

Strukturierte und unstrukturierte Daten in Analysen: Das Potential integrativer Modelle

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sMon Workshop
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Die neuesten statistischen Entwicklungen

Methods in Ecology and Evolution 

ADVANCES IN MODELLING DEMOGRAPHIC PROCESSES |  Free Access

The recent past and promising future for data integration methods to estimate species' distributions

David A. W. Miller , Krishna Pacifici, Jamie S. Sanderlin, Brian J. Reich

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 Trends in Ecology & Evolution



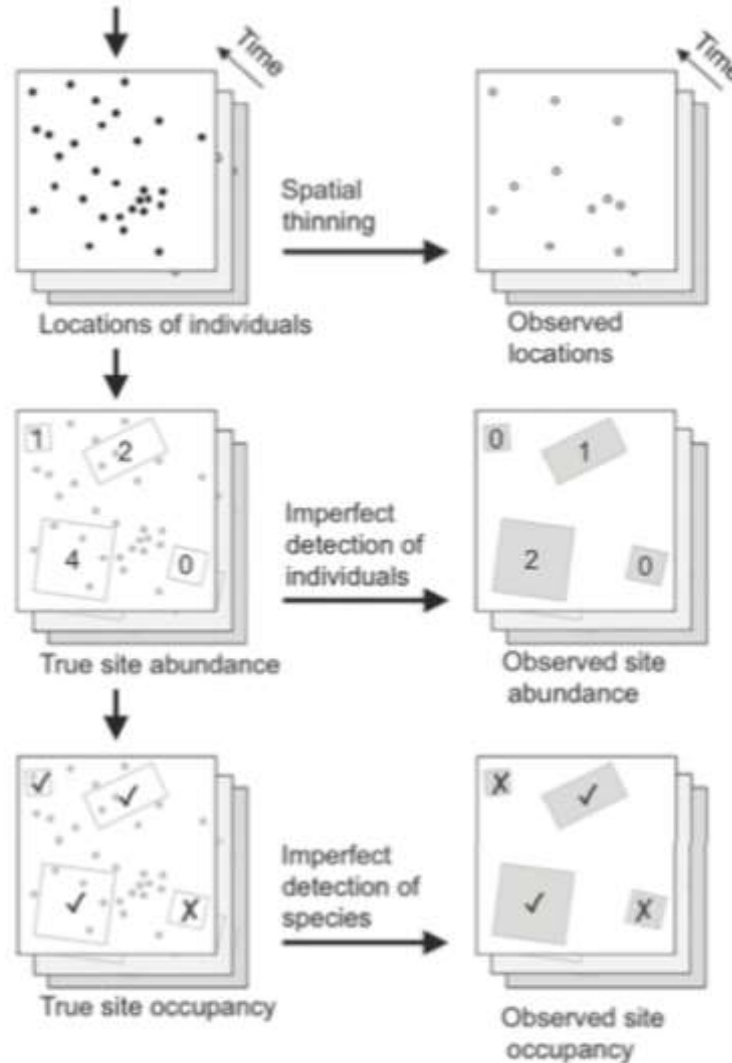
Review

Data Integration for Large-Scale Models of Species Distributions

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Ella Browning,^{2,8} Stephen N. Freeman,¹ Nick Golding,⁹ Gurutzeta Guillera-Arroita,⁹ Peter A. Henrys,¹⁰
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Realität

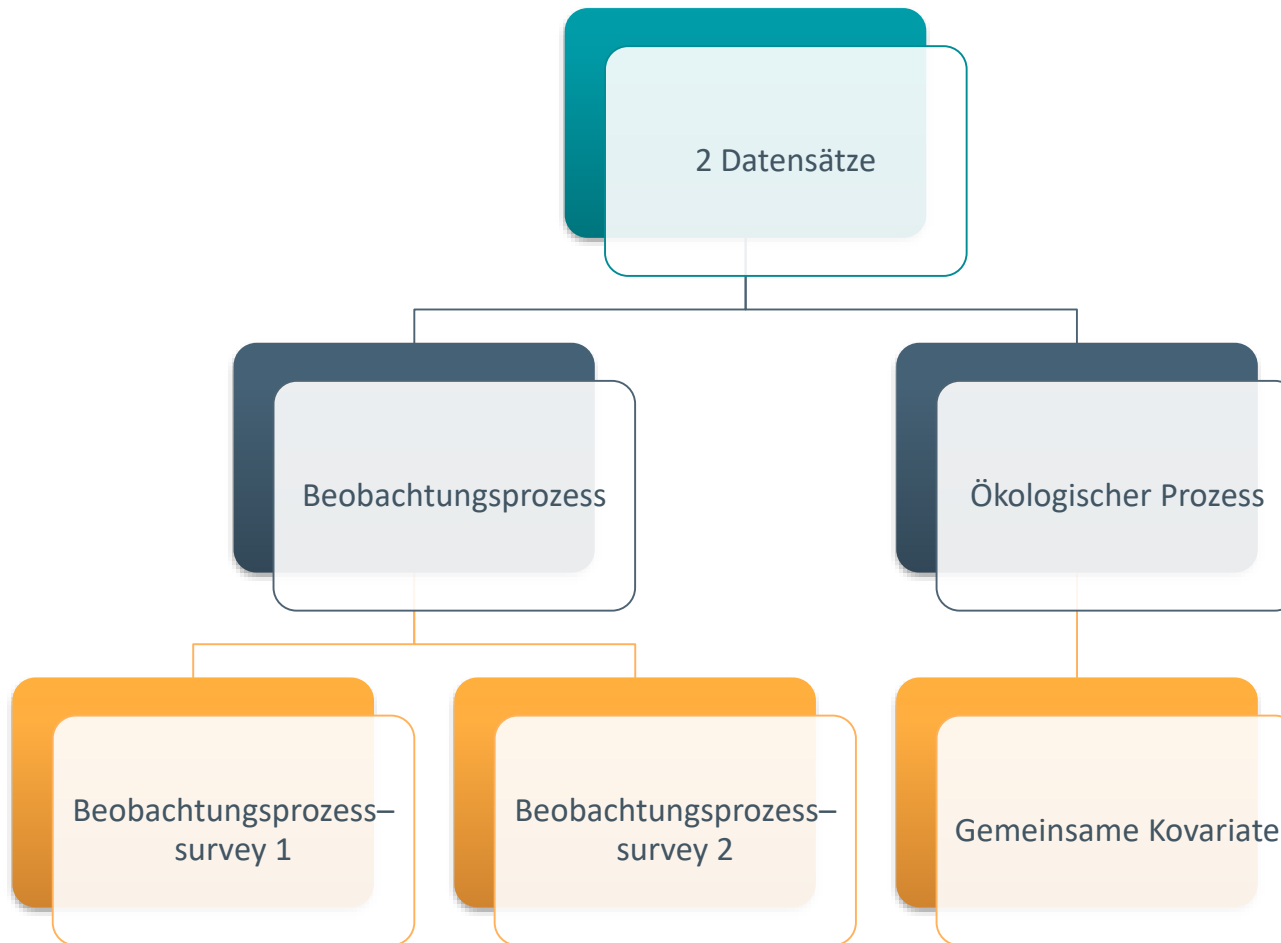
Beobachtung



Ökologischer
Prozess (z.B.
Lebensraumwirkung)
ist derselbe

Nur der
Beobachtungsprozess
unterscheidet sich!

Hierarchische Modelle:



Beispiel: Schneehuhn in Norwegen



Kombination von Abundanz- und Vorkommensdaten



Abundanzdaten

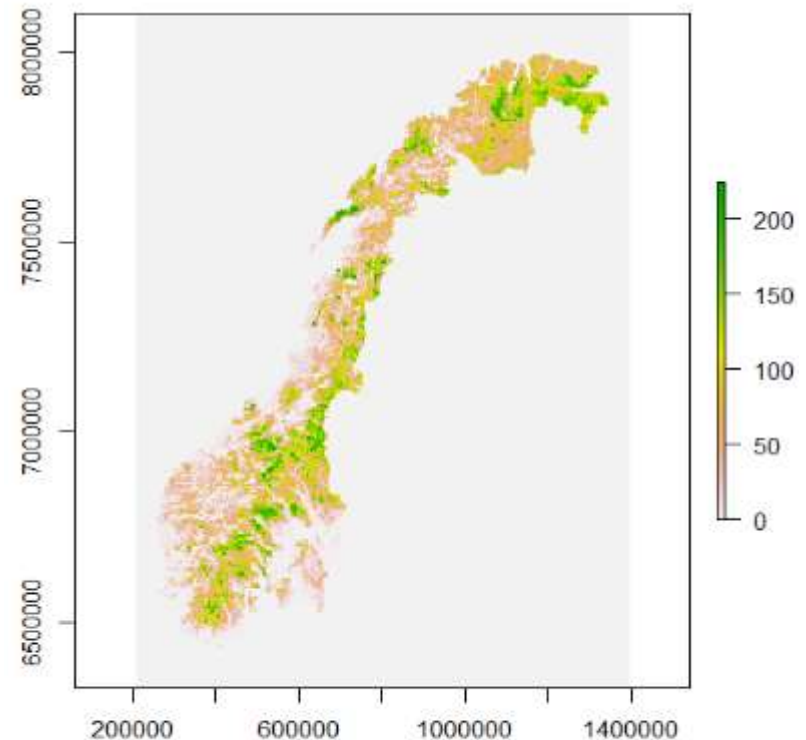


Anwesenheitsdaten

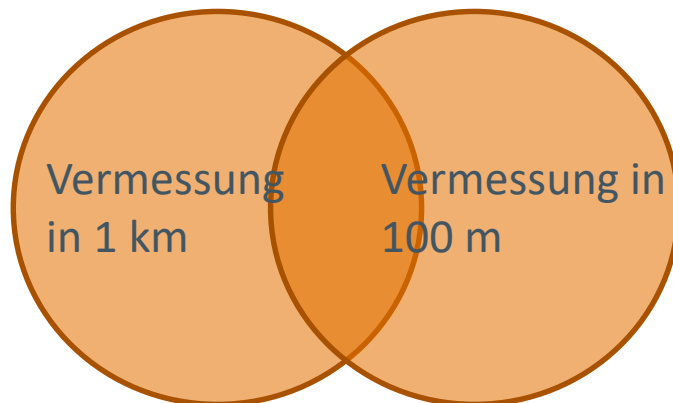
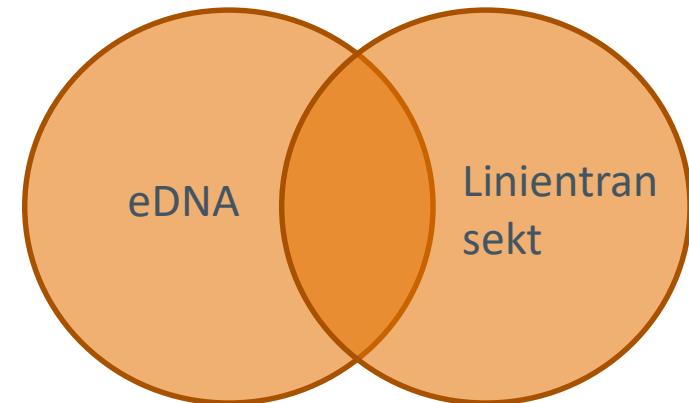
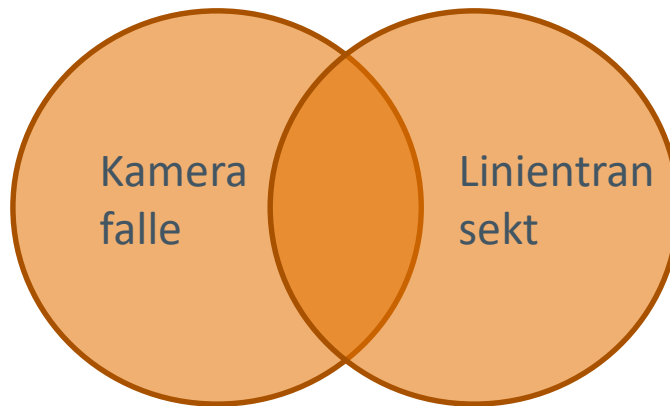
Kombination von Abundanz- und Anwesenheitsdaten



- Hierarchisches Modell, das beide Datentypen kombiniert
- Vorhersagen der Gesamtvorkommen in Norwegen
- c. 900,000 individuals



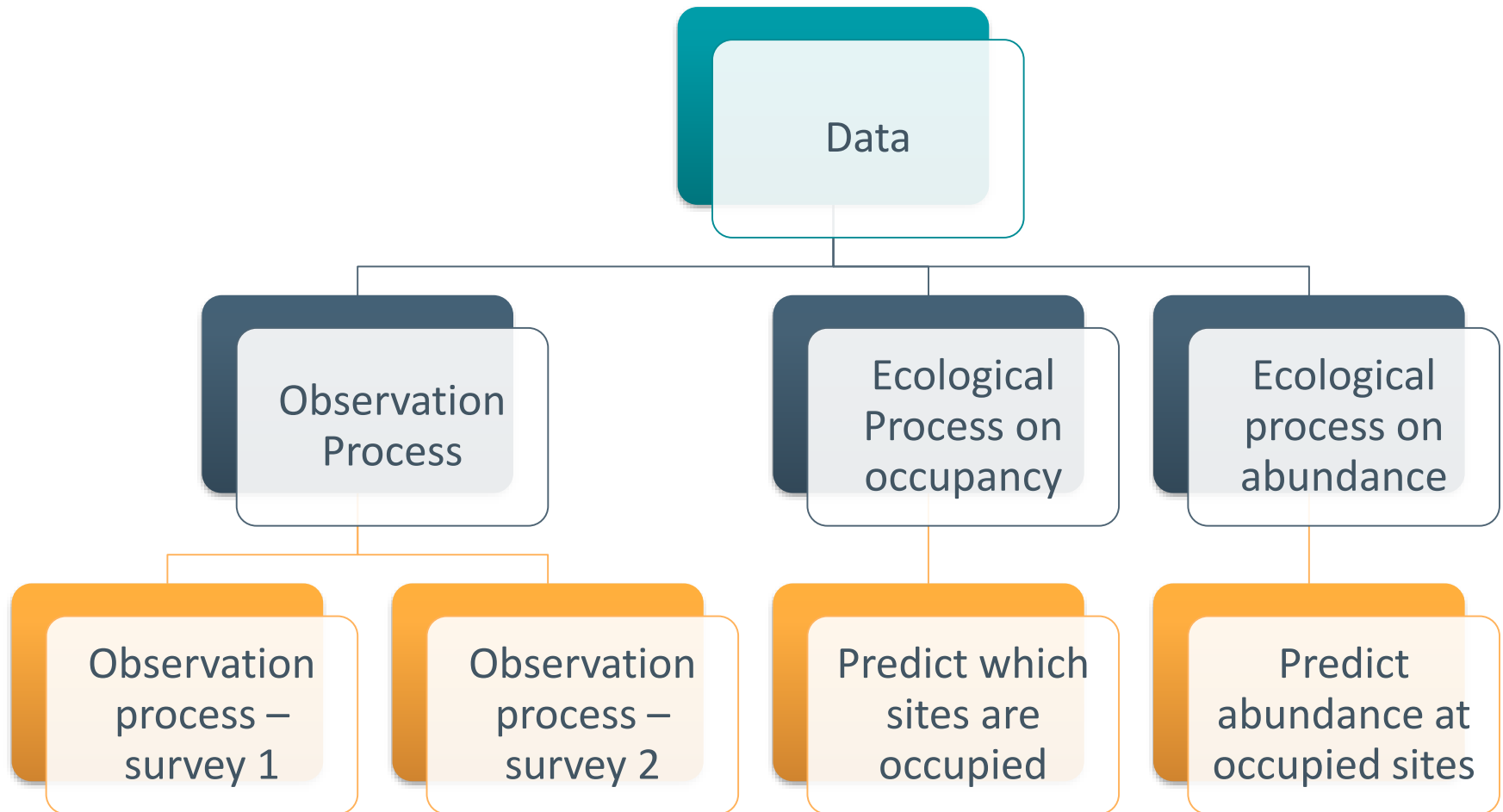
Möglichkeiten



Aktuelle Herausforderungen

- Werkzeuge müssen noch entwickelt werden
- Kann schwierig zu laufen sein
- aber viele Anwendungen am Ende
- vielleicht die Zukunft!!

Hierarchical models:



Beziehung zwischen Vorkommen und Abundanz

φ - Vorkommenwahrscheinlichkeit

λ is Mittlere Abundanz

$$\varphi = 1 - \exp(-\lambda)$$

$$-\log(1 - \varphi) = \lambda$$

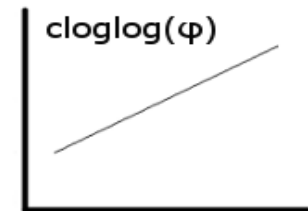
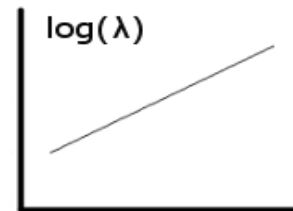
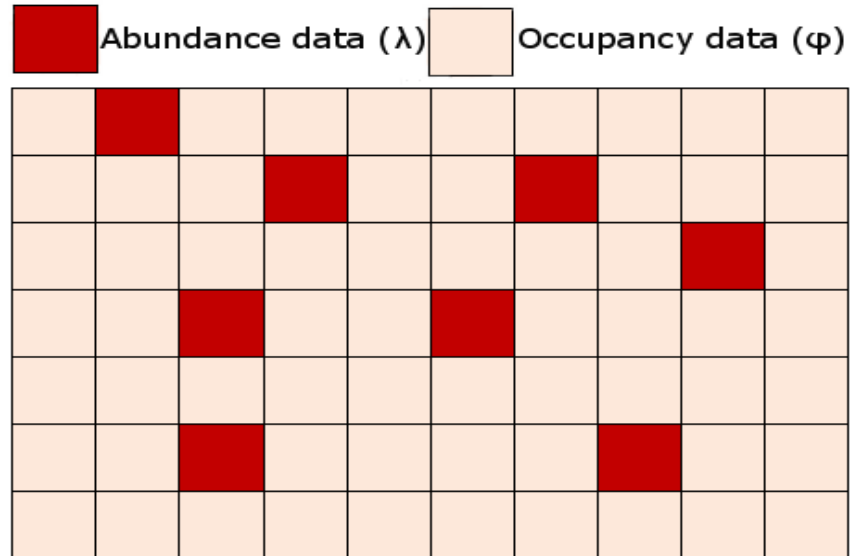
$$\log(-\log(1 - \varphi)) = \log(\lambda)$$

cloglog

log

cloglog

log



environmental covariate