



World Meteorological Organization

Weather • Climate • Water

WMO

Climate Monitoring Activities

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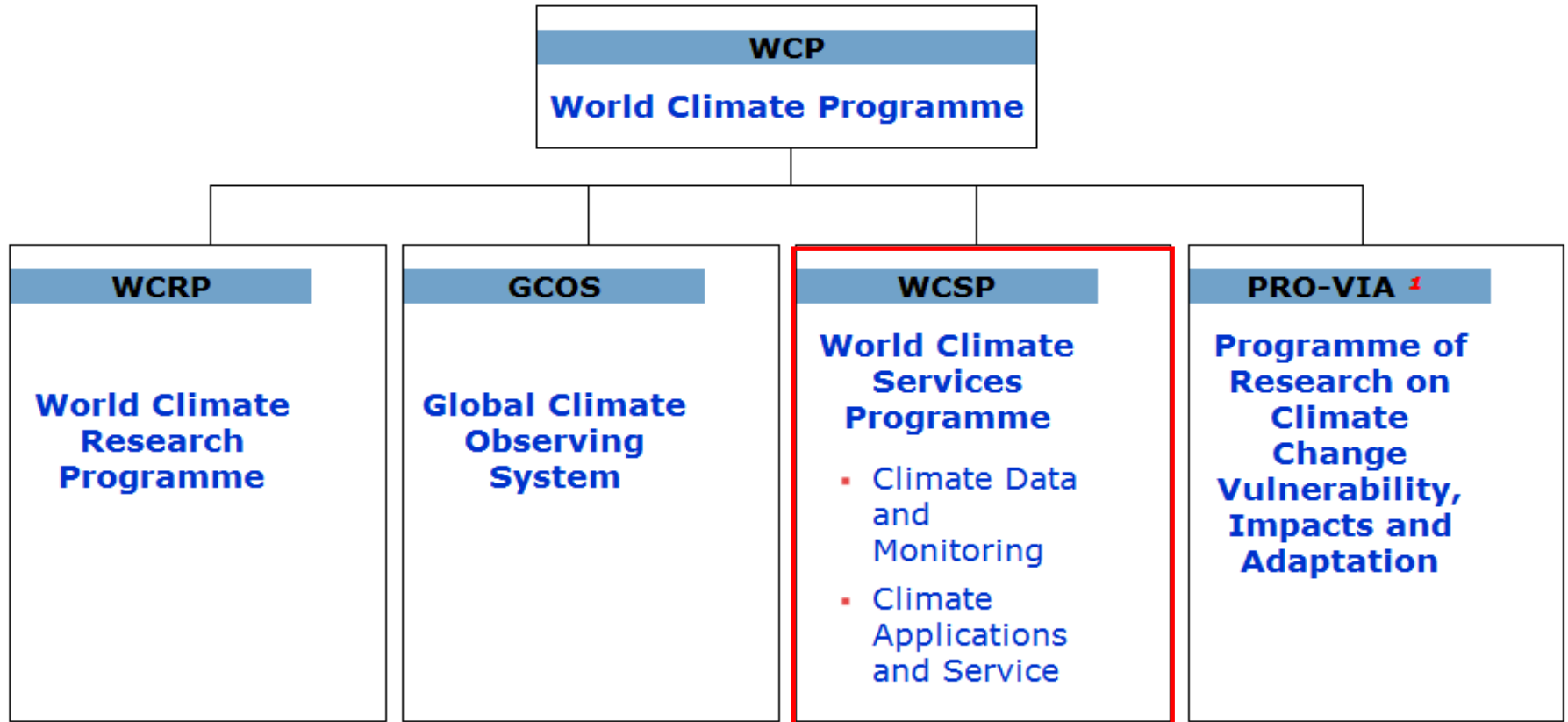
CONTENT

1. Brief introduction on WCP and WCSP
2. Purpose of WMO Climate Monitoring activities
3. New initiatives
4. Challenges and Recommendations



World Climate Programme new Structure

Congress 16 Resolution 18



¹ PROVIA became the fourth component of the WCP, by Resolution 4.3(2)/1 of EC-65.



Purpose of the WMO Climate Monitoring

1. Provide a platform for collaboration for developing data sets for monitoring the climate system and assessing Climate change
2. Promote using best practices for addressing Climate Metadata , QC, and Homogenisation of the data
3. Promote the development and use of global and regional infrastructure to help National Meteorological Services in producing climate information, climate reports and climate advisories for their users
4. Training and Capacity Building; in Data Rescue, Data Management, Climate Watch, Climate indices, etc...
5. Develop showcases on Global and Regional Climate reports



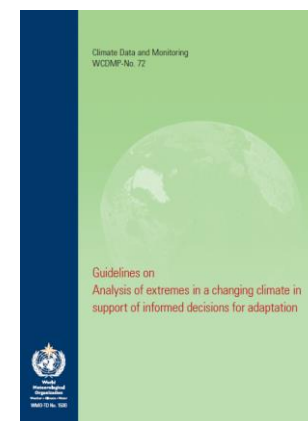
1. Platform for collaboration on Data sets

1. Facilitate the provision and exchange of monthly Data sets such as CLIMAT reports.

1. Coordination of the submission of World Weather Records on annual basis

2. Guidance on producing Climate indices suitable for assessing climate change nationally and globally (ETCCDI)

3. Foster collaboration amongst Global Data centres and National Meteorological Services for filling data gaps in the historical records (Data Rescue)



Guidelines on submission of WWRs

World Weather Records Data Sheet, 1991-2000																												
Header Record																												
Blank	WMO Number	Latitude	Longitude	Country Name (English)	Station Name (English)	Station Height	Barometer Height																					
	54511	39.48 N	116.28 E	CHINA	BEIJING	31	313																					
Data Record																												
Blank	WMO Number	Year	January	February	March	April	May	June	July	August	September	October	November	December	Annual													
	54511	2	1991	10221	10194	10170	10089	10051	9983	9956	10019	10079	10124	10187	10220	10108												
	54511	2	1992	10213	10164	10173	10051	10049	10009	9985	10029	10071	10167	10195	10206	10110												
	54511	2	1993	10237	10182	10143	10086	10033	9971	9971	10010	10072	10158	10200	10222	10108												
	54511	2	1994	10181	10182	10167	10062	10001	9989	9966	10016	10070	10152	10191	10235	10101												
	54511	2	1995	10211	10189	10122	10063	10028	9986	9976	10020	10088	10144	10159	10241	10103												
	54511	2	1996	10213	10218	10146	10099	10052	9982	9990	10037	10077	10139	10193	10174	10110												
	54511	2	1997	10213	10197	10160	10131	10042	10027	10010	10030	10126	10160	10214	10129													
	54511	2	1998	10243	10216	10176	10098	10093	10009	9988	10026	10150	10179	10241	10126													
	54511	2	1999	10216	10212	10144	10100	10063	10017	10003	10038	10098	10169	10197	10245	10125												
	54511	2	2000	10274	10218	10141	10073	10045	10018	9984	10040	10107	10175	10227	10218	10127												
	54511	2	2000	10223	10197	10155	10086	10045	9999	9983	10026	10087	10154	10194	10224	10114												
	54511	2	2010	10242	10220	10174	10100	10057	10012	9997	10037	10105	10167	10214	10238	10130												
Column Descriptions																												
A World Meteorological Organization (WMO) Number. 99999=Unassigned.																												
B Element Designator Code. 1=Header Record, 2=Mean Station Pressure (hPa), 3=Mean Sea Level Pressure (hPa), 4=Mean Air Temperature (deg C), 5=Total Amount of Precipitation (mm), 6=Mean of the Daily Maximum Air Temperature (deg C), 7=Mean of the Daily Minimum Air Temperature (deg C)																												
C Latitude. Format: DDMMH, where DD=Latitude Degrees (00 to 90), MM=Latitude Minutes (00 to 59), H=Hemisphere ('N'orth/'S'outh)																												
D Longitude. Format: DDDMMH, where DDD=Longitude Degrees (000 to 180), MM=Latitude Minutes (00 to 59), H=Hemisphere ('E'ast/'W'est)																												
E Country Name (in English)																												
F Station Name (in English)																												
G Height of Station. Format: whole meters.																												
H Height of Barometer. Format: tenths of a meter (decimal implied).																												
I Year of Data.																												
J #Average Value Designator Code. Format: Blank=Yearly Data, 1=Decadal Average, 2=Climatological Normal (CLINO) or other long-term mean.																												
K Monthly/Annual Data Values. Format: tenths of a deg C, mm, or hPa (decimal implied), -9999=missing value, annual value mean of monthly values. Precipitation: CLINO values to nearest whole mm (all others to tenths of a mm), annual value sum of monthly values. zero precipitation indicated with a '0', trace precipitation total (>0 and <0.05 mm) indicated with a '00' right aligned in the columns.																												



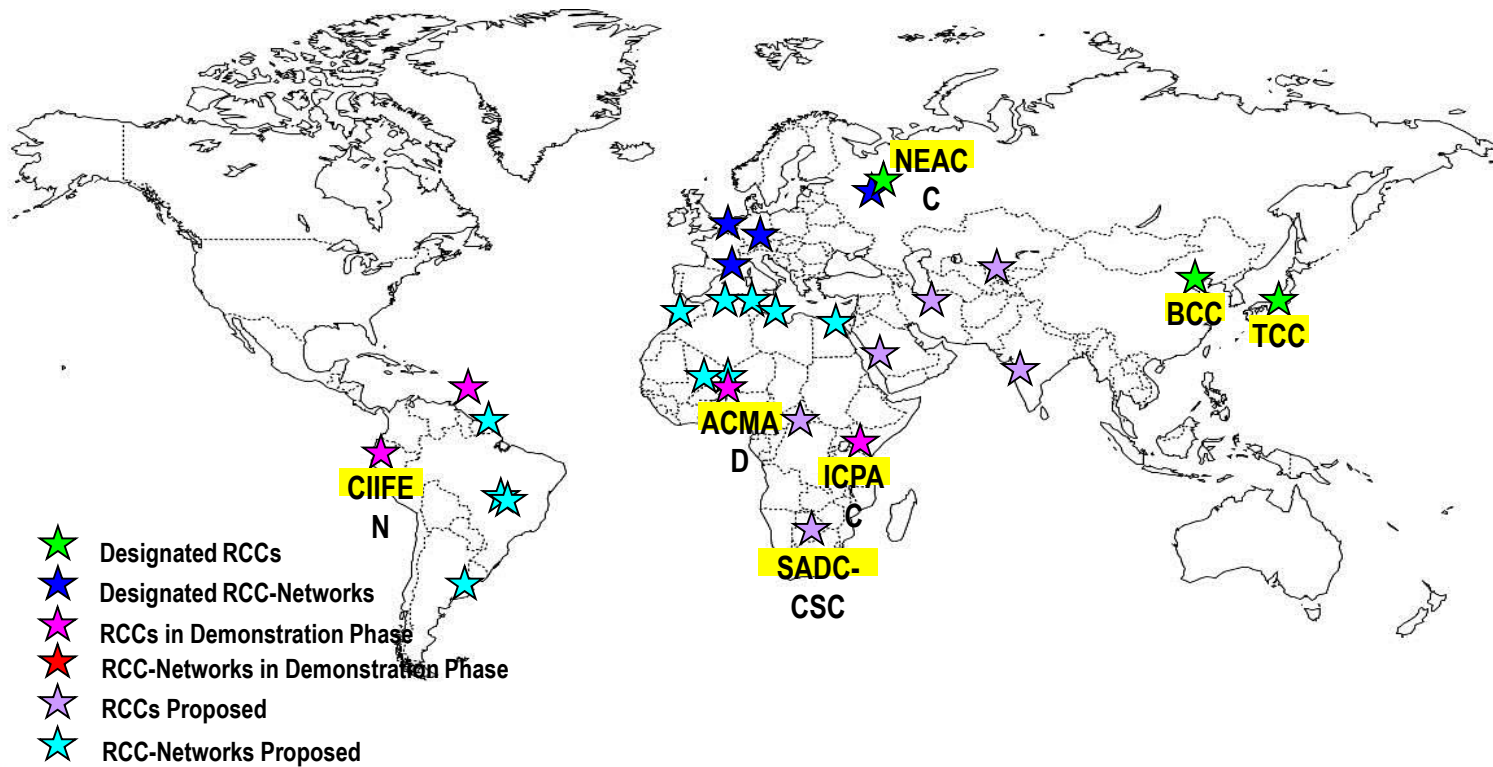
2. Use of best Practices , QC, HOM, Indices

1. Expert Team on Climate Data Management
2. Task Team on Data Homogenisation
3. Joint CCI/Clivar/JCOMM Expert Team on Climate Change Detection and Indices, 27 indices based on RR and T*, RCLIMDEX RH Test.
4. Support Regional initiatives on Data Rescue and homogenisation (MEDARE, INDARE)
5. Guidelines on Metadata and Data Homogenisation (WCDMP No.53)

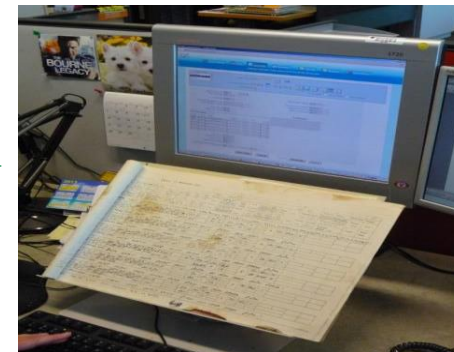


3. Infrastructure: Regional Climate Centre

RCCs are formally designated by WMO to achieve certain climate functions and products, i.e Climate data Climate diagnostics and climate predictions



Capacity Development Data Rescue and QC, Homomogenisation and Climate Change indices and



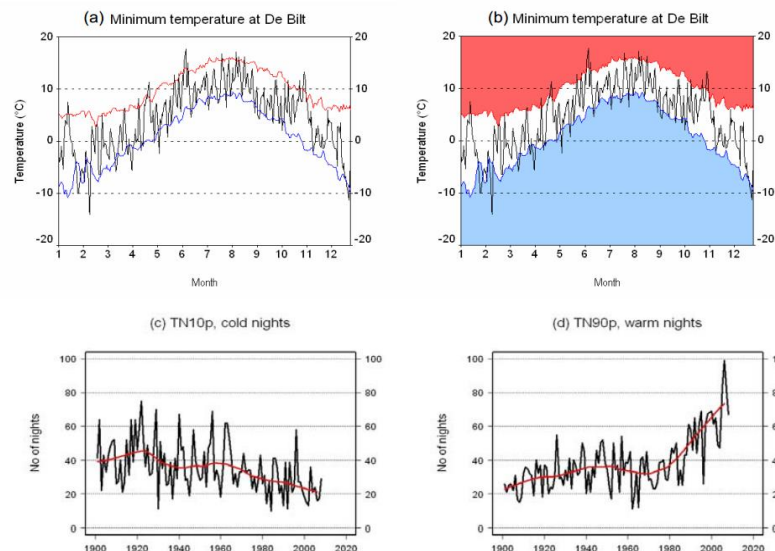
Data Rescue (DARE) is an integral part of the World Climate Services Program with a long term goal of rescuing and digitizing climate records. A focus is made on those records at risk of loss. DARE enables climate science and climate services by making readily available long and high quality climate datasets needed for:

Progressing science

- Climate variability and climate change assessment,
- Modeling,
- Calibration of Satellite data

Sector Applications and Risk Management

- Agriculture, Water Resources, Energy, Insurance
- Disaster Risk Reduction
- Climate Early Warning



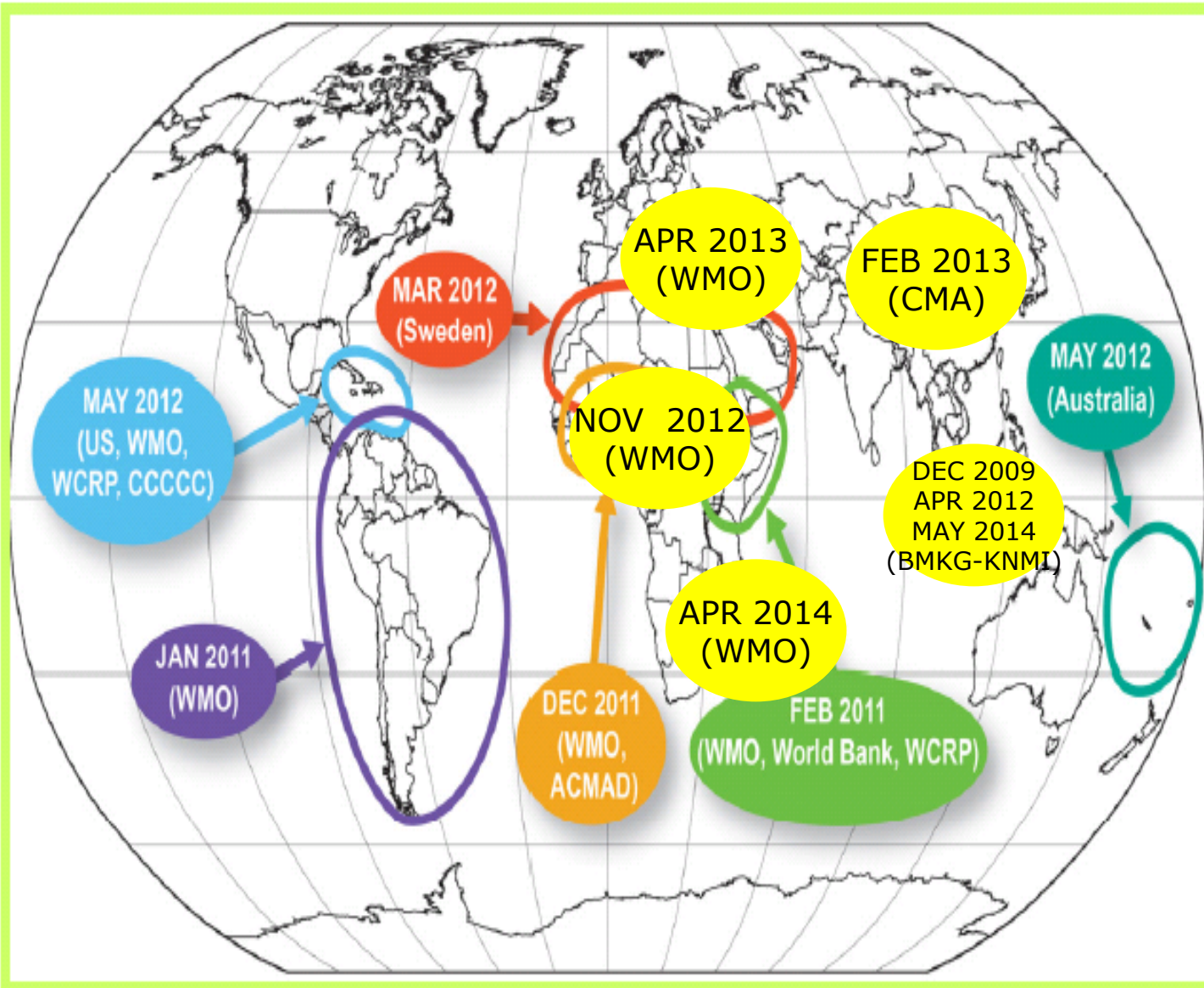
Climate Indices

Guided by CCI/WCRP-Clivar/JCOMM Expert Team on Climate Change Detection and Indices

- 27 climate indices have been developed and being used for analyzing climate extremes related to temperature and precipitations
- These workshops are designed to address the specific needs in climate change detection and indices, provide training to national experts.
- Size varies according the regions from 10 to 20 Participants
- 4 to 5 days: A combination of seminars and hands-on data analysis.
- These workshops resulted usually in a scientific paper in the peer-reviewed journal, like International Journal of Climatology of the Royal Meteorological Society



ETCCDI Regional Workshops 2011 - 2012

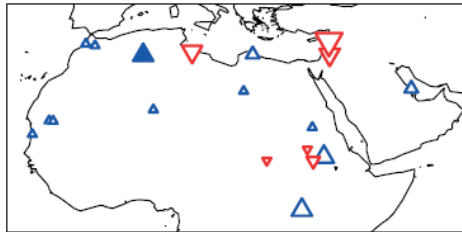


Zhang et al.,
WIREs Clim
Change,
2011

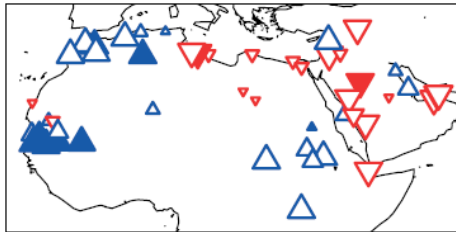


Climate Indices Example from Casablanca workshop

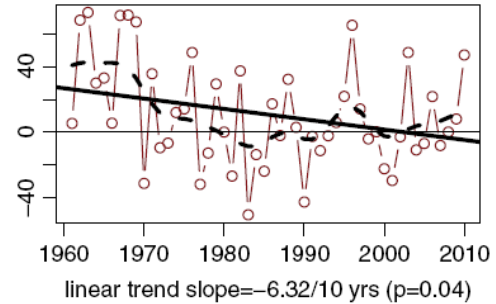
(a) PRCPTOT



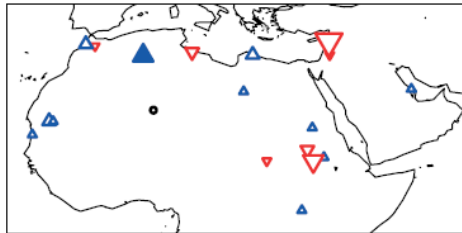
▲ > 20 ▲ > 10 ▲ > 5 ▲ > 0



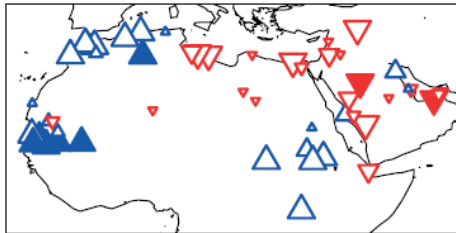
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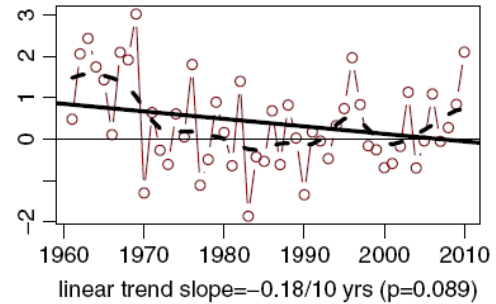
(b) R10mm



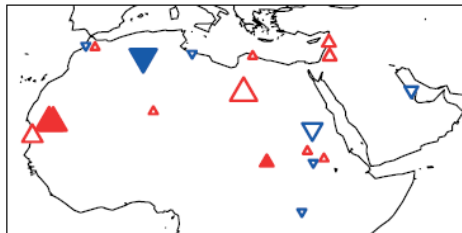
▲ > 0.6 ▲ > 0.4 ▲ > 0.2 ▲ > 0



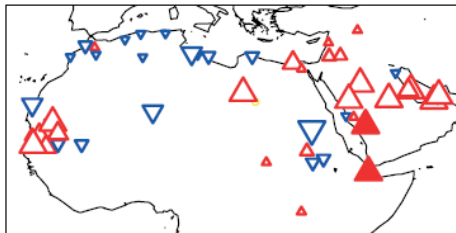
▼ < 0 ▼ < -0.2 ▼ < -0.4 ▼ < -0.6



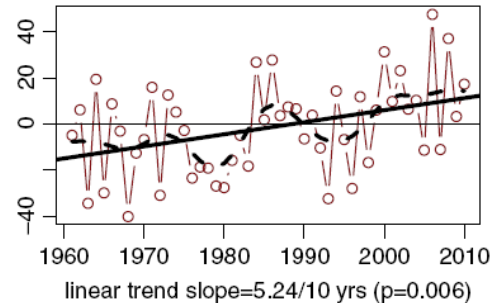
(c) CDD



▲ > 15 ▲ > 10 ▲ > 5 ▲ > 0



▼ < 0 ▼ < -5 ▼ < -10 ▼ < -15



Promote Climate Monitoring Show cases at Global and Regional levels

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Home Secretary-General Weather Climate Water Environment Applications FAQs

World Climate Data and Monitoring Programme

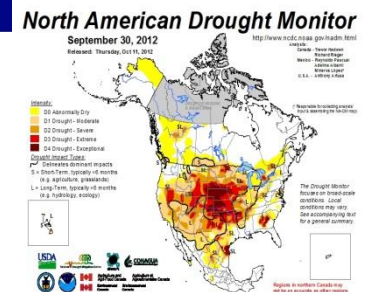
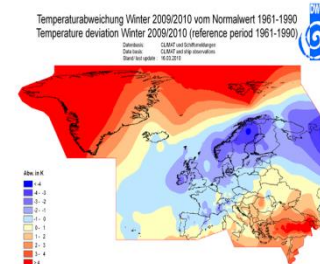
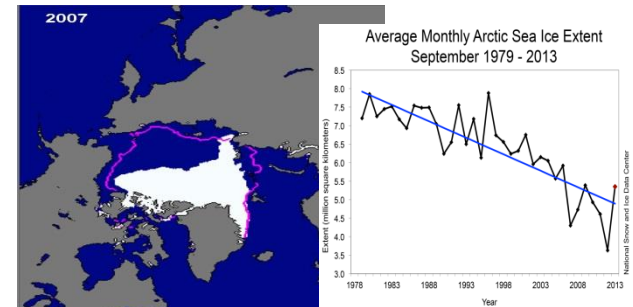
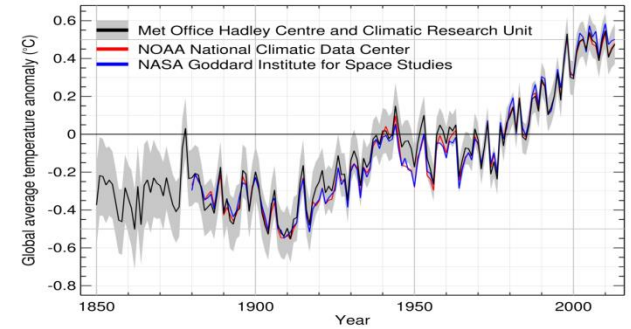
Programmes > WCP > WCDMP > CA_Statements

WMO Statement on the Status of the Global Climate

WMO, working with UNEP (United Nations Environment Programme), is responsible for the periodic assessments of climate change issued by the Intergovernmental Panel on Climate Change (IPCC). In June 1993, the 45th session of the Executive Council of WMO decided that greater efforts were needed to promote the WMO role as a provider of credible scientific information on climate and its variability and requested that arrangements be made for the regular wide distribution of WMO statements on the status of the global climate. In response to this decision, statements have been provided annually through the WCDMP.

2012 2011 2010 2009 2008 2007 2006

[See the complete series of online available WMO climate statements](#)



Climate Data Management System Specifications

- CDMS Governance
- Time Series Climate Data
- Climate Data Management
- Climate Data Analysis
- Climate Data Presentation
- Climate Data Delivery Services
- Core IT Infrastructure



New Initiatives: International Data Rescue Portal (I-DARE)

Commission for Climatology ET-Data Rescue

→ Single entry portal to data rescue worldwide

- **Inventory** of to-be-rescued and rescued data
- Stimulation of **best practices and knowledge sharing**
- Promotion of **applications** using rescued data
- Stimulation of **new** data rescue projects
- Converge **contents** of new and existing DARE WebSites
- Avoid **duplication** of data rescue activities
- An information gate for **donors**
- Promote **citizen science to enhance DARE activities**

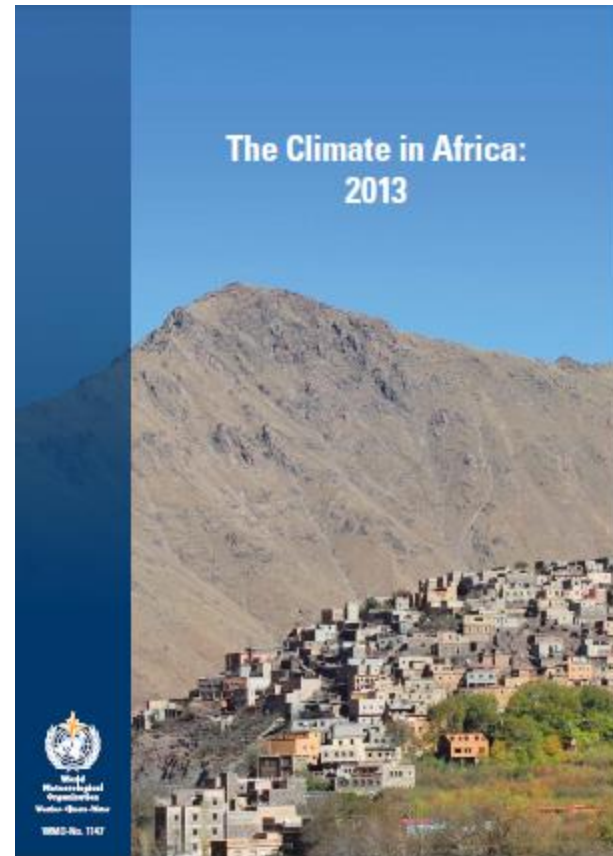
A white paper on I-DARE (endorsed by CCI-16) can be found at:
http://www.wmo.int/pages/prog/wcp/wcdmp/documents/IDARE_wcdmp83.pdf



Climate Statement on the Status of Climate in Africa, Annual basis WMO-ACMAD-Regional Association for Africa

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Challenges

- Data availability and data quality
- Inconsistency in producing national climate reports
- Difficulties in monitoring climate with regularity in the regions , i.e Africa, South America, South Asia. No regional homogenized data sets
- A large need for enhancing capacity in Developing and least developed countries and lack of sufficient resources



Recommendations

- Develop coherent and consistent methodology for submission on national climate monitoring products (Commission for Climatology)
- Work on Regional homogenized climate data sets
- Develop simple tools and software that can be used by NMHSs in producing regular and timely monitoring bulletins at national level
- Promote internet web Platform to share and make use of global data for producing climate information in easy manner.
- Guide Countries and RCCs in providing additional background information, i.e reference period and uncertainty estimates
- Foster partnership and collaboration to meet the large need in capacity development; training, Software, workshops,etc.





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Thank You

Contacts

http://www.wmo.int/pages/prog/wcp/wcdmp/index_en.php

Climate Data and applications division

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