Migration strategies and winter movements of King Eiders in the Bering Sea

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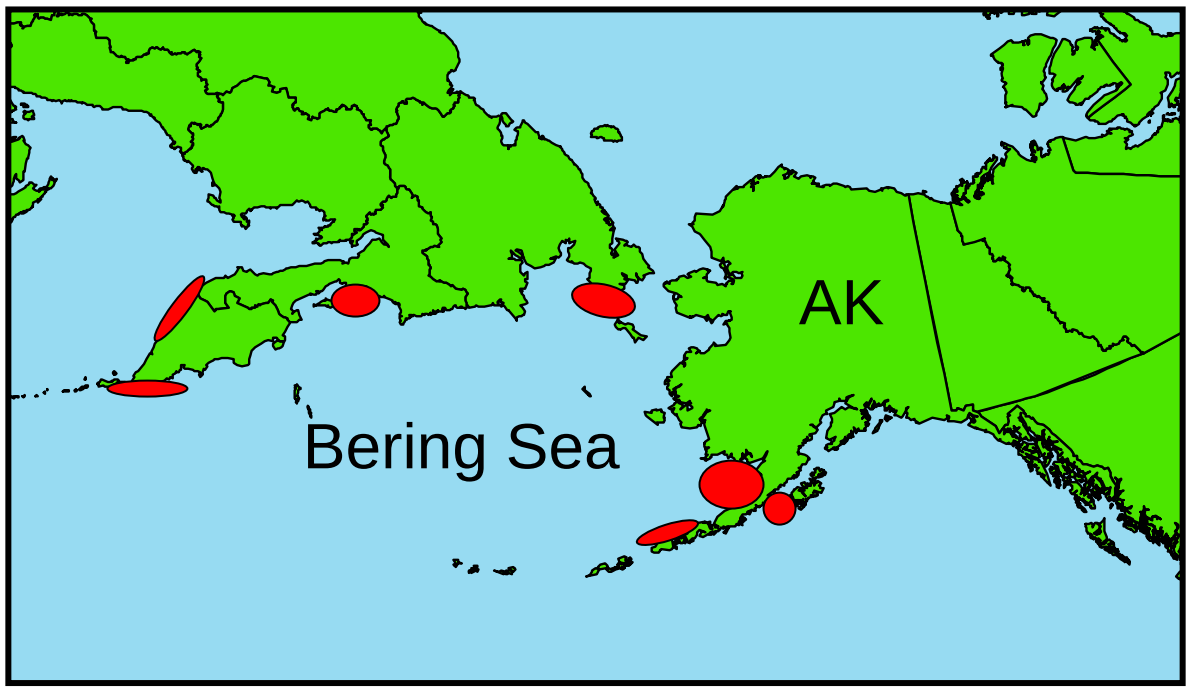
Background

- King Eiders spend 10 months/year at sea
- AK birds migrate to Bering Sea in winter
- Wintering range spans 15° latitude



Background

- migration trade-off:

distance ⟷ environmental conditions

- birds wintering further north face harsher climate
- more likely to be forced to move in winter

Questions

- What proportion of the population uses >1 wintering site?
- Are winter movements more common at higher latitude?

Methods

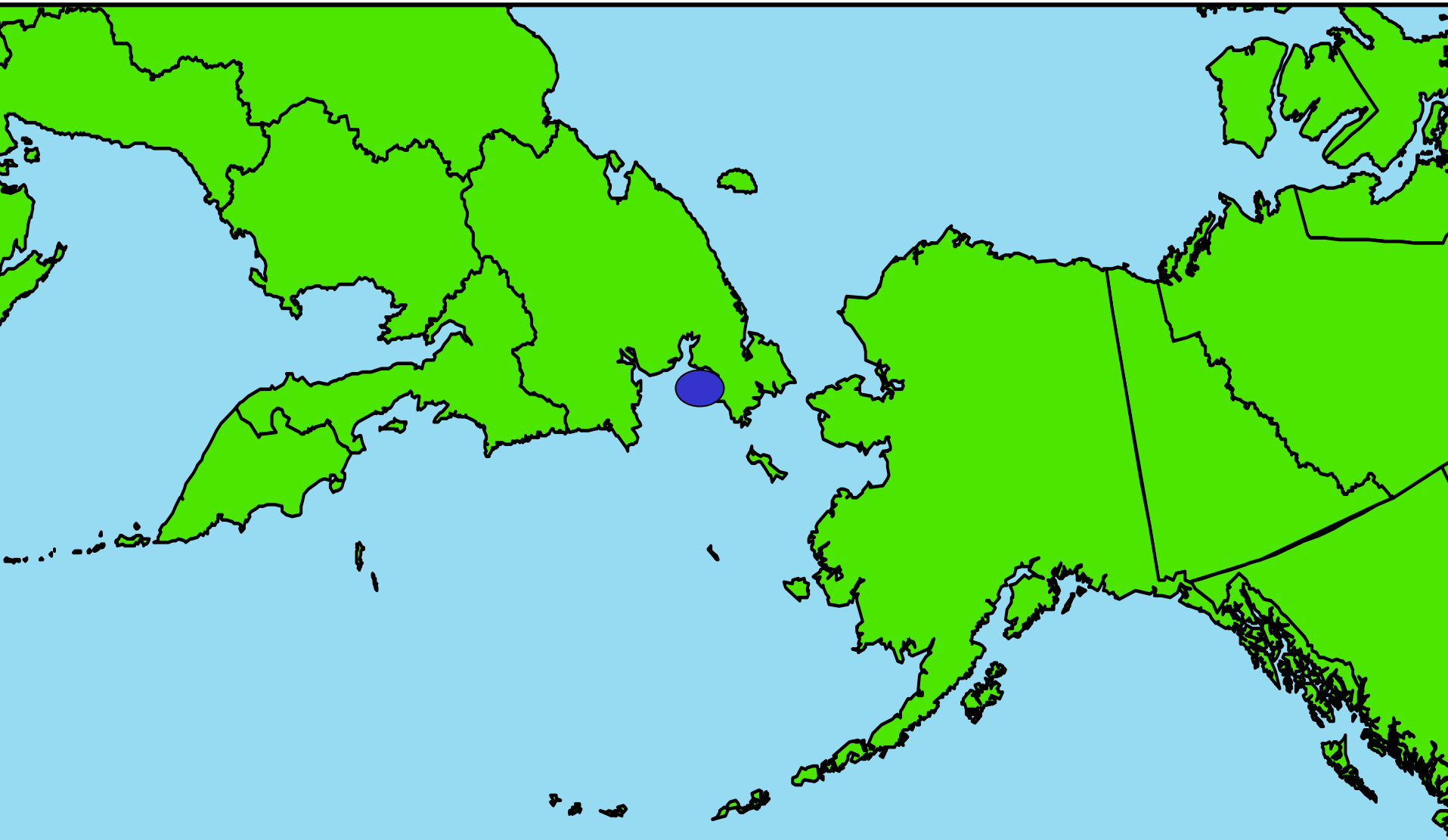
- 80 birds fitted with satellite transmitter in June 2002-2005
- data filtered for best location per duty cycle
- one location every 2-7 days
- classification of seasons based on movement rate

King Eider seasons

Molt migration (July – September)

King Eider seasons

Wing molt (August – October)

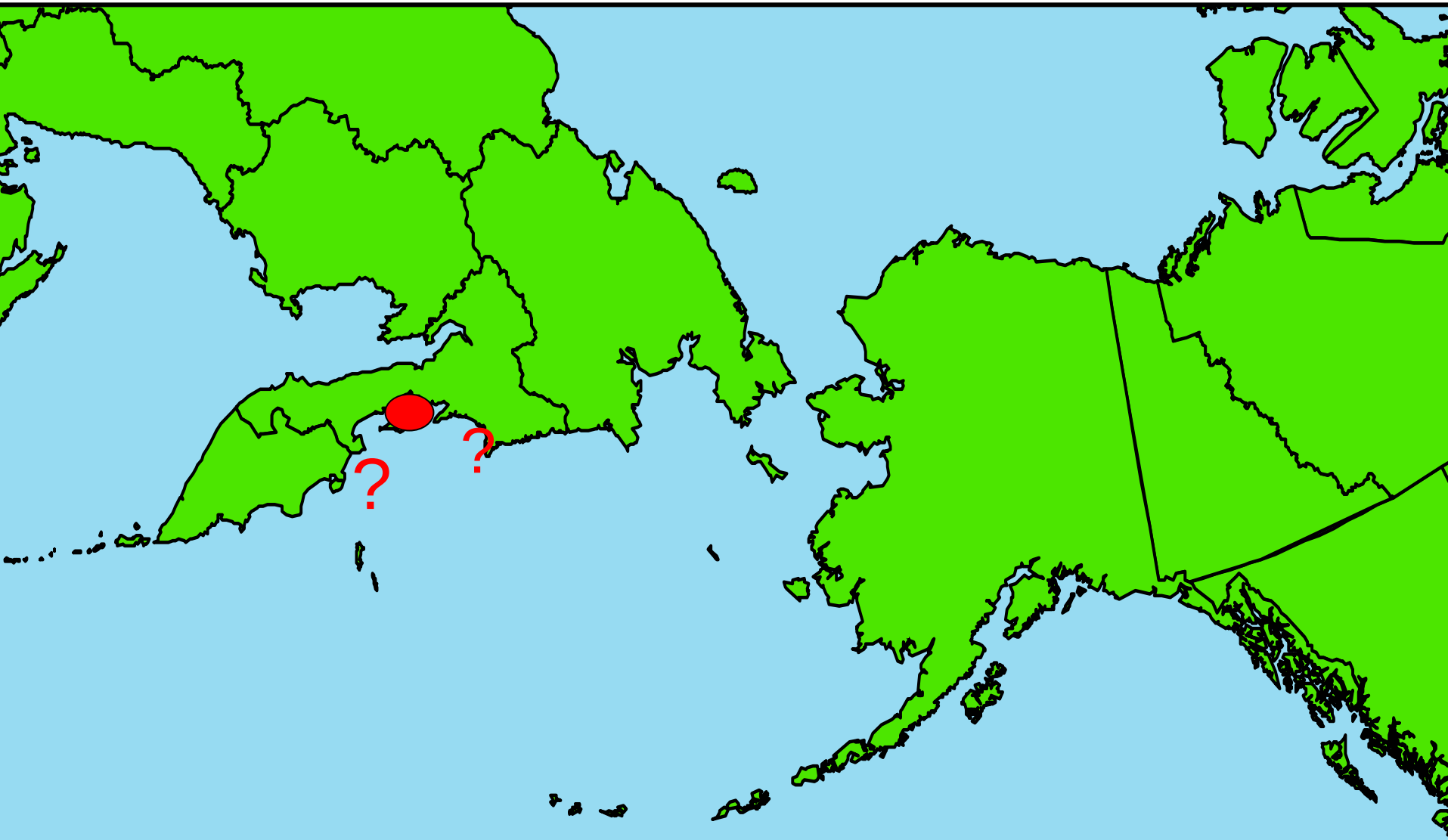


King Eider seasons

Fall migration (October – December)

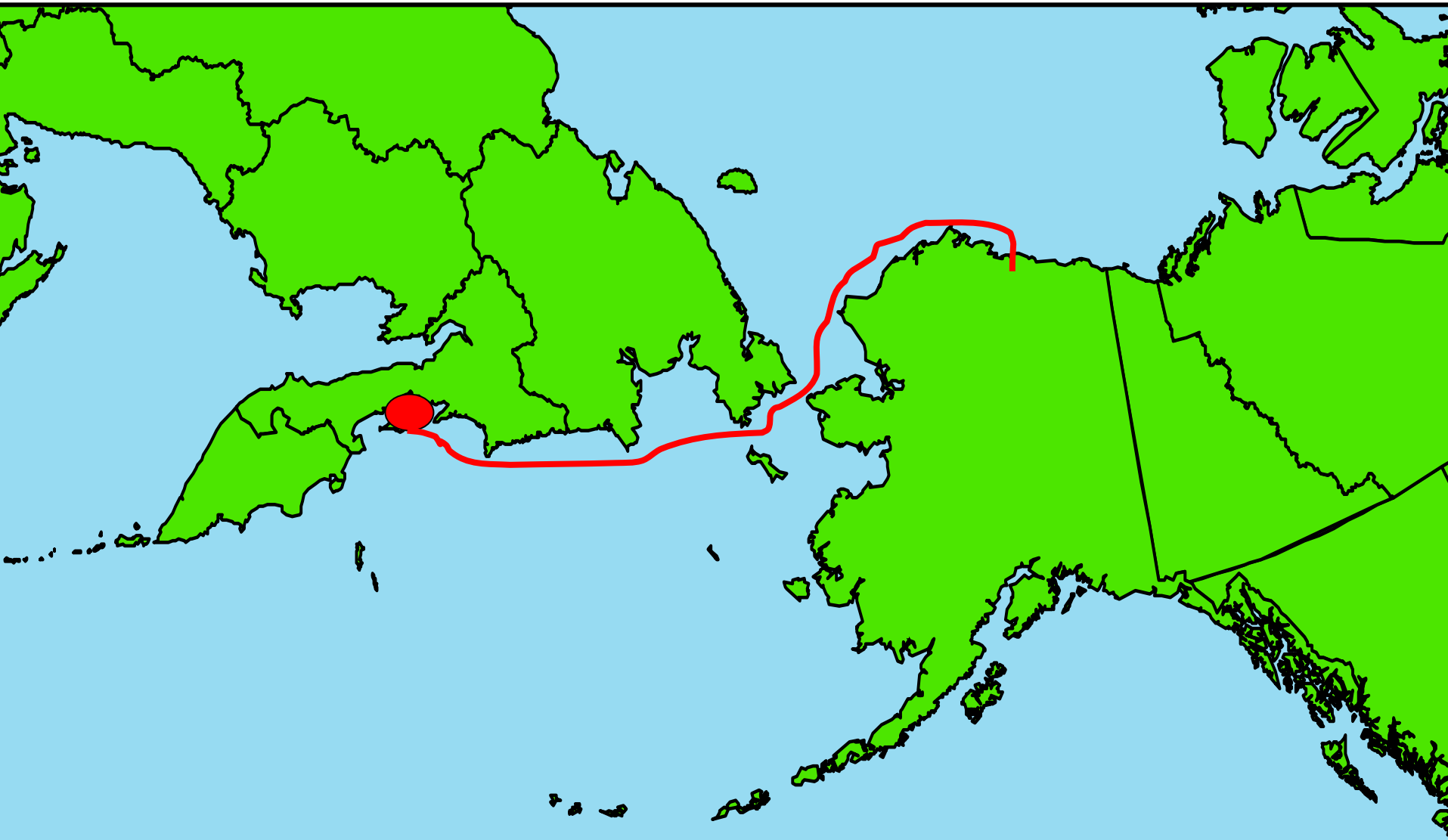
King Eider seasons

Winter period (November – March)

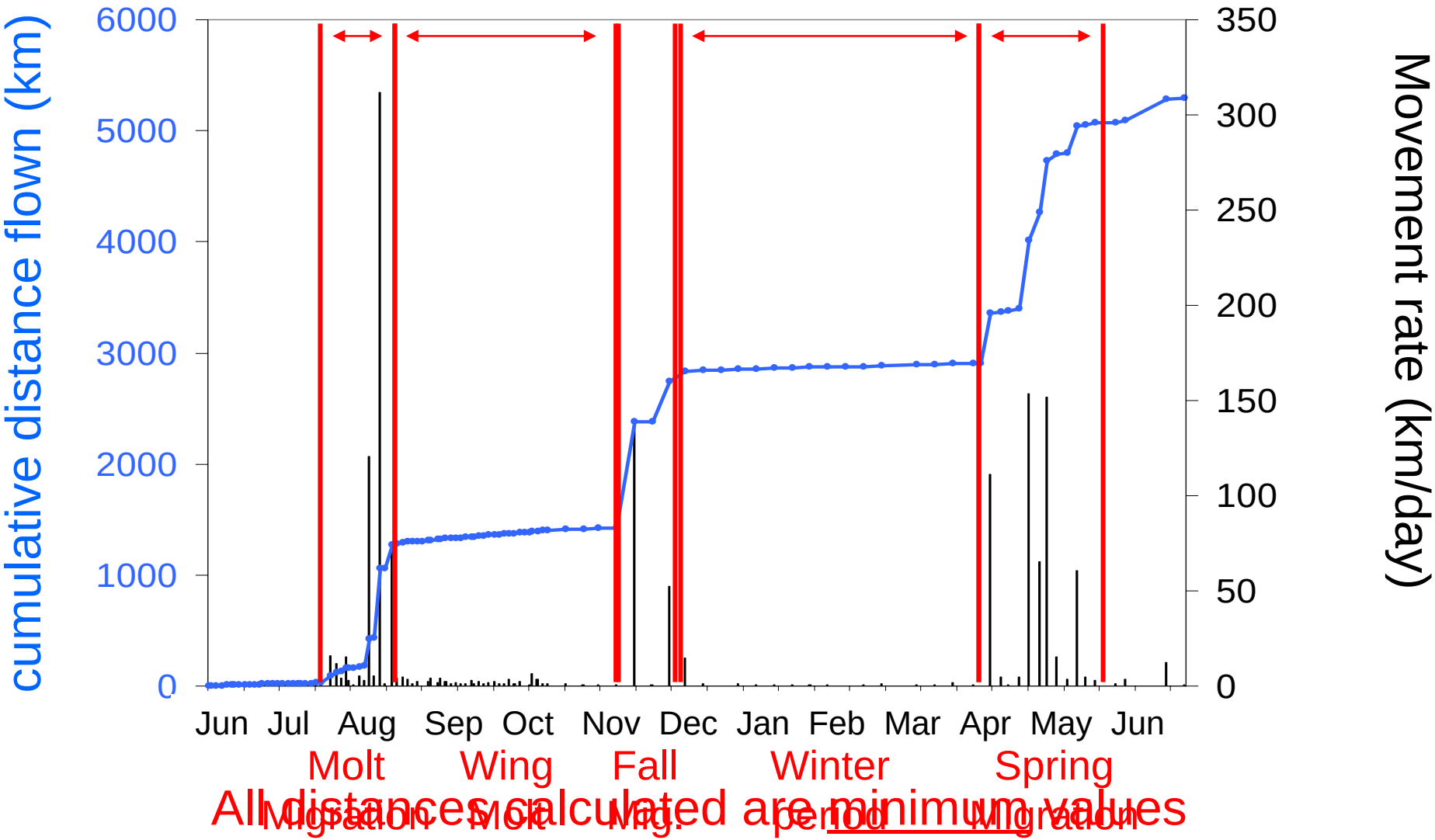


King Eider seasons

Spring migration (April – June)



Methods



All distances calculated are minimum values

Results: fall migration

- 43.4% of tracked King Eiders have no fall migration

- three strategies of fall migration

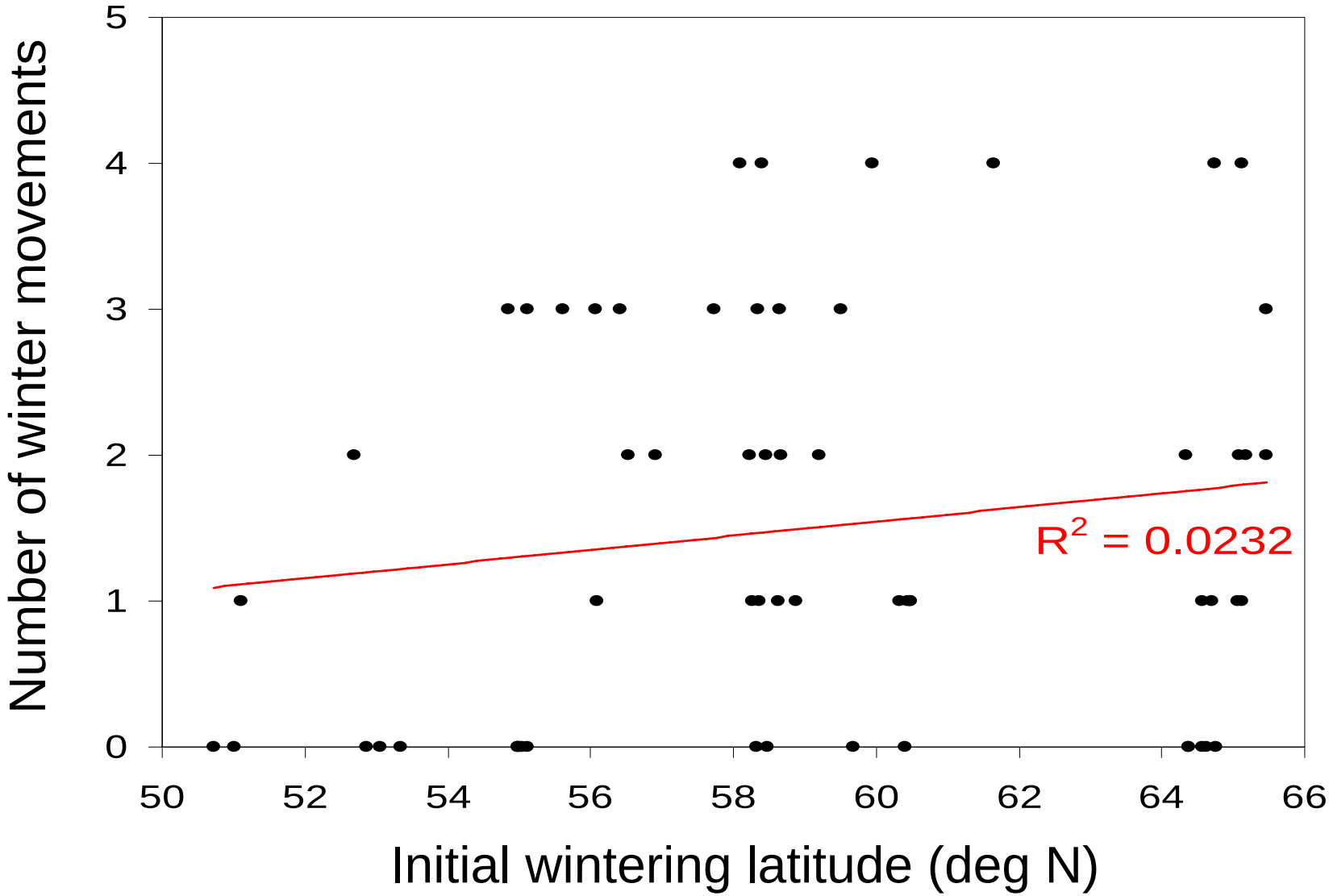
  1) none (43.4%)
  2) short, one step (27.7%)
  3) long, multi-stage (28.9%)

- birds wintering in AK and RUS use strategies equally

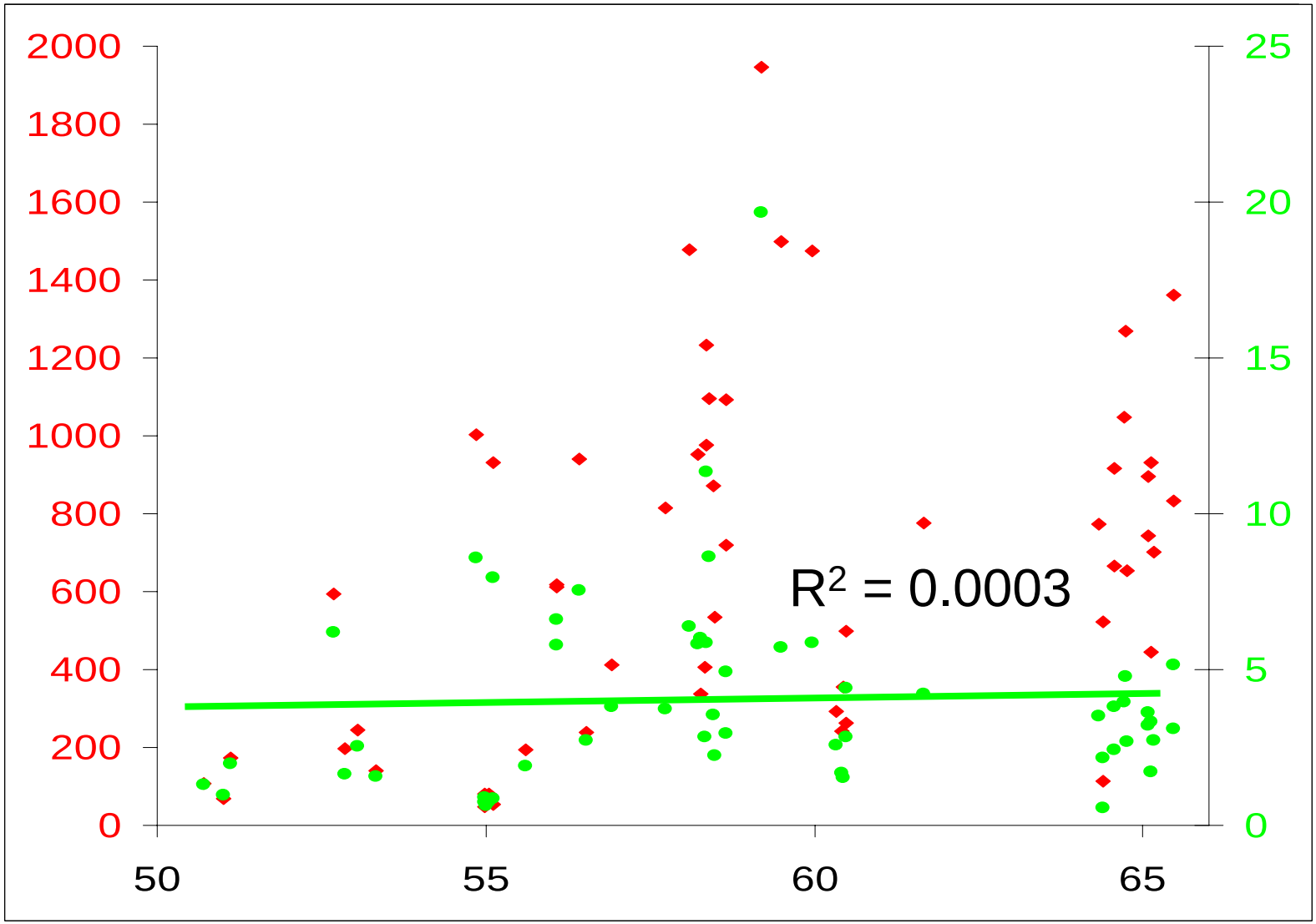
Results: winter movements

- winter period 56 – 280 days depending on strategy
- 56.9% of tracked birds used >1 wintering site
- mean distance traveled in winter 644 km (± 453 km SD)
- large variation, range 46 km – 1947 km

Results: winter movements



Results: winter movements



Results: winter movements

- winter movements not explained by:
  - latitude (p = 0.159, Lin. Regr.)
  - year (p = 0.988, ANOVA)
  - sex (p = 0.815, ANOVA)
- winter movements differ between migration strategies
  no fall migration > one-step fall migration (p = 0.014)

Discussion

- winter movements occur in > 50% of adults
- potential explanation for low spatial genetic structure
  (Pearce et al. 2004)
- causes not related to latitude, year or sex:
  - food depletion?
  - age and experience of the bird?
  - social factors?
- temporal resolution insufficient to track movements?

(Bump and Lovvorn 2004: Spectacled Eiders fly >2000 km in winter)

Future directions

- explore local weather correlates that may cause movements
- track juveniles and successfully breeding females
- explore spatial and temporal availability of benthic prey

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Questions?