

Seasonal divisions and annual temperature predictions



Nicodeme DJIEDEU, Faculty of Sciences, University of Douala, Cameroon

Introduction

The seasonal divisions and the annual temperature of the Douala airport is studied over ten years using the universal standard calendar (U.S.C) [1]. This is quite impossible with the Gregorian calendar [2].

Two approaches are used: the graphical approach and the statistical approach.

Monthly and decadal mean temperatures [3]

Year\Month	Jan	Feb	Mar	Apr	May	Jun	Nat ^a	Jul	Aug	Sep	Oct	Nov	Dec
2001	27,2	27,9	27,7	27,5	26,9	26,3	25,6	24,1	25,6	27,8	26,3	26,8	27,3
2003	27,8	28,1	28,2	27,1	27,9	26,8	25,8	25,6	25,0	25,7	26,4	26,6	27,3
2005	27,2	28,6	28,0	28,1	27,1	26,6	25,4	24,9	25,2	25,7	26,0	27,4	27,1
2007	27,4	28,6	28,6	27,8	27,6	26,2	25,8	25,0	25,1	25,7	25,8	26,1	27,3
2009	27,7	27,7	27,9	27,4	27,1	26,8	25,6	25,4	25,3	25,9	26,1	27,1	28,1
Decadal mean	27,5	28,2	27,8	27,2	27,0	26,2	25,5	25,0	25,1	25,8	26,1	26,8	27,4

(^anature : a new month)

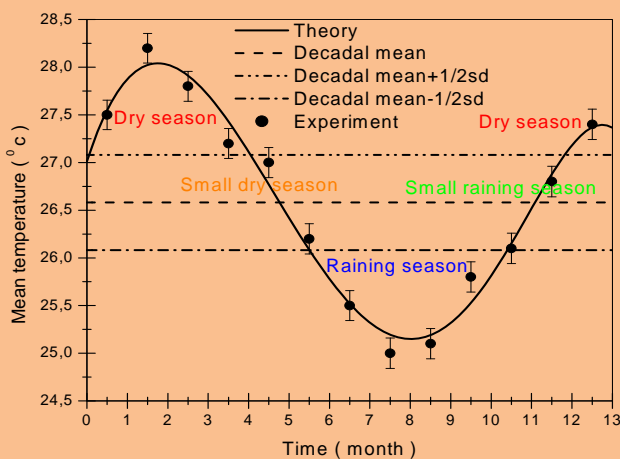


Fig: prediction of the 2010 annual temperature

2-Statistical approach

year\Date	E1	E2	E3	E4	E5
2000	4,2156	5,8725	10,664	11,9026	13,0357
2001	4,2319	5,0576	9,0451	12,4132	13,0357
2002	2,8464	4,0116	8,8002	11,3067	13,0357
2003	4,6064	6,0448	10,7301	12,4052	13,0357
2004	3,9388	5,3408	10,4995	12,0289	13,0357
2005	4,3515	5,7413	10,3114	11,5616	13,0357
2006	4,0359	5,8506	10,633	11,7558	13,0357
2007	4,4486	5,7413	11,2339	12,4719	13,0357
2008	3,7689	5,5835	10,2385	11,1185	13,0357
2009	4,2847	5,7292	10,4873	11,5798	13,0357
Mean	4,1	5,5	10,3	11,9	13,0
Duration	4,1	1,4	4,8	1,6	1,2
σ^a	0,5	0,6	0,7	0,5	0,0

Prediction of the 2010 seasonal divisions

1-Graphical approach

The above figure displays the behavior of the predicted 2010 annual temperature. The four seasons of the year are displayed as well. They end respectively at the following abscises 4.0 months, 5.5 months, 10.4 months, 11.8 months corresponding to the following dates of the year: 28th April, 14th June, 12th September and 23rd November in the universal standard calendar. This curve inspire that there are four seasons in any area of the world.

Duration

The dry season appears twice in the year, especially at the beginning and the end of the year. In fact, it appears in end November and continues up to end April of the next year. Its duration is (4+13-11.8) that is 5.2 months.

The small dry season is (5.5-4.0) that is 1.5 month.

The raining season is (10.4-5.5) that is 4.9 months.

The small raining season is (11.8-10.4) that is 1.4 month.

Analysis and conclusion.

The difference between the duration of each season in the two approaches is quite small (less or equal to 0,2 month that is 6 days). The graphical approach is better because it is the easiest way to predict the annual temperature behavior. The biggest standard deviation σ^a is observed during the raining season which is 0.7 month (20 days). This period is particularly the most instable in the year. A similar work was done for Moored Surface wind observations [4]. This work is one of the first steps for decadal predictions [5] and is applicable to any other area of the world.

Literature

- [1] N. Djiedeu "Universal standard calendar" (unpublished)
- [2] Gregorian calendar
- [3] Cameroon National Meteorology
- [4] D. Halpern "Moored Surface wind observations at Four Sites along the Pacific Equator between 140° and 95°W" AMS Journal of climate Vol.1 1251 (1988)
- [5] Gerald A. Meehl et al "Decadal Prediction, can it be skillful?" BAMS/1467 (2009)