



WORLD METEOROLOGICAL ORGANIZATION

EXTERNAL ASSESSMENT OF THE RTC ARGENTINA **5 to 7 May 2009**

World Meteorological Organization **Executive Council Panel of Experts on Education and Training** **External Assessment Panel**

Summary

This report is part of the second external assessment of the RTC in Argentina by WMO's EC Panel of Experts on Education and Training. The RTC has two components, one at the National Meteorological Service (SMN) and one at the University of Buenos Aires (Department of Atmospheric and Oceanic Sciences, Faculty of Exact and Natural Sciences DCAO-FCEN).

The group in charge of the external assessment was composed by Dr. Vilma Castro (convenor) and Ing. Abraham Salcedo (representative from RAIII); both from the EC Panel of Experts on Education and Training. Also in the group were Dr. Susana Bischoff, appointed by the Permanent Representative of Argentina with WMO, and Mr. Mustafa Adiguzael from WMO's Secretariat.

The RTC is open to all students of the world. The working language is Spanish, unless stated otherwise. All training is provided free of charge. Training at SNM is focused in operational Meteorology, whereas at DCAO-FCEN in addition to the operational training there is a focus toward a university degree and theoretical aspects of meteorology.

Most of the participants to the courses provided by the RTC through several years are from Argentina, a few are from Venezuela, Ecuador, Bolivia, Brazil, Peru, Costa Rica, Uruguay and Dominican Republic.

General recommendations for the RTC, without any particular order, are: to continue offering courses open for the region and the efforts toward the development of distance education, to encourage students from the RTC to participate in post-graduate courses from other RTCs or universities using distance learning management systems such as Moodle, to maintain close contact with the EC Panel Expert Team on Distance Learning and the Rapporteur on E&T for RAIII, to find co-sponsors in order to increase the number of participants of the region to the courses, to coordinate more with WMO so more members can take advantage of the RTC training resources, to continue cooperating with UNIDATA and the participation in the monthly weather discussions of WMO's Virtual Laboratory on Satellite Meteorology Training.

Recommendations for WMO regarding the RTC Argentina are: to report annually on the activities of the RTC Argentina to the members of the region through the PRs, E&T focal points, web page, etc.; to provide both components of the RTC Argentina with the missing numbers of the Blue Series, educational CDs and divulgation brochures; to send communications related to E&T not only to the PR but, where appropriate, to members of both components of the RTC to ensure a response to the communication.

WMO and the RTC should put together an agreement containing the commitments and responsibility limits for the RTC partners and WMO.

The external assessment team strongly recommends that WMO Executive Council continues recognizing and supporting, in all possible ways, the two components of the RTC Argentina, considering the outstanding quality of the training programmes, the excellence of their facilities and equipments, and their contribution to science through active research and numerous publications.

1. Introduction

This report is part of the second external assessment of the RTC in Argentina by WMO's EC Panel of Experts on Education and Training; the first one took place in 2005. The RTC has two components, one at the National Meteorological Service (SMN) and one at the University of Buenos Aires (Department of Atmospheric and Oceanic Sciences, Faculty of Exact and Natural Sciences DCAO-FCEN).

The visit to both components was undertaken in the period 5-7 May, 2009. The group in charge of the external assessment was composed by Dr. Vilma Castro (convenor) and Ing. Abraham Salcedo (representative from the region), both from the EC Panel of Experts on Education and Training; Dr. Susana Bischoff (local representative appointed by the PR of Argentina) and Mr. Mustafa Adiguzael from WMO's Secretariat. Ing. Abraham Salcedo was not present during the visit. The program for the visit was arranged by Dr. Mónica Marino, head of the Direction for Research, Development and Training of the SMN, and Drs Celeste Saulo and Claudia Campetella, Director and Deputy Director of the Department of Atmospheric and Oceanic Sciences at DCAO-FCEN.

2. General Overview

The report presents the essential information on the work of the two components of the RTC. The self assessments of both components and other information are attached as appendices.

Appendix 1 contains the self assessment of the SMN component (WMO format).

Appendix 2 contains an auto-evaluation of the SMN component (*Informe de autoevaluación, Centro Regional de Formación Profesional Meteorológica Buenos Aires "Julio Hugo Hordij", 2009*).

Appendix 3 contains a report for 2007 of the DCAO-FCEN component (Memoria 2007).

Appendix 4 contains the self assessment of the DCAO-FCEN component (WMO format).

Appendix 5 contains an extension of several topics in WMO's self assessment questionnaire, by DCAO-FCEN (*Report of Activities to be presented to WMO Representatives – May 2009*).

3. Courses and Programs

The RTC is open to all students of the world. Working language: Spanish, unless stated otherwise. All training is provided free of charge. The RTC Argentina is a WMO Center of Excellence for training in Satellite Meteorology since 2006..

3.1 Courses and programs at SMN: a description of some of the following short courses and two workshops (duration: one to several weeks) is in Appendix 2, Annex 2. Different requisites apply to attend the courses and workshops. The RTC-SMN has a fair knowledge of the training needs of the region; however courses are designed to meet the needs of the NMS of Argentina. The courses and programs in general fit well with WMO 258 guidelines.

1. Assistant to Meteorological Observer
2. Surface Meteorological Observer
3. Meteorology Plotter
4. Technician in Maintenance of Meteorological Instruments
5. Meteorological Inspector
6. Analysis and Interpretation of Satellite Imagery
7. Operational Aeronautic Meteorology
8. Use of Satellite Data in Analysis and Weather Forecasting
9. Training workshop of radar specialist for RAIII
10. Workshop on Antarctic Meteorology
11. Surface Ozone
12. Introduction to the Evaluation of Solar Radiation
13. Interaction Between the Earth's Magnetic Field and Space Climatology

Workshops:

1. Radiosonde Observer (Workshop)
2. Advanced Techniques for Weather Forecasting in South America (Workshop)

3.2 Courses and programs at DCAO-FCEN: a list of the courses which constitute the following long terms programs (a year or more) can be found in Appendix 3, section 1.1.2. The RTC-DCAO-FCEN is aware of the training needs of the region but its priority is to provide a holistic college education. The courses and programs exceed WMO 258 guidelines.

1. Licensee in Atmospheric Sciences
2. Licensee in Oceanography
3. Bachelor in Atmospheric Sciences (with four specialization areas)
4. PhD in Atmospheric Sciences
5. PhD in Oceanography

DCAO-FCEN is also involved in interdisciplinary graduate and postgraduate programmes:

1. Licensee in Paleontology
2. Licensee in Biology
3. Master in Environmental Sciences

4. Faculty, lecturers

4.1 Twenty people from SNM have contributed to provide training throughout the last decade; their CVs are in Appendix 2, Annex 1. They are members of the staff at the SMN and do not usually work full time in training. Their participation depends on the courses that are offered. Training at SMN is focused on operational meteorology. Usually trainers are not trained as trainers.

4.2 DCAO-FCEN staff is composed by 27 professors, 17 of them are employed full time. DCAO-FCEN also hires many researchers and PhD students (currently 35 PhD students, 5 of them from abroad), many of them as teaching assistants. The full time researchers and PhD students are supported by different programmes within the University, the National Council for Scientific and Technical Research (CONICET), and other national and international agencies. A list of the invited professors, professors, researchers and assistants is provided in Annex 3, pages 4, 5 and 6. The report in Annex 3 shows that DCAO-FCEN has a strong focus on research, as can be deduced by the large number of articles published in journals, proceedings, books, etc.

5. Students

Details on the number of students graduated in the different SMN courses are given in pages 13 to 17 of Appendix 2. Most participants are from Argentina, a few are from Venezuela, Ecuador, Bolivia, Brazil, Peru, Uruguay Costa Rica and Dominican Republic. All the courses in 2007 and 2008, with the exception of the courses "Analysis and Interpretation of Satellite Imagery" and "Operative Aeronautical Meteorology" (Appendix 2, page 17), were attended exclusively by Argentinians.

Details of the 147 students attending DCAO-FCEN in 2007 is given in Appendix 3, page 2. Appendix 5, pages 13 to 15, shows the historical record of graduates since 1955. All regular students in 2007, 2008 and 2009 were Argentinian.

The RTC Argentina was host of three international courses in 2008:

WMO Regional Training Course on Satellite Techniques Applied to Meteorology for RAIII and IV, 22 September - 3 October.

Intensive course on Data Assimilation, 27 October.-7 November, more information can be found in <http://4dvarenkf.cima.fcen.uba.ar/course/en/index.php?m=2>

Workshop on 4D-Var and Ensemble Kalman Filter Intercomparisons, 10 – 13 November, see <http://4dvarenkf.cima.fcen.uba.ar>

6. Facilities and funding

The RTC is funded by the government of Argentina. Both components of the RTC have adequate facilities regarding classrooms, staff offices, laboratories, recreational areas, library and archive rooms, projectors, and computer equipment, though increased computer power was mentioned in the self-assessments as desirable. Facilities at SNM for accommodating students are very limited. Students of DCAO-FCEN live with their families or rent rooms or apartments in the neighborhood.

7. Difficulties and challenges

The SMN was created in 1872. In 1966 the SMN was taken over by the army, who ruled it until 2007. When the Ministry of Defense took charge in 2007, 70 members of the staff left the SMN, severely affecting most of the departments, including the RTC component. Trainers are facing the fact that there are 85 new people in the staff at the SMN, and that 25% of the existing personnel will retire in the next 5 years. The SMN has hired several recent retirees who were former faculty members of DCAO-FCEN in order to fill empty positions. The training courses at the SMN, which are the courses the RTC offers to countries in the Region, will be scheduled with these challenges in mind. Countries in the region have shown interest in the courses, but do not send candidates because of lack of travel funding.

The DCAO-FCEN component reports that although their facilities are adequate to carry out their activities, they need to improve the computer lab through an upgrade of their servers. Also, additional human resources are needed to develop and maintain modern databases and to optimize the use of UNIDATA services. DCAO-FCEN relies on an IDL software system from UNIDATA to access real time satellite imagery and model data, but the system is not working at present and has not been fixed due to lack of personnel.

If DCAO-FCEN had more funds, in addition to addressing the above, it would like to support visits from experts on several fields, and to open short intensive courses, particularly in Aeronautical Meteorology.

8. Plans for the future: New courses

DCAO-FCEN is planning:

1. The implementation of a Condensed BIP-M programme, to receive students in the region after they get their first university degree (e.g. Mathematics, Physics, Engineering) at their local universities.
2. The organization of a training course in Aeronautical Meteorology, specially designed to follow Argentina's NWS requirements. The course will be open to the region and is planned to start the 1st semester of 2010. No distance learning techniques are involved in this course.
3. A specific course in Aeronautical Meteorology, with blended face to face and distance learning components, specifically designed to assist the Region's and Argentina's NWS to comply with ICAO and WMO requirements. See Appendix 3 of Appendix 5 for further details on this course.
4. A course on the use of seasonal predictions for applications in Latin America, co-sponsored by WGSIP (Working Group on Seasonal to Interannual Prediction) and other agencies.
5. To create a university based course of 2 years duration (its name would be "Meteorology Forecaster") aimed at the meteorological technician level. Successful graduates will be able to gain credits from this course towards a full degree if they subsequently wished to pursue a career in Meteorology. The idea of this short course is to create an alternative for the long term career, in which Meteorology topics are addressed at the end of the career, with the subsequent loss of interest of students and a large percentage of drop outs.

9. Recommendations

Recommendations for the RTC are, without any particular order:

1. To continue with the effort of implementing the new courses described in section 8.
2. To take advantage of the urgent need of training within the country, and in the region, to continue the efforts toward the development of distance education.
3. To keep in touch with the Expert Team on Distance Education of the EC Panel on Education and Training which is investigating options for the delivery of an accredited online undergraduate degree that could be taken by Members whilst continuing to work at their institutions.

4. To encourage students from the RTC to participate in post-graduate courses from other RTCs or universities using distance learning management systems such as Moodle.
5. To find co-sponsors in order to increase the number of participants of the region to the courses.
6. To keep a closer contact with the Rapporteur on E&T for RAIII and the WMO Secretariat.
7. To coordinate more with WMO so more members can take advantage of the RTC training resources. To inform WMO of any course, in electronic form for regular courses for incorporation in the ETR upcoming courses, and through the PR for specific new courses to be announced in the region. In other words, to report WMO annually on its activities for WMO to be able to inform the members of the region.
8. DCAO-FCEN: to continue cooperating with UNIDATA to ensure the provision of near real time satellite and model data to students at the university campus and to continue being a component of the flow of data through universities. Noting that Argentina is part of the Virtual Laboratory for training in Satellite Meteorology DCAO-FCEN should be encouraged to talk to their two sponsors, NOAA and CONAE, about getting the server fixed.
9. To continue participation in the monthly weather discussions of WMO's Virtual Laboratory on Satellite Meteorology Training.

Recommendations for WMO regarding the RTC Argentina:

1. To report annually on the activities of the RTC Argentina to the members of the region through the PRs, E&T focal points, web page, etc.
2. To provide both components of the RTC Argentina with the missing numbers of the Blue Series, educational CDs and divulgation brochures.
3. To send communications related to E&T not only to the PR but, where appropriate, copies to members of both components of the RTC to ensure a response to the communication.

Recommendations to both WMO and the RTC:

1. To put together an agreement containing the commitments and responsibility limits for the RTC partners and WMO

10. Conclusion

The external assessment team strongly recommends that WMO Executive Council continues recognizing and supporting, in all possible ways, the two components of the RTC Argentina, considering the outstanding quality of the training programmes, the excellence of their facilities and equipments, and their contribution to science through active research and numerous publications.

Addendum: Some pictures from the visit.



Fig.1. Meeting room at SMN headquarters in Buenos Aires. From left to right: Mónica Marino, Gustavo Necco, Vilma Castro, Hector Ciapessoni, Mustafa Adiguzael y Susana Bischoff. Picture to the right: SMN, Regional Instrument Centre at the airport in Aeroparque. This is where the courses in meteorological instruments take place.



Fig.2. SMN component of the RTC dedicated to meteorologist Julio Hugo Ordij at Villa Ortúzar, in the suburbs of Buenos Aires: Commemorative plate, a classroom, view of the high resolution satellite receiving station and a room in the guest house.



Fig.3. At the entrance of DCAO-FCEN with the Dean of the Faculty of Sciences (2nd from left) and meeting room: Claudia Campetella, Mustafa Adiguzael, Vilma Castro, Celeste Saulo, Susana Bischoff and Monica Marino.



Fig.4. DCAO-FCEN, computer laboratory.



Fig.5. DCAO-FCEN, faculty and students attending a lecture and stands from the library.