

CHAPTER 6

Final Conclusions

It is a testament to the dedication of observers and meteorologists that a reasonably high quality of data collection is maintained in regions such as Sri Lanka in spite of many limitations. Now there is particular interest in detecting climate change where estimates of the warming trend are only of the order of 0.004°C per year (IPCC, 2003). Minor errors in temperature data can throw off such estimates of climate change substantially. Hence, it is important to undertake careful assessments of data quality. In addition, there is a need to salvage all available information out of historical data that may not be entirely precise. Thus one needs techniques for reconstruction of missing data, for adjustment for relocation of stations and for adjustment where possible for poor instrument calibration.

The examination of the quality and consistency of mean temperature data using station histories, exploratory data analysis techniques, correlation techniques and reconstruction techniques reveals that the twentieth century records are of excellent quality. However, the data quality in the nineteenth century of several stations was relatively poor. In addition, there have been a deterioration in data quality in the last decade which may be related to the civil conflict in Sri Lanka.

In contrast to the methods described in Chapter 1 the GHCN quality controlling decision is binary: either one uses the data point or one does not. GHCN makes the final decision and removes all data points that they determine as probably erroneous. However, they also supply a companion file of these removed data points so users with specialized knowledge of historical climate events in their region of interest are able to access data points that failed their quality control.

In the meantime researchers using homogenized series need to be constantly aware of the present limitations of homogenization methods. Homogenized series, although an improvement and sometimes vast improvement, on the original series, should not be treated as 'clean' data. Whatever adjustment procedures are used, the presence of site changes causes an accumulating uncertainty. The cumulative uncertainties associated with site change effect whether adjustments are made or not, are often large compared with effects appearing in studies of long-term climate change.

Seasonal climate forecasts are needed by early March for Yala and early September for Maha. During this period, the acreage of rice that is to be cultivated, the type of rice variety that is to be used and the choice of crops are deliberated upon by farmer groups and water managers. As an example, during seasons where below normal rainfall is predicted farmers may choose drought resistant short-term varieties. Irrigation managers may increase the carryover storage to tide over water deficits.

It is important to mention that ENSO based forecasts may be far from perfect. Farmers, irrigation managers and others who could use it for agricultural decision making should be aware of it. The challenge in the successful use of probabilistic ENSO forecasts is the

communication of the level of uncertainty to farmers and water managers and the choice of steps that will minimize regret in case of failure of the predictions.

Future investigations of influences of other climatic precursors such as Indian ocean conditions etc. on rainfall should help to improve the prediction scheme.



REFERENCES

Ceylon Administration reports 1884
George J.A. Skeen , Government printer , Ceylon
Part 11: Scientific : Meteorology of Ceylon : 26B

Ceylon Administration reports 1887
George J.A. Skeen , Government printer , Ceylon
Part 11: Scientific : Meteorology of Ceylon : 13B

Ceylon Administration reports 1888
George J.A. Skeen , Government printer , Ceylon
Part 11: Scientific : Meteorology of Ceylon : 35B

Ceylon Administration reports 1890
George J.A. Skeen , Government printer , Ceylon
Part 11: Scientific : Meteorology of Ceylon : B1-B35

Ceylon Administration reports 1896
George J.A. Skeen , Government printer , Ceylon
Part 11: Scientific : Meteorology of Ceylon : B1

The Ceylon Blue Book 1901
Printed by H.C. Cottle , Government printer , Ceylon
Meteorological observations : N1

The Ceylon Blue Book 1907
Printed by H.C. Cottle , Government printer , Ceylon
Meteorological observations : N1-N38

The Ceylon Blue Book 1910-1911
Printed by H.C. Cottle , Government printer , Ceylon
Meteorological observations : N1-N51

The Ceylon Blue Book 1912
Printed by H.C. Cottle , Government printer , Ceylon
Meteorological observations, & c ,during 1912 : G1-G47

The Ceylon Blue Book 1914
Printed by H.C. Cottle , Government printer , Ceylon
Meteorological observations, & c ,during 1914 : N1-N41



The Ceylon Blue Book 1916

Printed by H.C. Cottle , Government printer , Ceylon
Meteorological observations, & c ,during 1916 : N1-N42

The Ceylon Blue Book 1920

Printed by H.C. Cottle , Government printer , Ceylon
Meteorological observations, & c ,during 1920 : Y1-Y30

The Ceylon Blue Book 1921

Printed by H.C. Cottle , Government printer , Ceylon
Meteorological observations, & c ,during 1921 : Y1-Y31

The Ceylon Blue Book 1925

Printed by H.Ross Cottle , Government printer , Ceylon
Meteorology : X1-X24

The Ceylon Blue Book 1926

Printed by H.Ross Cottle , Government printer , Ceylon
Meteorology : Y1-Y12

The Ceylon Blue Book 1928

Printed by A.G. Richards , Acting Government printer , Ceylon
Meteorology : Y1-Y14

The Ceylon Blue Book 1929

Printed at the Ceylon Government press , Colombo
Meteorology : Y1-Y14



University of Moratuwa, Sri Lanka
Electronic Theses & Dissertations
www.lib.mru.ac.lk

The Ceylon Blue Book 1931

Printed at the Ceylon Government press , Colombo
Meteorology : Y1-Y18

The Ceylon Blue Book 1935

Printed at the Ceylon Government press , Colombo
Meteorology : Y1-Y12

The Ceylon Blue Book 1936

Printed at the Ceylon Government press , Colombo
Meteorology : Y1-Y12

The Ceylon Blue Book 1938

Printed at the Ceylon Government press , Colombo
Meteorology : Y1-Y12

D.A. Rhoades and M.J. Salinger. 1993. Adjustment of temperature and rainfall records for site changes. *International Journal of Climatology*. 13: 899-913

D.R. Legates and C.J. Willmott. 1990. Mean Seasonal and Spatial Variability in Global Surface Air Temperature Theor.Appl. Climatol
41 : 11-21.

David R. Easterling and Thomas C. Peterson. 1995. A new method for detecting undocumented discontinuities in climatological time series. International Journal of climatology. 15: 369-377

David R. Easterling, Thomas C. Peterson and Thomas R. Karl. 1996. On the Development and Use of Homogenized Climate Datasets. Notes and Correspondence. Journal of Climate 9 : 1429-1434

H Jameson 1936. Note on the Exposure of Thermometers in Ceylon. Ceylon Journal of Science (E) II : 61-67

Jon K. Eischeid, C. Bruce Baker and Thomas R. Karl, Henry F. Diaz. 1995. The Quality Control of Long-Term Climatological data Using Objective data analysis. Eischeid et al. Journal of Applied Meteorology 34 : 2787-2795.

Lareef Zubair. 2001. El Nino-Southern oscillation influences on rice production in Sri Lanka. International Journal of Climatology. 22: 714-739

Longterm Hydrometeorological Data in Sri Lanka
Data book of "Hydrological Cycle in Humid Tropical Ecosystems" Part I
Edited by: K. Nakagawa ,H. Edagawa ,V. Nandakumar and M. Aoki

M. Steven Tracton, Eugenia Kalnay. 1993. Operational ensemble prediction at the National Meteorological Center: Practical Aspects. Weather and Forecasting. 8 : 379-398

Nathaniel B. Guttman and Robert G. Quayle. 1989. A Review of Cooperative Temperature Data Validation. Journal of Atmospheric and Oceanic Technology. 7: 334-339

Perry's Chemical Engineers' HandBook (Section 2)
Robert H. Perry
Don Green

Peterson, Thomas C. and Russell S. Vose, 1997: An overview of the Global Historical Climatology Network temperature data base, *Bulletin of the American Meteorological Society*, 78, 2837-2849.

Ramasamy Suppiah. 1998. Relationships between the southern oscillation and the rainfall of Sri Lanka. International Journal of Climatology. 9: 601-618



Report on the Colombo Observatory for 1946
Printed at the Ceylon Government Press
Climatology : 45-56

Report on the Colombo Observatory for 1949
Printed at the Ceylon Government Press
Climatology : 52-63

Report on the Colombo Observatory for 1955
Printed at the Ceylon Government Press
Climatology : 59

Report on the Colombo Observatory for 1965
Printed at the Ceylon Government Press
Climatology

Report on the Colombo Observatory for 1966
Printed at the Ceylon Government Press
Climatology

Report on the Colombo Observatory for 1971
Printed at the Ceylon Government Press
Climatology

Report on the Colombo Observatory for 1972
Printed at the Ceylon Government Press
Climatology

Report on the Colombo Observatory for 1974
Printed at the Ceylon Government Press
Climatology

Thomas C. Peterson and David R. Easterling. 1994. Creation of homogeneous composite climatological reference series. *International Journal of Climatology*. 14 : 671-679

Thomas C. Peterson, Russell Vose, Richard Schmoyer, Vyachevslav Razuvaev. 1997. Quality Control of Monthly Temperature Data: The GHCN Experience. QC of Monthly temperature Data. <http://lwf.ncdc.noaa.gov/oa/climate/research/ghcn/ghcnqc.htm>

Thomas Peterson. The Global Historical Climatology Network (GHCN).
<http://www.ncdc.noaa.gov/cgi-bin/res40.pl?page=ghcn.html>

