Examples of lattice processes and lattice data

- Torstein (Lithology)
- Thea (only catchments)
- Doctor-prescription in France
- Oral cavity cancer in males in Germany, 1986–1990, for 544 districts.
- Scots pine in Sweden
- Temperature change

Doctor-prescription in France
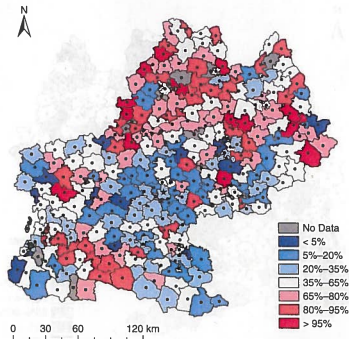
From Cressie and Wikle

Figure 4.11 Choropleth map showing doctor-prescription amounts per consultation in the cantons of the Midi-Pyrénées (France). The "star" denotes the canton containing Toulouse. Percentiles used for shading are obtained from [R.]

Scots Pine Data

Pedigree 56 unrelated parents, partial diallel design. Original 8160 seedlings.

Spatial location 2.2×2.2m grid, two trail sites.

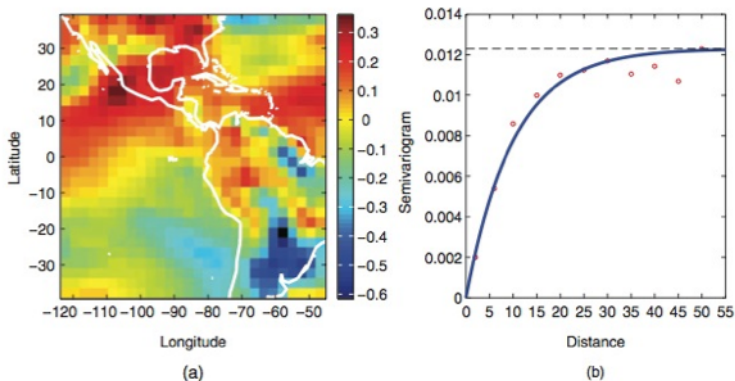Data Hight and bad(1) / good(0) branch angle of 4970 26-years-old scots pine.

Temperature differences
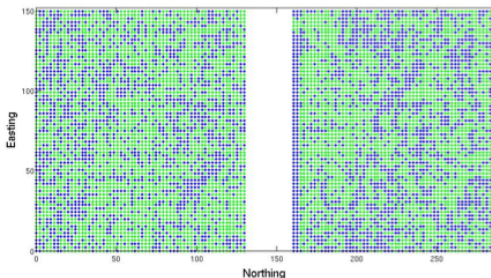
Figure 4.5 (a) Temperature change (1990s minus 1980s) in 28×28 grid cells over the Americas. The values were originally produced by an NCAR model, and they represent "the truth." (b) Empirical and fitted (exponential model) semivariogram after the values in (a) were detrended by latitude and longitude.

'Time processes' (1D)

Markov: $[Y_t|Y_{-t}] = [Y_t|Y_{t-1}, Y_{t+1}]$

AR(1) model, version 1

- $Y_1 \sim N(0, \frac{\sigma^2}{1+\phi^2})$
- $Y_t = \phi Y_{t-1} + \epsilon_t$ with $\epsilon \sim N(0, \sigma)$ and $|\phi| < 1$

AR(1) model, version 2

- $Y_t|Y_{-t} \sim N(\frac{\phi}{1+\phi^2}(Y_{t-1} + Y_{t+1}), \frac{\sigma^2}{1+\phi^2})$ for $t = 2, \ldots, n$
- $Y_1|Y_{-1} \sim N(\phi Y_2, \sigma^2)$
- $Y_n|Y_{-n} \sim N(\phi Y_{n-2}, \sigma^2)$

Version 1 = Version 2