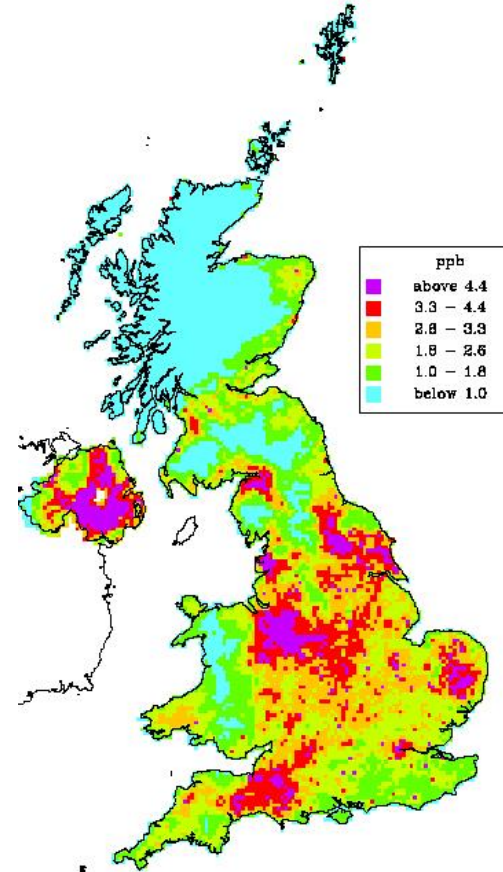


# Concentration Based Estimated Deposition (CBED)

- CBED predicts air pollutant deposition to UK landscape from measured concentrations at monitoring sites. (SO<sub>2</sub>, NO<sub>2</sub>, HNO<sub>3</sub>, NH<sub>3</sub>, SO<sub>4</sub>, NO<sub>3</sub> and NH<sub>4</sub>)
- Deposition is product of concentration map and a process to deliver the pollutant from the atmosphere to the landscape.

Concentration of ammonia – 2015\_f12

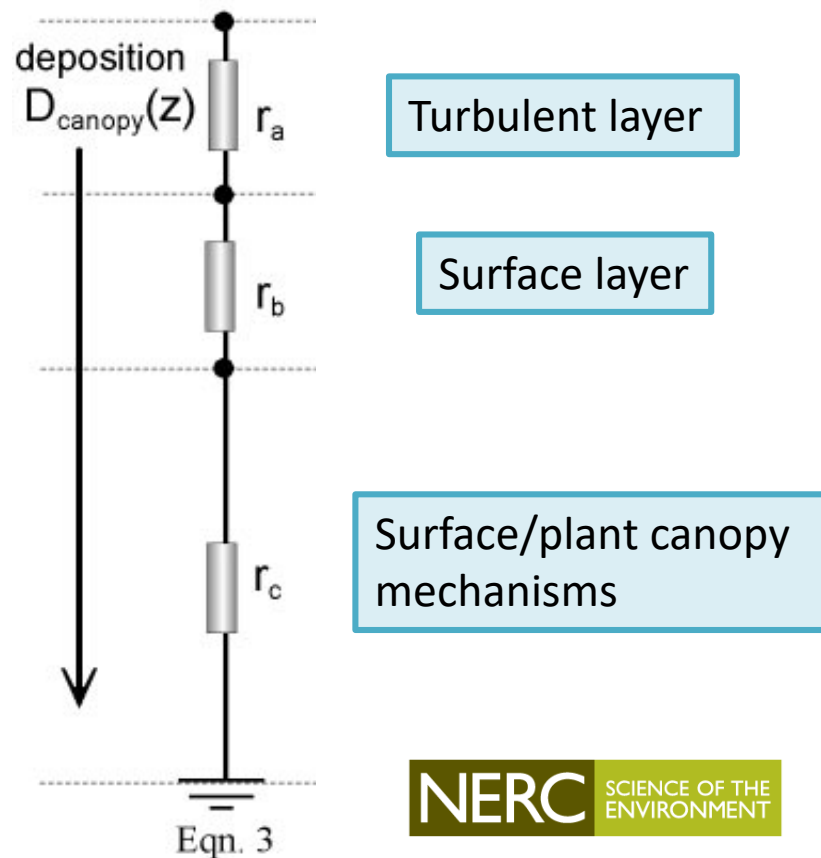


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# CBED – Dry deposition $\text{NH}_3$

- Modified big leaf model.
- Transfer rates - atmosphere to canopy surface.
- Uptake by mechanisms within plant canopy e.g. leaf stomata.



*Smith et al (2000)*

# CBED uncertainties

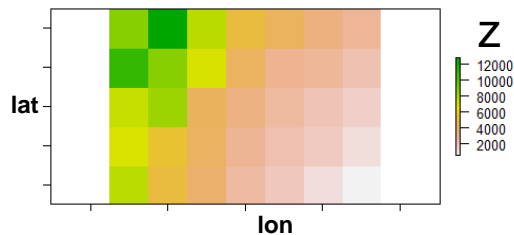
Deposition

Parameters



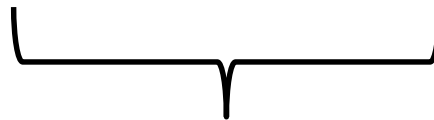
Ideally:

$$z = \text{CBED}(\theta)$$



Actually:

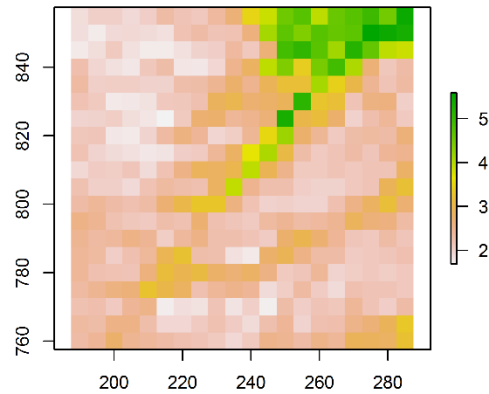
$$\log(z) = \log(\text{CBED}(\theta)) + \text{bias} + \text{GP}(0; \sigma_f^2, \sigma_l^2) + \varepsilon$$



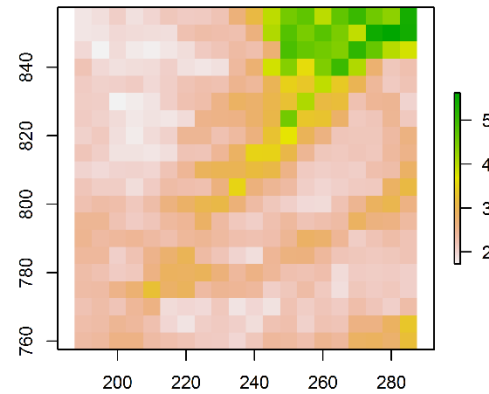
Three ways in which the model  
can be wrong



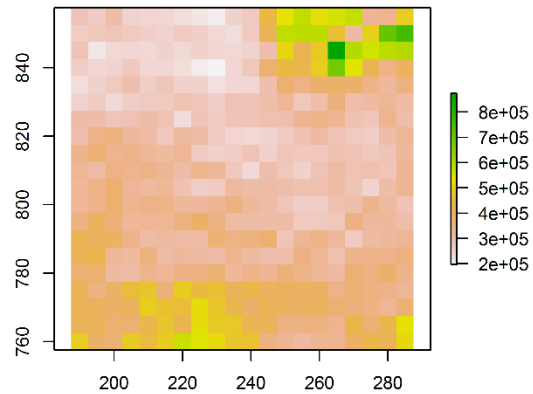
**Ellenberg N Data**



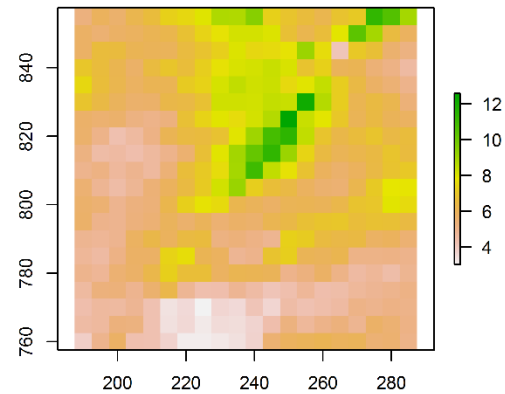
**CBED + GP**



**CBED**



**GP**



# Marginal distribution of posterior CBED parameters

