
V. Altava-Ortiz, A. Barrera-Escoda, M. Barnolas, M. Herrero, A. Serra, A. Sairouni & M. Prohom

1) Meteorological Service of Catalonia
Department of Territory and Sustainability. Government of Catalonia.
C. de Berlín 38-48, 4a planta. E-08028 Barcelona (Catalonia)
e-mail: recerca@meteo.cat ; valtava@meteo.cat
www.meteo.cat

2) Wildfire Forest Prevention Service
Department of Agriculture. Government of Catalonia.
Finca de Torreferrussa s/n E- Sta Perpetua Mogoda (atalonia)

Generalitat de Catalunya
MOTIVATION and OBJECTIVE

Meteorological services and other environmental centers spend a lot of human and economic resources monitoring the territory and storing data.

Observational data, well managed and filtered is high valuable, because..

- In a context of climate changes, the detection of PPT/TMP trends and behavior changes is crucial.
- High resolution datasets are highly needed to verify the increasing resolution of climate models.

OBJECTIVE

- The Construction of a high resolution (1km) PPT and TMP database in Catalonia
PPT and TMP dataset

Initial distribution
(National historical database)

More than 1250 raingauges and 660 temperature stations

1996-2015

Automatic weather station network
(SMC)

High mountain network

Evolution # raingauges


time (years)

Catalan Meteorological Service restoration

Austerity programs

New spots detected
Time coverage improvement
1. Hand-made selection

**METADATA** for each weather manual station

**ACCESS** database

<table>
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<tr>
<th>No.</th>
<th>Data</th>
<th>Element</th>
<th>Tipo Incidencia</th>
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<td>01/01/1905</td>
<td>Abbe Stevenson (?)</td>
<td>Instalats</td>
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<td>Terms, Ten</td>
<td>Instalats a interior d'aboc (In-Regnet/In-Rutherford)</td>
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<td>Max Holman</td>
<td>Instalats a 1.5 m de terra</td>
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<td>15</td>
<td>21/01/1905</td>
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**Additional information about the observatory.**

**Information about the measurement instruments** within the life of the observatory (thermometers, raingauges, weather shelters...)

**General information about the observatory** (location, soil type, near obstacles...)

[Image of a data quality control document with annotations and diagrams]
DATA QUALITY CONTROL

2. Comparison with homogenous stations (BAIC)

BAIC is a set of homogeneous and continuous stations from 1950 to date

- How correlation decays when station distance increase
3. Outlier filtering
LINEAR MULTIREGRESSION ANALYSES

GRID CONSTRUCTION: CLUSTERS

BAIC vs ALL NETWORK

PREDICTOR VARIABLES: z, C, geograf. Coord.

Area of Influence
LINEAR MULTIREGRESSION ANALYSES

Grid point

Rg1  Rg2  ...  Rgi  ...  Rgn

| 15 | 20 | 50 | 0.2 | 60 | 5 | 10 | ...

Color:
BAIC CORRELATION

Cluster Linear multiregression

Composite Linear multiregression
Precipitation verification

Stations excluded (2012-1015)

- Improvement in mountain areas
Precipitation verification

Stations excluded (2012-1015)

- Same results near the coast
Temperature verification

Stations excluded (2012-1015)

- The improvement in mountain areas is remarkable
The improvement in low mountain areas and coastal strip is lower.
Temperature verification

By comparing different methodologies to implement a real time SFC analysis

Combines WRF and AWS in a 2D analysis field

Multiregression field
PRELIMINARY RESULTS

TEMPERATURE INDECES

# WD: T > 30°C  # TN: > 20°C
# TD: T > 35°C  # TON: T > 25°C

PRECIPITATION INDECES

# n5: PPT > 5mm
# n50: PPT > 50mm

TEMPERATURE MEANS & ‘NORMALS’

Dedadal scale and Clim. Period(30y)

PRECIPITATION MEANS & ‘NORMALS’

Dedadal scale and Clim. Period(30y)
First climatologies of Temperature indices
First climatologies of Temperature indices

OBS: TR MITJANA ANYUAL (days)
PERIOD: 1976-1985 / RESOLUTION: 01 KM

OBS: TR MITJANA ANYUAL (days)
PERIOD: 2006-2015 / RESOLUTION: 01 KM

OBS: TO MITJANA ANYUAL (days)
PERIOD: 1976-1985 / RESOLUTION: 01 KM

OBS: TO MITJANA ANYUAL (days)
PERIOD: 2006-2015 / RESOLUTION: 01 KM
First climatologies of Temperature indices
First climatologies of Precipitation indices

OBS: n50PPT MITJANA ANUAL (days)
PERIOD: 1976–1985 / RESOLUTION: 01 KM

OBS: n50PPT MITJANA ANUAL (days)
PERIOD: 2006–2015 / RESOLUTION: 01 KM
First climatologies of seasonal PPT

PPT DGF (mm) 1971-2000

PPT DGF (mm) 1986-2015

PPT MAM (mm) 1971-2000

PPT MAM (mm) 1986-2015
First climatologies of Precipitation
THANK YOU FOR YOUR ATTENTION

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