

$$Y = f(\vec{X} | \beta, \lambda) + \epsilon$$

$Y = \text{growth}$

$X_1 = \text{dbh}$

$X_2 = \text{competitor biomass}$

multiple regression

$$\begin{cases} Y = \beta_0 + \beta_{\text{dbh}} \cdot \text{dbh} + \lambda \cdot \text{bm} + \epsilon \\ \hat{Y} = \hat{\beta}_0 + \hat{\beta}_{\text{dbh}} \cdot \text{dbh} + \hat{\lambda} \cdot \text{bm} \end{cases} \quad \text{①} \quad \leftarrow$$

One model for competition that does not distinguish between competitor species

$$Y = \beta_0 + \beta_{\text{dbh}} \cdot \text{dbh} + \lambda_{\text{dec}} \cdot \text{bm}_{\text{dec}} + \lambda_{\text{marb}} \cdot \text{bm}_{\text{marb}} + \lambda_{\text{bitch}} \cdot \text{bm}_{\text{bitch}} + \epsilon$$

②
A model that does distinguish between competitor species.

Parameter Count:

Model ①: 3

Model ②: 5 \leftarrow More complex

" parameter to
estimate for
the same
sample size.

Question: Is the additional
complexity of model (2)
over model (1)
warranted?

Ockham's Razor

All things being equal,
simpler is better.