propose hosting too.

**Deadline:** VLMG-10

**Actionee(s):** Mark H., Duncan T., and Marcial G.

## **15. Review of actions and recommendations from VLMG-9**

All actions and recommendations were revised and confirmed by nominated actionees. The list of actions and recommendations is available in Annex III. A live list, containing updates on the status of each action is available at

<https://docs.google.com/document/d/15Fpkzq8pRkkL5e62KyRv3dQttmKGQOs7XD6yc7XLfKM/edit?usp=sharing>



**ANNEX I**  
**List of VLMG-9 participants**

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1	<b>Ms.</b> Marinés Campos	<b>SMN</b> CoE Argentina	marinescampos27@gmail.com
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**Remote participation - VLMG-9**

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**Participants & Presenters of Day at CIRA (19 July 2019)**

	<b>Name</b>	<b>Institution</b>
1	<b>Ms.</b> Beth Kessler	<b>CIRA/CSU</b>
2	<b>Ms.</b> Nezette Rydell	<b>NWS</b>

3	<b>Ms.</b> E. Dagg	<b>CIRA/CSU</b>
4	<b>Mr.</b> Kevin Micke	<b>CIRA/CSU</b>
5	<b>Mr.</b> Henry Reges	<b>CSU</b>
6	<b>Mr.</b> Noah Newman	<b>CSU</b>
7	<b>Mr.</b> Matt Rogers	<b>CIRA/CSU</b>
8	<b>Mr.</b> Louie Grasso	<b>CIRA/CSU</b>
9	<b>Mr.</b> Dan Bikos	<b>CIRA/CSU</b>
10	<b>Mr.</b> Jorel Torres	<b>CIRA/CSU</b>
11	<b>Mr.</b> Jack Dostalek	<b>CIRA/CSU</b>
12	<b>Ms.</b> Yoo-Jeong Noh	<b>CIRA/CSU</b>
13	<b>Mr.</b> Chris Slocum	<b>CIRA/CSU</b>
14	<b>Mr.</b> John Knaff	<b>CIRA/CSU</b>
15	<b>Mr.</b> John Forsythe	<b>CIRA/CSU</b>
16	<b>Mr.</b> Curtis Seaman	<b>CIRA/CSU</b>

## Acronyms

<b>ARSET</b>	Applied Remote Sensing Training
<b>BMTC</b>	Bureau of Meteorology Training Centre
<b>CIMH</b>	Caribbean Institute for Meteorology and Hydrology
<b>CIRA</b>	Cooperative Institute for Research in the Atmosphere
<b>CMA</b>	China Meteorological Administration
<b>CMATC</b>	China Meteorological Administration Training Center
<b>COSPAR</b>	Committee on Space Research
<b>CPTEC</b>	Centro de Previsão do Tempo e Estudos Climáticos
<b>CSU</b>	Colorado State University
<b>DGM</b>	Directorate General of Meteorology
<b>ESA</b>	European Space Agency
<b>EUMETSAT</b>	European Organisation for the Exploitation of Meteorological Satellites
<b>KMA</b>	Korea Meteorological Administration
<b>NASA</b>	National Aeronautics and Space Administration
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>NWS</b>	National Weather Service
<b>SAWS</b>	South African Weather Service
<b>SMN</b>	Servicio Meteorológico Nacional
<b>UCAR</b>	University Corporation for Atmospheric Research
<b>UCR</b>	Universidad de Costa Rica
<b>WMO</b>	World Meteorological Organization

**ANNEX II**  
**Notes from various Regional Group Discussions**  
**(exported from the GDocs composed during the meeting)**

**RA I Regional discussions**

Coordination between training centres & satellite operators on:

1. Implementing VLab strategy in the region
2. Using the SDR processes
3. Gathering training needs
  - PR representation at User Forums
  - COE reps capture User needs at Forum Events
4. Coordinating training events and resources creation
5. Managing translation needs of the region
6. Managing/ contribution to / coordination training events alongside satellite user conferences
7. Coordinating regional training of trainers in training skills and in satellite applications

**EUMETSAT USER FORUM IN AFRICA WEB SITE**  
<https://ufa.eumetsat.int/>

Relationship between Met trainings and other providers

UN Office of Outer Space Affairs, UN Space, meeting once per year (30 UN orgs that are using Space Based data for Humanitarian, agriculture, all applications, etc)  
History: Focus originally on remote sensing, held many workshops, training events, (1970s)

BY 1990's, Did not see increase in capacity (so decided to focus more on Train the Trainers models)

- ECA, ESCAP, ECLAC, (regional hubs) Many countries wished to be Centers of Excellence,
- Evaluations were conducted in each region to decide proposed country locations, countries would finance participation, train for 6 months (like RTCs)

- Regional Centers of Space Tech and Education: First center in ISRO, 5 others, (Mexico, Brazil, w INPE), Jordan,
- UN wanted to ensure training quality coming out of these centers, developed curriculum, ID topics (Comm Sat, Space/Atmos science, Global Climate)
  - Could benefit from VLab trainings?
- There is duplication of trainings, lack of awareness of these trainings between Proper MET (EUMETSAT, etc )Trainings,

Can we get the directors from these centers to attend VLabs meetings?

Ask to communicate what they are doing, share curriculums, Share VLabs met curriculum in their centers

- CEOS could play a role here too.

A Value of VLabs is the clear focus for the VLabs training efforts, (e.g. competency trainings)

Discussions about VLabs opening its aperture. Should it?

- Vlab strategy is clear due to the clear definition of the training audience. However, the role of op met is changing.

Umbrella structure: UN, then GEO, to CEOS under that CGMS, all attempting to meet EO needs,

The diff between weather and climate is the timeline, there are bridges that can exist between Proper Vlabs trainings, but Hydro Met expansion would be the obvious next step

- GFCS, expansion moving slowly in RSA, a concerted effort to expand,

Strategy to build capacity, built upon partnerships, such as dept of health, applications for predicting vector borne diseases, for example,

Low hanging fruit: WMO has Hydro as part of their mission, agro extension services in country, Impact based forecasting (averting famine, etc),

Satellite Skills for hydrologists, ag was excluded from VLabs? Who can fill that void? Who picks up the training here for the operational job descriptions in AG? What are the op ag/hydro job descriptions?

Met services are not mandated to do so within countries, some countries combine hydro and met, some are kept apart

RSA is already delving into flash flood guidance systems (water in the air versus water on the ground divisions)

Some COEs train more on hydro, general capacity building (private pilots, etc) used to work with health systems,

The COE that are further along (AUS and private clients) to give presentation about how they are expanding, why, what are their priorities? To facilitate sharing among the network.

A Non-profit at a GEO symposium with a focus on climate and small island states, an example of how fast climate should be part of the training conversation

Prediction: Within 10 years, African countries will be combining climate and impact based forecasting. How will the role of op forecasters expand?

Flood, drought mitigations, are the applications of op forecasting, It will be hotter, wetter in E. Africa, = increase in malaria.

NASA SERVIR Program: and weather related disasters theme in Hindu\_Kush and forecasting of extreme weather, (Applied sciences team, 3 year projects) improving capacity to forecasting, Working with Met depts (bangladesh, Nepal, ICIMOD, is it the research arms or op forecasting dept? (an overlap but Vlabs is not involved). Developed products, passed along once operational (Readiness level), these products are co-produced so partners are involved throughout the 3 year project timeline. (Tech): using WIWAT, warf model, cloud comp, Pass along capacity in workshop setting trainings, held at the SERVIR hub. Hubs are decided by USAID has determined need is the highest.

(SERVIR) RCMRD, LCLUC and REDD+ , ID country need to to build capacity of tech staff to develop land maps that are up to IPCC standards,

WMO weather research dept to operations

RSA: The connection between research arms and op forecasters. This can be difficult.

- Some meteorologists only have time to forecast, others make time to investigate what is coming next out of the applied research fields,

Nepal: UN ESCAP Asia and Pacific, regional space app program and countries expressing need for training,

## Overlap of Trainings/Efforts

There is a large amount of overlap and possible duplication (example: UN Space apps prog does drought monitoring and WMO has drought activities), *many times one hand does not know what the other hand is doing.*

Global Training Centre Symposiums would be a good initiative to find places to coordinate. The UN should play the coordination role in efforts such as these. Bring reps from UN training centres, CEOS trainers, NASA training programs and the like: Action set up an organizing committee, and encourage an event such as this symposium, designed to id the opportunities, discuss best practices, regional activity coordinations,

CEOS, UNOOSA, VLab

- If there were a way to integrate the various actors, the impact could be greater. But everyone want to protect their own and define their own agendas,
- Engagement with training centres outside VLab, weather touches everything, it is worthwhile to pull in outside expertise

Among the larger, global operational community, is there already a desire to combine of Met, Hydro, and Ag applications operationally from the ground up? Stats below: at least from the NASA ARSET perspective (2015-2018) ARSET has trained 398 participants from the Met community (80 unique orgs/agencies, from 62 countries; have accessed 39 online training events (342 participants) and 9 hands on workshop events (56 parts)

In the themes of:

- Disaster Management (96 participants)
- General (Train the Trainers & Intro to RS) (11)
- Health and Air Quality (96)
- Land Management/Conservation/Eco (55)
- Water Resources (140)

Sector breakdown:

- Federal/Central Government (318 participants) (Met services, primarily)
- Private (33)
- Multinational Organization (25)
- State/Provincial Government (10)
- Non-Profit/Non-Governmental Organization (5)
- Academia, Faculty (4)

- Academia, Student (1)
- Municipal Government (1)

Top trainings (what are they attending/ what are the interests?)

<b>Monitoring Tropical Storms 2018</b>	<b>32</b>
<b>Air Quality Applications In-person 2018</b>	<b>29</b>
<b>Intro to VIC Webinar 2018</b>	<b>26</b>
<b>Water Quality Webinar 2014</b>	<b>26</b>
<b>Advanced Drought 2017</b>	<b>23</b>
<b>GPM</b>	<b>23</b>
<b>IITM AQ 2017 Workshop</b>	<b>15</b>
<b>Water Resources Management 2015</b>	<b>15</b>
<b>Soil Moisture and ET Applications 2016</b>	<b>14</b>

### Met Offices Participation

<b>Organization</b>	<b>Count</b>
<b>Institute of Hydrology, Meteorology and Environmental Studies (IDEAM)</b>	<b>48</b>
<b>National Service of Meteorology and Hydrology, Peru (SENAMHI)</b>	<b>46</b>
<b>Agency for Meteorology Climatology and Geophysics, Indonesia (BMKG)</b>	<b>40</b>
<b>Indian Institute of Tropical Meteorology</b>	<b>36</b>
<b>National Institute of Meteorology, Uruguay</b>	<b>17</b>
<b>Egyptian Meteorological Authority</b>	<b>16</b>
<b>National Meteorological Service, Argentina</b>	<b>11</b>
<b>Pakistan Meteorological Department</b>	<b>8</b>

<b>National Institute of Meteorology, Mozambique (INAM)</b>	<b>7</b>
<b>India Meteorological Department</b>	<b>5</b>
<b>Indonesia Meteorological, Climatological, and Geophysical Agency (BMKG)</b>	<b>5</b>
<b>Benin National Meteorological Agency</b>	<b>4</b>
<b>Liberia Meteorological Service</b>	<b>4</b>
<b>Naval Hydrographic Service, Meteorology Department, Argentina</b>	<b>4</b>
<b>Sudanese Meteorological Authority</b>	<b>4</b>
<b>Ukrainian Hydrometeorological Institute</b>	<b>4</b>
<b>Department of Meteorology and Hydrology, Paraguay</b>	<b>3</b>
<b>Meteorological Direction of Chile</b>	<b>3</b>
<b>Meteorological and Hydrological Service, Croatia</b>	<b>3</b>
<b>National Meteorological Institute, Tunisia (NIM)</b>	<b>3</b>
<b>Republican State-owned Enterprise Kazhydromet, Kazakhstan (RSE)</b>	<b>3</b>
<b>Trinidad and Tobago Meteorological Service</b>	<b>3</b>
<b>Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG)</b>	<b>2</b>
<b>Meteorological State Agency of Spain (AEMET)</b>	<b>2</b>
<b>National Meteorological Institute, Costa Rica</b>	<b>2</b>
<b>Nigerian Meteorological Agency</b>	<b>2</b>
<b>State Hydrometeorological Service, Moldova</b>	<b>2</b>
<b>Aviamettelecom of Roshydromet</b>	<b>1</b>
<b>Badan Meteorology, Climatology, and Geophysics Council (BMKG)</b>	<b>1</b>
<b>Center for Meteorology of Mexico (CENAM)</b>	<b>1</b>
<b>Czech Hydrometeorological Institute</b>	<b>1</b>
<b>Department of Meteorology and Hydrology, Myanmar (DMH)</b>	<b>1</b>
<b>Finnish Meteorological Institute</b>	<b>1</b>
<b>Indian Institute of Tropical Meteorology (IITM)</b>	<b>1</b>



<b>Institute of Meterology (INSMET)</b>	<b>1</b>
<b>Jordan Meteorological Department</b>	<b>1</b>
<b>Kenya Meteorological Department (KMD)</b>	<b>1</b>
<b>Latvian Environment, Geology and Meteorology Centre (LEGMC)</b>	<b>1</b>
<b>MetMalaysia</b>	<b>1</b>
<b>Meteorological Development Cooperation, Honduras</b>	<b>1</b>
<b>National Agency for Meteorology Hydrology and Environmental Monitoring, Mongolia (NAMHEM)</b>	<b>1</b>
<b>National Center for Hydro-Meteorological Service, India</b>	<b>1</b>
<b>National Institute of Meteorology and Hydrology, Ecuador (INAMHI)</b>	<b>1</b>
<b>National Institute of Meteorology and Hydrology, Venezuela</b>	<b>1</b>
<b>National Institute of Seismology, Volcanology, Meterology, and Hydrology, Guatemala</b>	<b>1</b>
<b>National Meteorological Center, Haiti</b>	<b>1</b>
<b>National Meteorological Administration, Romania</b>	<b>1</b>
<b>National Meteorological Authority, Uganda</b>	<b>1</b>
<b>National Meteorological and Hydrological Service of Peru (SENAMHI)</b>	<b>1</b>
<b>National Meteorological and Hydrological Service, Belize (NMHS)</b>	<b>1</b>
<b>National Meterology Agency, Ethiopia</b>	<b>1</b>
<b>Oman Met Office</b>	<b>1</b>
<b>Republic Hydrometeorological Institute of Serbia</b>	<b>1</b>
<b>Roshydromet</b>	<b>1</b>
<b>Rwanda Meteorology Agency</b>	<b>1</b>
<b>Sudan Meteorological Authority</b>	<b>1</b>
<b>Thai Meteorological Department</b>	<b>1</b>
<b>Turkish State Meteorological Service</b>	

**ANNEX II**  
**Notes from various Regional Group Discussions**  
**(exported from the GDocs composed during the meeting)**

**RA II & RA V Regional discussions**

Coordination between training centres & satellite operators on:

**1. Implementing VLab strategy in the region**

The activities below were viewed to be the pathways towards implementing the V-Lab strategy.

**2. Using the SDR processes**

There was limited understanding of the SDR process amongst the VLMG members from RA-II & V. We committed to endeavouring to find out more about what is happening in our parent organisations with regards to SDR.

We also committed to see if there are opportunities to better connect VLab for training and VLab for data portal.

Furthermore, we could learn what the other regions are doing with regards to the SDR process.

[https://www.jma.go.jp/jma/jma-eng/satellite/ra2wigosproject/documents/finalreport/Final-Report\\_RAII-2017-Vladivostok.pdf](https://www.jma.go.jp/jma/jma-eng/satellite/ra2wigosproject/documents/finalreport/Final-Report_RAII-2017-Vladivostok.pdf)

The linked report from the WIGOS report included a section about the RA-V Task Team on Satellite Utilisation.

Duncan will talk to Agnes Lane and Roger Deslandes about the user data requirements that has been gathered to date.

**3. Gathering training needs**

We committed to plan a meeting amongst the COE's to discuss the training requirements for the AOMSUC. This was seen as a high priority activity given it's proximity in time.

We also want to meet to discuss the next 12 months of RFG sessions based on known seasonal training requirements based on the impacts experienced in each agency. We would like to run a survey with past participants as well as have 15 minutes in an RFG dedicated to gathering training needs. Initially we will collaborate on a standard form/questionnaire for consistently gathering training needs.

#### **4. Coordinating training events and resources creation,**

BMTC's ambition is to plan the next 12 months RFG meetings. This will now be incorporated into our ambition to plan and coordinate.

Each NHMI will have different interests at different times of the year and we should coordinate the training around these requirements.

We should distribute this to other COE's in RA-II & V to coordinate our RFG content better and promote our RFG training sessions amongst our regions.

KMA and others already contribute to the BoM RFG so we should contribute to a single RFG and have a single name.

Suggested names:

AO RFG Weather Discussion

RA II & V RFG

We will need to consider an appropriate time (or times). Currently Bodo runs the sessions at 0200 UTC.

We could consider packaging recorded RFG sessions on WMO learn (or possibly bmtc moodle - <https://bmtc.moodle.com.au/>) to improve access and quality of asynchronous version. Perhaps try for 1 or 2 this year to assess the effort involved as well as the benefit obtained.

## **5. Managing translation needs of the region**

Use English as the primary language for training as it's the common language.

## **6. Managing/ contribution to / coordination training events alongside satellite user conferences**

## **7. Coordinating regional training of trainers in training skills and in satellite applications**

BMTC to consider hosting 1 or 2 train the trainer sessions each year for RA - II & V on blended learning technology & techniques. (investigate Blue Jeans as a webinar platform). KMA have issues with security with using WebEx.

We should consider training our trainers in satellite applications.

We could also consider the use of assessments (either in Moodle or elsewhere) to understand training needs.

### 9th AOSUMC (<http://aomsuc9.bmkg.go.id/>)

- Recommend the host country determine the training requirements to be addressed during the 2 training days.
- BOM, KMA, JMA (and others) are contributing to the training

**ANNEX II**  
**Notes from various Regional Group Discussions**  
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**RA III & RA IV Regional discussions**

Coordination between training centres & satellite operators on:

**1. Implementing VLab strategy in the region**

1. Promotion of trainings and workshops in the Region both within country and collaborations with NOAA.
2. Costa Rica and Brazil developed technical skills (re data access through GNC-A, LDM, and other internet) Priority: coordination to identify resources, training, and share resources
3. display programs (python code, Sigmacast, McIDAS-V), and training that can be shared;
4. Recommendation in the RA III/RA IV meeting (thru Glendell CMO and RA IV Rep) there is need for technical support training.

**2. Using the SDR processes**

1. All countries have membership in the SDR and VLab is promoted.
2. In the recent pass through the SDR there has been positive results such as the increase in bandwidth on the GNC and in
3. Until the WMO Scientific Officer for Satellite Utilization and Products position is filled, what WMO leadership can we tap into?

**3. Gathering training needs**

1. There is an SDR training needs requirement
2. There is an VLab needs
3. Argentina did an enabling needs analysis

**4. Coordinating training events and resources creation**

1. NOAA (GOES-R program (engage JPSS program more directly) has a training plan for international users and list of workshops;
2. Need to improve communications between Regional CoEs at it relates to work done, exchange of skills/knowledge; cases studies

**5. Managing translation needs of the region**

1. Through the Southern Hemisphere Demonstration project and extension there has been translation services for the training modules.

6. **Managing/ contribution to / coordination training events alongside**

1. See 4-b and 7

7. **Satellite user conferences**

1. Recommendation for the next NOAA Satellite Conference training on the weekend prior to the conference:
  1. Technical 1: installation and continuing operation of GEONETCast
  2. Technical 2: Data access - PDA, Internet Data Distribution (IDD) /Local Data Management (LDM)
  3. Train the Trainer (expert): Display and interpretation
8. **Coordinating regional training of trainers in training skills and in satellite applications**

## Annex III

### VLMG-9 - Actions and Recommendations

**Action 1:** WMO-SP engage RA II WIGOS coordination group chair to investigate the benefits for VLab involvement in the RAI/V “Satellite Data Requirements” process, with the aim to encourage VLab participation in the meeting, noting that training is part of the meeting purpose ([http://www.jma.go.jp/jma/jma-eng/satellite/ra2wigosproject/ra2wigosproject-intro\\_en\\_jma.html#workplan](http://www.jma.go.jp/jma/jma-eng/satellite/ra2wigosproject/ra2wigosproject-intro_en_jma.html#workplan)) Regional VLab members to also brief their representatives who could be at the meeting

**Deadline:** Next WIGOS meeting

**Actionee(s):** Werner Balogh and VLMG members from RA II&V

**Action 2:** VLab Co-Chairs to contact the Chair of the International Conference Steering Committee of AOMSUC, Dr. Jim Purdom, to invite the training event organisers to involve VLab in the design of the training event associated with the Conference (looking to 2019 and beyond) - contact BoM/KMA.

**Deadline:** 20 October 2018

**Actionee(s):** VLab Co-Chairs

**Action 3:** VLab to organise an informative online presentation (or another training intervention) to provide awareness on the use of satellite data in climate monitoring. This should be translated to the 7 languages used within VLab. (this was originally VLMG-8 Action 12).

**Deadline:** 2019

**Actionee(s):** Kathy-Ann to form a working group and coordinate the progress of this action. WG members: Kathy-Ann C., Christine Traeger (EUMETSAT). Nancy S. and Bernie C. to possibly indicate people from their contacts to collaborate in this WG.

**Action 4:** Mark H. to invite Christine Traeger (EUMETSAT) to present EUMETSAT’s work on training for the use of satellite data on climate services. This should be an online presentation to VLMG.

**Deadline:** Dependant on Christine’s availability

**Actionee(s):** Mark H. and Lu V.

**Action 5:** Add a new question to the reporting template, requesting a statement describing a situation where VLab members’ activities resulted in impact related to aspects in the VLab Strategy document.

**Deadline:** Nov/2018

**Actionee(s):** Lu V.

**Action 6:** VLab reporting period to be changed to Dec/year“n” to Nov/year“n+1”. Deadline to submit reports to TSO is Dec/year“n+1”.

**Deadline:** Nov/2018 (to circulate the template). Submit reports Dec/2018

**Actionee(s):** Lu V. to adapt template. VLMG to adopt new reporting period

**Action 7:** Updating and translating the VLab Factsheet. Include benefits of being part of VLab Network.

**Deadline:** December 2018

**Actionee(s):** Lu V., Bernie C. and Marcial G.

**Action 8:** Disseminate VLab Summary of annual report to WMO-ETR for transmission to National Focal Points.

**Permanent action**

**Actionee(s):** TSO

**Action 9:** Mark to contact the Training Calendar developers and inquire, as a priority request, the enabling of satellite training events that are submitted via WMO Learn Calendar, to also show in the EUMETSAT Calendar front end (and all the members calendars).

**Deadline:** November 2018

**Actionee(s):** Mark H.

**Action 10:** Mark to send appropriate instructions and Code to display the Training calendar on VLab members' and partners' websites. Bernie C., Winifred J., Marines C., Brock B., Marcial G., Natalia R., Lu V., Nancy S., and Humaid A. voiced interest on receiving the instructions.

**Deadline:** December 2018

**Actionee(s):** Mark H.

**Action 11:** EUMETSAT is further developing the Calendar, and intends to involve VLab members, in order to make sure their needs are addressed. Volunteers are needed from VLab members and partners to take part in the pre-release development testing.

**Start:** August 2018 to February 2019

**Actionee(s):** Mark H. Volunteers: CoE Australia, CMATC, ARSET, and maybe CoE South Africa.

**Recommendation:** VLMG recommends all training organisers to: 1) Design courses following the WMO Guidelines for Trainers in Meteorological, Hydrological and Climate Services (WMO-No. 1114), available at

[http://www.wmo.int/pages/prog/dra/documents/wmo\\_1114\\_en.pdf](http://www.wmo.int/pages/prog/dra/documents/wmo_1114_en.pdf)

2) Link courses to the relevant WMO skills / competencies frameworks (see WMO Guide to Competency – WMO-No 1205 at [https://library.wmo.int/doc\\_num.php?explnum\\_id=4237](https://library.wmo.int/doc_num.php?explnum_id=4237) and more information on the Competency Frameworks at <http://www.wmo.int/pages/prog/dra/etrp/competencies.php>).

**Action 12:** Add to VLab Terms of Reference that the Co-Chair representing Satellite Operators will check the Annual CGMS final meeting report for actions involving the VLab.

**Permanent Action**

**Actionee(s):** Co-Chair representing Satellite Operators



**Action 13:** VLab Co-Chair to contact CGMS secretariat to request that CGMS meeting actions and recommendations that involve VLab are communicated to VLab Co-Chairs for acceptance prior to publishing of the final report.

**Deadline:** Before CGMS-47

**Actionee(s):** Mark H.

**Action 14:** VLMG to discuss and propose a process to ensure Co-Chairs attendance to IPET-SUP and CGMS meetings.

**Deadline:** December 2018

**Actionee(s):** VLMG

**Action 15:** Design and implement a training request form to be available in the VLab website. This should allow users to send requests directly to their selected CoE, using the language the training is requested. A disclaimer should be used in order to clearly inform that making a request does not guarantee the training will be offered by VLab.

**Deadline:** December 2018

**Actionee(s):** Lu V. to draft. VLMG to revise, test and approve the form.

**VLMG and Partners Joint Recommendation:** VLMG and Partners recommend that satellite training providers use Creative Commons License by attribution (CC BY) to provide clear identification of copyrights license in their training resources (see <https://creativecommons.org/licenses/by/4.0/>). This is an effort to improve sharing of resources, and is also part of adapting to the standards for submission of resources to the WMO Learn Library. NOTE: VLMG Partners attending VLMG-9 will further discuss this recommendation within their members for ratification).

**Action 16:** VLMG to disseminate the recommendation via CGMS, IPET-SUP, WMO-ETR, and other networks

**Deadline:** July 2019

**Actionee(s):** VLMG

**Action 17:** VLMG and partners to investigate and identify where duplication efforts occur in training for the utilisation of data and products from meteorological and environmental satellites. All to report back in the VLMG online meeting in a year time.

**Deadline:** June 2019

**Actionee(s):** VLMG and partners

**Action 18:** Werner to share the links to Regional Centres for Space Science and Technology Education (affiliated to the UN). VLab members to check these links with the aim to identify opportunities for collaboration and the existence of duplication of efforts.

**Deadline:** July 2018

**Actionee(s):** Werner B. and Lu V. provide links in the VLMG-9 meeting website. VLMG and partners to investigate opportunities.

**Action 19:** VLab to invite Adrian Trotman (CIMH) and Rich Jeffries (UCAR) to make presentations on GFCS and IDSS to inform VLMG.

**Deadline:** Aim October 2018

**Actionee(s):** Kathy-Ann C. to invite presenters, and TSO to organise the online presentations

**Action 20:** Werner B. to contact WMO-ETR to find out how other Skills' Sets are being handled to assure the "Guidelines on Satellite Skills and Knowledge for operational meteorologists" are handled in the most appropriate way.

**Deadline:** September 2018

**Actionee(s):** Werner B.

**Action 21: VLab to** Investigate if there is an "agriculture competency" within WMO.

**Deadline:** September 2018

**Actionee(s):** Mark H.

**Action 22:** New training resources created from now on, should include identification of the satellite skills and knowledge addressed (up to level 3).

**Permanent action**

**Actionee(s):** All VLab Members

**Recommendation:** Whenever appropriate, the satellite skills and knowledge addressed in a training event should be identified in the certificate of participation.

**Action 23:** VLab members who produced Quick Guides to investigate the copyrights license of these resources and share the original template (if appropriate). Existing Quick Guides to be listed and files (pdf and original design format, when possible) to be provided to VLab TSO. Files to be made available in the VLab Central Website (and submitted to WMO Learn Resources Library).

**Deadline:** October 2018

**Actionee(s):** Bernie C., Vesa N., Lu V.

**Action 24:** Write a white paper to propose the continuation of projects in the creation of CM4SH. White paper to be submitted to the agencies supporting the CoEs involved in the project.

**Deadline:** November 2018

**Actionee(s):** Natalia R., Marines C., Bernie C., Lee-ann S.

**Action 25:** VLMG members to identify what is happening within their regions in terms of co-creation of content related to satellite meteorology.

**Deadline:** Next VLMG online September 2018

**Actionee(s):** All VLMG members and partners

**Action 26:** Final drafting of the New VLab Strategy document (2020-2024) to be concluded by a strategy WG.

**Deadline:** 31 August 2018

**Actionee(s):** Duncan T., Humaid A., Bernie C., Werner B. and Kathy-Ann C.

**Action 27:** VLMG to revise the final draft of the New VLab Strategy document 2020-2024 (provided by the WG at the end of August), and be ready to discuss and approve the text.

**Deadline:** VLMG online meeting - beginning of September 2018

**Actionee(s):** VLMG

**Action 28:** CoEs to consider the possibility to nominate a candidate to act as VLab Co-Chair for the next 3 years (starting November 2018), and or a designate co-chair (to assume in 3 years-time).

**Deadline:** VLMG online meeting in September 2018

**Actionee(s):** VLMG

**Action 29:** VLMG to revise the VLab expectations documents after the new VLab Strategy is finalised.

**Deadline:** Revision to start in September

**Actionee(s):** VLMG

**Action 30:** EUMETSAT to organise VLMG-10 (August 2020). BoM to explore the possibility of organising VLMG-11 (2022), and CoE Costa Rica VLMG-12 (2024). Other VLMG members interested in hosting the meeting are welcome to propose hosting too.

**Deadline:** VLMG-10

**Actionee(s):** Mark H., Duncan T., and Marcial G.