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The effects of individual characteristics and ocean conditions on the reproductive phenology and demography of pigeon guillemots (Cepphus columba) on Protection Island, WA

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The effects of ocean conditions on the demography of Pigeon Guillemots (*Cepphus columba*) on Protection Island, WA

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GOAL

Examine the effects of **ocean conditions** on **survival** and **fecundity**.

ECOLOGICAL MOTIVATION

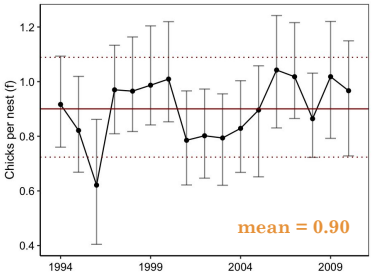
- **Pigeon Guillemots** (PiGu; *Cepphus columba*) are an **indicator species** in Puget Sound, WA.
- **Limited knowledge** about population status, abundance, demography, or links to environmental variability.

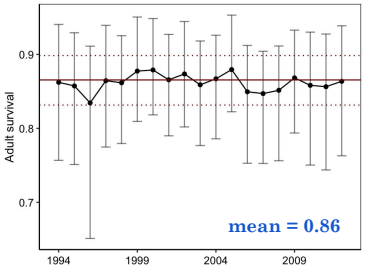
PROTECTION ISLAND

- National wildlife refuge
- PiGu habitat with little human disturbance (steep bluffs and driftwood-covered beaches)
- 20-38 nest boxes and 200 banded birds monitored from 1994-2013

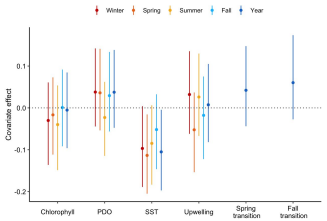
FECUNDITY & SURVIVAL OVER TIME

Greater variability in **fecundity** compared with **adult survival**



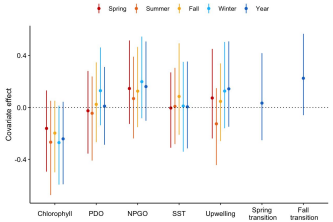


FECUNDITY: Lower with warmer SST and higher with warm-phase PDO and later fall transition dates



Positive effect | Negative effect

SURVIVAL: Lower with higher chlorophyll and higher with warm-phase NPGO and later fall transition dates



First estimates of Pigeon Guillemot demography and effects of ocean conditions in the Salish Sea will inform ongoing monitoring and understanding of this species as a local ecosystem indicator

METHODS

- Estimated **fecundity** (fledglings/ nest) and **adult survival** using Bayesian **nest production** and **Cormack-Jolly-Seber** models
- Effect of ocean conditions on demography, having either direct (e.g., storminess) or indirect (e.g., prey availability) effects
  - *Pacific decadal oscillation (PDO); sea surface temperature (SST), chlorophyll, North Pacific Gyre Oscillation (NPGO), spring & fall transition dates*

FUTURE DIRECTIONS

- 46 nest boxes to be used in a new study linking foraging with demographic rates.
- PiGu will be banded and tracked using GPS units to identify key foraging areas.
- Intersection of shipping lanes and foraging areas will be evaluated.

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