

# FISH 556: Final Project

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## Model equation

$$\log(d_{s,t}) \sim \beta + \omega_s + \epsilon_{s,t}$$

Where:

- $s$  is the station
- $t$  is the year
- $d$  is the density of a species caught in a tow
- $\beta_t$  is the median density in year  $t$
- $\omega_s$  is the density for location  $s$  relative to the median location that is typical across years
- $\epsilon_{s,t}$

**bespoke TMB implementation**

**sdmTMB package implementation**