



Training on Seasonal Climate Forecast: enabling a more informed climate related risk management and services.

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- **Climatic variability and related risks affect water availability** with a direct impact, both at the global and local level, on different economic sectors and on food security. This framework calls research centres, government agencies, businesses, and end-users to challenge and find new and innovative ways to interpret, apply and disseminate climate information for Decision Making.
- **Seasonal to inter-annual hydro-climatic predictions in the Mediterranean** region is an opportunity to develop a proactive approach towards a more effective water management.
- In 2009, World Climate Conference-3 acknowledged **Capacity Development** as a transversal component underpinning all the other Pillars of the GFCS. Within the WMO Education and Training Programme, Regional Training Centres (RTC) play a major role in supporting member countries in the development of operational climate services.

- Since 2014, **CNR-Ibimet as Regional Training Centre (RTC)** in agreement with WMO and member countries of Region I-VI, has identified **seasonal climate forecasts (SCF) as a strategic issue for capacity building** in the target countries to mitigate the effects of extreme events such as drought, desertification and famine especially in semiarid regions of North, West and East Africa.
- In this framework, the **training activities** carried out by CNR-Ibimet as WMO-RTC are to build the capacity to transform meteo-climatic information into useful and practical knowledge for specific users, such as national hydro-meteorological service staff, to support specific risk mitigation strategies.
- From 2014 to 2016 RTC Italy adopted **different training solutions**, to meet learning goals and user needs. The evolution of training solutions and the satisfaction of trainees' expectations, encouraged WMO and CNR-Ibimet to widen the spectrum of beneficiaries and to make the courses content available for other regions and other RTCs as a distance learning course package.

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The World Meteorology Organization Regional Training Center in Italy

Since mid '70s, the Institute of Biometeorology of the National Research Council (**IBIMET-CNR**), in collaboration with **LaMMA** (a consortium between CNR and Tuscany Region, and operating as met service), was offering training activities for Members from RA VI and RA I.

The RTC was finally established in the early '90.



WMO-RTC in Italy: recent activities

June 2014: Climate change impacts on agricultural systems in Africa

June 2014: Water footprint application for water resources

September 2014: Seasonal forecasts for agriculture in the Mediterranean

October 2015: Seasonal forecast and water management in the Mediterranean: integrated approach

November 2016: Verification of Operational Seasonal Forecasts in the Mediterranean region

November 2017: Climate Services For Disaster Prevention



Goals and Objectives of the courses

To ***build capacities*** in

- Analysis of climate change impacts on crop production, with a special focus on North and West Africa agricultural systems.
- Application of climate seasonal forecast for agriculture and water management in Africa and Mediterranean.
- Respond to the need of WMO Member Countries to offer tools for
 - evaluation of the performance of climate models output and quantification of associated uncertainties;
 - derivation of value-added products (graphics, maps and reports) to communicate climate forecasts and climate model information.

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T.O.P. SEASONAL FORECAST

Training and Operational Principles Course Package

Seasonal Forecast Course Package T.O.P." is a set of online resources whose goal is to enhance knowledge in the theory of seasonal forecasting and operational use of seasonal climate forecasts.

This online training package has been developed by the WMO Regional Training Center (RTC) Italy, Institute of Biometeorology, CNR-National Research Council Rome, Italy (CNR-Ibimet).

T.O.P. is joint initiative [World Meteorological Organization](#) and CNR-Ibimet, with the collaboration of [MeteoSwiss](#).



MODULE 4 - SEASONAL
FORECAST APPLICATIONS



MODULE 5 - CLIMATE
SERVICES



MODULE 6 - CLIMATE DATA
ANALYSIS



MODULE 8 - R STATISTICAL
SOFTWARE (TUTORIAL)



Seasonal Forecast Course Package T.O.P. is based on the training materials produced during a series of face-to-face courses from 2014-17.

These training materials, created by acknowledged researchers and scholars for RTC Italy training Initiatives, have been reorganised in a new concept structure, partially re-edited, and enriched with videos and other documentations.

This set of resources can be used by other trainers to develop their own courses, facilitating knowledge sharing and dissemination.



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Training and Operational Principles Course Package

1

The evolution of training solutions adopted by RTC Italy, and the satisfaction of trainees' expectations, encouraged WMO and RTC Italy to widen the spectrum of beneficiaries and to make the courses content available for other regions and other RTCs as a distance learning course package.

2

"Seasonal Forecast Course Package T.O.P. (**Training and Operational Principles**)" is a set of online resources providing theoretical and practical knowledge on seasonal forecast and predictability models, climate and data analysis, forecast verification, and specific application of seasonal forecast for agriculture and water management.

3

T.O.P. is particularly helpful for NMHS staff who wish to improve their climate services competencies or to specialize in seasonal forecasting.



4

This Course package has been developed adapting tools and materials of the previous courses into a digital learning environment. Slides, videos, documents, and webinar are used to create an engaging learning experience and reach the learning objectives.

5

In order to meet the heterogeneous knowledge levels of the learners, each course unit illustrates the prerequisites and propose external resources to fill knowledge gaps. This allows learners to create a personalized learning path taking into account different levels and needs.

6

T.O.P. also includes essential guidelines to facilitate the course adoption or adaptation by different institutions, with the possibility to integrate or modify content, or create similar content, to fulfill their regional or institutional education needs and standards.



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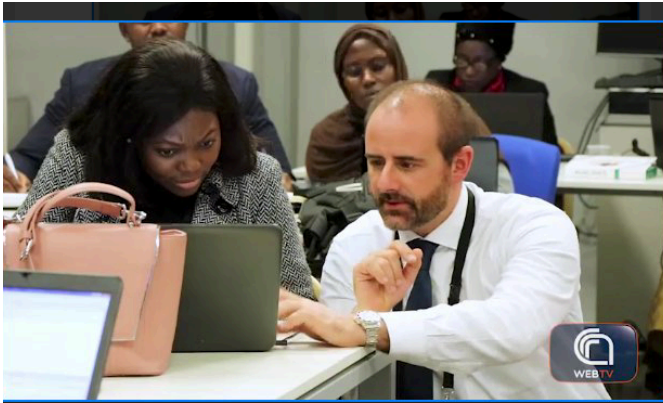
Training and Operational Principles

Course Package

Seasonal Forecast Course Package T.O.P. is based on the **training materials produced during a series of face-to-face courses from 2014-2017**.

These training materials, created by acknowledged researchers and scholars for RTC Italy training initiatives, have been reorganised in a new concept structure, partially re-edited, and enriched with videos and other documentations.

This set of resources can be used by other trainers to develop their own courses, facilitating knowledge sharing and dissemination.





T.O.P. SEASONAL FORECAST

Training and Operational Principles

Description of the course package

The goal of the online course is to **allow seasonal climate forecast knowledge transfer to increase operational capabilities of the targeted users.**

This online course will provide participants with a **theoretic and practical set of knowledge on seasonal forecast** and predictability models, climate and data analysis, forecast verification, and specific application of seasonal forecast for agriculture and water management.

The course package will include **model outline with learning objectives, case studies, in-depth studies, quizzes, structured bibliography, readings.**

The aim is also to **provide some essential guidelines to facilitate the course adoption by a wide number of institutions and instructors** that will have the possibility to provide additional content – e.g. to better meet students needs – and modify content to fulfil their region and national or institutional education standards.



TOP Course Structure #1

The project team defined the course modules structure that could respond to user learning needs on the basis of previous training experiences.

Then training materials from previous courses have been selected and analysed to define **the best set of resources to fit the learning purpose of each module.**

The course consist of **lectures, exercises, and tutorials**. Recent trends in eLearning highlight the effectiveness of approaches such as **videos and interactive videos, micro-learning and learning paths**. In this perspective, different content types/formats have been used to create an engaging learning experience.

The T.O.P. course package includes: slide presentations, with audio or annotated comments, videos, documents, and live recorded sessions.



TOP Course Structure #2

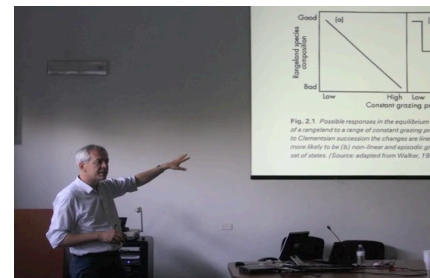
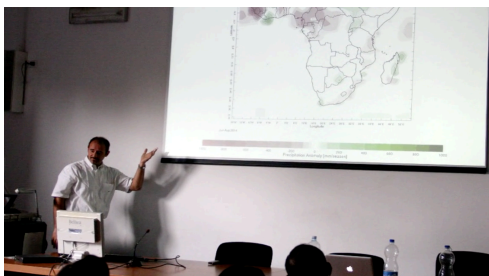
The Course Package is organized in **modules** and each module contains a **group of lessons** focusing a **specific topic**.

- Learning Objective
- Lessons
- Exercises / Tutorials
- Case Studies
- Learning Activities
- Supplemental Resources



Audience

It can be used by national **hydro-meteorological service staff members** who wish to improve their climate services competencies or to specialise in seasonal forecasting. For this audience, the course package will provide theoretical and practical knowledge on seasonal forecast and predictability models, climate and data analysis, forecast verification, and specific application of seasonal forecast for agriculture and water management.





Learners

In order to meet **heterogeneous needs of the learners**, each course unit will illustrate the prerequisites and will propose external resources to fill knowledge gaps.

This approach will provide learners with a personalised learning path based on their interaction with learning components, following the idea that it is more effective to take into account different levels and needs rather than “*one size fits all*”.





Prerequisites

This course is designed for forecasters and climatologists with **knowledge on general meteorology** as well as physical and dynamic meteorology. Accordingly, familiarity with the following concepts is assumed. However, some of this content are covered briefly in the context of **offering more specific expertise in climate predictions**.

Required skills and knowledge

- *Basic knowledge of the structure of the atmosphere*
- *Basic understanding of atmospheric dynamics and thermodynamics*
- *The general circulation of the atmosphere and oceans*
- *Weather analysis and forecasting*
- *Basic knowledge of remote sensing data*
- *Goal & Outcomes*



Climate Services Competency Framework

According to the Climate Services Competency Framework approved by the WMO Executive Council of June 2016, the training course addresses the Competency 3: Create and/or interpret climate forecasts, climate projections and model output, and more specifically the following Performance Criteria.



- Locate, select and retrieve climate forecasts and climate models output generated by Regional Climate Centres, Global Producing Centres and other institution
- Create sub-seasonal, seasonal and longer scale forecast products
- Apply statistical and geo-statistical analysis, including downscaling, to monitor the spatial distribution and temporal evolution of model output
- Evaluate the performance of climate models output and quantify the associated uncertainties
- Create value-added products, such as graphics, maps and reports to communicate climate forecasts and climate model information



Course Goals



After completing the course, learners should be able to:

Identify and manipulate seasonal forecast products and related information suitable for their specific interests

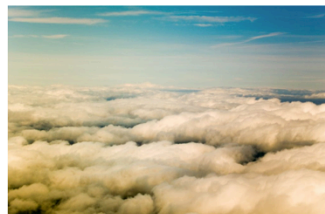
Set up a verification analysis both for probabilistic and deterministic forecasts

Identify proper strategies to transform model outputs into climate services for specific applications

How to access the T.O.P. Course Package

The course package is structured as an eLearning Course.

Please login/register to create a personal account and set up a personal profile to track your training activities. To take a module, and download the materials, you'll need to enrol.



Module 1 – Introduction to seasonal forecasting

By [instructional editor](#) // [June 26, 2017](#) //



Module 2 – Seasonal forecasting and regional predictability

By [instructional editor](#) // [June 30, 2017](#) //



Module 3 – Forecast Verification

By [instructional editor](#) // [June 30, 2017](#) //



Module 4 – Seasonal Forecast Applications

By [instructional editor](#) // [July 3, 2017](#) //



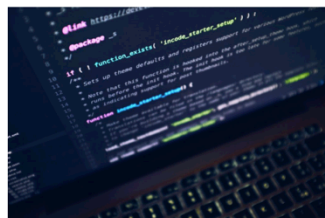
Module 5 – Climate Services

By [instructional editor](#) // [July 3, 2017](#) //



Module 6 – Climate Data Analysis

By [instructional editor](#) // [July 4, 2017](#) //



Module R – R Statistical Software (Tutorial)

By [instructional editor](#) // [July 3, 2017](#) //

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31/05/2017

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COURSE PACKAGE T.O.P.
Theory and Operational Principles

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Guide for Adaptation

COURSE PACKAGE T.O.P.
Theory and Operational Principles

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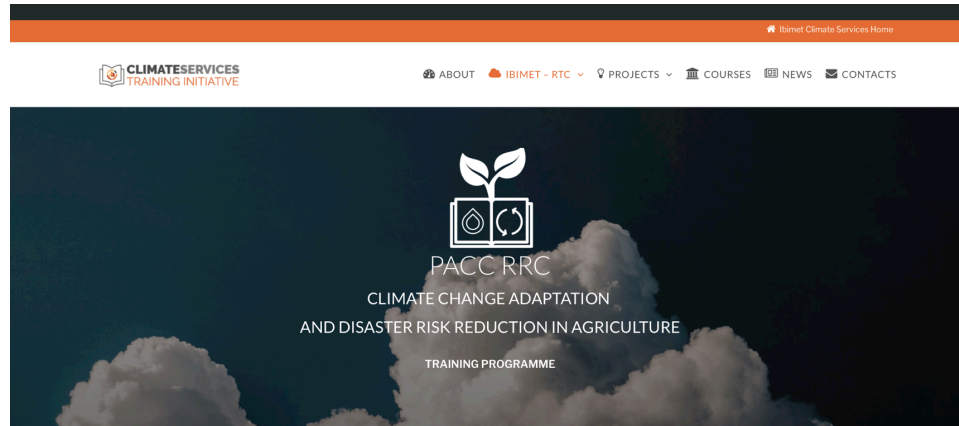
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Climate Change Adaptation and Disaster Risk Reduction in Agriculture



The Project Climate Change Adaptation and Disaster Risk Reduction in Agriculture is a training programme with the aim to reduce the impacts of Natural Disaster and Climate Change on the agricultural sector in West Africa.

TARGET GROUPS

Experts of National Agriculture, Agro-Meteorological, Hydrological and Early Warning Services.

BENEFICIARIES

The intervention area of the project are the 17 member states of CILSS/ECOWAS.





A new Training Programme: PACC-RRC Climate Change Adaptation and Disaster Risk Reduction in Agriculture

Aim

To reduce the impacts of Natural Disaster and Climate Change on agriculture in West Africa.

Target Groups

Experts of National Agriculture, Agro-Meteorological, Hydrological Services.

Beneficiaries

The intervention area of the project are the 17 member states of CILSS/ECOWAS.

Outcome of Training Courses

Enhance the Technical and scientific knowledge on CCA and DRR of the technical services' staff of the CILSS/ECOWAS member Countries.

Four training courses will be conducted in Italy and in Niger. Topics will include climate change impacts assessment, disaster prevention, and development of agromet services for agriculture.

Outcome of Networking

Strengthen the Regional network that brings together the community of technical services involved in CCA and DRR. Networking activities include: networking conference, mentoring and support for regional programs of research and development.



Thank you!

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