A Global Campus Roadmap
for the
World Meteorological Organization

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Executive summary

The WMO Global Campus is an initiative that intends to assist WMO Regional Training Centres and other WMO-Member training Institutions to work together more collaboratively. The rationale for the WMO Global Campus is to help WMO Members meet the growing range and depth of education and training demands required to develop their service capabilities and ensure the competence of personnel and institutions.

The WMO Global Campus Roadmap provides an overview of the Global Campus journey from 2013 through 2030 (four WMO inter-sessional periods). This document provides an insight into the rationale behind the development of the WMO Global Campus and describes the underpinning methodology of the initiative, its themes and priority activities, and its design and implementation.

The WMO Global Campus is based upon WMO’s tried and tested practice of linking Members’ existing facilities to create a coordinated, distributed network from the existing specialist WMO-related education and training institutions. As with other WMO networking initiatives such as observations and communications, the Global Campus establishes a network the disparate institutions and defines a mechanism for collaboration that allows sharing of education and training resources and knowledge. An underlying premise is ensuring that all Members can contribute to, and benefit from, the proposed networking arrangements.

The WMO Global Campus complements the existing WMO Regional Training Centres, and other institutions that provide education and training to WMO Members. By complementing the RTC network and providing additional access to education and training opportunities that are not available nationally or through the RTCs, it is expected that the this mechanism will enhance education and training opportunities.

The WMO Global Campus mechanism is expected to increase the effectiveness of the WMO Education and Training Programme as it helps the community to create and implement standard and best practices, encourages institutions to work together and provides capacity that no one Member could create. While each participant will need to consider customization and translation needs, starting from a shared pool of resources and expertise will strengthen their efforts.

The WMO Global Campus Roadmap document has been drafted to assist WMO Members prepare for discussions during Cg-18 in 2019.
Preamble

Following a very successful two year secondment of an expert by the United Kingdom to work on the Global Campus it was determined that a roadmap was needed to guide the feasibility study for the Global Campus. This draft WMO Global Campus Roadmap for the World Meteorological Organization, hereafter referred to as “the Roadmap”, was developed by the WMO ETR Office and the Executive Council Panel of Experts on Education and Training. They were assisted by Members and Experts from Australia, Canada, China, Kenya, New Zealand, United Kingdom, and the United States of America.

This document is intended as a report to the Eighteenth World Meteorological Congress (Cg-18) in May 2019.
1. Introduction

Following the introduction of the Global Campus concept in Toulouse, France in October of 2013, in 2014, the World Meteorological Organization (WMO) Education and Training (ETR) Office distributed surveys to all Members and estimated that, over the next 20 years, WMO Members will have a gap between demand and supply for the training of a global NMHS workforce of around 200,000 people. The Office concluded that the current global training infrastructure as it exists will not be able to meet this expected increase in demand without increasing the efficiency and effectiveness of collaborative efforts among training institutions and introducing new approaches to training.

At the 66th session of the WMO Executive Council (EC-66), it was recognized that collaboration in developing and sharing of the identified needs, training resources and expertise available from the Regional Training Centres (RTCs) and other training institutions represented one possible, cost-effective approach to address the growing training deficit worldwide. WMO EC-66 agreed that a feasibility study for such a mechanism, a WMO Global Campus, should proceed.

The following specific issues were identified as challenges to be addressed through a WMO Global Campus:

1. Changes in workforce numbers, profiles, and roles;
2. Expansion of existing and new services for NMHSs;
3. Lack of training resources in some countries to support development and expansion of current capacity;
4. New training and new approaches to facilitate meeting competency standards;
5. New training strategies, technologies, and delivery methods that could make training more efficient and cost-effective; Stresses to training budgets.

A WMO Global Campus provides a way to enhance how WMO RTCs and other training institutions can work collaboratively to meet the training needs of WMO Members. It builds on the well-established WMO RTC network, and has the potential to significantly increase global access to training, both face-to-face and on-line. RTC Directors and the Steering Committee established to guide this mechanism recommended the term “WMO Global Campus”.

1.1 Rationale and background

The WMO Global Campus was first introduced as a nascent concept during the WMO SYMET meeting in Toulouse, France, in October 2013. During this initial meeting, the following concerns were raised that have required further clarity:

1. Was it a replacement or a supplement to the existing WMO RTCs?
2. Did it represent a new institution to be governed?
   1. If so, how would it be funded and how would it be governed?
   2. How would any new technical and material resources and expertise be acquired?
3. Did it suggest a turning away from traditional training approaches?
Such questions led to a series of WMO meetings in 2014 and early in 2015 to better articulate the concept. At the WMO Standing Committee of Heads of Training Institutions and their Coordinating Committee (SCHOTI-COCOM) meeting in September 2014, the WMO Global Campus was further defined as:

“The ‘Global Campus’ is a collaborative network of education and training institutions and NMHSs involved in the development and delivery of training in meteorology, climatology, hydrology and other related sciences. It is built on the synergies, sharing and cooperation between these institutions and will address global priorities and the growing and changing requirements and needs for training of the community.”

The vision behind the WMO Global Campus concept is to have a coordinated and collaborative network of institutions that work together to meet the education and training needs of WMO Members. It will build upon the existing network of RTCs but expand this to recognize other contributing national and international organizations and academic institutions, promote the use of new training delivery mechanisms, and take into account new and emerging training needs. The WMO Global Campus framework provides a coordination and communication system, as well as associated information and data tools that will enhance the sharing of resources, knowledge and expertise, and the efficiency and effectiveness of the overall network.

EC-66 decided that the EC Panel of Experts on Education and Training (EC Panel on ETR) should proceed with a feasibility study on the WMO Global Campus concept and listed a series of items that should be investigated. A detailed proposal for the establishment of, and implementation plans for, a WMO Global Campus was prepared and presented to the Seventeenth World Meteorological Congress (Cg-17) in May 2015. Cg-17 directed further investigation of the Global Campus concept by means of the feasibility study, the results of which would be presented to CG-18.

1.2 Development stages of the feasibility study
A summary of the evolution of the WMO Global Campus concept, the feasibility study, this Roadmap, as well as, future decisions required is depicted in Figure 1.
Figure 1: Key milestones in the WMO Global Campus feasibility study.

A list of WMO RTCs operating globally is contained in Annex 1. However, it is noteworthy to mention the number of WMO RTCs operating in each Region:
1. 8 in WMO RA I;
2. 7 in WMO RA II;
3. 4 in WMO RA III;
4. 2 in WMO RA IV;
5. 2 in WMO RA V;
6. 4 in WMO RA VI.

1.3 Objectives of the Roadmap
The Roadmap is intended to provide guidance on:
1. the implementation of the WMO Global Campus and how to derive maximum benefits from the initiative;
2. how to leverage and utilize the WMO Global Campus to build capacity within specific areas of interest and responsibility;
3. the requirements and benefits of the WMO Global Campus and its potential benefits for WMO Members.
2. Benefits of the WMO Global Campus to Members

One goal of the Global Campus is to help align the WMO Training delivery with the UN goals. One UN goal is to support national strategies and increase resilience. Recognizing that capacities for NMHSs to service their national sectors vary, the implementation of the WMO Global Campus may help NMHSs to increase their engagement with partners and capacity to support national strategic plans and policies, and ultimately contribute towards increased resilience.

While potential social, economic, and environmental benefits are described below, the overall benefits to Members from enhanced capacity and competence expected from the WMO Global Campus include, but are not limited to:

1. Increased training opportunities to support broadening of the knowledge-base, skills and job competencies of NMHS staff, especially NMHSs in Least Developed Countries (LDCs), Small Island Developing States (SIDS) and Developing Countries in general;
2. Increased cooperation among WMO RTCs and other training institutions and access to existing training for WMO competencies resulting in streamlining the development of education and training programmes and resources by participants;
3. Narrowing of the gap in the quality of training programmes and resources between training institutions;
4. Increased interaction with WMO programmes and Commissions and promotion of compliance with WMO standards;
5. Reduction in the overall cost of some training events, thus allowing more persons to receive high quality training as a result of the Global Campus quality assurance process;
6. Reduction in the environmental impact of training;
7. And ultimately, contribute to development and delivery high quality products and services by NMHSs and other beneficiaries.

2.1 Social benefits

NMHSs and other Members’ institutions contribute to the safety and well-being of society by providing weather, climate and hydrological/water information to sensitive sectors at the spatial and temporal scales necessary for informed planning of risk and decision-making. The ability of NMHSs to develop and deliver the relevant information and services to national, regional and international stakeholders is strongly dependent on the capabilities of their human capacity and access to technology.

A goal of WMO is to align initiatives to the UN Sustainable Development Goals (SDG). The Global Campus is an initiative under the WMO ETR Program and is aligned to the UN SDGs. In 2015, the UN identified 17 SDGs aimed at improving the quality of life and society, especially in Least Developing Countries and Developing Countries. WMO has noted that achieving and sustaining many of these SDGs requires access to some level of weather, climate and hydrological/water information. As a result, WMO has identified 11 of the 17 SDGs that align with its areas of work of the organization. These include Goals 1, 2, 3, 6, 7, 9, 11, 13, 14, 15 and 17 (https://public.wmo.int/en/resources/bulletin/wmo-supporting-2030-agenda-sustainable-development). Education and training is a cross-cutting activity within WMO in support of these goals.
Underpinning all WMO programmes is the requirement for knowledgeable and competent professionals in NMHSs to support implementation of activities and delivery of services. Enabling the development of capacity will allow these organizations to improve their services and in so doing enhance the socio-economic development of their respective countries. However, having access to low cost, but effective, training required to achieve the critical mass of personnel required to make a significant difference in many of these countries has been a major limitation.

The WMO Global Campus is intended, at its core, to address the challenge of providing increased access to capacity development opportunities to NMHSs to support the building of a critical mass of staff with the requisite expertise to sustainably deliver user required products and services. It is expected that by increasing the sharing of identified training needs, resources, expertise and opportunities through open platforms, increasing collaboration in the development of high quality training materials, using training impacts assessments to guide improvements, and increasing lower cost training delivery systems, that the number of well-trained persons in NMHSs of members, LDCs and SIDS can be increased to a sustainable critical mass. The increased opportunities and access to hydrometeorology and climate training materials could also aid in achieving gender balance within WMO Members.

2.2 Economic benefits

With the rise in occurrences of severe weather events and the increases in vulnerable populations the accuracy of NMHS products and services are critical factors in member countries ability to make decisions that save lives and property needed to support national economies. Early warning services and forecasts inform economically-driven decisions that mitigate the effects of meteorological and hydrological hazards.

The WMO Global Campus will support the delivery of economic benefits to Members through the provision of a cost-effective platform to increase training opportunities to Members. It is anticipated that through the WMO Global Campus, the number breadth of training opportunities to Members will increase, with the greatest benefits being in the Developing Countries and LDCs. It is expected that the increased capacity resulting from the implementation of the WMO Global Campus will result in more accurate, timely and impact-oriented weather, climate, water and related environmental services from Members, in particular from their NMHSs, and consequently make a significant contribution to economic stability, efficiency, and growth in many sectors.

Significant efficiencies are expected from the WMO Global Campus as greater awareness of learning opportunities and sharing of educational resources (both materials and curricula plans) will reduce instances of duplicated efforts, generating cost savings that can be invested in other areas. In this way, more learning opportunities can be created and efforts can be sustained. The WMO Global Campus should also help identify opportunities for RTCs, training institutions and other partners to develop and deliver training that they cannot do by themselves.

2.3 Environmental Benefits

WMO and its Members monitor the environment and changes in climate variables over time, providing insight into possible impacts on the world’s climate, food and water security, natural ecosystems, and human health, among others. Changes are continuously occurring in rainfall and temperature, the chemical composition of the atmosphere, surface and groundwater availability,
land cover and soil condition, the temperature and chemical balance of the oceans, and pollutants in the air, water, and soil. Subtle changes in these parameters can have profound consequences for ecosystems, biodiversity, and food production systems.

The increased capacity and competence of NMHS personnel anticipated from the implementation of the WMO Global Campus is expected to increase understanding of changing weather patterns and environmental monitoring in Developing Countries, SIDS and LDCs, and is further expected to increase the rate of knowledge acquisition related to the impacts of weather, climate and hydrologic processes and socio-economic development in these countries. It is expected that the results of the increased capacity will improve planning and adaptation policies related to climate change, increased climate variability and extreme weather in countries around the world.

Core responsibilities of WMO include the focused coordination of education and training activities, developing capacity and competence in NMHSs, as it facilitates the delivery of products and services to communities and stakeholders. As NMHSs move toward impact based forecast, warnings and implementation of multi-hazard early warning systems (MHEWS), the need for training and education on the changing weather patterns, communication of impacts and support for decisions is growing. The WMO Global Campus initiative supports this activity through the sharing of information on course offerings, learning resources, and learning solutions across training institutions to enable efficient coordination in the delivery of education and training to NMHS personnel. The cost-effectiveness associated with enabling the sharing of resources and opportunities across institutions will facilitate training and capacity development opportunities to reach larger numbers of persons in, for example, Developing Countries, SIDS and LDCs. In these countries, the training and capacity development needs are greatest, and the investment can significantly strengthen the delivery and quality of NMHSs products and services to stakeholders. Hence, this Roadmap will help guide not only the activities of the WMO Global Campus but also the broader capacity development programmes of WMO and its partners.

For the WMO Global Campus to achieve its full potential, training centres and NMHSs in developed countries should take an active role. It is intended that the WMO Global Campus will provide the means to facilitate this involvement across the entire education and training community.

The WMO Global Campus will promote and facilitate access to shared training resources and online based training resources, diminishing, though not eliminating, the need of face-to-face training and thus the institutional, economic and environmental costs associated to travel.

3. Global Campus Priorities
3.1 Identification and design of Global Campus priority activities
The WMO Global Campus has the potential to be a transformational initiative capable of increasing capacity, especially in LDCs, SIDS and Developing Countries through the sharing of knowledge and know-how, learning resources, and enhanced collaboration between training institutions. This section will highlight the thematic focus areas and priority activities that have been identified to help bring about increased capacity through enhanced access to training.
The long-term success of the WMO Global Campus initiative will be determined by how well it facilitates WMO in achieving its strategic objectives, especially in its priority areas of

1. Capacity Development;
2. Disaster Risk Reduction;
3. WMO Integrated Global Observing System;
4. Aviation Meteorological Services;
5. Polar and High Mountain Regions;
6. Global Framework for Climate Services; and
7. WMO Governance.

As a result, a critical feature of the WMO Global Campus Roadmap is the support of WMO priority areas and activities. The Roadmap must be flexible and forward-looking to anticipate and adjust to changing WMO priorities, as well as the ranking of priorities, because education and training underpins all capacity development and technology infusion efforts of the WMO. WMO is continuously evolving in response to changes in technology, new opportunities and changes in the rules and regulations in downstream industries that are dependent on the products and services of WMO Members. Therefore, the WMO Global Campus must be built on principles that facilitate large-scale availability of training that can be delivered in rapid response to changing needs and priorities.

This section describes the principles behind the identification and design of priority activities for the WMO Global Campus Roadmap (both generic and project-specific) in areas aligned with WMO Goals and Strategic Objectives, the WMO Strategy for Service Delivery, defined thematic areas, other internal and external linkages and interactions. It is recognized that ongoing support to WMO Priority Areas is essential if the WMO Global Campus is to be a sustainable initiative. Section 4 outlines the work plan and status of the feasibility study at the time of the development of the Roadmap, as well as milestones through 2019.

For consistency, an approach similar to that used in the WMO DRR Roadmap has been adopted to illustrate how the WMO Global Campus initiative will seek to work collaboratively with existing and planned or potential future programmes, projects, and frameworks, and where appropriate, in partnership with third-party initiatives.
3.2 Thematic focus areas and alignment with WMO priorities

Figure 2. WMO Global Campus thematic areas

Figure 2 shows the foundational thematic focus areas, derived from the request of EC-66, guiding WMO Global Campus activities. These are driven by WMO Members needs as articulated by Congress, Executive Council and its panels, technical commissions, and the relevant strategic plans and priorities put forth by these bodies. The themes include:

1. **stronger linkages to WMO strategic plans** priority areas, regulations, and education and training standards

2. **increased collaboration among training providers**, including collaborative projects, exchange of experts and sharing of best practices

3. **sharing of quality assured learning opportunities and training resources** aligned to WMO competency and qualification frameworks,

4. increased communication to encourage awareness, research and **adoption of new curriculum advances and training practices**

5. development of and training on the use of **shared platforms and tools for delivering training**

6. **standard certificates and credit sharing systems** for more flexible attainment and documentation of qualifications and competencies
As described further in section 3.4, these thematic areas are directly linked to WMO Goals and Strategic Objectives, WMO Service Delivery Strategy and the WMO Capacity Development Strategy, and designed to aid advancements in all WMO priority areas, the human resources capacity development activities requested by all WMO Technical Commissions and carried out by WMO technical programmes, and the capacity development projects initiated by the WMO Development and Regional Activities Programme. The activities of these WMO programmes overlap and are coordinated in productive ways, and the WMO Global Campus seeks to support their implementation.

3.3 Priority activity areas
At a meeting of the RTC Directors, WMO established eleven initial priority areas, and these were further refined by EC-66 when they requested that the EC Panel on ETR proceed with a feasibility study on the WMO Global Campus. EC-66 (Resolution 4.6(1)/3) requested that the feasibility study include the following areas:

1. Building clarity of the concept of the WMO Global Campus and its potential benefits to WMO Members;
2. Investigating options to develop a trial WMO Global Campus registry of resources and activities, and as exploring possible modes of distribution, while considering infrastructure and IT capabilities of Members (Calendar and Catalog);
3. Establishing basic criteria for partners and providers to list resources and activities on the registry (Quality criteria) and developing ways to actively solicit and encourage organizations to offer their resources to WMO Members;
4. Testing and implementing new arrangements/processes that have the potential to provide more resources in multiple languages at modest cost;
5. Investigating ways to assure the quality of resources and activities available via the Global Campus;
6. Examining issues surrounding the acceptance of courses and academic credits from a dispersed set of providers by surveying representative users;
7. Engaging with at least one new global partner as a way of increasing the capacity for WMO education and training activities;
8. Seeking new resources for supporting education and training opportunities, especially in climate services, aviation, and hydrology, that can be made available to WMO Members;
9. Examining and testing ideas for providing training and support to RTCs so that they could:
   a. Make an increasing contribution to providing resources, particularly for e-learning, to the WMO Global Campus; and
   b. Benefit from the resources available via the WMO Global Campus;
10. Identifying and recognizing potential constraints/challenges in the implementation of the Global Campus and where possible, propose ways of overcoming them;
11. Identifying the human and financial resources required, along with possible resourcing arrangements, for implementation of the WMO Global Campus in terms of both initiation and maintenance.

The eleven EC-66 priority areas derive from the thematic areas shown in Figure 2
The WMO Global Campus feasibility study will be conducted through various demonstration projects designed to address as many of the 11 priority areas as feasible, thereby enhancing the availability of training to Members. The WMO Global Campus Working Group has commenced work on the WMO Global Campus Searchable Calendar/Catalogue system (Area 2), identification and delivery of aviation competency training and the expansion of training and learning resources for the Climate Services competencies (Area 8). In order for these areas to be addressed, Areas 1 (Building clarity), 3 (Quality criteria) and 11 (Identifying resources) were also addressed. Implementation work in these priority areas will be advanced while the WMO ETR office and the Global Campus Working Group continue to focus incrementally on the others as well. These activities are expected to have a notable impact on the quantity and access to training activities for WMO Members. Impacts of the initial demonstration efforts will be reported to Cg-18 in 2019.

Figure 3 shows the initial priority activities being carried out in the demonstration project (in bold), as well as the associated activities being initiated, all linked through pathways required for implementation of the roadmap. These include activities related to the organization of the WMO Global Campus partners and communication methods used to build community, as well as activities related to the implementation of new tools and technologies. These are not independent, however, and finally merge toward common goals.

Key activities required to develop the Roadmap and for its continuing design and implementation include, but are not limited to:

(i) Stakeholder identification and engagement through a consultative process designed to elicit information on needs;

(ii) Review and alignment of relevant training offerings with WMO policies and guidance materials;

(iii) Review of the objectives of the various WMO programmes and commissions to identify training needs and strategic objectives;

(iv) Reviews of WMO publications, regional reports, and other available reports that provide information on current and future training needs; and

(v) Consultations with WMO Executive Council and technical commission expert panels.
3.4 Internal and external linkages and interactions

Internal Linkages and Interactions:
The following are key linkages for guiding development of the Roadmap, determination of themes, and design of activities. These linkages represent sources of influence for the Global Campus feasibility study activities and areas of alignment within other WMO activities and plans, which will ensure that the initiative meets its goals to help WMO Members meet the growing range and depth of education and training demands required to develop their service capabilities and ensure the competence of personnel and institutions.
WMO technical guidance, including WMO-No. 49 Technical Regulations
The WMO Global Campus activities are driven in part by the need for Members to access cost-effective training in an efficient manner that allow them to build the required competencies in their services to comply with the standards and recommended practices described in the WMO Technical Regulations and the various Manuals and Guides produced by the WMO Technical Commissions. Education and training resources developed and disseminated through the WMO Global Campus will be identified as following recommended quality assurance standards and, where appropriate, contributing to the implementation of the regulations and competency frameworks described in these publications. The WMO Global Campus mechanisms will include quality assurance processes based on those outlined in WMO-No. 1114, Guidelines for Trainers in Meteorological, Hydrological and Climate Services.

WMO Service Delivery Strategy
The WMO Service Delivery Strategy ((http://www.wmo.int/pages/prog/amp/pwsp/documents/WMO-SSD-1129_en.pdf)) sets forth the cyclical stages for developing and delivery meteorological, hydrologic, and climate services (see Figure 4).

![Figure 4. WMO Service Delivery Strategy.](image)

The four stages of a continuous, cyclic process for developing and delivering services are:

1. User engagement and developing partnerships
2. Service design and development
3. Delivery
4. Evaluation and improvement

The six elements necessary for moving towards a more service-oriented culture are:

1. Evaluate user needs and decisions
2. Link service development and delivery to user needs
3. Evaluate and monitor service performance and outcomes
4. Sustain improved service delivery
5. Develop skills needed to sustain service delivery
6. Share best practices and knowledge

The WMO Service Delivery Strategy informs the operations of the education and training component of any NMHS, as well as other institutions supporting the development of NHMS staff. For this reason, the WMO Global Campus links to it.

The Global Campus directly supports the Evaluation and Improvement stage. In this stage, the ability of members to meet the needs of their stakeholders in an effective and efficient manner is assessed. Where deficiencies related to the competence of staff are identified, a cost-effective human resources capacity development programme that complies with national and international
standards can be designed and delivered, taking advantage of the content offered and partnerships that might be developed within the WMO Global Campus.

The Global Campus also supports the **User Engagement and Developing Partnerships stage**. The Global Campus facilitates greater user engagement and participation of Members and the general public in the education and training process through online sharing of educational and training materials and advertisement of opportunities. The Global Campus provides an open and collaborative platform that encourages co-development of training materials and courses. In doing so, the Global Campus represents a key mechanism for the strengthening existing partnerships and developing new innovative partnerships, especially if regulation is carefully balanced between the need to ensure quality products and the desire of partners, especially those partners with less capacity, to contribute to the platform. Co-development of products is expected to be a natural outcome of user engagement and partnership development. Such co-development supports sharing knowledge and know-how, bridging the north-south gaps that are frequently observed in education and training. Finally, students from differing institutions participating in the same instructional events increases sharing, fosters ongoing collaboration, and leads to partnerships that could increase benefits to stakeholders.

The Global Campus supports the **Delivery stage**, in this case the delivery of education and training services. The Global Campus represents an attempt to improve the delivery of high-quality education and training services to a large segment of Members. Increasing the competence of staff in NMHSs is expected to lead to an improvement in the quality of products and services delivered to stakeholders.

The Global Campus supports the **Service Design and Development stage** as the provision of greater opportunities to participate in the education and training process will lead to new ideas to design/redesign and develop/redevelop services and products that will further address the needs of stakeholders. Where products and services are redesigned and redeveloped, greater efficiencies may be achieved.

Of the six (6) elements necessary for moving toward a more service oriented culture listed above (see Figure 4), the WMO Global Campus has direct linkages to three (3):

1. **Element 3** - Evaluate and monitor service performance and outcomes

2. **Element 5** - Develop skills needed to sustain service delivery

3. **Element 6** - Share best practices and knowledge.

The global collaboration and sharing promoted and supported by the WMO Global Campus will facilitate these necessary elements.

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**WMO Capacity Development Strategy and Implementation Plan WMO-No. 1133**

The WMO Global Campus, with its emphasis on aiding Members to be compliant with WMO standards regarding performance levels of staff members, particularly through collaboration
between global and regional centres for education and training, aids the WMO Capacity Development Strategy particularly in its Objectives 1, 3, 5 and 6.

1. Objective 1, ‘Define required capacities and identify deficiencies’, will be aided by the sharing of best practices in regards to learning needs assessment and competency assessment.

2. Objective 3, ‘Optimize knowledge management’, will be aided through the WMO Global Campus mechanisms for sharing best practices and best learning opportunities.

3. Objective 5, ‘Strengthen global, regional, and subregional mechanisms’, will be aided through strengthening of the WMO Regional Training Centre network, as well as involving other institutions and WMO centres involved in education and training activities for WMO Members.

4. Finally, Objective 6, ‘Increase education and research opportunities’, will be directly aided through mechanisms for raising awareness of and access to events and available learning resources, as well as stimulating collaborative development of learning opportunities as a mechanism to reducing costs.

WMO Programmes and Frameworks (e.g., GFCS, DRR Roadmap, CSIS, etc.)

It is expected that the WMO Global Campus will provide capacity development opportunities for all members as education and training cuts across all WMO programmes. The ability is demonstrated in the following examples:

1. **GFCS Climate Service Information System**

   The competence of persons building and providing climate products and services under the CSIS of the GFCS is critical as many of these products and services will guide planning and policy actions essential for adaptation to climate change and increasing variability at either community, national or regional levels. Because climate change and increasing climate variability will impact SIDS and Least Developed Countries disproportionately, and due to the limited human resources available in many of these countries, providing low cost access to education and training to expand the competence of local personnel is needed to improve decisions on adaptation if these countries are to achieve their sustainable development goals.

2. **Aviation**

   Safety is the cornerstone of the aviation industry. Underpinning this safety are quality management systems that stress, among other things, the competence of individuals providing service to the industry. As meteorology services provide critical support to the aviation sector, and because the level of service is expected to increase in the future, the competence of meteorological personnel supporting the aviation sector is critical. The WMO Global Campus provides a mechanism to facilitate access to up-to-date low cost training opportunities and information to them.
3. **Water Resources Management**

Access to water is critical for sustainable development. Although managing water resources is an essential consideration for all countries, unfortunately many Least Developed Countries and SIDS lack sufficient capacity to effectively manage their water resources. This challenge is becoming greater due to the increasing frequency of severe weather, climate change and increasing climate variability. This situation is compounded by increasing competency standards in the water sector globally. The WMO Global Campus will provide a low-cost mechanism for such countries to access training, information and partnerships essential for building competence in the water sector.

**Links to WMO Members, Commissions and Programmes**

The WMO Global Campus initiative will assist the WMO Secretariat in its work to ensure all Members meet the standards and best practices described in WMO Technical Regulations by offering more avenues for guidance and training. It will support the WMO Technical Commissions and Technical Programmes by providing greater access to the courses and resources they promote to meet their strategic objectives. In addition, the strengthened collaborative training network that is created can aid in identifying training needs, creating effective training solutions, and generating cost-saving partnerships for meeting these objectives.

**WMO Long-term Goals and Strategic Objectives (SO)**

For the current WMO Strategic plan, 2016-2019, the Global Campus feasibility study is initially most directly working to support the following key three priority areas through activities designed to increase access to education and training opportunities:

2. Implement climate services under the Global Framework for Climate Services.
4. Improve the ability of NMHSs to provide sustainable high-quality services to support the safety, efficiency and regularity of air traffic management worldwide.
6. Enhance the capacity of NMHSs to deliver on their mission.

In the draft WMO Strategic Plan 2020-2023 (Decision 16.2(1)/1, EC-69), a set of goals and strategic objectives for the coming quadrennial are articulated, to be refined for further consideration by EC-70. The draft goals are presented below:

1. Better serve societal needs: Delivering actionable, authoritative, accessible, user-oriented and fit-for-purpose services
2. Enhance Earth system observation and predictions: Strengthening the technical foundation for the future
3. Advance targeted research: Leveraging leadership in science
4. Close the gap on service: Enhancing and leveraging existing capabilities among all WMO Members to bring capability to all
5. Work smarter: Supporting effective policy- and decision-making and implementation in WMO

To the extent that each of these draft goals depends upon human resources capacity development efforts, the WMO Global Campus initiative has the potential support all through the increased
access and lower-cost learning opportunities. It will particularly assist in meeting draft Goal 4, through mechanisms to better understand learning needs of developing countries, providing opportunities to strengthen core competencies and expertise, and establishing strategic partnerships to help in achieving these. It also represents an attempt to “Work smarter” (draft Goal 5) in the context of the existing WMO Education and Training Programme through supporting collaboration and sharing.

External Linkages and Interactions:

1. The WMO Global Campus should consider partnerships with other international training organizations such as UNESCO IHE, UNITAR, UNESCO-IOC, GEO and GWP among others to (i) expand global awareness of opportunities, (ii) increase catalog content, (iii) co-develop new cross-cutting products and services, (iv) develop and implement quality standards and (v) facilitate resource mobilization. Consultations with UNESCO-IOC and UNITAR have already contributed to the development of this road map.

2. The WMO Global Campus initiative may provide increased support to international development programmes (e.g., Sendai Framework for Disaster Risk Reduction 2015-2030, Paris, SAMOA Pathway and the UN Sustainable Development Goals among others) as key activities for the success of many of these agreements include capacity development (particularly in SIDS, Developing Countries and Least Developed Countries) and development and transfer of technology and knowhow (through north-south and south-south partnerships) in areas of weather, climate and water to improve community, national and regional decision-making. The key activities in the areas mentioned, already being addressed by the WMO Secretariat, are well aligned with the core activities and principles of the WMO Global Campus and will benefit significantly from the initiative given that it promotes inexpensive training opportunities through the sharing and collaboration.

3. International and national standards on Education & Training, such as ISO 29990, quality standard frameworks for academic content, International education and training organizations and professional societies identify best practices in education and training, including training solutions, instructional technologies, implementation of competency frameworks, standard certification methods, and ways for developing the skills of training professionals. These offer sources for potential solutions to address WMO Global Campus activities. Academic organizations must work with their Permanent Representatives to gain approval for their individual programs in meeting the WMO 1083 standards. Each country Permanent Representative must approve the academic programs that support their workforce. These programs should be reviewed to insure compliance with WMO 1083 requirements to ensure compliance with ICAO standards.

4. Credit transfer systems such as ERASMUS and many other regional networks of institutions that promote freedom of choice and movement in reaching required educational levels can serve as models, or be leveraged, to achieve WMO Global Campus goals.
4. Progress and plans for priority activities (2016-2019)

Section 4 discusses the plans and priority activities for the WMO Global Campus for the Period 2016-2019 and the annual progress made during this period.

The plans and priority areas for the WMO Global Campus result from numerous contributions from WMO RTC Directors, the WMO ETR Office, the WMO EC ETR Panel of Experts, EUMETSAT, COMET, CIMH and the UKMET Office College. The WMO EC ETR Panel in their capacity as the WMO Global Campus Working Group holds monthly meetings to monitor the progress and discuss the activities associated with the WMO Global Campus Workplan. In 2014, the initial ideas for the Global Campus Workplan were drafted during a meeting at WMO Secretariat. In 2015 during the RTC Directors meeting at Langen, Germany, the workplan was further refined and then finalized and approved at the WMO ETR Panel of Experts Meeting in Florence Italy in 2016.

Table 1 shows the WMO Global Campus Workplan currently being executed through 2019. Under the columns identified by calendar year is a list of the annual accomplishments.

Table 1: Global Campus Workplan through 2019, depicting planned actions and milestones ahead of Cg-18.

<table>
<thead>
<tr>
<th>Calendar and Catalogue</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. MOODLE: CIMH will host the prototype with work starting 1 May 2016.</td>
<td>1. CMIH will maintain the Moodle prototype and members will add content.</td>
<td>1. EC demonstration of the working systems</td>
<td>1. Expansion of the system into other WMO Priority Areas.</td>
<td></td>
</tr>
<tr>
<td>2. EC Panel Demo – all EC panel to have loaded courses onto the Calendar prototype.</td>
<td>2. EC panel to work with CBS to explore the use of WIS for the Calendar/Catalogue.</td>
<td>2. Continual improvements to the systems based on initial adoption and feedback.</td>
<td>2. Promotion of the use of the Calendar and Catalogue by all learning services providers.</td>
<td></td>
</tr>
<tr>
<td>3. Progress and refine Metadata and QA processes, building on details from EC panel papers 9 and 12, this should consider what other MD details are needed for cataloguing</td>
<td>3. Technical team will explore additional platform options for the final implementation</td>
<td>3. Continued expansion of the systems through promotion with Members and Technical Commissions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Operational Prototype by end of 2016 will need a technical team to determine and implement the required functionality.</td>
<td>4. Recommend to EC the final platforms.</td>
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<tr>
<td>5. Technical team to produce a user guide.</td>
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<tr>
<td>6. The focus will be on submissions related to aviation and climate services training</td>
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<td></td>
<td></td>
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<tr>
<td>7. WIS: Request through EC for CBS to investigate calendaring metadata</td>
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A Global Campus RoadmapV2.13 clean5
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<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate Services</td>
<td>1. Gather more submissions of learning opportunities</td>
<td>1. Growing collection of Climate Services learning opportunities available through the Calendar and Catalog</td>
<td>1. Mature collection of Climate Services learning opportunities</td>
<td>1. Ongoing collection and utilization of Climate Services learning opportunities</td>
</tr>
<tr>
<td>Communications</td>
<td>1. Create a Global Campus Reference and Promotion Webpage on the WMO Website. 2. Create a bi-annual newsletter (June 2017 start) 3. Develop a Global Campus Roadmap 4. Benefit Stories of Global Campus activities 5. Define other communications options, 6. Identify and address challenges and risks 7. Define feedback mechanisms</td>
<td>1. Implement all communication options, including the WMO Public website, Facebook and LinkedIn social media, and the bi-annual newsletter. 2. Side-meeting on Global Campus at EC-69</td>
<td>1. Continued and explore new communications options 2. EC papers and presentations on WMO Global Campus</td>
<td>1. CG 18 papers and presentations 2. Ongoing communication through established media.</td>
</tr>
<tr>
<td>SYMET</td>
<td>1. Input to the SYMET Business case</td>
<td>1. Involvement in development, delivery and reporting of SYMET 2. Session(s) at SYMET on WMO Global Campus activities status</td>
<td>1. Report SYMET outcomes to EC-70 2. Addressing recommendation s and actions resulting from SYMET.</td>
<td>1. Ongoing Implementation of actions resulting from SYMET</td>
</tr>
</tbody>
</table>
Quality processes

| 1. Informal Review Panel recommends policies |
| 2. Form Review Panels for Aviation and Climate Services |
| 1. Formal Review Panels processes are implemented and refined |
| 1. Review the Review Panel processes for effectiveness |
| 1. Formal Review Panels in additional priority areas |
| 1. Ongoing implementation of the Review Panels |

Human and Financial Resources

| 1. Create a Technical Task Team for the Calendar/Catalogue implementation |
| 2. Seek additional funding for 2017 |
| 1. Seek funding partners and human resources |
| 1. Seek funding partners and human resources |
| 1. Seek funding stability through partners for infrastructure and human resources |

| 2016 | 2017 | 2018 | 2019 |

4.1 Initial Priority Activities

Early in the development of the WMO Global Campus concept it was determined that to provide the proper scope for development, a subset of tasks should be undertaken. During the Langen RTC Director’s conference the RTC Directors’ recommendations shaped the three key activities/demonstrations of the feasibility study, and were later endorsed by the EC ETR Panel. These suggested desirable features for a phase one implementation of a Global Campus, which included prioritization of the challenges to investigate.

These are:

1. **Global searchable calendar of events and catalogue of resources**

A WMO Global Campus Calendar website (learningevents.wmo.int/) has been established by the Caribbean Institute for Meteorology and Hydrology (CIMH) and is being populated with offerings from RTCs and other training institutions. A second platform is being investigated for implementation of the WMO Global Campus catalog of learning resources. A task team has been established by WMO ETR to guide the Calendar and catalog development and advise on a demonstration of the WIS integration approved at EC-68. The initial focus of both the calendar and the catalog will be training in support of WMO competency frameworks and other priority areas (first addressing Aeronautical Meteorology personnel and Climate Services). The Working Group will actively solicit and encourage organizations to submit their courses and resources to these databases.

2. **Aeronautical offerings**

The WMO Commission for Aeronautical Meteorology has developed a list of training materials mapped to WMO competencies (http://www.caem.wmo.int/moodle/course/view.php?id=7). In addition, a WMO Global Campus Aviation Task Team has developed an initial list of courses and academic programmes that address the BIP-M qualifications required of aeronautical forecasters. In 2017, these courses and resources will be submitted to the Global Campus Searchable Calendar and Catalogue to demonstrate the new capabilities provided by the WMO.
Global Campus. In 2016, the WMO President and Secretary General sent a letter to Permanent Representatives encouraging Members to take advantage of these courses and materials.

3. **Climate Services**

The CCI Expert Team on Education and Training developed the Competencies for Climate Services, which were approved by EC-68 for inclusion in WMO-No 49 Technical Regulations. The group is working for expansion and implementation of these competencies and to identify available learning opportunities to be listed in the WMO Global Campus Searchable Calendar/Catalogue.

4.2 Remaining Priority Areas:
In addition to the initial priority activities, additional development activities are being pursued. A description of these is provided below.

4.2.1 Building Clarity: The WMO ETR Office has sponsored numerous presentations and discussions to clarify the goals and potential benefits of the WMO Global Campus Concept. The EC-68 WMO Global Campus side meeting further clarified its goals and potential benefits. Discussion by EC-68 Members indicated a common understanding of the WMO Global Campus concept and suggested that clarity on the goals and benefits is growing among WMO Members. During EC-69 in 2017 another WMO Global Campus side meeting will be held to issue the initial draft of the WMO Global Campus Roadmap and provide a status update on all the priority areas. As the WMO Global Campus Searchable Calendar and Catalogue demonstrations continue and Members begin to utilize the WMO Global Campus capabilities, greater understanding is expected. Feedback received by members will also contribute to its refinement. New communications mechanisms are also being implemented (see section 4.4 below).

4.2.2 Quality Assurance: The WMO Global Campus Working Group has established a Review Panel to develop the processes and criteria to establish and validate the Quality Assurance requirements for listing content and courses via WMO Global Campus mechanism. These quality criteria are being put in place for the Calendar and Catalogue of learning resources, and will be tested as organizations increasingly inform about their courses and share resources.

4.2.3 Testing Processes for Translation of Content: WMO, Canada and the United States have developed a Guide to Translation Project Management, which was introduced to WMO RTCs at the Train-the-Trainer workshop in Buenos Aires in 2016. In 2017, a Translation Resource Centre was established at COMET to host the Translation Resource Guide and other translation templates and resources.

4.2.4 Establish Process for Transfer of Academic Credit: This action is still being evaluated by the EC Panel on ETR. Model systems used by other groups will be investigated as models.

4.2.5 Engaging New Global Partners: WMO Marine Meteorology and ETR Offices have engaged the International Oceans Society to begin discussions on collaboration and leveraging content to be utilized in the WMO Global Campus. More details will follow.
4.2.6 Provide E-learning Support to RTCs: WMO ETR Office is conducting a series of Train-the-Trainer Workshops for training providers in each WMO Region. These workshops include a focus on best practices in utilizing e-learning content in the classroom and are delivered in a blended learning format. The core assignment of the workshop requires participants to utilize the WMO Competencies for Training Providers to develop a training plan for classroom or e-learning delivery as a key part of the workshop outcomes.

The course contains a unit on developing and accessing online learning resources, and promotes the utilization of shared content between RTCs and other affiliated training institutions supporting WMO. WMOLearn is a communication mechanism for the WMO Global Campus. It provides a portal to opportunities for sharing and discovering learning events and resources, information about collaborative projects, and fora for stimulating collaborative efforts. WMO Learn will facilitate collaboration, raise awareness of successful efforts, and foster new ideas for human resources development efforts for WMO Members (see section 4.4). Future courses will identify WMOLearn and WMO Global Campus as significant resources for initial development of new instructor-led and blended-learning courses, as well as self-directed learning.

4.2.7 Identify Constraints and Solutions for Implementing the WMO Global Campus: Every institution wanting to contribute learning resources to the WMO Global Campus will be encouraged to share, to the extent they are able to do so, and to adhere to whatever copyright policies exist within their institution. Institutions will be encouraged to offer broad copyright licenses that allow reuse and adaptation (including translation) of materials offered, and will be shown methods to do this, but this is not mandatory. Those that offer more open copyright licenses could see more adoption and adaptation of their resources, which could in turn increase their reach and impact.

Recent research suggests that sequential micro learning pathways, or methods of linking small units of instruction, may increase the utilization of shared training resources between organization. However, this could require adoption of standard micro-learning pathways between organizations. Alignment of learning pathways with WMO Competency Frameworks may aid in the development of micro-learning pathways that can be shared between RTC’s.

The WMO Global Campus will not promote only on-line education and training. While an increase in the amount and quality of on-line training being developed, and delivered to assist WMO Members is expected, there will always be a critical role for face-to-face training. The Global Campus will encourage high-quality face-to-face offerings to increase as well.

Key challenges in implementing the WMO Global Campus include Quality Assurance, developing common learning pathways aligned to WMO competency frameworks, sharing of credit between institutions, and integrating the WMO Global Campus Calendar and Catalog with major WMO communication systems. Each of these challenges will impact collaboration between learning providers. The WMO Global Campus Working Group and Technical Advisory Team are focused on developing ways to overcome the limitations and implement solutions that will enhance utilization of the Global Campus and improve collaboration between learning providers.
4.2.8 Identify Human and Financial Resources to Develop and Support the Global Campus: While the human resources required for the feasibility study have come from many volunteers and some small short-term contracts made possible primarily by VCP Trust Funds, the long-term needs are being studied and carefully controlled. Action on this task for the long term will begin in 2017.

4.2.9 Collaboration: With the implementation of the WMO Global Campus Catalogue and communication mechanisms, the potential for effective collaboration between RTC’s and other training institutions will be enhanced. To ensure viability of content sharing centers of excellence for specific content areas may be identified. The utilization of agreed upon learning pathways may improve sharing of content between RTCs and centers of excellence. A future priority of WMO ETR and the EC Panel of experts is expected to focus on enabling collaboration between learning providers.

4.3 Financial and resource considerations
The creation of the Global Campus is not expected to increase costs to WMO Members through assessed contributions. Individuals and institutions accessing courses and learning opportunities via the WMO Global Campus may have to pay for these services as they currently do. The WMO Global Campus would not change costing structures already in place.

The WMO Global Campus is intended to increase access and sharing of products, opportunities and experiences. However, successful introduction of the WMO Global Campus will hopefully reduce costs in some areas as development costs are shared amongst institutions. It may also reduce costs by attracting additional external funding.

Attracting additional funding outside of the WMO Regular Budget is an additional challenge for the WMO Global Campus. Extra-budgetary funding has contributed to the WMO Global Campus feasibility study to date and will likely be the primary source of funding during the remainder of the development phase given that the implementation demonstrates value.

The success of the WMO Global Campus feasibility study will be assessed by Congress in 2019 who will determine whether it should be extended or operationalized. While implementation of the WMO Global Campus could follow the current funding modality, operationalization of the concept will require the development of operations, strategic and business plans to ensure the sustainability of the initiative. The development of these plans for presentation to Congress in 2023 will be guided by the WMO EC Panel on ETR during the inter-sessional period from 2019 through 2023.

4.4 Communication and outreach
It is expected that the ETR Office will take the lead in raising the profile of the WMO Global Campus within the wider educational community. Those participating in the feasibility study will be encouraged to do likewise.
To ensure that Members are kept abreast of the progress of the WMO Global Campus, the WMO ETR established a promotional portal in collaboration with the WMO Communications Office. This new portal, WMOLearn, on the WMO public website (http://public.wmo.int/en/resources/training/wmolearn), will provide access to other WMO Global Campus communication and collaboration tools, including the Calendar, Catalog, and social media forums. It will also provide success stories to inspire others. The social media sites will provide a user forum and collaboration mechanism for users to ask questions of other WMO Global Campus users and to leverage lessons learned. The goal is to increase understanding of the value of WMO Global Campus and to strengthen the WMO ETR community.

4.5 Monitoring and evaluation

Monitoring and evaluation of the progress and impact of the WMO Global Campus will require establishment of new learning metrics that might include:

1. utilization of WMO Global Campus tools and platforms, such as the calendar, catalog, and media platforms, to access information and resources
2. numbers of submissions to the calendar and catalog
3. reports of time savings through collaboration and sharing of content
4. reports of cost savings by utilization of courses and content provided by other learning sites
5. expansion of the global learning capacity through utilization of WMO Global Campus calendar and catalogue in all regions
6. expansion of the learning and certification attained that align to the WMO Competencies
7. changes in funding requests to WMO for education and training support
8. evidence of changes in the quality and nature of courses being offered by RTCs and other training providers

These impacts are expected to occur through maximizing utilization of existing global learning capacity. More metrics will be determined as this section is expanded in the future.

The initial monitoring and evaluation of the WMO Global Campus during the feasibility phase will focus on attainment of workplan activities (milestones) outlined in Table 1. During the feasibility study, the routine monitoring of the metrics and progress evaluation will be accomplished through monthly meetings of the WMO EC ETR Panel of Experts Global Campus Steering Group, discussions at SYMET13, presentations and side meetings at the WMO EC and CG and through routine progress reports to the WMO ETR.
The following activities are used to monitor progress of the WMO Global Campus feasibility study.

1. The Executive Council ETR Panel of Experts monitors progress of the WMO Global Campus work plan through monthly calls where issues are discussed and progress is demonstrated. The work plan activities being monitored are listed in the monthly call agenda and include:
   a) WMO Global Campus Calendar Development at CIMH
   b) WMO Global Campus Catalogue Development Option by the Technical Team and WIS
   c) WMO Global Campus Roadmap Development
   d) Aviation Training Identification and Promotion
   e) Climate Training Identification and Promotion
   f) Advertisement and Promotion of the WMO Global Campus
   g) Review Panel Development and Criteria
   h) SYMET13 activities related to WMO Global Campus
   i) Identification of Additional Resources to Support Global Campus

2. The WMO ETR has established a Technical Team to evaluate the WMO Global Campus Calendar and develop options for improving the calendar and implementing the WMO Global Campus Catalogue system.

3. Demonstrations of the Calendar and Catalogue systems at the Regional Association Meetings and at the Executive Council side meetings will be used to identify strengths and weaknesses through feedback.

4. One goal of WMO Global Campus is to increase collaboration between RTC’s and other training institutions, so we will monitor the number of collaborations and how many resources are shared between WMO Global Campus users.

5. We will also monitor the utilization of training resources and events made available in the calendar and catalogue.
5. Concluding remarks

Global Campus 2030: We envision a WMO education and training programme where global training institutions collaborate fully to support the education and training of the global workforce. The Global Campus 2030 concept aligns with the current performance period of the UN Sustainable Development Goals that it supports. The WMO Global Campus is not strictly a technology solution, but a collaborative network of institutions that share education and training materials, staff and technical expertise, and training materials that are focused on all WMO competency requirements and provide the most cost-effective education and training services for meteorology, hydrology, and climate services possible. The quality of training offerings is increased, and learning outcomes are performance-based and focus on the required certifications of competency and qualifications, in all WMO languages, and aligned to current products and services.

The WMO Global Campus will evolve with time. New projects and initiatives will emerge as ideas come forth and new needs arise. As noted earlier in this roadmap, the EC Panel, The ETR Office, and the RTC Directors have set themselves a target during the feasibility study of developing three demonstration activities and investigating others. Success of these is dependent on the commitment and interest of the RTCs, other training institutions and all WMO Members in increasing the range and scope of education and training opportunities delivered by them and to Members.

As WMO Members see benefits from the feasibility study in the form of improved cooperation and collaboration that lead to increased learning opportunities, and as details on the feasibility study activities that EC-66 requested are developed, Members will have more confidence that the Global Campus concept is a success and look to Cg-18 in June 2019 to approve continued implementation.
## Annex I WMO RTCs and RTC Components as of 2017

<table>
<thead>
<tr>
<th>Country</th>
<th>RTC Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALGERIA</td>
<td>Institut Hydrométéorologique de Formation et de Recherches (IHFR)</td>
</tr>
<tr>
<td>ANGOLA</td>
<td>Instituto Nacional de Meteorologia e Geofísica (INAMET)</td>
</tr>
<tr>
<td>ARGENTINA</td>
<td>Universidad de Buenos Aires (UBA)</td>
</tr>
<tr>
<td>ARGENTINA</td>
<td>Servicio Meteorológico Nacional (SMN)</td>
</tr>
<tr>
<td>BARBADOS</td>
<td>Caribbean Institute for Meteorology and Hydrology (CIMH)</td>
</tr>
<tr>
<td>BRAZIL</td>
<td>Centro Virtual de Ensino e Treinamento em Meteorologia (CVEM)</td>
</tr>
<tr>
<td>CHINA</td>
<td>Nanjing University of Information, Science and Technology (NUIST)</td>
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<tr>
<td>CHINA</td>
<td>China Meteorological Administration Training Center (CMATC)</td>
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<tr>
<td>COSTA RICA</td>
<td>Universidad de Costa Rica (UCR)</td>
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<tr>
<td>EGYPT</td>
<td>The Egyptian Meteorological Authority (EMA)</td>
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<tr>
<td>INDIA</td>
<td>India Meteorological Department Training Centre (IMD-New Delhi)</td>
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<tr>
<td>INDIA</td>
<td>Central Training Institute (IMD-Pune)</td>
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<td>INDIA</td>
<td>National Water Academy (NWA-Pune)</td>
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<td>INDIA</td>
<td>Indian Institute of Technology Roorkee (IIRT-Roorkee)</td>
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<tr>
<td>INDONESIA</td>
<td>Agency for Meteorology, Climatology and Geophysics (BMKG)</td>
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<td>INDONESIA</td>
<td>Research Centre for Water Resources (RCWR)</td>
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<td>IRAN</td>
<td>Islamic Republic of Iran Meteorological Organization (IRIMO)</td>
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<td>Iraqi Meteorological Organization (IMO)</td>
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<td>Postgraduate Training Centre for Applied Meteorology (PTCAM)</td>
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<td>ITALY</td>
<td>National Research Council Institute of Biometeorology (CNR-IBIMET)</td>
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<td>University of Nairobi (UON)</td>
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<td>Ecole Nationale d’Enseignement de l’Aéronautique et de la Météorologie (ENEAM)</td>
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<td>Country</td>
<td>Institution</td>
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<tr>
<td>NIGER</td>
<td>Centre Régional Agrhymet (AGRHYMET)</td>
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<td>Ecole Africaine de la Météorologie et de l’Aviation Civile (EAMAC)</td>
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<td>SOUTH AFRICA</td>
<td>South Africa Weather Service (SAWS)</td>
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<tr>
<td>UZBEKISTAN</td>
<td>Tashkent Hydrometeorological Profecional College (THMPC)</td>
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<tr>
<td>VENEZUELA</td>
<td>Universidad Central de Venezuela (UCV)</td>
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