NEST SURVIVAL FOR A THREATENED SHOREBIRD

THE LESSER YELLOWLEGS (*Tringa flavipes*)

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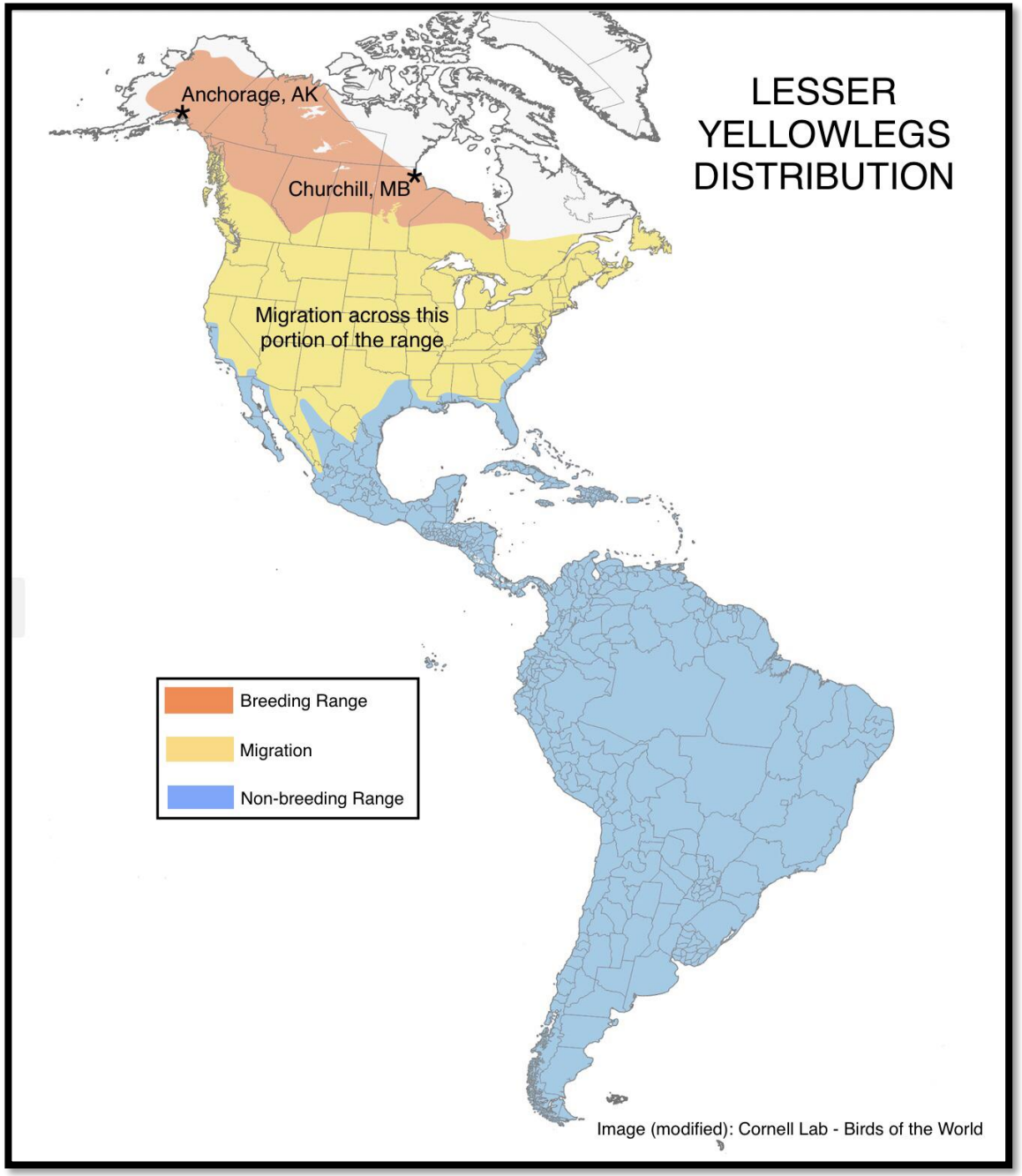
R2Rbirds.org


LESSER YELLOWLEGS DISTRIBUTION
Anchorage, AK
Churchill, MB
Migration across this portion of the range
Breeding Range
Migration
Non-breeding Range
Image (modified): Cornell Lab - Birds of the World

Lesser Yellowlegs breeding range:

Boreal and subarctic region of North America

Credit: Laura Maskell

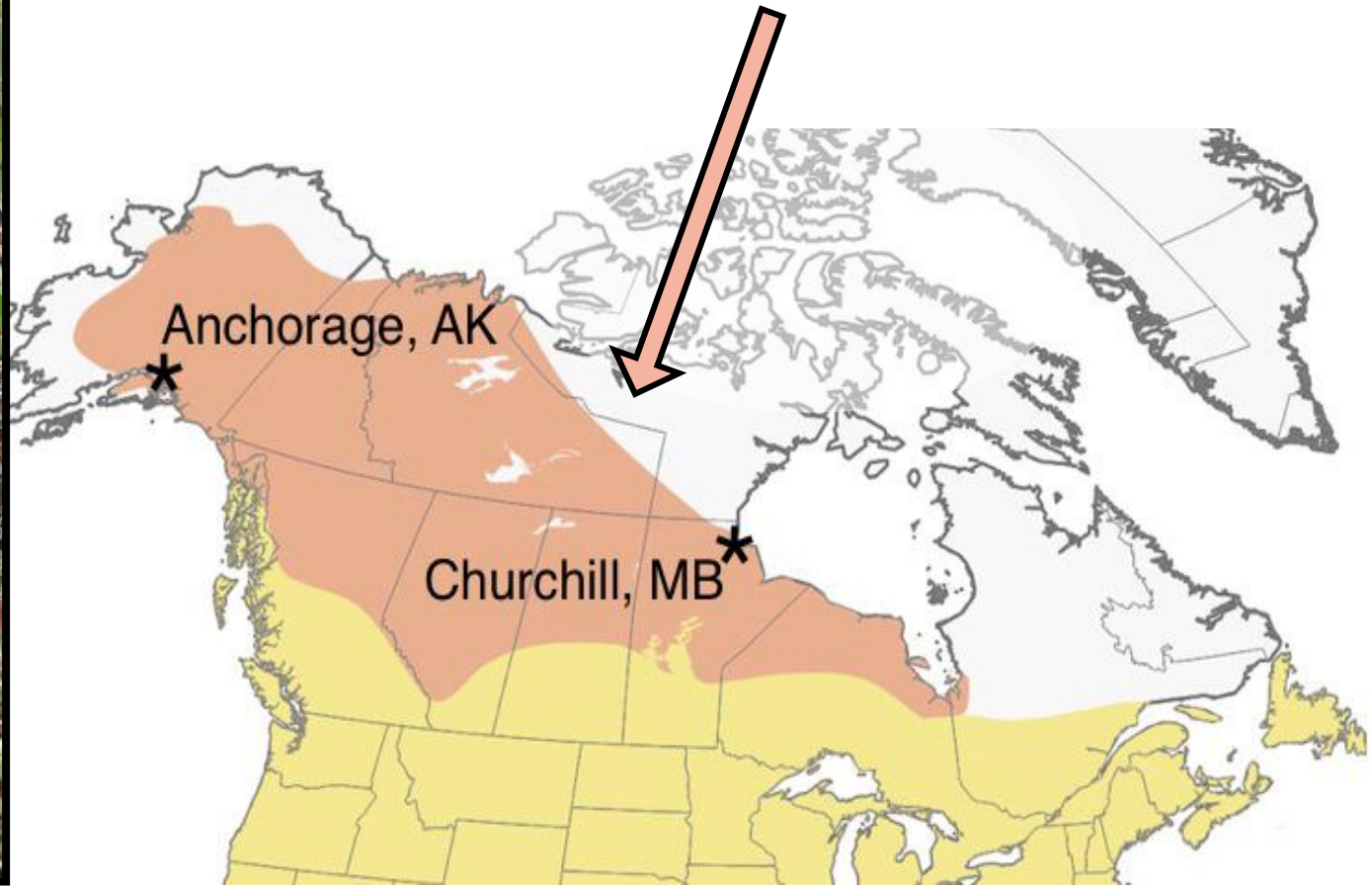


Image (modified): Cornell Lab, https://birdsoftheworld.org

Background:

- Steep (and accelerating!) population declines

- <u>Conservation status:</u>

  Listed as **Threatened** in Canada
  Species of Greatest Conservation Need in Alaska

- Multiple threats throughout the range

- High adult nest site fidelity

- Eastern breeding birds likely at higher risk of harvest during migration

Photo: S. Bonnett

We DON'T know if declines are due to

high adult and juvenile mortality

or

low replacement rate

(or possibly both)

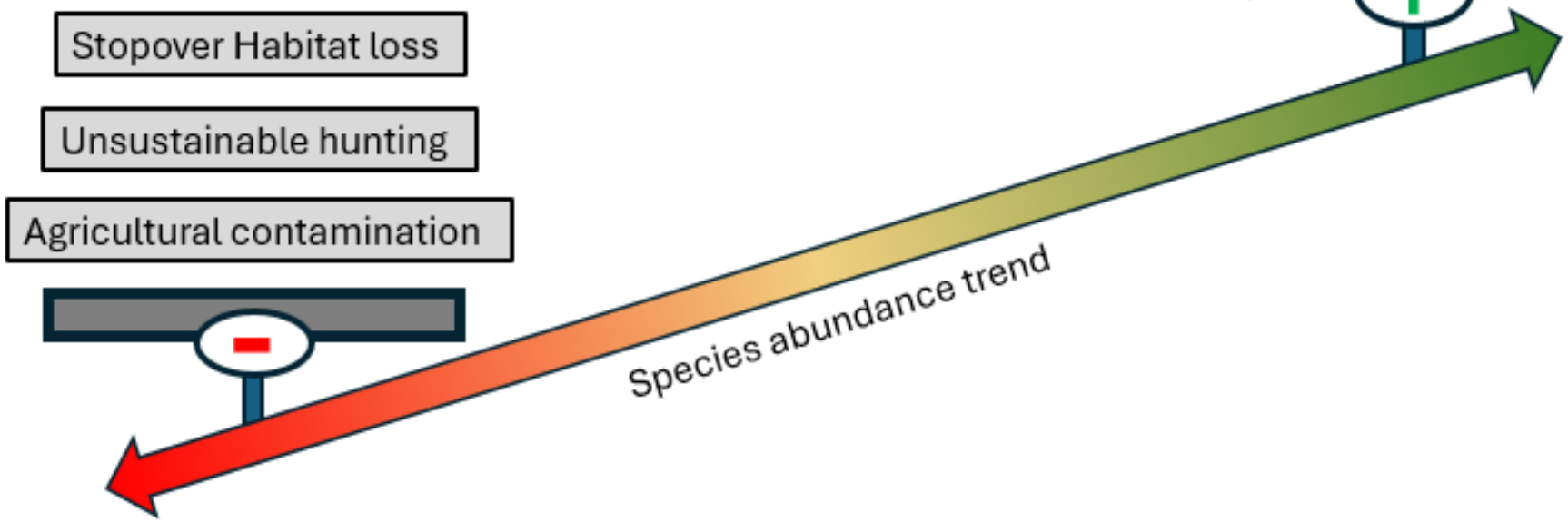
Photo: S. Bonnett

Lesser Yellowlegs population "equation"

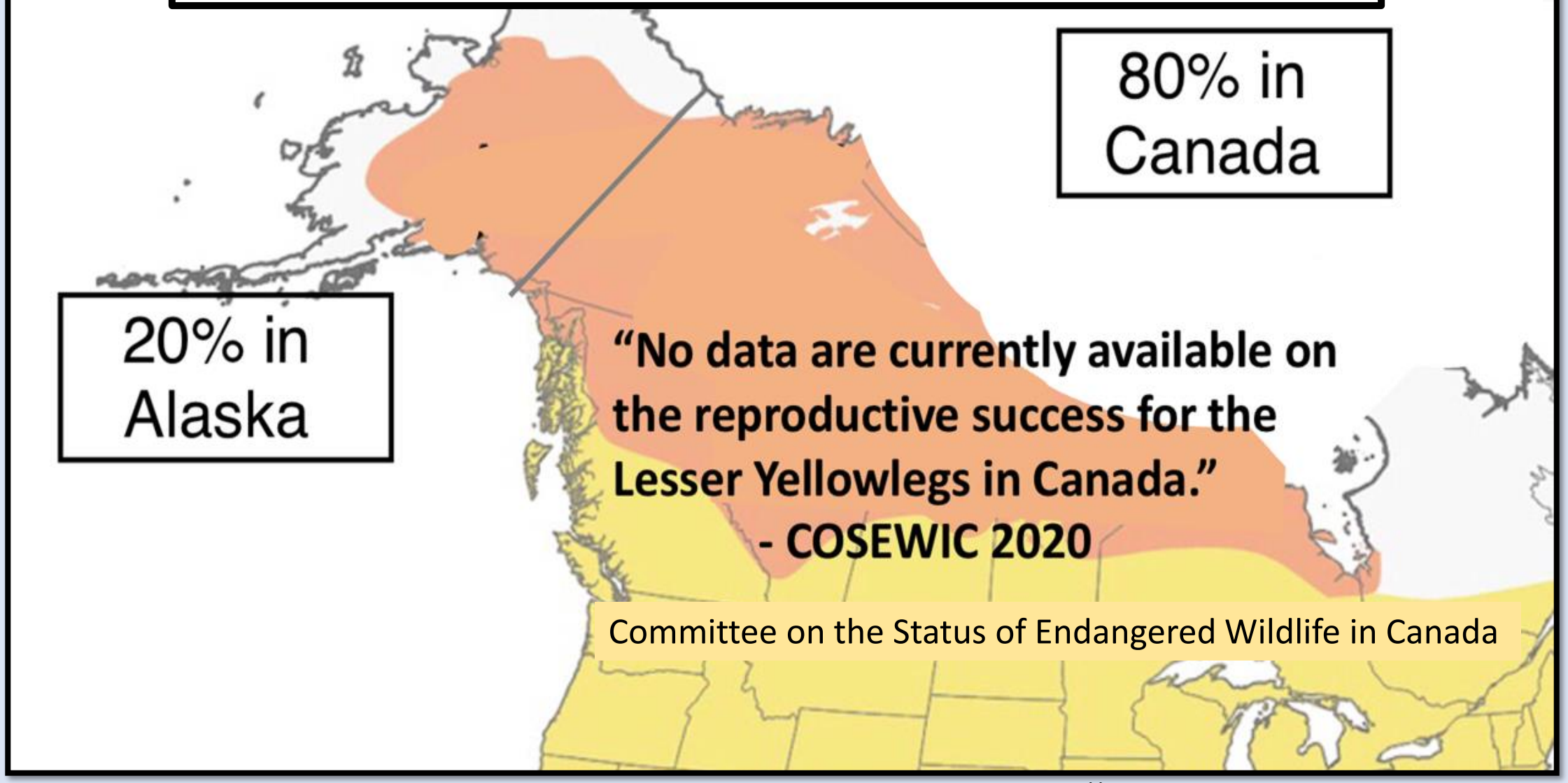
ONE source of growth:

MANY factors decreasing abundance:

- Wetland drying
- Stopover Habitat loss
- Unsustainable hunting
- Agricultural contamination



Lesser Yellowlegs breeding population distribution



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Calculate reproductive success for Lesser Yellowlegs in Churchill, Manitoba compare with Anchorage

Daily nest survival rate (DSR)

- Probability of nest surviving one day to the next

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Overall nest survival = DSR^{26}

- Seasonal probability over 26 days (laying + incubation)

Finding Nests

- Visual search
- Behavioral cues

Discovery day

- Nest age
- Location

Nest Monitoring

- Every 5-6 days
- Fate

Research Questions:

1) Did success differ between Churchill and Anchorage?

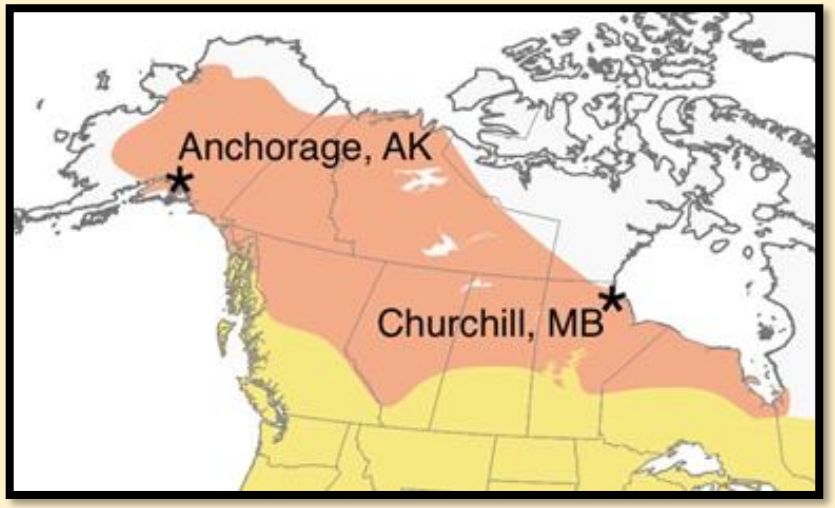
2) What factors may influence reproductive success?

Prediction:

Higher success in Anchorage

(Rationale follows..)

Site Contrasts



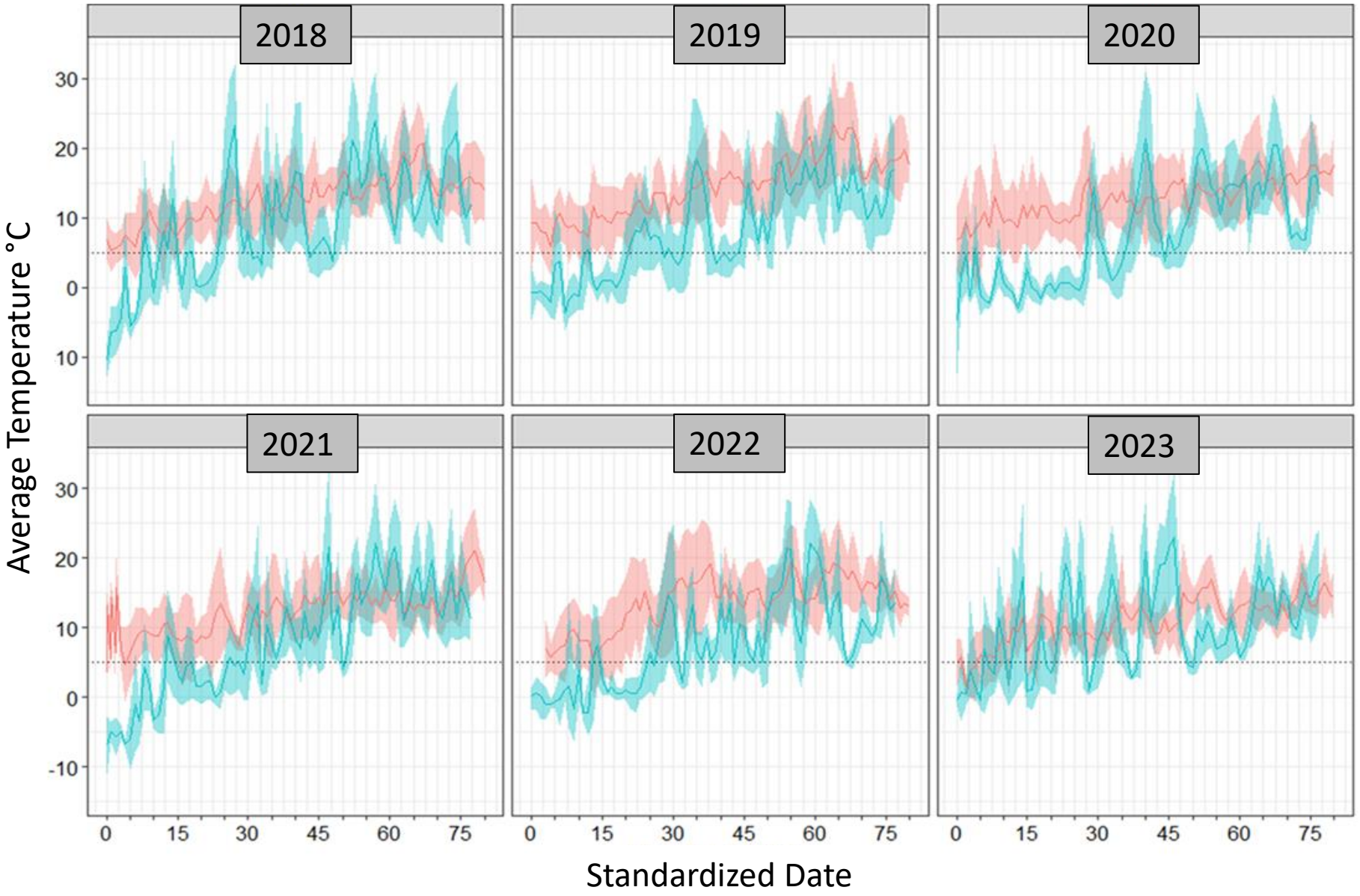
Anchorage:

- Southern range limit in west
- Southern edge of boreal forest
- At the boreal-temperate forest ecotone
- Maritime climate patterns

Churchill:

- Northern range limit in east
- Northern edge of boreal forest
- At the arctic-boreal forest ecotone
- Subarctic continental climate

Churchill was colder and more variable



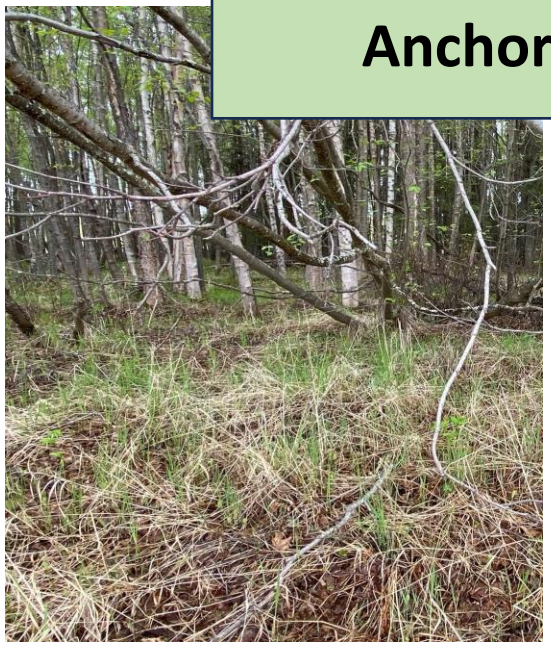
Anchorage

Churchill

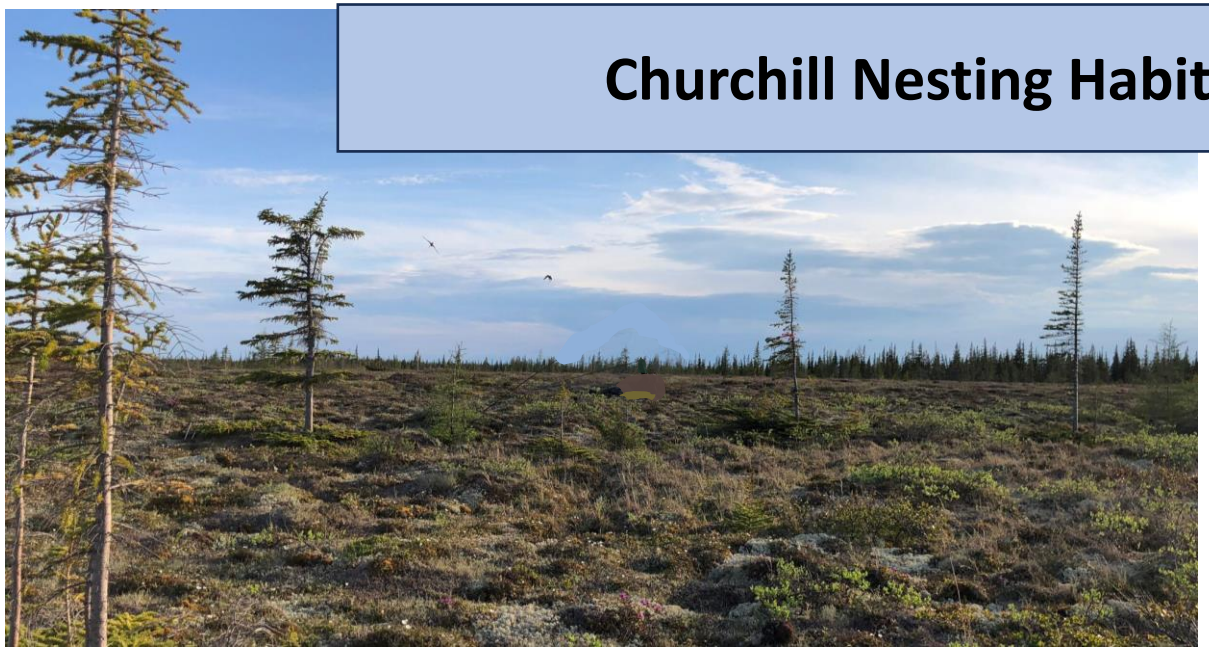
*Shading shows daily min and max °C

Standardized dates:
Anchorage May 1 – July 17
Churchill May 15 – July 31

Anchorage Nesting Habitats – more densely vegetated overall



Churchill Nesting Habitats - more open overall



Hypotheses:

1. ↑ Movement ⇢ ↑ Predation
2. ↑ Energetic demands ⇢ ↑ Abandonment
3. ↑ Concealment ⇢ ↓ Predation

Data overview

Sample size for analysis:

(n=75 nests)

Year	Anchorage	Churchill
2018	3	(na)
2019	4	(na)
2020	20	(na)
2021	15	(na)
2022	5	12
2023	2	14
Total	**49**	**26**

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- Created “nest periods” to test factor effects on individual nests at different incubation stages

Early
(laying and early incubation)

Mid
(Middle incubation)

Late
(Late incubation and hatch)

DATA ANALYSIS

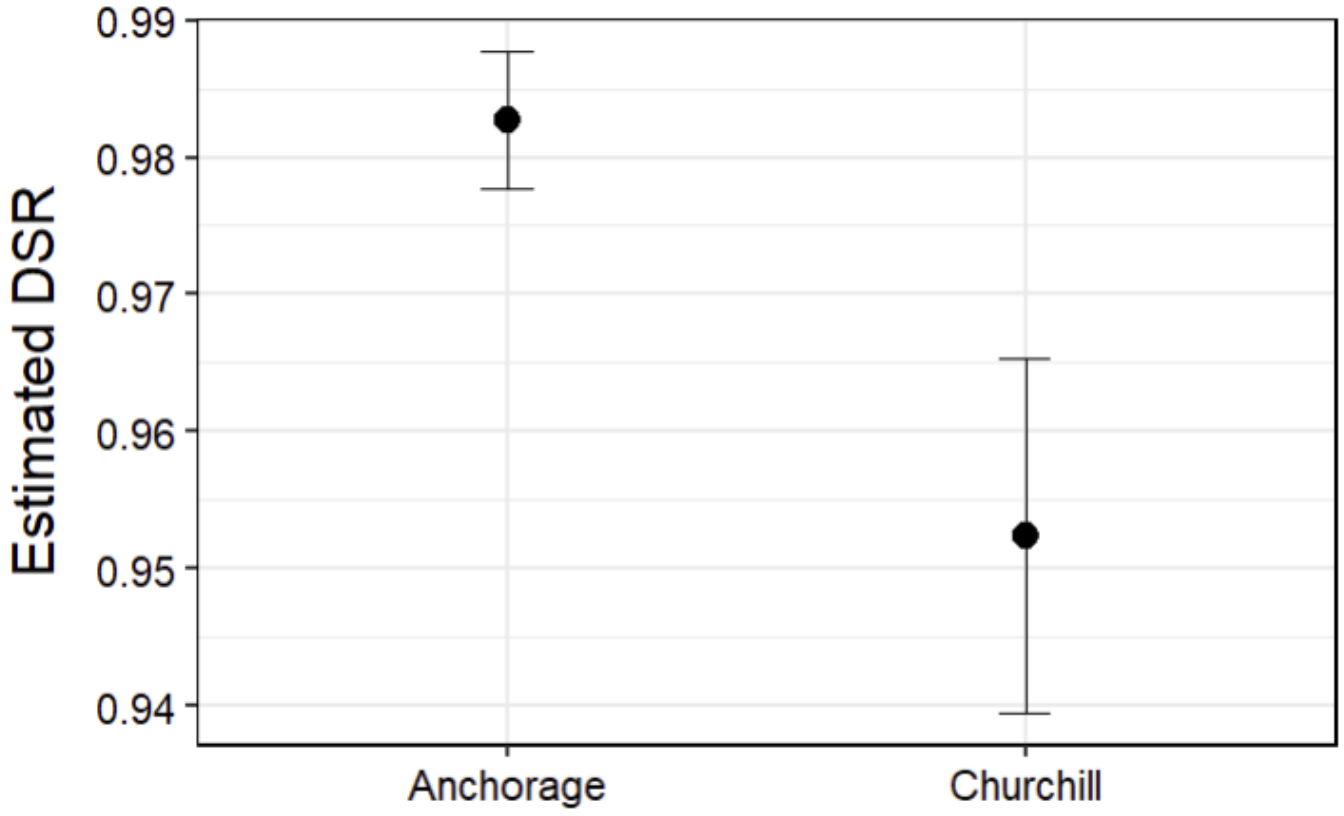
Modeled daily survival rate of nests in RMark:

Effects of:
- -site
- -time
- -nest age
- -habitat type
- -nest initiation
- -concealment
- -temperature
- -select factor combinations

Information-theoretic approach
(considers results of all closely weighted models)

Modeled full dataset (n = 75 nests)

Results: Estimated daily nest survival (DSR) for Anchorage was higher than Churchill



(*Bars denote standard error)

Anchorage

Mean DSR = 0.98

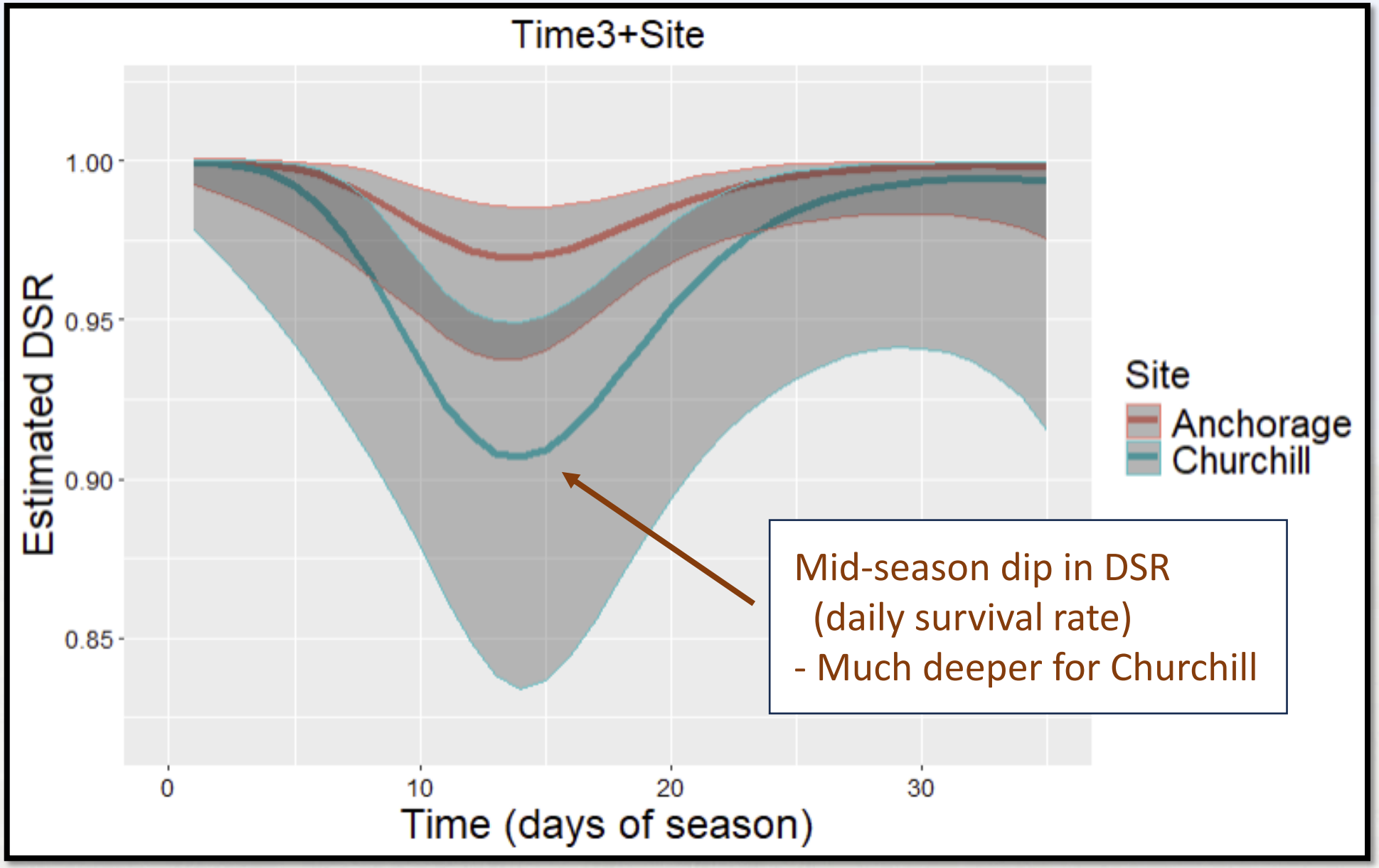
Overall survival = 63%

Churchill

Mean DSR = 0.95

Overall survival = 28%

Best model: Cubic time trend + Site



Supported models

Linked

- *warmer mid-incubation temperatures*
- *higher percentage nest concealment*

with higher daily nest survival

Discussion:

- Significant site effect (Anchorage much higher)

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- Mid season dip in daily nest survival rate

* *possible* mechanisms:

- Predator breeding cycles may drive increased predation pressure
- Possible midseason threshold when nest abandonment increases

RECAP

- First reproductive success estimate for Lesser Yellowlegs in Canada

- Potential mechanisms affecting nest survival:
  -Mid-incubation temperature
  - Nest concealment

- Contributes critical data to larger conservation efforts

“Take-away”

Reproductive success may vary widely across breeding range

Conservation implications

If these results are representative of the Eastern end of the breeding range

Effects of low nest survival in Churchill may be compounded by

- High nest site fidelity (adults return)
- Likely at higher risk of harvest on migration
- In combination, declines may be occurring much faster for this breeding population

FUTURE WORK

Estimate nest survival at more southern or central sites

Yellowknife, NWT anyone…?

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THANK YOU!
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Churchill 2022: Haley Grieve, Jacob Gerard, Courtland Brown, Sarah Bonnett

Churchill 2023: Elias Malcolm, Laura Maskell, Sofia Pardo, Courtland Brown

Not Pictured **Anchorage 2018-2023**:
Deep gratitude to the many other Anchorage folks
whose hard work built the data set I have been privileged to work with!

Questions?

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