



World Meteorological Organization

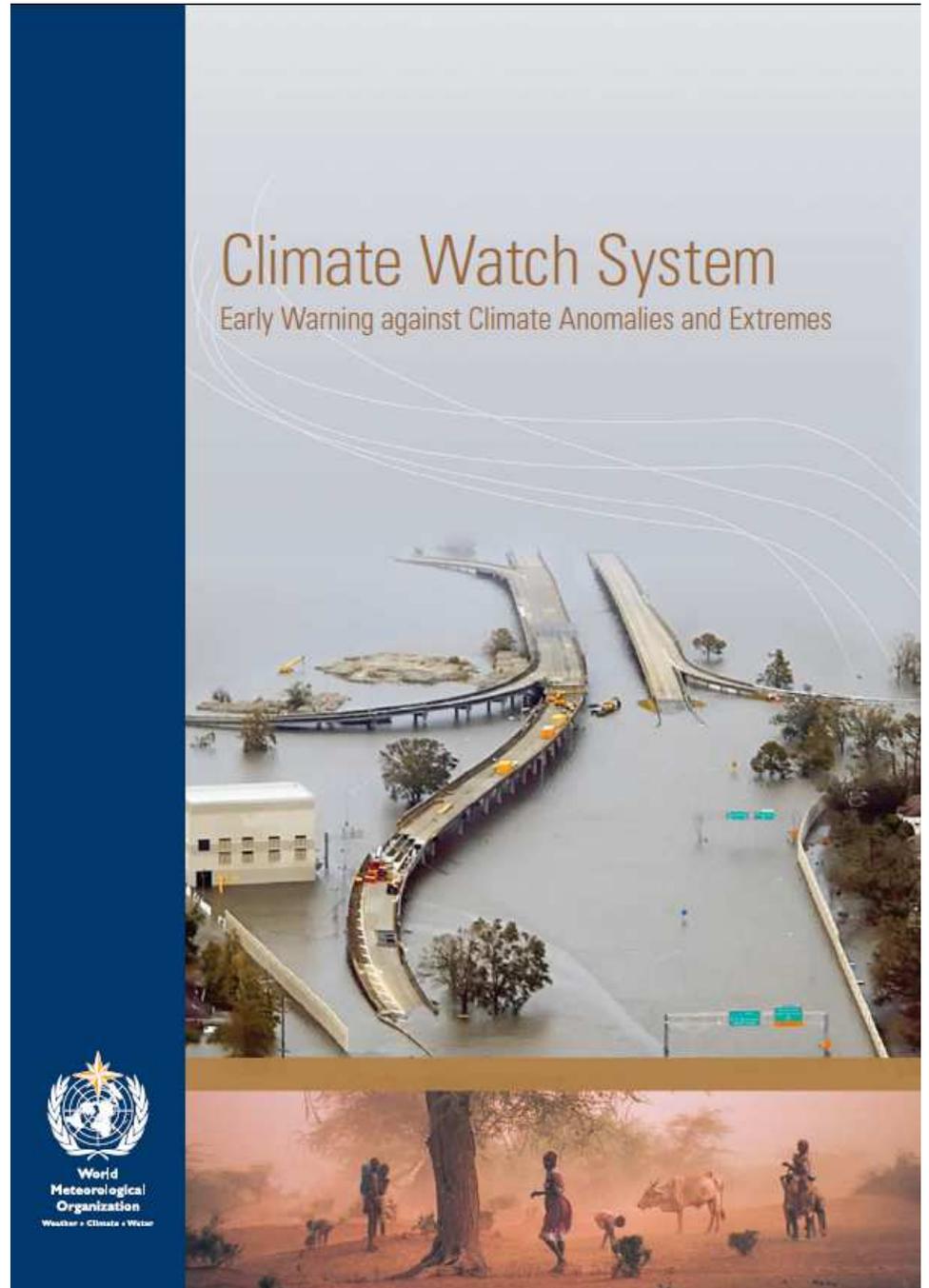
Weather • Climate • Water

# WMO Climate Watch System

## Purpose and Requirements

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# Introduction – SREX report



“There is medium confidence that **droughts will intensify in the 21st century in some seasons and areas**, due to reduced precipitation and/or increased evapotranspiration. This applies to regions including southern Europe and the Mediterranean region, central Europe, central North America, Central America and Mexico, northeast Brazil, and **southern Africa**”

“High confidence: **Likely more frequent and/or longer heat waves and warm spells in Southern Africa**. Droughts in Africa, especially since the end of the 1960s, have impacted agriculture, with **substantial famine** resulting.”

“**Increasing drought risk may cause a decline in tourism, fisheries, and cropping**. This could reduce the revenue available to governments, enterprises, and individuals, and hence further deteriorate the capacity for adaptation investment.”



# Introduction – SREX report

“There is low to medium confidence in regional trends in heavy precipitation in Africa due to ***partial lack of literature and data, and due to lack of consistency in reported patterns in some regions***”



“Simulations by 12 GCMs projected ***an increase in heavy precipitation intensity and mean precipitation rates in east Africa, more severe precipitation deficits in the southwest of southern Africa, and enhanced precipitation further north in Zambia, Malawi, and northern Mozambique***”

“***Strongest and most consistent signal is likely increase in HP in E. Africa***”

“***The periods of extreme rainfall and recurrent floods seem to correlate with the El Nino phase of ENSO events.*** When such events occur, important economic and human losses result. ***The floods had a devastating effect*** on livelihoods, destroying agricultural crops, disrupting electricity supplies, and demolishing basic infrastructure”



# Introduction

**“Damage to African port cities** from flooding, storm surge, and high winds ***might increase due to climate change***. Floods and droughts ***can cause major human and environmental impacts*** on and disruptions to the economies of African countries.”

“Agriculture as an economic sector is most vulnerable and most exposed to climate extremes in Africa. It contributes approximately 50% to Africa’s total export value and approximately 21% of its total GDP”



- Setting up an efficient extreme weather and climate warning system has long been a focus of WMO.
- The climate watch system, based on the continuous monitoring and forecasting of climate anomalies, is such a warning system.
- Its main governing entity should be the National Meteorological and Hydrological Services.



# CWS in general

The climate watch system *provides advisories and statements to inform users* (particularly those involved in natural hazards preparedness, mitigation and response) about evolving or foreseen climate anomalies

National Meteorological and Hydrological Services should *continuously monitor and assess the status of the climate*, evaluate available climate forecasts and, if warranted, issue appropriate advisories to users

Advisories should be based on all available climate information from National Meteorological and Hydrological Services, global producing centres and regional climate centres. This information includes observations on current conditions and weekly, 10-day, monthly, seasonal and annual monitoring and forecasting products

A climate watch system provides a proactive mechanism for interacting with users and alerting them to major climate anomalies and extremes which *adds value to existing climate monitoring and forecasting systems*

Should be developed with a view to fully involving users in providing the conditional elements of the system: thresholds, indices, criteria and databases.

Users should also take part in crafting the format and the content of the advisories, providing timely feedback and developing operational procedures and best practices



# CWS components

## 1. Data and observations

- Near-real-time and historical climate observations are necessary for monitoring and forecasting of extreme climate events
- Monitoring changes in climate extremes generally requires high-quality resolution data on a daily basis

## 3. Long-range forecasts

- Using global and/or regional climate model outputs from the global producing centres or regional climate centres
- Downscaling – relating large-scale phenomena to localized climate variability;
- Adapting regional climate forecasts generated by the regional climate outlook.
- Forecasts should be verified and results made available to the user community.
- It is necessary to assess the effectiveness of climate watch criteria over a period of time, which includes monitoring false alarms and hit rates.

## 2. Monitoring and analysis

- Before: the current climate status and the magnitude of anomalies should be determined.
- During: issuing organization must provide updated information to end-users on the evolution of climate anomalies and changes in climate outlooks (issuing a climate watch review at set stages after the initial advisory
- After: potential for further climate anomalies should be monitored.

## 4. Outputs

- initial climate watch advisory (expected climate anomaly)
- one or more climate watch updates (informing end-users of the progress of a climate watch)
- Final climate watch statement (confirming that the climate watch has expired)
- content and the format should be developed in conjunction with the appropriate user intermediaries based on user needs and requirements.
- Advisories should be issued in a timely manner so that the end-user can benefit from their early warning aspect.

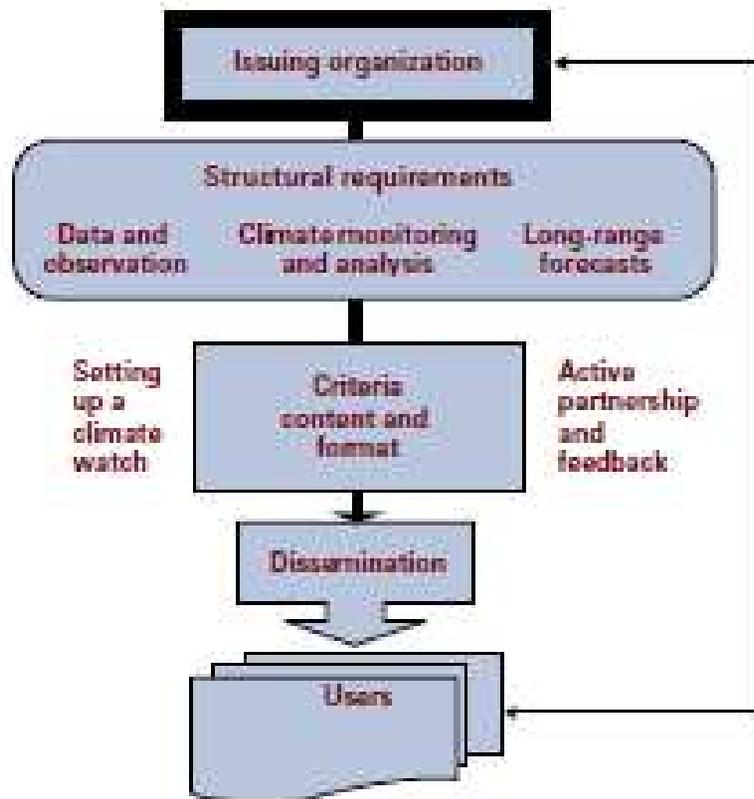


# CWS requirements

- Provide timely observations of current climate conditions for their areas of responsibility and adequate historical climate data;
- Perform timely monitoring and analyses of current climate anomalies;
- Enjoy access to current global climate forecasts and possess the technical capabilities to interpret and downscale them to their region;
- Deliver probabilistic climate forecast products that the user community can understand;
- Regularly update records of past forecasts and analyses of past forecast performance;
- Employ effective methods for the routine dissemination of climate information to user groups and sectors;
- Develop active partnerships with the user community and feedback mechanisms to provide guidance for the design of climate watches and evaluate their effectiveness.



# Examples



*How to develop a climate watch system*

## Example of format and content of a climate watch advisory



### INITIAL CLIMATE WATCH

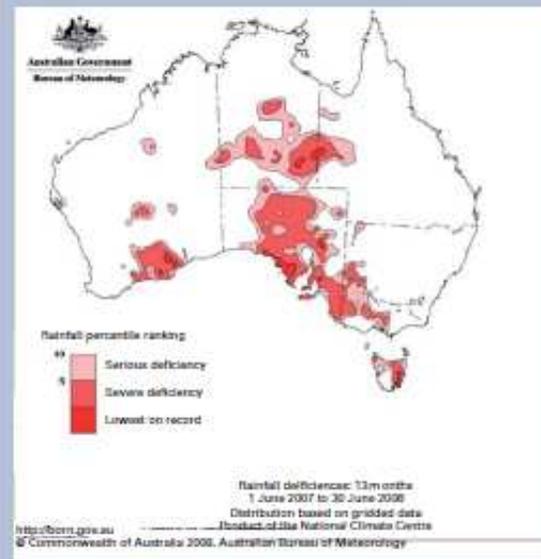
Bureau of Meteorology National Climate Centre

CLIMATE WATCH FOR RAINFALL DEFICIENCY Climate watch valid for South Australia and western Victoria

Issued on 3rd July 2008

Valid until 4th August 2008

Areas of serious to severe rainfall deficiencies across South Australia and western Victoria are likely to persist during the coming season. Most of SA and western Victoria have recorded rainfall totals in the lowest decile range for the thirteen-month period from 1st June 2007 to 30th June 2008. The outlook for the next three months, July to September, derived from the Bureau of Meteorology's statistical forecast model, shows that the chance of exceeding the median rainfall is only between 30 and 40% for these areas affected by rainfall deficits. Outlook confidence for this forecast is moderate over northern and central SA, with a skill level of around 60%. The confidence level for western Victoria is low, although in several areas the July to September rainfall total would need to be decile 8 or higher for the deficits to be removed.



These figures meet or exceed the criteria for a rainfall deficit climate watch for this region, being:

- Rainfall for the past three or more months: decile one or lower
- Chance of rainfall being greater than the median: 40% or lower
- Forecast skill score: 55% or greater

**Climate situation:** Sea-surface temperatures in the central equatorial Pacific have gradually increased over the previous two months and are now generally close to average. The final remnants of the 2007/08 La Niña event continue to linger in the western Pacific, although the overall ENSO state is rated as neutral. A majority of computer models in a recent survey indicated that neutral conditions are likely to persist for the next three to six months. However, these same

models show that a positive dipole of Indian Ocean temperatures (IOD) may persist for a few more months. This phase of the IOD has been linked with reduced rainfall over central and south-eastern Australia.

This climate watch is expected to be updated on or before 4th August 2008.



# Initial

Due to the recent weather situation (current heat wave in parts of Southern and South-eastern Europe) and the results from monthly forecast we expect

**"A period with (significantly) above normal temperatures at least up to the end of the July with possible extension of such conditions into August is expected for South-eastern Europe. The probability for this anomaly is estimated to be above 70%."**

This information should be used as guidance for the National Meteorological and Hydrological Services (NMHS) in a pre-operational mode. It is up to the concerned NMHSs in the South-eastern European region to closely monitor the status and evolution of the current climate conditions and to consider issuing a national Climate Watch Advisory. As part of this pre-operational exercise we would appreciate feedback from NMHS whether this information was helpful. Also, any suggestion on further pieces of information needed by NMHSs is highly welcomed!

EUROPE Temperature Anomaly [°C]

17-06 – 23-06-2012

24-06 – 30-06-2012

01-07 – 07-07-2012

08-07 – 14-07-2012

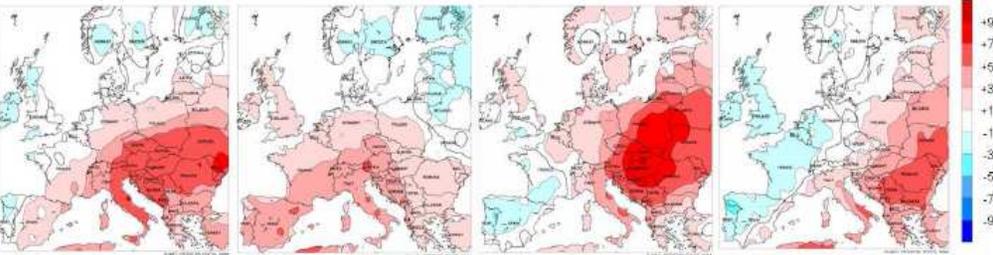


Figure 1: Temperature anomaly for the last four weeks (source: Climate Prediction Center, USA)

# 1. update

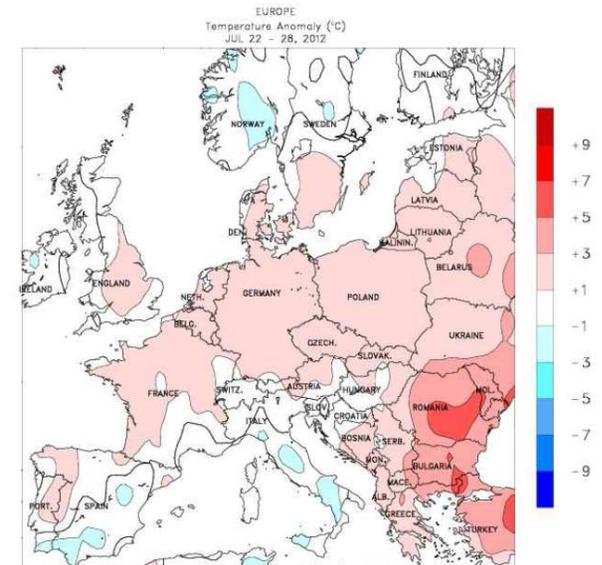
This is an update of the Climate Watch Guidance for South-eastern Europe issued on 19 July 2012.

The following information is provided as an **example** of a real guidance from the RCC-Network on trial basis.

Temperature anomalies of last week (22-28 July 2012) were above +1°C over most of southeastern Europe, in Romania, Moldavia, Bulgaria, parts of Greece and Turkey even above +3°C (see figures below). Recent maximum temperatures were exceeding 35°C in many parts of several southeast European countries for several days, up to around 40°C. Minimum temperatures reached up to around 25°C in places throughout southeastern Europe. ECMWF monthly forecasts predict a continuation of this anomalous warmth at least for the next 2 weeks, in eastern parts of southeastern Europe possibly longer.

Due to the recent weather situation (current heat wave in parts of Southern and South-eastern Europe) and the results from monthly forecast we expect

**"A continuation of the period with (significantly) above normal temperatures at least up to mid-August with possible extension of such conditions until the end of August is expected for South-eastern Europe. The probability for this anomaly is estimated to be above 70%."**



CLIMATE PREDICTION CENTER, NOAA  
Computer generated contours  
Based on preliminary data



## 2. update

This is an update of the Climate Watch Guidance for South-eastern Europe issued on 19 July 2012, last updated on 31 July 2012.

The following information is provided as an **example** of a real guidance from the RCC-Network on trial basis.

Temperature anomalies of last week (5-11 August 2012) were above +1°C over most of South-eastern Europe, in Romania, Moldavia, Bulgaria, Greece, Bosnia-Herzegovina, Albania, parts of Croatia and Turkey even above +3°C (see figures below). Recent maximum temperatures were exceeding 35°C in many parts of several southeast European countries for several days, up to around 40°C. Minimum temperatures reached up to around 25°C in places throughout South-eastern Europe. ECMWF monthly forecasts predict a transient cooling for the eastern parts of the Balkan Peninsula, western Turkey and the Middle East for this week, whereas the warming will continue in western parts of the Balkan Peninsula and the South Caucasus region. For next week a continuation of higher-than-normal temperature for South-eastern Europe except the eastern parts (eastern Turkey and South Caucasus region) is predicted with continuation until end of August and possible extension of such conditions until the beginning of September.

Due to the recent weather situation (current heat wave in parts of Southern and South-eastern Europe) and the results from monthly forecast we expect

**"A continuation of the period with (significantly) above normal temperatures up to the end of August for Adriatic Sea region and the South Caucasus for this week and for South-eastern Europe - except eastern parts - for the following weeks with possible extension of such conditions until the beginning of September. The probability for this anomaly is estimated to be above 70%."**

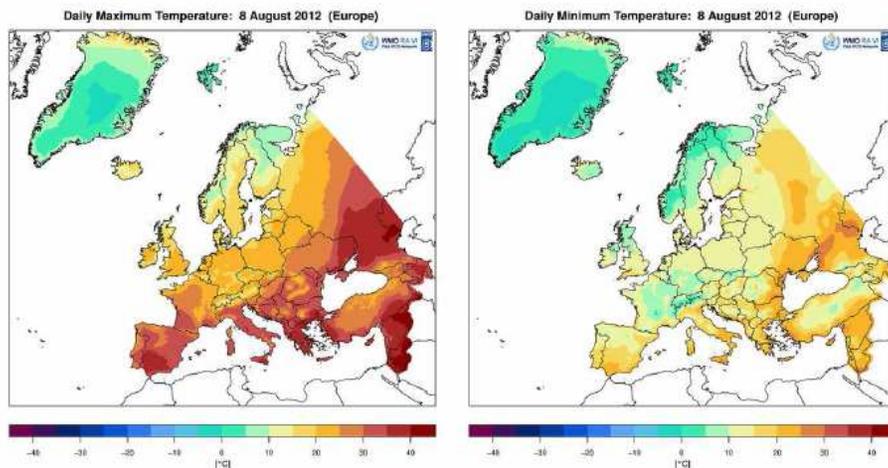


Figure 2: Daily maximum and minimum temperature in Europe on 8 August 2012

(source: Deutscher Wetterdienst, Germany)

## Final statement

This is the final statement on this Climate Watch Guidance for South-eastern Europe issued on 19 July 2012, last updated on 12 September 2012.

The following information is provided as an **example** of a real guidance from the RCC-Network on trial basis.

In the second week of September cyclone Hermine brought high precipitation amounts (partly more than 100 mm) to western parts of Balkan Peninsula. This event went along with a slight cooling. Eastern parts of Balkan Peninsula got only little or no precipitation. Here still higher than normal temperature was observed (up to +5°C temperature anomaly). Daily maxima dropped down to less than 30°C in most parts of Balkan Peninsula. In the third week of September temperatures within the normal range were observed and some precipitation in the eastern parts of Balkan Peninsula. Daily maxima did not exceed 30°C in that week except places in Greece, Turkey, the South Caucasus and the Middle East.

ECMWF monthly forecasts predict positive anomalies above +3°C for this week (24-30 September) for the Balkan Peninsula, Turkey and western Caucasian region with continuation at least until the next week (1-7 October), but with lower anomalies (above +1°C). Due to the annual cycle absolute temperatures in October will not reach the same high level as in the previous months. Therefore, a continuation of the Climate Watch Advice for high temperature is not necessary from our point of view. A precipitation deficit is still predicted for this week in whole south-eastern Europe except the Middle East, but the signal will decrease in the following weeks.

Due to the recent weather situation and the results from monthly forecast we announce

**"Termination of this Climate Watch Advice at the end of September due to weakness of signal and decreasing of absolute temperature at the beginning of October"**



Adapted by  
Serbia for  
South-Eastern  
Europe

Climate Watch (Serial No.: 20120630 – Number)

Initial/Updated/Final

Topic: Drought/Fire

Warning:

Organization issuing the statement: Republic Hydrometeorological Service of Serbia

- 0 No particular awareness
- 1 **Potentially dangerous**
- 2 Dangerous
- 3 Very dangerous

Issued/ Amended / Cancelled 17-09-2012 12:00 P.M.

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Valid from – to: 17-09-2012 – 01-10-2012 Next amendment: 24-09-2012

Region of concern: Western Balkans

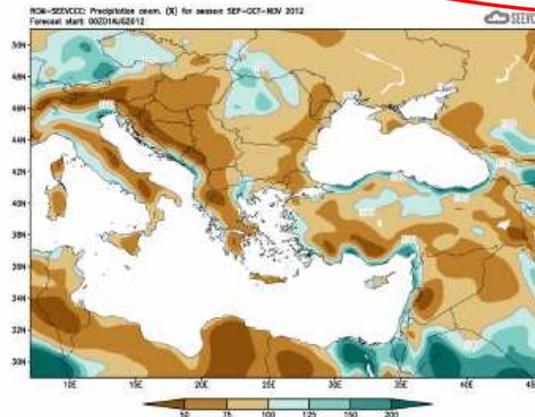
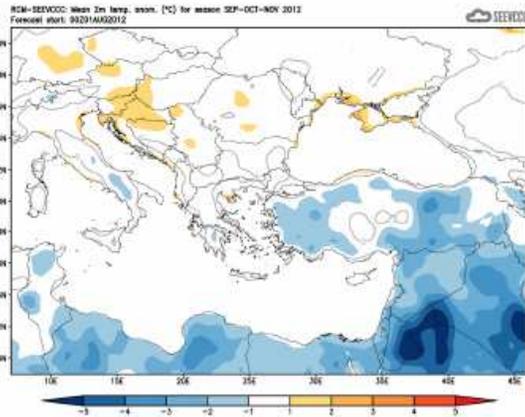


Figure 5. Mean seasonal temperature and precipitation quantity anomalies for the autumn season (seasonal outlook of RCM – SEEVCCC)



**B- ADVICES AND ACTIONS OPTIONS FOR THE TOURISM SECTOR DURING  
FEBRUARY-MARCH-APRIL 2013**

Given the temperature and precipitation outlooks above and interactions with experts of the sub-regional health, tourism and insurance sectors, the **eastern Mediterranean including much of Algeria is a potential risk area for precipitation deficits and warmer than average air near the surface**. The following advices and action options are proposed to reduce risks:

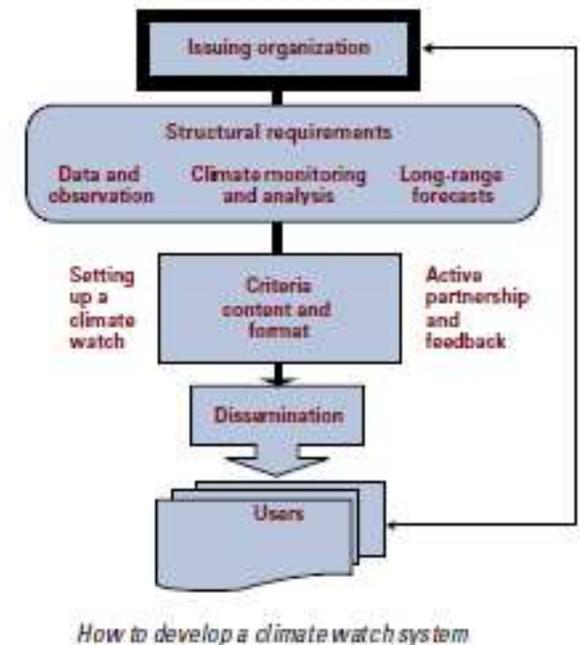
- ✓ National Meteorological and Hydrological Services provide information on local precipitation and evapotranspiration ranges for the below normal precipitation and above normal temperature categories to insurance and agriculture stakeholders;
- ✓ advise agriculture sector stakeholders on optimal practices for dry and warm spring climate;
- ✓ keep contact with National Meteorological and Hydrological Services for monitoring and forecast information at daily to weekly timescales.

*Users are strongly advised to contact their National Meteorological and Hydrological Services as well as ACMAD website ([www.acmad.org](http://www.acmad.org)) for further expert advices and assistance.*



# Summary

- Issued to heighten awareness in the user community concerning a particular state of the climate system;
- Disseminated to serve as a mechanism for initiating preparedness activities by users and/or a series of events that affect user decision making;
- Based on real-time monitoring (current status) of conditions and on climate outlooks;
- Issued by individual NMHSs, perhaps in coordination with other NMHSs or regional Climate Centers in the region or beyond;
- Developed as a result of continuous and iterative collaboration with users





**World  
Meteorological  
Organization**

Weather • Climate • Water

Thank you for your attention

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