

# Risk and Environmental Sustainability, 2025

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## Lecture contents

1. Introduction (19/2/25, ACD, slides 1–32)
  - Motivation: examples. Plan. Revision: statistical models. (1–23)
  - Revision: likelihood methods, QQplots. Poisson process in the line. (24–32)
2. Poisson processes (26/2/25, ACD, slides 33–52)
  - Bengal cyclones example. (33–41)
  - Point process basics. Poisson process: definition, conditioning and Laplace functional. (42–52)
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  - Mapping and marking. (55–56)
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  - Revision. GEV and its properties. Application to Abisko data. (79–87)
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9. Statistics of extremes V/Bivariate extremes I (16/4/25, LM, slides 148–162)

- Complications: dependence (148)
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- Multivariate extremes again. Copulas. (158–171)
- Extremal dependence measures. Poisson process approach to multivariate extremes. (172–180)

11. Bivariate extremes III (7/5/25, slides 181–199)

- Multivariate extremes: parametric models and statistical modelling.
- Example of modelling with wind data.

12. Bivariate extremes IV (14/5/25, slides 200–216)

- Multivariate extremes: Poisson process likelihood and censored likelihood.
- Example of modelling with wave and surge height.

13. Probabilistic forecasts I (21/5/25, slides 219–241)

- Introduction to forecasts.
- Calibration of forecasts.
- Scoring rules: introduction.

14. Probabilistic forecasts II (28/5/25, slides 242–255)

- Proper scoring rules.
- Testing for equal predictive performance.
- Forecast dominance.