

Infos zu Shen, S. S. P.; North, G. R.: Statistics and data visualization in climate

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Inhaltsangabe:

A comprehensive overview of essential statistical concepts, useful statistical methods, data visualization, and modern computing tools for the climate sciences and many others such as geography and environmental engineering. It is an invaluable reference for students and researchers in climatology and its connected fields who wish to learn data science, statistics, R and Python programming. The examples and exercises in the book empower readers to work on real climate data from station observations, remote sensing and simulated results. For example, students can use R or Python code to read and plot the global warming data and the global precipitation data in netCDF, csv, txt, or JSON; and compute and interpret empirical orthogonal functions. The book's computer code and real-world data allow readers to fully utilize the modern computing technology and updated datasets. Online supplementary resources include R code and Python code, data files, figure files, tutorials, slides and sample syllabi.

Inhaltsverzeichnis:

1. Basics of Climate Data Arrays, Statistics, and Visualizatio
2. Elementary Probability and Statistics
3. Estimation and Decision Making
4. Regression Models and Methods
5. Matrices for Climate Data
6. Covariance Matrices, EOFs, and PCs
7. Introduction to Time Series
8. Spectral Analysis of Time Series
9. Introduction to Machine Learning; References and Further Reading; Exercises; Index.

Autoren:

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Gerald R. North is University Distinguished Professor Emeritus and former Head of the Department of Atmospheric Science at Texas A&M University. His research focuses on modern and paleo-climate analysis, satellite remote sensing, climate and hydrology modeling, and statistical methods in atmospheric science. He is an elected Fellow of the American Geophysical Union and the American Meteorological Society. He has received several awards including the Harold J. Haynes Endowed Chair in Geosciences of Texas A&M University, the Jules G. Charney medal from the American Meteorological Society, and the Scientific Achievement medal from NASA. North holds both B.Sc. and Ph.D. degrees in Physics.