

The WMO Regional Training Centre in Italy and the Institute of Biometeorology

The Institute of Biometeorology CNR-IBIMET, Florence

The Regional Training Centre in Italy is run and managed by the Institute of Biometeorology of the National Research Council of Italy (CNR-IBIMET) in Florence.

The CNR IBIMET was founded in 2001 by grouping together the followings Institutes:

1. Institute of Agrometeorology and Environmental Analysis, IATA-CNR Florence
2. Laboratory of Agrometeorology and Ecophysiology, Bologna
3. Laboratory for Monitoring of Agroecosystems, Sassari
4. Laboratory of Evaluation and Management of Land, Environment and Agriculture-Systems, Bologna

IBIMET is located in Florence, Bologna, Sassari and Rome, and its staff is composed of approximately 150 permanent and temporary researchers and technicians. The RTC is hosted in the Sesto Fiorentino Research Campus, on the outskirts of Florence.

Over the years, IBIMET has promoted the creation of a number of related research centers:

- LaMMA - Laboratory for Meteorology and Environmental Modelling,
- CESIA - Center for Studies of Informatics in Agriculture of The Georgofili Academy,
- FCS - Foundation for Climate and Sustainability,
- CIBIC - Center for Bioclimatology in partnership with the University of Florence.

Mission of IBIMET is *to work to define strategies, develop technologies and explore practical solutions to contribute to the resilience and sustainability related to food, climatic, meteorological and energy emergencies, which are interconnected through a series of key deliverables.*

IBIMET main research areas can be summarized as follows:

- Analysis, planning, protection and development of territorial and environmental resources
- Climatology and impacts of climate variability and change on human health
- Food and no-food production
- Cooperation in developing Countries
- Sustainable strategies for mitigation and adaptation to climate change
- Education and training

To achieve its goals, IBIMET Scientists use innovative techniques for meteorological observations at local, micro, urban scale, advanced methodologies in earth observations aimed at monitoring terrestrial and marine ecosystems (remote sensing, GIS, cartography, innovative technologies), and the most advanced tools for analysis and modelling.

History of the WMO-RTC in Italy

The WMO Regional Meteorological Training Centre operative for WMO RA-VI has been first established in Erice, at the International School of Meteorology of the Mediterranean under the direction of Gen Abele Nania¹ and recognized by WMO Executive Council in 1983 during its 35th Session². The School was especially active during the years 1980-1987, when a number of courses on specific characteristics of the Mediterranean weather, as well as on satellite and radar meteorology, were held. An impressive number of eminent meteorologists visited the School during this period.

With the strong support of Gen Carlo Finizio, WMO PR-Italy and President of RA-VI, a new component of the RTC was established in Italy at the Institute of Agrometeorology and Environmental Analysis for Agriculture (IATA) which was recognized in 1997 by the WMO Executive Council during its 49th Session as “an additional component of the WMO RMTTC in Italy for the training of Class I meteorological personnel in the area of agriculture meteorology”³, as also reported at the 12th Session of RA-VI⁴.

In fact, already during the '80s the Institute of Agrometeorology and Environmental Analysis, IATA-CNR, based in Florence, and directed by Prof. Giampiero Maracchi started to offer technical assistance and training activities for the National Hydro-Meteorological Services in African (Sahelian) Countries, and for others Institutions such as CSE⁵, and AGRHYMET⁶.

This involvement led to the development of research and projects in the fields of agrometeorology with special attention to food-security, vulnerability, mapping, and early warning, natural resources monitoring, land recovery in arid and semiarid Regions of Africa^{7,8}.

¹ WMO Bulletin Volume 45, No. 3, July 1996

² WMO Report n. 619

³ WMO Report n. 903

⁴ WMO Report n. 882

⁵ CSE: Centre de Suivi Ecologique, Dakar-Senegal

⁶ AGRHYMET: Regional Training Centre for Agrometeorology and Operational Hydrology and their Applications, Niamey-Niger

⁷ Bacci, L., Maracchi, G., Senni, B.: Les strategies agrometeorologiques pour les pays Saheliens, IATA-CeSIA (Ed.), pp. 175, 1992.

The IBIMET experience in planning education and training, started from the analysis of users needs of the African National Meteorological Services and Technical Organizations involved in “The Early Warning and Agricultural Production Forecast Project” (AP3A Project) financed by the Italian Cooperation through WMO⁹.

In particular, the main purpose of RTC training programme was to develop capacity building in the target Countries, in order to mitigate the effects of extreme events such as drought, desertification and famine especially in semi-arid regions of North, West and East Africa¹⁰.

Until around 2010, various projects have been carried out under the assignment of the World Meteorological Organization (WMO), while others have been developed in collaboration with the General Direction for Development Cooperation (DGCS) of the Italian Ministry of Foreign Affairs, or funded by other International Organizations: FAO, World Bank, UNCCD, ESA-ESRIN, EUMETSAT; European Commission.

Some support has been also provided for Technician Meteorologists with the so-called seminars on demand on “*Automatic Weather Stations for Agrometeorological Applications*”. A list of the courses held during the years is provided in *Appendix A*.

Over the years, the RTC established active and fruitful collaborations with the National Meteorological Service and with the University of Florence. In particular, RTC was involved for some consecutive years (2002-2006) in a university level Master of Science in Applied Meteorology offered by the University of Florence – Department of Agrifood Production and Environmental Sciences, while with the NMS the collaboration is continuous not only because of its role as National PR at WMO, but also in terms also of contribution by NMS staff in the training and contribution of RTC staff to WMO Commissions and Task Teams (*see Appendix B*).

Another fruitful collaboration still active is with the Istituto Agronomico per l’Oltremare based in Florence.

Beginning in 2011 new collaborative research activities started in Mali, Senegal, and Niger, and the involvement in initiatives such as COST, PresaNord and MedCOF have inspired new ideas and plans for the RTC. The focus of the training offered shifted towards climate change and variability and their effects on natural resources and agriculture, and on sub-seasonal to seasonal forecast/predictions as a tool for water and agriculture management.

⁸ Maracchi, G., G. Pini: The Ibimet-CNR approach to early warning for food security analysis, Proceedings of an International Workshop “Crop and rangeland monitoring in eastern Africa for early warning and food security” organized by FAO and JRC, Nairobi, Kenya, 28–30 January, ISBN 92-894-6521, 139–145, 2003.

⁹ WMO Bulletin, Volume 48 No. 4, 1999

¹⁰ De Filippis, T., A. Di Vecchia, G. Maracchi, F. Sorani. Training programme for the dissemination of climatological and meteorological applications using GIS Technology. *Advances in Geosciences*, 8, 19-25, 2006

WMO RTC Italy has also largely contributed during the years to a number of specific training activities and workshops in African Countries in the framework of international projects.

The courses offered by the RTC consist of short-term training courses (1 – 2 weeks) or workshops held in Florence or in other facilities selected for specific projects, in Italy and abroad, and in long-term stages (2 to 4 months) in the framework of long term projects and collaborations, such as the recent projects DIPLOMAZIA, ANADIA, PAPSEN.

The activities of the RTC in Florence have been externally assessed in 2004, and the Executive Council, following Recommendation 1 (PAN-XXII), reconfirmed the status of the RMTC hosted by Italy as WMO-recognized RMTC during its 58th Session¹¹.

Another external assessment took place in 2014, the RTC reconfirmation was discussed during the 26th Session of the Executive Council Panel of Experts on Education and Training held in 2015 and its reconfirmation status deferred to the 68th Session of the Executive Council.

In the last three years, RTC participated to a work-table managed by the International Organization for Certification DEKRA for the development of a professional scheme for Meteorologist and Technical Meteorologist. The scheme is respondent to the WMO n.1083 recommendations and to the UNI CEI EN ISO/IEC 17024 regulation.

Human Resources

Currently the RTC Italy counts on highly qualified and experienced staff personnel, most of them with a strong background in mathematics, physics, engineer disciplines, agricultural sciences, while the administrative officers of IBIMET-CNR are providing support with their competencies.

- **Dr Antonio Raschi: Director of the IBIMET-CNR**
- **Dr Marina Baldi: Director of RTC**
- **Mr Francesco Sabatini: Implementation of field and instrumental activities for RTC Courses**
- **Mrs Francesca Caporossi: RTC Logistics**

And, as Scientific Responsible for RTC Courses:

- **Dr. Vieri Tarchiani**
- **Dr Massimiliano Pasqui**
- **Dr Teodoro Georgiadis**

¹¹ WMO Report n. 1007

- **Dr Maurizio Bacci**
- **Dr Anna Dalla Marta**

Furthermore, thanks to the multiple collaborations between IBIMET-CNR and other Research Institutes and Universities in Italy and abroad and governmental bodies and agencies, teaching activities are carried on by CNR researchers, government employees from the Italian Meteorological Service and Regional Services, and other national and foreign institutions (EUMETSAT, ECMWF, etc.) who are assigned depending on the characteristics and content of the courses.

Appendix A

List of courses offered by WMO RTC Italy		
Seminars on demand: "Automatic Weather Stations for Agrometeorological Applications"		
Year	Location	Director of the Course
1998	Bahrein (Oman, Qatar, Kuwait)	Mr Francesco Sabatini
1999	Iran	Mr Francesco Sabatini
2000	Morocco (Ivory Coast, Ghana, Niger, Mali, Tunisia)	Mr Francesco Sabatini

Short Term courses			
Year	Location	Title	Director of the Course
1999	Florence	Methodologies for remote sensing and conventional data merging.	Director: Dr Ing Andrea Di Vecchia Scientific Director: Tiziana De Filippis
2001	Florence	Methodologies pour l'élaboration de données agrométéorologiques et leur intégration dans les Systèmes d'Alerte Précoce pour les Regions Arides.	Director: Dr Ing Andrea Di Vecchia Scientific Director: Tiziana De Filippis
2002	Florence	Planning the Response to Climatic Events and Drought Effects by Capitalizing on the Experience and Information of Operational Early Warning Systems - PRECEDE.	Director: Dr Ing Andrea Di Vecchia Scientific Director: Tiziana De Filippis
2003	Florence	Les Méthodologies, les Produits et les Applications à développer par l'emploi du MSG - MAP 1 Edition.	Director: Dr Ing Andrea Di Vecchia Scientific Director: Tiziana De Filippis
2004	Florence	Meteosat Second Generation Satellites: Applications, Products and Methodologies for Applied Meteorology and Climatology, MSG-MAP 2 Edition.	Director: Dr Ing Andrea Di Vecchia Scientific Director: Tiziana De Filippis
2005	Florence	Application of GIS in meteorology and climatology (COST Summer School)	Director: Prof Gianpiero Maracchi Scientific Director: Tiziana De Filippis

2006	Florence	Climate Change and Natural Disasters in the Mediterranean Basin	Coordinator: Dr Vieri Tarchiani Scientific Director: Dr Lorenzo Genesio
2006	Florence	Early Warning Systems for extreme events impact. Managing drought for a sustainable development in the Mediterranean Basin	Coordinator: Dr Vieri Tarchiani Scientific Director: Dr Lorenzo Genesio
2007	Florence	Desertification and environmental monitoring in the Mediterranean Basin	Coordinator: Dr Vieri Tarchiani Scientific Director: Dr Lorenzo Genesio
2014	Florence	Climate change impacts on agricultural systems in Africa	Coordinator: Dr Vieri Tarchiani, Scientific Director: Dr Massimiliano Pasqui
2014	Florence	Water footprint application for water resources (with COST ES1106)	Coordinator: Dr Anna Dalla Marta
2014	Florence	Seasonal forecasts for agriculture in the Mediterranean	Coordinator: Dr Vieri Tarchiani, Scientific Director: Dr Massimiliano Pasqui
2015	Florence	Seasonal Forecasts and Water Management in the Mediterranean Basin: Integrated Approach	Coordinator: Dr Vieri Tarchiani, Scientific Director: Dr Massimiliano Pasqui

Appendix B

Participation of CNR IBIMET and RTC Italy staff to WMO Commissions and Task Teams

Commission of Agrometeorology, CagM	Dr Federica Rossi	Vice President
Management Group of the Commission for Agricultural Meteorology, CAgM	Dr Federica Rossi	Member
Steering Committee of WAMIS/CAgM/WMO	Dr Federica Rossi	Member
RAVI Working group on Climate and Hydrology	Dr Federica Rossi	Member
Inter-Commission Coordination Group, WMO WIGOS	Dr Federica Rossi	Member
Executive Council Task Team on Data Policy and Emerging Issues.	Dr Federica Rossi	Member
Intercommission Task Team on Quality Management Framework, ICTT-QMF	Mr Francesco Sabatini	Member – CagM representative
Expert Team on Automatic Weather Stations, ET-AWS	Mr Francesco Sabatini	CAgM representative
Solid Precipitation InterComparison Experiment, WMO-SPICE	Mr Francesco Sabatini	Member
Commission for Climatology, WMO-CCI	Dr Marina Baldi	National delegate (2006-2010-2014)
Task Team on the Guide to Climatological Practices, TT-GCP	Dr Marina Baldi	Nominated Member
International Association of Meteorology and Atmospheric Sciences, IAMAS	Dr Teodoro Georgiadis	National delegate
International Union of Geodesy and Geophysics: Committee “Capacity Building and Education”	Dr Teodoro Georgiadis	Nominated Member
Mediterranean Climate Outlook Forum, MedCOF	Dr Massimiliano Pasqui	National Delegate