

# Bowhead Whales, Bayesian Growth Analysis and other Statistical Tales

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with thanks to the  
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Program

# Contents

- Bayesian Growth Analysis
- Counting Whales
- Human Disturbance

# Bayesian Modeling

- Strengths:
  - incorporates random effects
  - incorporates data from related studies and related species
  - incorporates anecdotal evidence
  - handles uncertainty in age better than measurement error model

# Bayesian Modeling

- Weaknesses:
  - sensitivity to prior parameters
  - sensitivity to shape of the prior
  - multivariate prior (dependency)

# Bayesian Modeling

- What is independent?
  - Prior on:
    - conception date, **parturition date**, birth length, growth rate (Reese et al)
    - conception date, **gestation length**, birth length, growth rate (Altman)

# Results for Gestation Length

parametrized by

	mean	SD
parturition date	424 days	35.2
days gestation length	437 days	
	27.5 days	

# Counting Whales

- Population Dynamics
- Transect Methods
  - “ $G_0$  Problem”
- Mark Recapture
  - marking
  - recapturing

# Counting Whales

- Acoustic Detection
  - What percentage of whales are calling?
  - How many whales are calling?
  - Locating and tracking

# Acoustic Monitoring of Human Disturbance

- Call rate
- Call location
- Examples:
  - naval exercises
  - undersea drilling
  - ATOC

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