Regional Workshop on Climate Prediction / Projection and Extreme Event Indices In The Arab Region

Presentation of the Meteorological National Office of Algeria

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PRESENTATION OF THE ALGERIAN MET OFFICE
Organization of National Meteorological Office

To ensure its missions, the Algerian met-office employs a manpower of 1198 agents among which, 64% represents the technical body.

The Algerian territory is covered by a network of observational stations:

- 81 for the surface and 05 for the altitude
  - observation stations, 296 climatological stations, 200 Automatically

- 40 SMA DCP (locust invasion), 10 SMA (Local area , Algiers)

- 3 radar centers (Setif, Seraidi, D.E.Beida)

- 2 special Research stations, dedicated to specific observation

Concerning the structures:

- 4 Functional directions and 4 Operational ones at the central level.
- 6 Directions at the regional level, in charge of the observational Network (Constantine, Algiers, Oran, Bechar, Ouargla and Tamanrasset).

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National Network

Stations dedicated to specific observations

Station of KSAR CHELLALA
Arid and semi-arid Zones

Station of ASSEKREM (2710 m)
Global atmosphere Watch
LA MÉTÉOROLOGIE S'ORGANISE SUIVANT TROIS VITESSES DE VENT.

STATION AUTOMATIQUE DE KSAR CHELLALA

Direction du vent

Vitesse vent

Température

Humidité
AWS at oued Korriche
Doppler radar at Algiers-airport
National Network 4

EVOLUTION OF the SYNOPTIC NETWORK 1936-2007

6 stations with continuous observations from 1936 till 2010
The main tasks of the National Climate Centre:

It is responsible for implementing, monitoring and operation of the climatologically database development and dissemination of periodic publications and climate assistance to users.

Conducts studies to identify and quantify the weather impact on economic activity.

Has the climate expertise to process and statistical analyze of data.

Able to offer operational services to ensure the monitoring of weather derivatives.
Channel acquisition and processing of climatologically data

Messages
AGMET + CLIMAT

Synoptic stations

Stations of Observations (SP, PCP, PP, Auto)

Regional Structures

Central Structure
CNC

Users

- Acquisition of data and documents
- Document Control
- Capture and control data in CLICOM
- Inspection stations
- Document Archiving (Manuscript and Electronic)
- Re-check the data CLICOM
- Updating the database
- Processing and publication of data (Atlas, Newsletters ... ....)
Base of climatological data 1

Handwritten archived on two sites ORAN before 2003, ALGIERS since 2003

The oldest climatologically document Algiers city 1856
Base of climatological data 2

Volume of the bank data

- 2977 years of synoptic data (sorting-schedules)
- 10 000 years of daily data (precipitation, extreme temperatures)
- 1000 years of (automatic) hourly data
- 17 years of data VAG
Climate Publications

- Newsletter of decadal climate and agro meteorological information.
- Monthly newsletter of climate information.
- Annual Summary of weather in Algeria.
- Newsletter of the seasonal forecast
Climate Products 2

Routinely collected meteorological data from meteorological stations has to:

Observations:
- Medium,
- Normal,
- Return periods …

From series homogenized
Generator series:
- Probabilities,
- Case studies.

Seasonal forecast:
- Anomalies of precipitation and temperatures of 1, 2 and 3 months

Statistical adjustments:
- Correlation between observations and model outputs
Prévision mensuelle des précipitations et des températures moyennes  
Jun-Jul-Août

Source : NOAA/NWS/NCEP.
Dernière mise à jour : Mercredi 02 Juin 2010.
Ce bulletin est élaboré à L’Office National de la Météorologie à titre expérimental, il sera amélioré et enrichi avec les avis des utilisateurs. Il est issu des sorties du Modèle CFS (NCEP).

Modèle : NCEP/ Climate Forecast System (CFS)
CFS a été développé au Centre de modélisation de l'environnement NCEP. C'est un modèle couplé représentant l'interaction entre les Océans, la Terre et l'Atmosphère. Devenu opérationnel en août 2004.

Probabilité mensuelle des précipitations
Fig. 6 : Tendance des pluies annuelles (zone : plaines côtières)

Station : Jijel

\[ y = -0.0188x + 0.8761 \]
\[ R^2 = 0.25 \]
Fig. 9 : Tendance des pluies annuelles (Test de Mann Kendall)
All stations have positive temperature differences except the station with Mostaga limit of our study area Ghardaïa, -0.12 °C.

The warmest years were 2003, 1999, 1994, 1989, 2001 and 2006. Generally, the last two decades have warmer years except for 1991 and 1992, which were relatively cold (0.12 °C, 0.5 °C).

Since 1950, there was a significant increase in mean annual temperatures compared to the normal level of northern Algeria in the order of 0.5 °C to 0.6 °C.
Tendency of the indices basing itself on the minimal temperatures

(a) TN10p

(b) TN90p
Une grande partie de l’Algérie est extrêmement vulnérable aux variations et extrêmes climatiques,

- Une sécheresse récurrente : 1943 à 1948, depuis la décennie 80
- La vague de chaleur de l’été 2003,
- La vague de froid du mois de janvier 2005,
- En novembre 2001, plus 800 personnes ont perdu leur vie à Bab El Oued du fait des pluies et inondations catastrophiques

Photos presse
Every region in Algeria is vulnerable

- The Algerian territory is very vast with over 2.5 millions Km² and culminating at 300 and presents very different meteorological and geographical variations from a region to another.

- The coasts lie over than 1200 km, in the southern side of the Western Mediterranean area.

- Algeria is affected by both the northern and the western disturbances, and also by the ones which are associated with the thermal cyclones when Saharian air is advected towards the coasts. Sometimes, the cyclone at the surface is not well formed (A. Jansa, 1990; B. Hamadache, 1992).

- The Mediterranean in general and the Western basin in particular are identified as being the most cyclogenic area in the world (Reither, 1975).

The cyclogenesis in the Mediterranean, has a great impact on the severe weather which, sometimes affects the surrounding countries.
What happened?

Between 18Z on 9th Nov and 12Z on 10th Nov 2001, over 260mm of rain fell over western and central Algiers.

- Run-off from mountain slopes converged in districts of Algiers.
- 776 dead, 126 missing, 1454 without shelter
- 389 vehicles destroyed

The factors aggravating the floodings are:

- The intensity and the length of the precipitation.
- The importance of the surface and the slope of the basin pouring: surface of 10 Km²s (maximal altitude of 395 m and minimal altitude of 01 m)
- The lack of plant cover and capacity of absorption of soil, accelerating the phenomena of erosion and ruissellement
- An urbanization in flooding zone
The floodings of BAB EL OUED
STATION DE BIRMANDREIS

- Rain started November 09, 2001 toward 9h 30 min. with downpours of average importance having permitted the saturation of soil.
- Rain took violently with a maximal intensity that had totaled between midnight and 4h of the morning of 73.5 mm.
- To level of Bouzaréah, situated in height, the intensity was stronger and the quantity recorded from 18h to 06h the following day is of 127.8 mm. of the downpours of rains.

Rainfull data which precipitate in 24 hours on average once all T years

The statistical analysis of this series permits to situate some frequency the intervening rainy event November 09 and 10, 2001 around one period return from 90 years.
Conclusion 1

- Latent heat release played the major role in this event
- The orography influenced the spacial distribution of humidity more over land than over sea
- Rainfall underestimated by the global model

The floods due to the severity of the weather phenomena in particular over the Algerian are at the origin of human loss of life and material damage at various harbour infrastructures;

The best way to deal with these phenomena is Essential, in order to be able to preserve the human life

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Conclusion 2

The results of the study showed that it’s difficult to well forecast the intensity and the location of the phenomena. So, after this study the Algerian Met service decided to:

* Integrate the ALADIN consortium as permanent member since 2005.

* The second step is to buy a new computer in order to run ALADIN/Algerie model with 10 km horizontal resolution.

* And AROME with 02 km horizontal resolution…

The main object is to increase the forecast accuracy to improve the prediction of the forecast of « severe weather » in order to preserve human life.
Catastrophic floodings to Ghardaia 2008, 30 September and 01 October
The new NWP Center at Algiers
The station of VAG of Tamanrasset

TAMANRASSET AND ASSEKREM WAS SELECTED FOR THE REASONS:
HIGH ALTITUDE : 1377 m and 2710 m
- ABSENCE OF ANTHROPI C ACTIVITIES
- ASSEKREM IS LOCATED IN THE FREE TROPOSPHERE

PROGRAM OF MEASURES
TAMANRASSET
TURBIDITY, TOTAL OZONE, RADIATION, AOD

ASSEKREM
SURFACE OZONE, AEROSOLS, SAMPLING GAS (GHG), MONOXIDE CARBONE
MEASURE OF TOTAL OZONE

- MEASURE SINCE APRIL 1994

- INSTRUMENT: SPECTROPHOTOMETER DOBSON N°11

- CALIBRATION: 2000 (SOUTH AFRICA), 2004 (EGYPT)

- DATA SENT REGULARLY TO WOUDC (TORONTO)
MEASURE OF RADIATION

- **SOLAR RADIATION** (0.28 µm – 4 µm)

Measure of Downward flux Since September 1994

Direct, Global, Diffuse, RG8 (>=0.69 µm)

- **ATMOSPHERIC RADIATION** (Long Wave): 4 µm - 100 µm

Measure of Downward flux Since Mars 2000

- **Calibration of Instruments**: PSP §NIP IN SITU WITH AHF REFERENCE
Variation of CO2, CH4, N2O, SF6 at Assekrem

- CO2 (ppm)
- CH4 (ppb)
- N2O (ppb)
- SF6 (ppt)

Date

SHUCRAN - THANK YOU