This Intensive Online Course in Climate Time Series Analysis is specifically tailored to the needs of PhD students and postdocs, who want to learn about an important combination of disciplines (climate change and time series analysis), but who have not had much exposure to in-depth statistical teaching. It will also attract professional researchers who wish to update their knowledge or learn new statistical techniques.
We expect participants to come from a background in climatology, ecology, econometrics, environmental sciences, geosciences, hydrology, meteorology, chemistry or physics.

We aim to be accessible to students at the beginning of their careers. We achieve this through an intensive online, chat-supported format combined with a repetitive, caring approach.

What makes it different from other online courses? First, the course provides videos that have been carefully designed, recorded and edited. You can watch the videos over and over again, pausing as necessary. You receive the course slides and can study them again. Second, daily two-way chat sessions on a video platform throughout the course allow you to prepare questions in advance and get comprehensive answers. Third, proprietary software designed specifically to get the most out of "dirty" climate time series data will add to your arsenal of analytical tools. Fourth, the individual feedback period of three months after the course (via email and possibly an online meeting) preserves the interactive mode of shared data analysis, allowing you to go deeper into real applications – perhaps on your own data! More details below and on the registration site.

Dr. Manfred Mudelsee,
CEO, Climate Risk Analysis

https://www.climate-risk-analysis.com/courses/time-series/49th-Online-Course-in-Climate-Time-Series-Analysis.html

Module (Lecture/Tutorial)	Themes
01–02 Introduction (L, T)	Climate variables, time series, statistics, notation, dating, climate equation, interpolation, temporal spacing, autocorrelation, distributional shape, paleoclimatology, proxy data, documentary data
03–04 Persistence Models (L, T)	AR(1) process, autocorrelation estmation, bias, even and uneven spacing, AR(2) process, other processes
05 Bootstrap Confidence Intervals (L)	Error bars, standard error, variance, standard deviation, mean, root mean squared error, confidence interval, Monte Carlo experiment, bootstrap principle, Moving Block Bootstrap resampling, hypothesis testing, Eemian
06–07 Regression I (L, T)	Linear regression, least squares, nonlinear regression (ramp, break), nonparametric regression, smoothing, climate model output, instrumental period, Pliocene, Northern Hemisphere Glaciation, Arctic river runoff
08–09 Spectral Analysis (L, T)	Spectrum, spectrum estimation, periodogram, WOSA, multitaper estimation, Lomb–Scargle method , speleothems, Holocene, monsoon, solar cycles
10–11 Extreme Value Time Series (L, T)	Risk, POT, block extremes, GEV & GP distributions, Poisson process, maximum likelihood, kernels, Cox–Lewis test, heavy tails, river floods, paleo hurricanes
12–13 Correlation (L, T)	Pearson's and Spearman's measures, river runoff, unequal timescales
14–15 Regression II (L, T)	Proxy variable, errors-in-variables regression, calibration, prediction, lagged regression, instrumental period, Pleistocene, climate skeptics
16 Future Directions (L)	Timescale modelling, novel estimation problems, higher dimensions, climate models, optimal estimation

1 Teacher
1 Book
11 Programs
16 Modules
16 Hours Video
408 Slides