Regional Workshop on Climate Prediction/Projection and Extreme Events Indices in the Arab Region

*Aim*: To Enhance Climate Data Collection and Processing Capability and the Dissemination of Derived Global Climate Change Information, along with Climate Prediction/Projection aspects for the Arab Region.

An Activity of the ESCWA/LAS/ACSAD/WMO/UNISDR/SMHI SIDA Project on Assessment of the Impact of Climate Change on Water Resources and Socio-Economic Vulnerability in the Arab Region

Workshop implemented in partnership with the:

Direction de la Météorologie Nationale (DMN)

Casablanca, Morocco

13 – 16 March 2012

Draft Annotated Agenda
(as of 09 March 2012)

*The workshop language is English*
1. **Background**

While substantial progress has been made in including regional analyses of changes in extremes in the Assessment Reports published by the Intergovernmental Panel on Climate Change (IPCC), they have not yet fully reflected the changes occurring in the Arab Region. Further, an assessment of the observational aspects of climate change in the Arab Region is critical for the evaluation and interpretation of model-based climate prediction/projection products increasingly being sought for vulnerability assessment and policy guidance. This workshop is intended to address the specific needs in climate change detection and indices, provide training to national experts and also discuss the various aspects related to climate prediction and projection relevant to the Arab Region. This workshop is part of a project within the framework of a Regional Initiative for the Assessment of the Impact of Climate Change on Water Resources and Socio-Economic Vulnerability in the Arab Region, coordinated by the United Nations Economic and Social Commission for Western Asia (ESCWA), League of Arab States (LAS), Arab Centre for the Studies of Arid Zones and Dry Lands (ACSA), Swedish Meteorological and Hydrological Institute (SMHI), World Meteorological Organization (WMO) and United Nations International Strategy for Disaster Risk Reduction (UNISDR), and funded by the Swedish International Development Cooperation Agency (SIDA). The participating countries are Members of LAS, namely Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates and Yemen.

An Expert Team led by WMO Commission for Climatology (CCI) on Climate Change Detection and Indices (ETCCDI) is coordinating a set of indices for analyses of extremes. These indices will be calculated at the workshop. Through the ETCCDI’s coordination, the indices analyzed for the Arab Region will be able to fit seamlessly into a true global analysis encompassing several other similar regional initiatives, supporting the IPCC Assessment as well as other assessments of vulnerability to climate change. See [http://cccma.seos.uvic.ca/ETCCDI/](http://cccma.seos.uvic.ca/ETCCDI/) for more information on the Expert Team.

The technical leads/resource persons for the workshop are:

1. **Dr. Thomas Peterson**, Principal Scientist, National Climatic Data Center (NCDC), National Oceanographic and Atmospheric Administration (NOAA), Asheville, USA, and President of the WMO Commission for Climatology (CCI);
2. **Dr. (Ms.) Manola Brunet**, Director, Centre for Climate Change, University Rovira i Virgili, Tarragona, Spain, and Co-Chair, Open Panel of CCI Experts on Climate Monitoring and Assessment;
3. **Dr. (Ms.) Fatima Driouech**, Ingénieur Principal, Responsable Service Etudes Climatiques, Centre National de Recherches Météorologiques, Direction de la Météorologie Nationale, Casablanca, Morocco, and Co-Chair, Open Panel of CCI Experts on Climate Monitoring and Assessment;
4. **Dr. Markus Donat**, Research Fellow, Climate Change Research Centre, University of New South Wales, Sydney, Australia;
5. **Dr. Mansour Almazroui**, Director, Center of Excellence for Climate Change Research, King Abdulaziz University, Jeddah, Saudi Arabia;

6. **Dr. (Ms.) Jayashree Revadekar**, Scientist, Center for Climate Change Research, Indian Institute of Tropical Meteorology, Pune, India;

7. **Dr. Rupa Kumar Kolli**, Chief, World Climate Applications and Services Division, WMO, Geneva, Switzerland;

8. **Dr. Tarek Sadek**, First Economic Affairs Officer (Climate Change), Water Resources Section, Sustainable Development and Productivity Division, ESCWA, Beirut, Lebanon; and


This workshop will be a combination of seminars and hands-on data analysis. This agenda is annotated so that details about the seminars and analyses are included in the agenda. The times are approximate. If seminars and discussion take less time there will be more time for hands-on data analyses.

2. **Preparing the data for analysis:**

The participants are expected to bring their country’s best digital “long-term” daily station precipitation, maximum temperature and minimum temperature data with them for hands-on analyses. The ideal time series would be from the beginning of observations to the present or at least back to 1950. However, if the early years are not yet digitized, then as long a period as possible should be brought. If a station has good quality and continuous data for only 30 years, that station may be preferable to a station with a longer but intermittent and poor quality data. Past workshops have found that 8 stations are about as many as one person can carefully analyze at a workshop. The software the workshop will be using will require the data to be in columns with one day’s data per line. The columns should be year, month, day, total precipitation, maximum temperature, and minimum temperature. Missing observations will need to be set to -99.9. A precipitation only station is fine to bring as long as the temperature columns are filled with -99.9. The same is true for temperature only stations with precipitation set to -99.9. Special code data will need to be removed or altered (e.g., if there is a code for trace precipitation, it can be replaced by 0.01 mm). The data for each station must be in a separate file. An additional record of station name, number, latitude, longitude and elevation will also be necessary but these can be in paper form and hand entered in the software. To speed this process along, a data sample can be sent in advance to Dr. Markus Donat (m.donat@unsw.edu.au), one of the technical leads for the workshop. Any questions about data format should be addressed to Dr. Donat. Also, information about station history, such as dates of station moves or changes in instrumentation, should be brought to the workshop as well.
WORKSHOP PROGRAMME

TUESDAY, 13 March 2012

8:30 a.m.  Registration

Session 1:  Opening and Background
Moderator: Dr. Fatima Driouech

9:00 a.m.  Welcome and opening remarks from the organizers of the workshop
  ▪ Mr. Abdalah Mokssit, Director, DMN, and 3rd Vice President, WMO
  ▪ Mr. Ashraf Nour Shalaby, Senior Expert on Meteorology and Climate Change, League of Arab States
  ▪ Dr. Thomas Peterson, President, WMO CCI
  ▪ Dr. Rupa Kumar Kolli, WMO
  ▪ Ms. Carol Chouchani Cherfane, ESCWA

9:30 a.m.  Introductions around the room.

10:00 a.m.  Regional Initiative for the Assessment of the Impact of Climate Change on Water Resources and Socio-Economic Vulnerability in the Arab Region
  ▪ Ms. Carol Chouchani Cherfane

10:20 a.m.  A Regional Approach to Climate Change Analysis:
  A brief history of these workshops with examples from a past workshop and goals and expected outcomes of the workshop: hands-on analyses of indices of extremes, journal paper on changes in extremes in the region, contribution to a global paper on changes in extremes, release of indices, potential sharing of data, etc.
  ▪ Dr. Thomas Peterson

10:40 a.m.  Open Discussion

11:00 a.m.  Health Break

Session 2:  Climate of the Arab Region: Past, Present and Future
Moderator: Dr. Rupa Kumar Kolli

11:20 a.m.  Observed climate change in the Arab Region: an overview discussion of how the climate of the region has changed based on instrumental data
  ▪ Dr. (Ms.) Fatima Driouech

11:40 a.m.  Climate Extremes in the Arab Region: Example from Saudi Arabia, including data quality and homogeneity
  ▪ Dr. Mansour Almazroui
12:00 noon  Climate data for climate monitoring and assessment: Need for data management and data rescue.
   ▪ Dr. (Ms.) Manola Brunet

12:20 p.m.  Questions and discussion

1:00 p.m.  Lunch

**Session 3:**  **Introduction to the climate and data in the region**  
_Moderator: Dr. Mansour Almazroui_

2:00 p.m.  Brief talks (approximately 10 minutes each) by the participants from each country in alphabetical order by country.  
A typical presentation (not more than 10 slides) might start with a few beautiful photographs of the country to help orient participants and be followed by a short description of the climate of the country. The presentation should essentially focus on an overview of climate data availability and selected stations at the national level. Each presentation should include a map showing the locations of the stations whose data were brought and a discussion of the period of record for the digital daily data.

3:30 p.m.  Health Break

3:50 p.m.  Country presentations (continued)

5:00 p.m.  Open discussion and wrap-up

**WEDNESDAY, 14 March 2012**

**Session 4:**  **Quality control of daily climate data**  
_Moderator: Dr. Thomas Peterson_

8:30 a.m.  Quality control of climate data and introduction to RClimDex  
Includes aspects such as insuring correct station location, correct units, and assessment of outliers. The latter is particularly problematic as the indices we will be calculating focus on extremes, yet it is the extremes that are most likely to be flagged as bad data by quality control (QC) software. Throwing out valid extreme values can cause errors as easily as keeping erroneous extreme values. The workshop will be using RClimDex software which is available from:  
[http://cccma.seos.uvic.ca/ETCCDI/](http://cccma.seos.uvic.ca/ETCCDI/). Participants are encouraged to download the software and test it to make sure their data can be read properly prior to the workshop. This software uses a statistical system known as “R”. The R statistical software are available free of charge from [http://www.r-project.org/](http://www.r-project.org/).
   ▪ Dr. (Ms.) Manola Brunet
Homogeneity testing of climate data and homogenization for RClimDex Introduction to data quality and homogeneity checks in RHtest, an accompanying software with RClimDex, their limitations and uses, types of graphing that can help one assess the validity of outliers (histograms, time series, neighboring stations’ data, etc.).

- Dr. Markus Donat

Questions and discussion

Participants start Quality Control work on their data using the RClimDex software.

- Assisted by: Dr. Markus Donat, Dr. Mansour Almazroui, Dr. (Ms.) Fatima Driouech and Dr. (Ms.) Manola Brunet

Health Break

Participants continue work on their data

Lunch

Participants continue work on their data

Health Break

Participants continue to work with the software on their data.

Plenary Discussion and wrap up

THURSDAY, 15 March 2012

Session 5: Indices derived from daily data

Moderator: Dr. (Ms.) Manola Brunet

Introduction to Climate Indices
Includes discussion of: Climate indices as a proxy for data; Need for indices; Problems with indices (e.g., non-reproducible by other scientist who lack access to the data); Economic value of data; Data exchange problems; Examples of some indices and usefulness; Identification of indices of relevance for this region

- Dr. Markus Donat

Questions and discussion

Participants to work on calculating indices using RClimDex with a view towards preparing country reports.

- Assisted by: Dr. Markus Donat, Dr. Mansour Almazroui, Dr. (Ms.) Fatima Driouech and Dr. (Ms.) Manola Brunet

Health Break
11:20 a.m. Participants work with the software on their data.

1:00 p.m. Lunch

2:00 p.m. Participants work with the software on their data.

3:30 p.m. Health Break

**Session 6: Country Reports on Climate Indices**
*Moderator: Dr. Markus Donat*

3:50 p.m. Presentation of country reports
As a mirror to the opening reports, country representatives will present the results of their analyses. The reports should mention the quality and homogeneity problems the data might have had and a summary (country or regional average) of the indices time series (About 5 minutes each, with not more than 5 slides).

5:10 p.m. How we will show the results of the indices for the whole region and showing a few examples of what country reports have looked like from previous workshops.
- Dr. Thomas Peterson

5:30 p.m. Plenary discussion and wrap-up

**FRIDAY, 16 March 2012**

**Session 7: Climate Prediction/Projection for the Arab Region**
*Moderator: Mr. Abdalah Mokssit*

9:00 a.m. Global Framework for Climate Services: Perspectives for the Arab Region
- Mr. Abdalah Mokssit

9:20 a.m. Potential operational mechanisms for climate prediction/projection in the Arab Region
- Dr. Rupa Kumar Kolli

9:40 a.m. Climate change projections for the Arab Region
- Dr. Mansour Almazroui

10:00 a.m. Regional climate model simulations for the Arab region: Domain selection, sensitivity studies and extreme climate events
- Dr. Grigory Nikulin, SMHI

10:20 a.m. Health Break

10:40 a.m. Regional synthesis of climate indices and trends in extremes: Some preliminary results and future plans.
- **Dr. Markus Donat**

11:00 a.m. Analysis of extremes indices in climate model simulations: Some examples
  - **Dr.(Ms.) Jayashree Revadekar (presented by Dr R. Kolli)**

11:20 p.m. Open Discussion

12:30 p.m. Friday Prayer and Lunch

**Session 8: Next Steps and Conclusion**

*Moderator: Ms. Carol Chouchani Cherfane*

2:30 p.m. Climate data rescue projects: MEDARE Experience
  - **Dr. (Ms.) Manola Brunet**

2:50 p.m. Current status and future needs of climate prediction/projection in the Arab Region, including early warning systems
  - **Dr. Khaled Mawed, ACSAD**

3:10 p.m. The way forward for the Regional Initiative
SIDA project work plan and follow-up actions from the workshop with proposals and mechanisms (i.e., focal points, protocols, agreement, consultancies, etc.) for data sharing and exchange for implementation of the Regional Initiative and development of a regional climate databases.
  - **Dr. Tarek Sadek**

3:30 p.m. Health Break

3:50 p.m. Open Discussion

4:30 p.m. Workshop conclusions and recommendations

5:00 p.m. Close of workshop