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# Aviation supply chains for fresh food and medicines to off-road Alaska

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Alaska House Tribal Affairs Committee – 10FEB26

# Food sources and food systems

Wild Food Collection

Home & Community Cultivation

AK farms/fisheries to retail

**"Outside" sources to** retail

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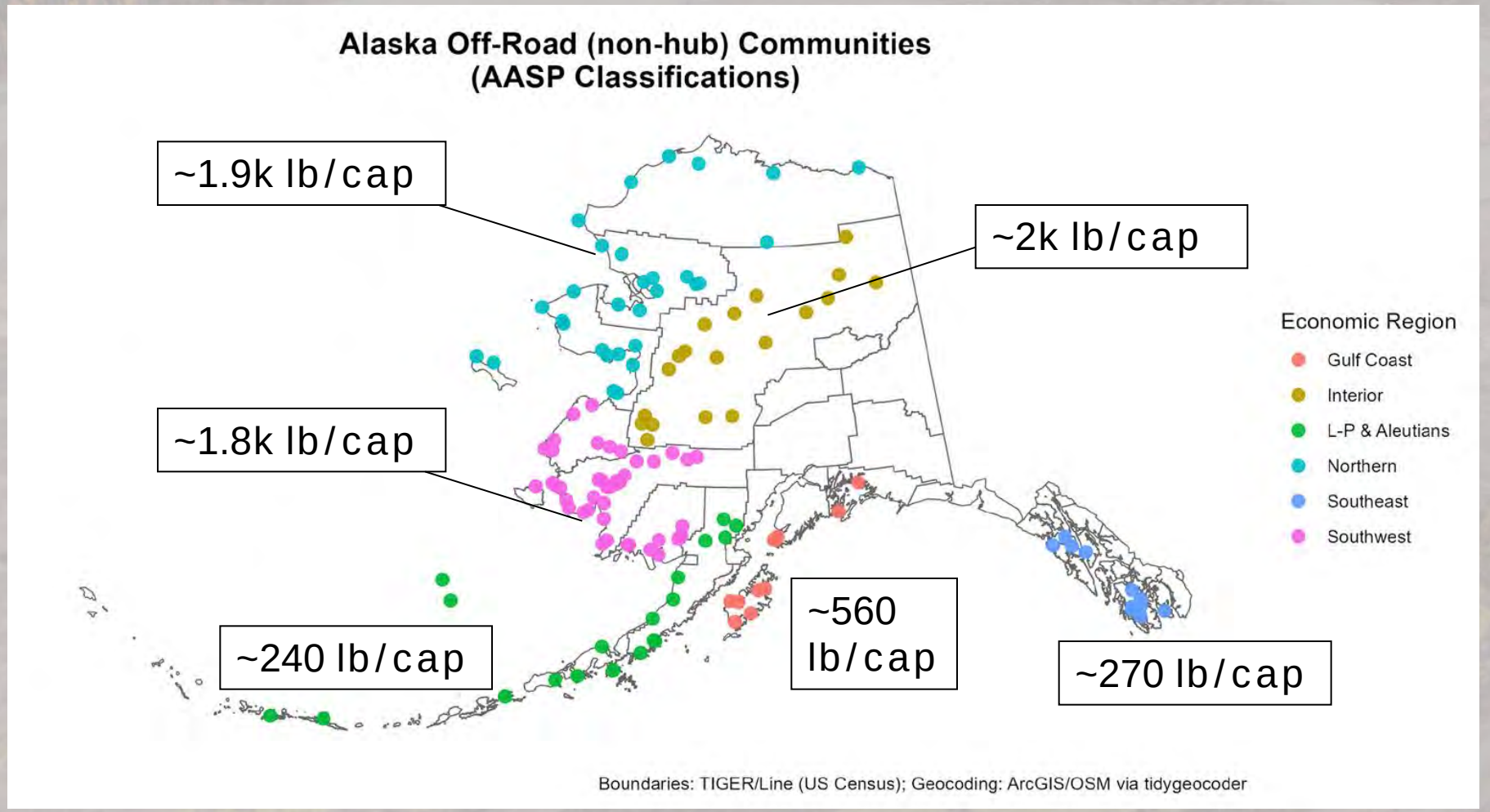
# Alaska has extreme dependence on aviation




## Air Cargo Delivery

Alaska state average at **550lb/cap.**

*Compare to Hawaii at 250lb/cap; California at 8lb/cap*

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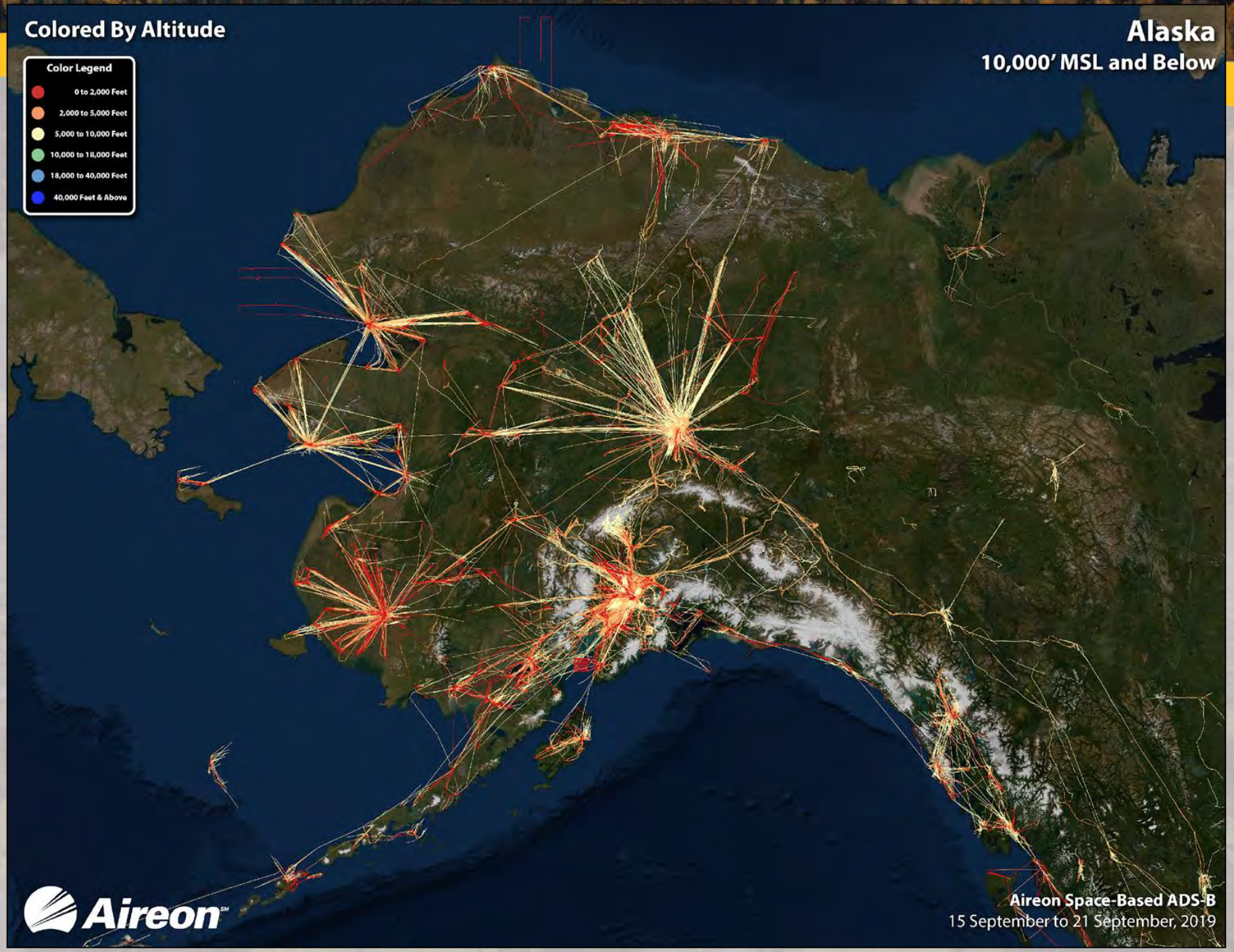
# Flight patterns follow clear hub & spoke model, upstream delays can cascade down



# Supply Chain fragilities from weather, runways, infrastructure, carrier disruptions in thin market

Alaska Desk

## Shelves are bare on St. Paul Island as 10 tons of food sit stranded in Anchorage

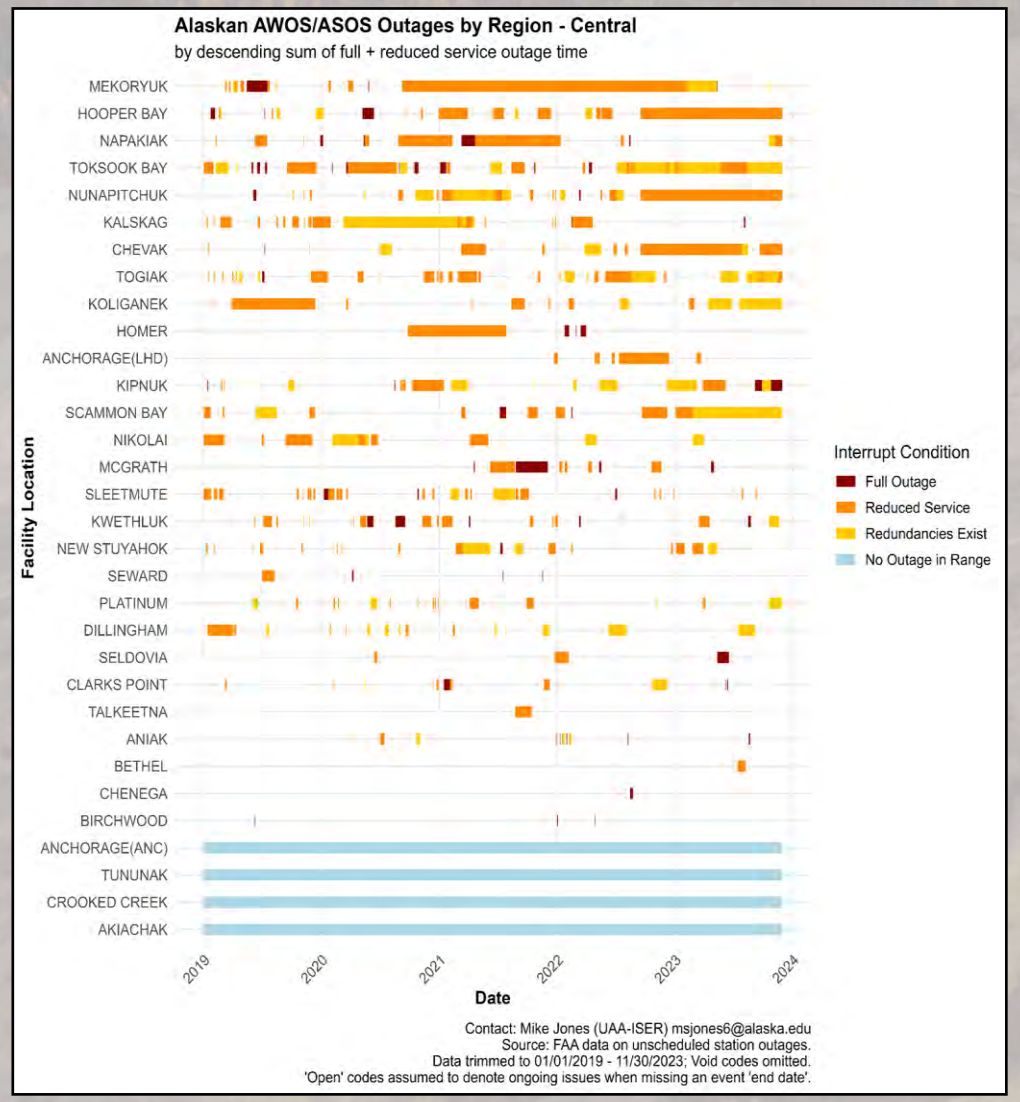
KUCB | By Theo Greenly
Published July 10, 2025 at 3:35 PM AKDT

Public Safety

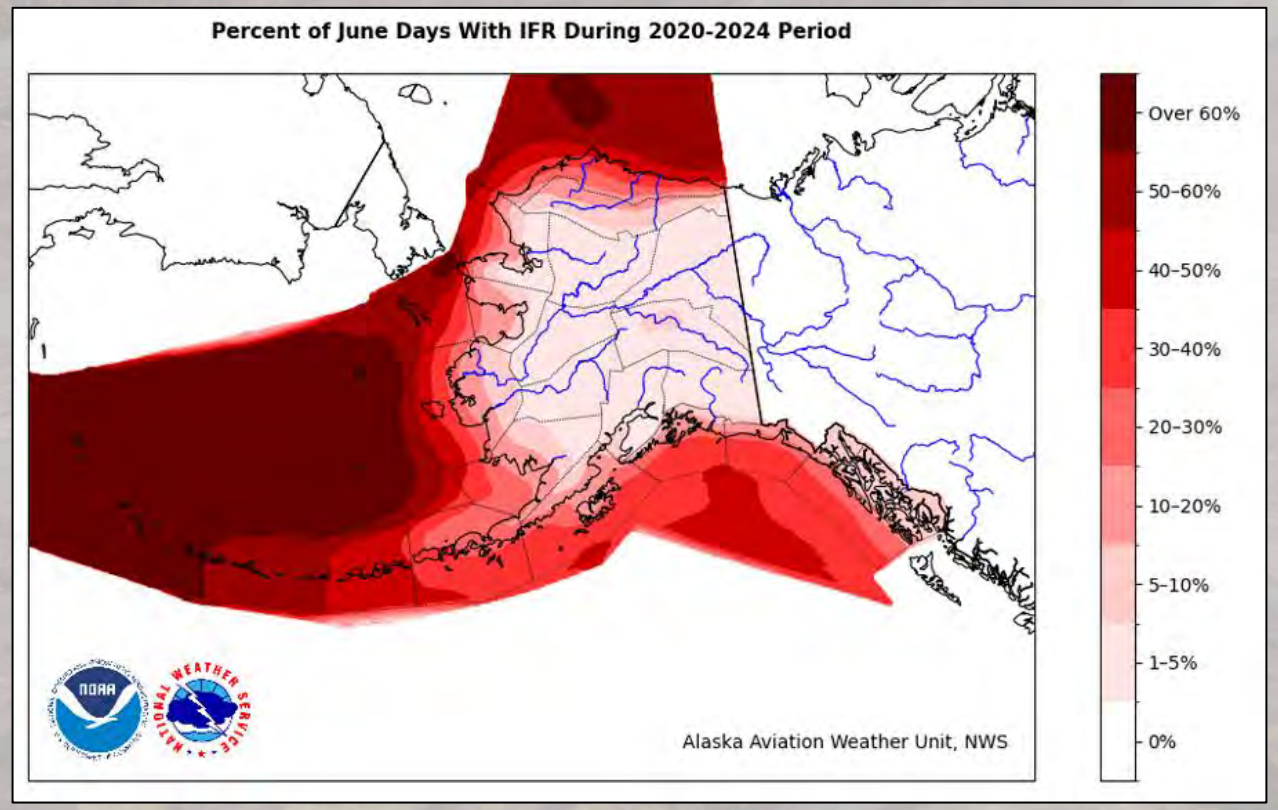
## Empty shelves at Kwethluk Native Store put damper on Slaviq celebrations

KYUK | By Evan Erickson
Published January 12, 2024 at 3:36 PM AKST

## Frequent weather station (AWOS/ASOS) outages




## Frequent challenging weather




*Denotes (a) cloud ceilings <1000ft AGL or (b) visibility < 3 statute miles

**Report**: Alaska aviation weather infrastructure: outage patterns and strategic prioritization

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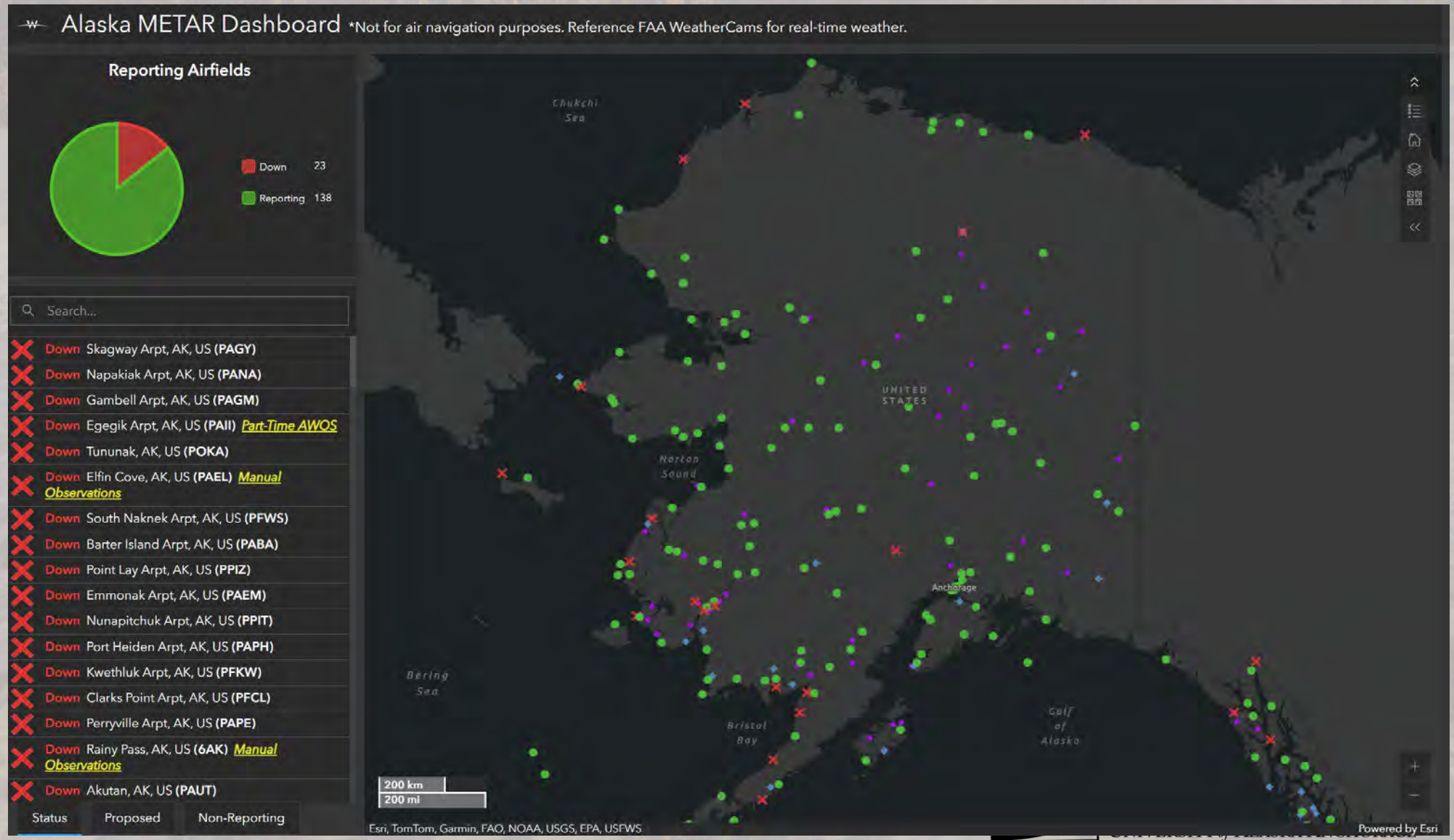
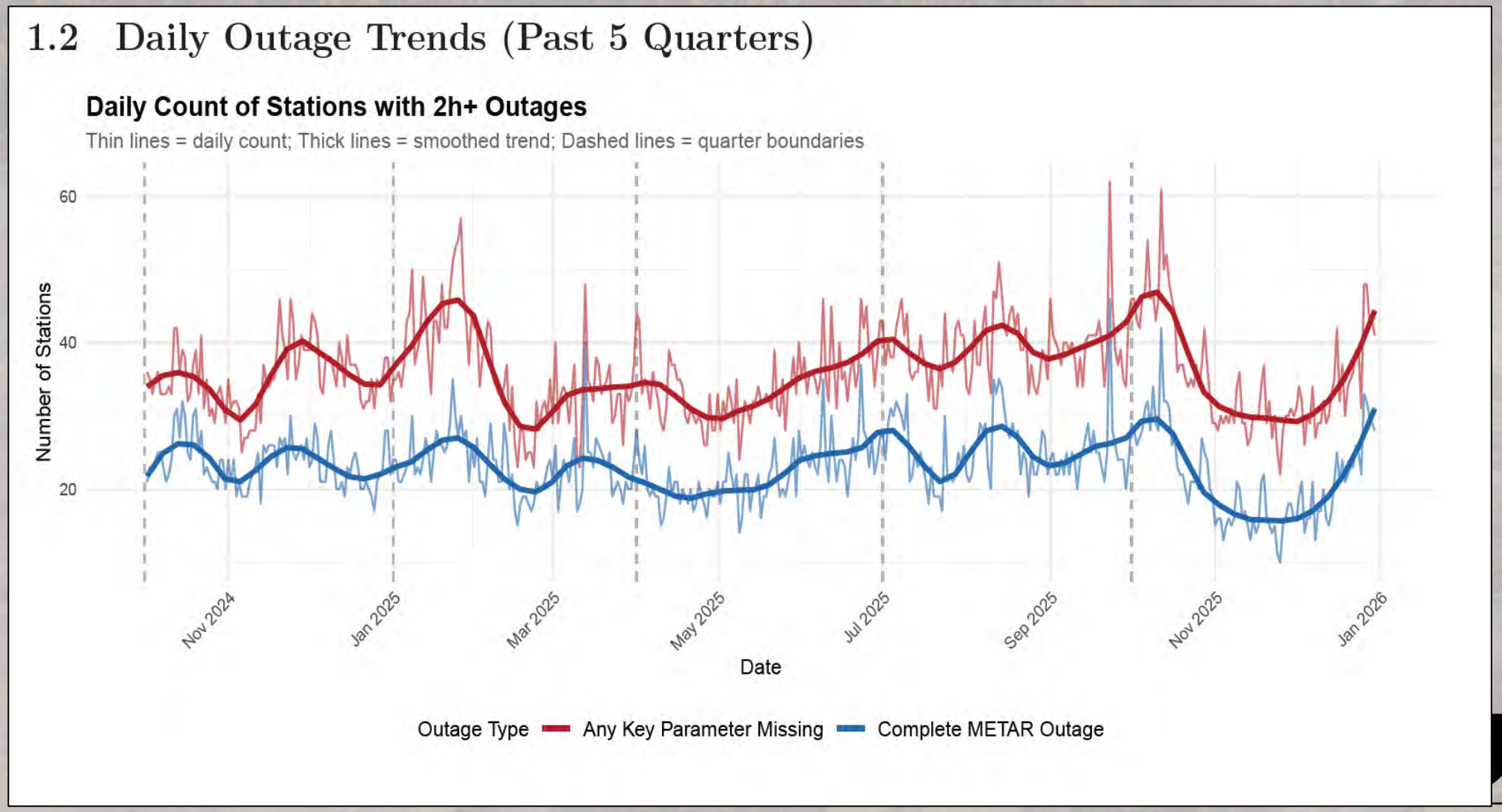
# Real-time AWOS outage dashboard by ADOT partners at Woolpert

Shows site expansions



# New ISER monitoring report on recent AWOS/AWOS history




Logged METAR outage defined as 2h+ of non-report for a) any METAR field, b) any of 8 identified 'key' sensors: *vis, skyc1, skylc, temp, dwpt, wind speed, wind dir, altimeter*

We can't see into past for dial-up availability – need FAA RMLS records (in FOIA process)

# Regional breakdown

Table 1: Complete METAR Outages by Region (Oct 01, 2025 to Dec 31, 2025)

| | | | Qtr Missing Pct | | 365-Day Missing Pct | |
|---|---|---|---|---|---|---|
| Region | Stations | Pct Off-Road | Current | Prior Year | Current | Prior Year |
| North Slope/Arctic | 8 | 88% | 22.9% | 34.4% | 21.3% | 18.1% |
| Western/YK Delta | 26 | 100% | 18.1% | 20.9% | 20.7% | 26.5% |
| Southwest/Bristol Bay | 25 | 100% | 13.2% | 12% | 12.4% | 13% |
| Southeast | 15 | 87% | 11.3% | 19.6% | 8.6% | 11.4% |
| Northwest | 25 | 100% | 10.4% | 15.2% | 15.1% | 19% |
| Southcentral | 19 | 21% | 7% | 2% | 3.9% | 2.2% |
| Interior | 19 | 53% | 1.7% | 1.9% | 2.1% | 7.8% |
| **TOTAL** | 137 | 80% | 12.1% | 15.1% | 12% | 14% |

Table 2: Any Key Parameter Missing by Region (Oct 01, 2025 to Dec 31, 2025)

| | | | Qtr Missing Pct | | 365-Day Missing Pct | |
|---|---|---|---|---|---|---|
| Region | Stations | Pct Off-Road | Current | Prior Year | Current | Prior Year |
| Western/YK Delta | 26 | 100% | 29.7% | 27.2% | 29.7% | 30.9% |
| Southwest/Bristol Bay | 25 | 100% | 26.5% | 18.4% | 22.7% | 19.8% |
| North Slope/Arctic | 8 | 88% | 24.2% | 40.8% | 24.6% | 24.2% |
| Northwest | 25 | 100% | 17.2% | 22.6% | 20.6% | 22.8% |
| Southeast | 15 | 87% | 15.2% | 24.5% | 12.5% | 16.1% |
| Southcentral | 19 | 21% | 10.2% | 6.1% | 8.1% | 6.4% |
| Interior | 19 | 53% | 6.1% | 4.6% | 4.9% | 11.4% |
| **TOTAL** | 137 | 80% | 18.4% | 20.6% | 17.6% | 18.8% |

Most regions see YoY improvement in coverage, though gaps remain high in predominantly off-road zones

*This is not ‘grading’ FAA; this is for awareness on objective logged METAR availability. What is a target uptime expectation/goal?

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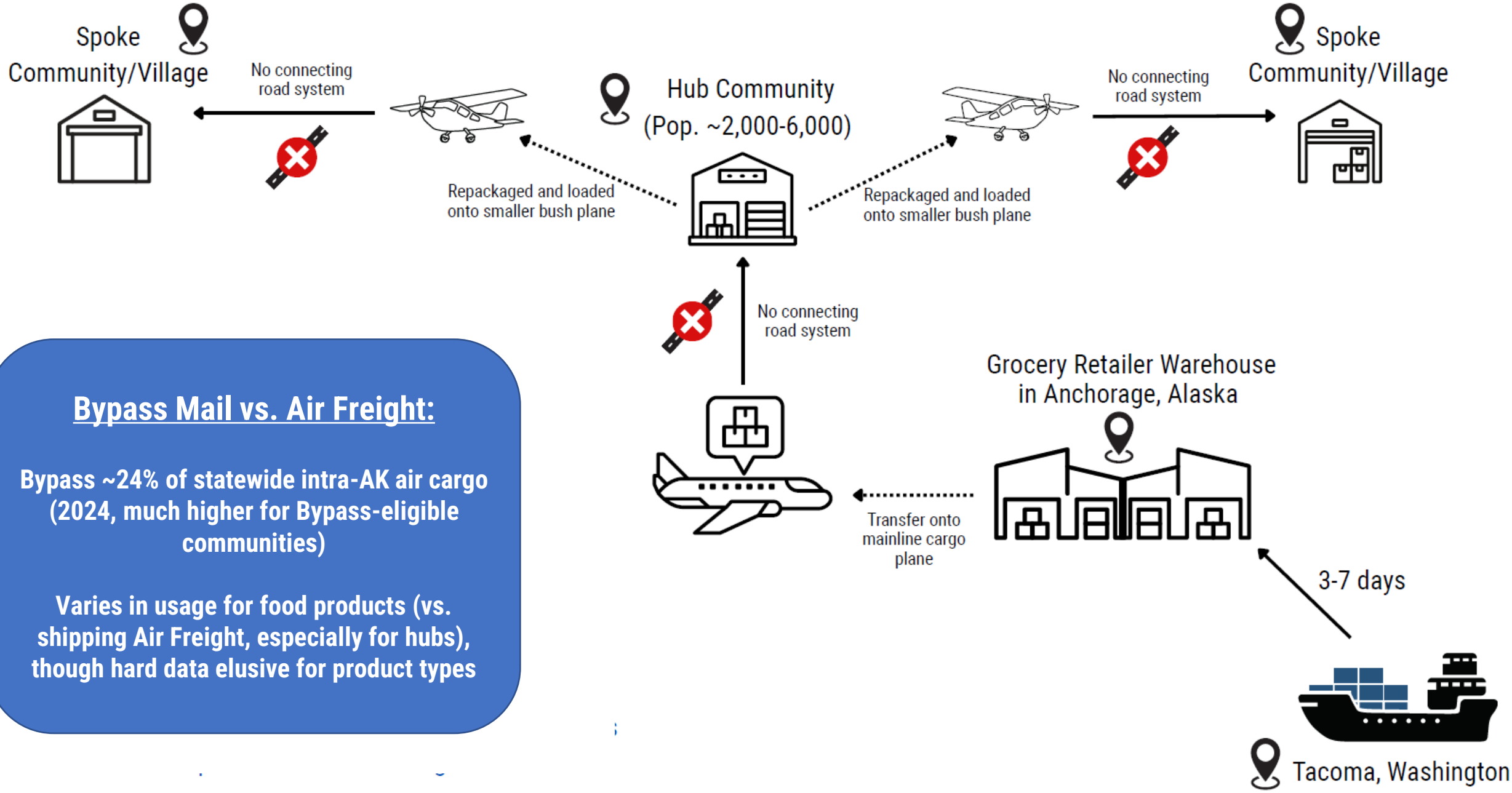
# Route of Perishable Goods Along the Cold Chain from Anchorage to Rural Alaskan Communities

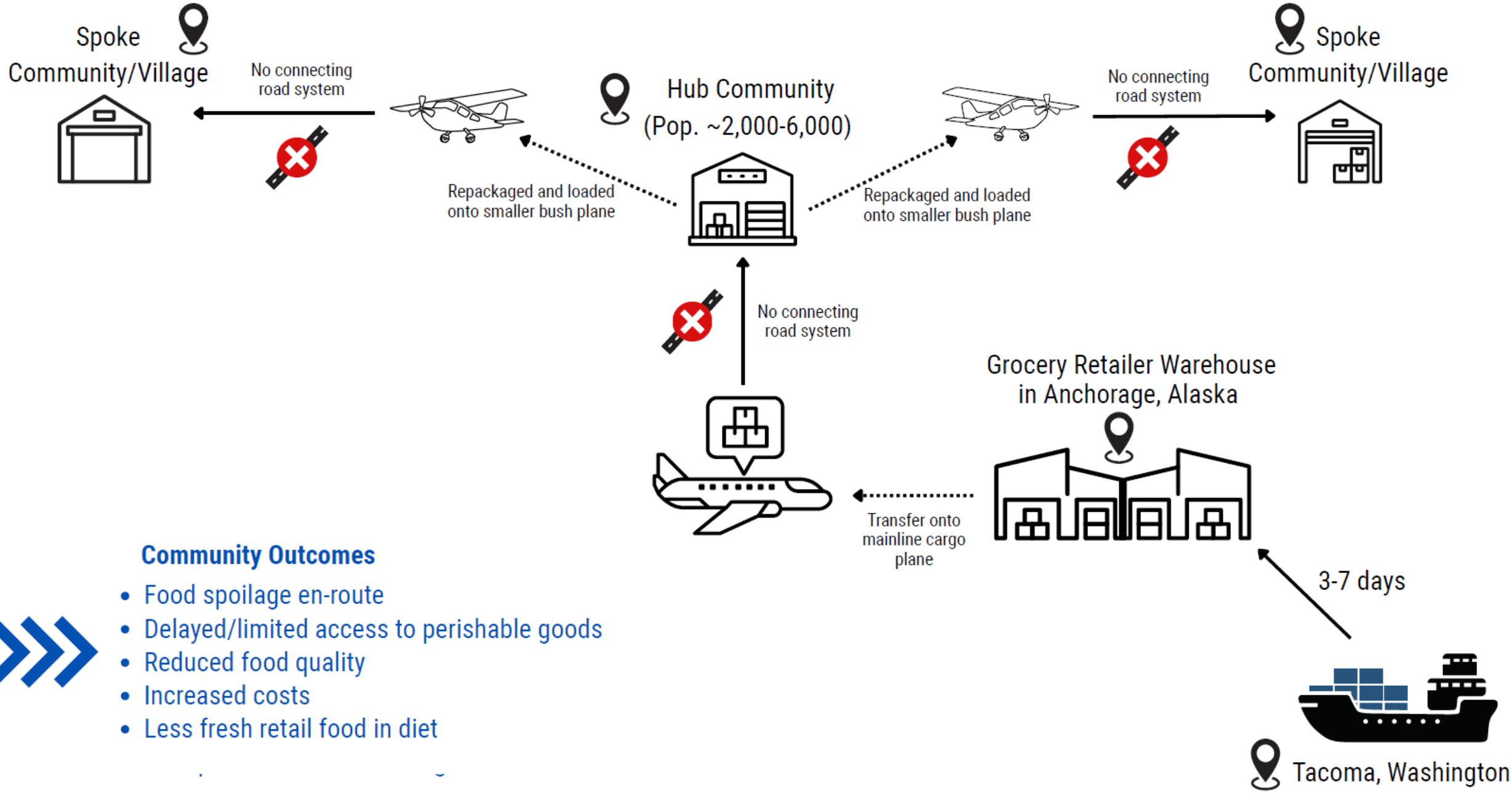



## Bypass Mail vs. Air Freight:

**Bypass ~24% of statewide intra-AK air cargo (2024, much higher for Bypass-eligible communities)**

**Varies in usage for food products (vs. shipping Air Freight, especially for hubs), though hard data elusive for product types**

# Route of Perishable Goods Along the Cold Chain from Anchorage to Rural Alaskan Communities




## Community Outcomes

- Food spoilage en-route
- Delayed/limited access to perishable goods
- Reduced food quality
- Increased costs
- Less fresh retail food in diet

INTERNATIONAL JOURNAL OF CIRCUMPOLAR HEALTH
2021, VOL. 80, 1961393
https://doi.org/10.1080/22423982.2021.1961393

Taylor & Francis
Taylor & Francis Group

OPEN ACCESS Check for updates

# Storekeeper perspectives on improving dietary intake in 12 rural remote western Alaska communities: the "Got Neqpiaq?" project

Kathryn R. Koller [a], Christie A. Flanagan [b], Jennifer Nu[c], Flora R. Lee[d], Christine Desnoyers[e], Amanda Walch[f], Lucinda Alexie[g], Andrea Bersamin[h] and Timothy K. Thomas [i]

## *Fruit and vegetable availability and sales*

At least one store in every community sold fresh produce. In general, fresh produce sold well. However, food spoilage due to air shipping delays, primarily during winter months, was a challenge. Storekeepers reported profit losses of up to 50% due to food spoilage and the cost was assumed by the store and passed onto customers. One storekeeper lamented, *"... there's times they come in ... too rotten from the travelling"*. Another stated, *"You learn once it gets below a certain temperature outside, you learn not to even try getting certain items ... "* While the majority of stores do not have trouble storing fresh produce, they order only enough to shelve when delivered and do not keep additional inventory.

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# Fresh Produce shipping data - initial insights

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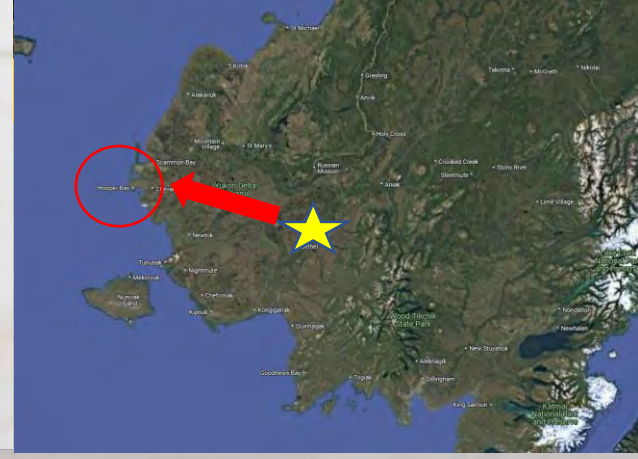
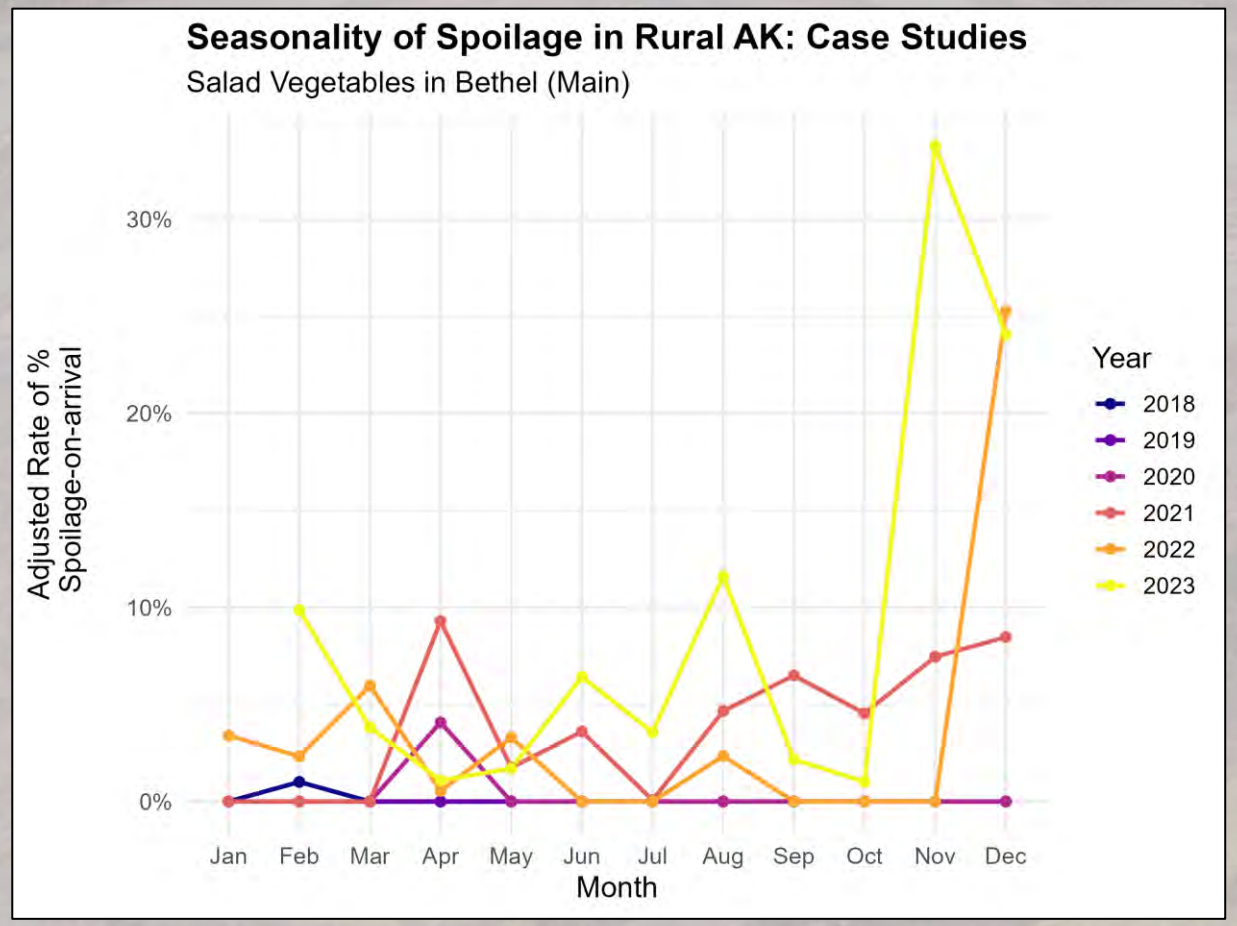
# Spoilage to Bethel (hub) vs. Hooper Bay (spoke)



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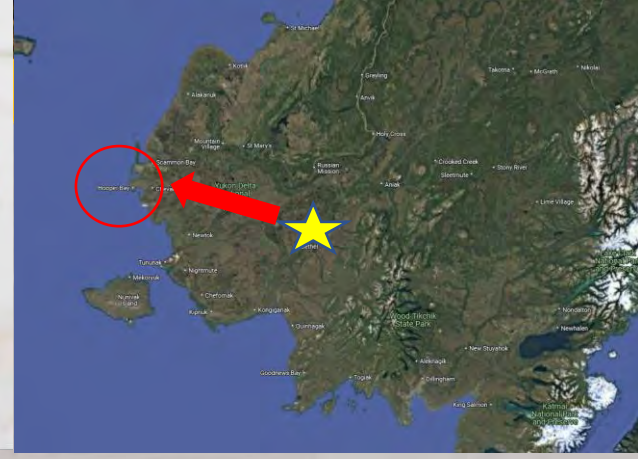
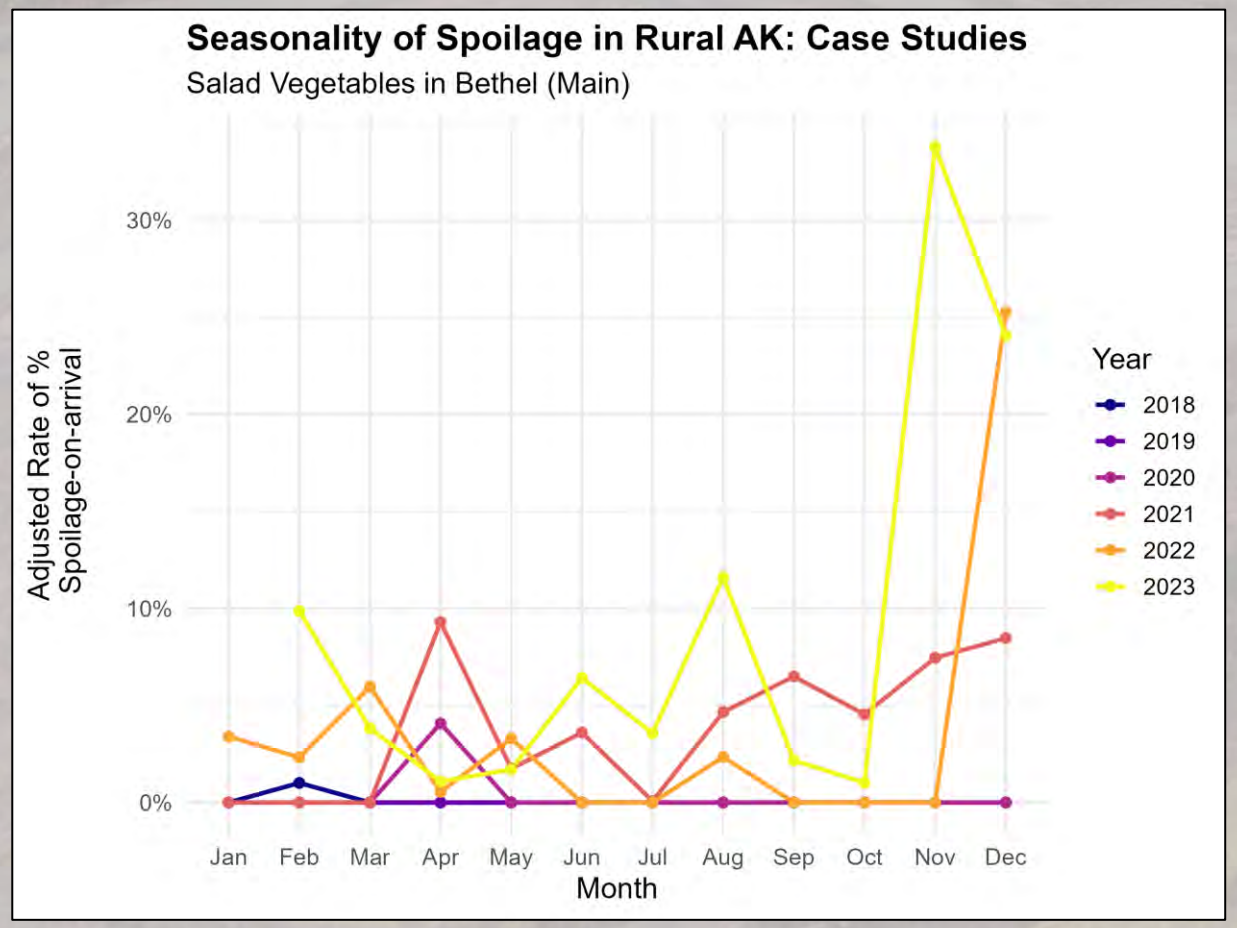
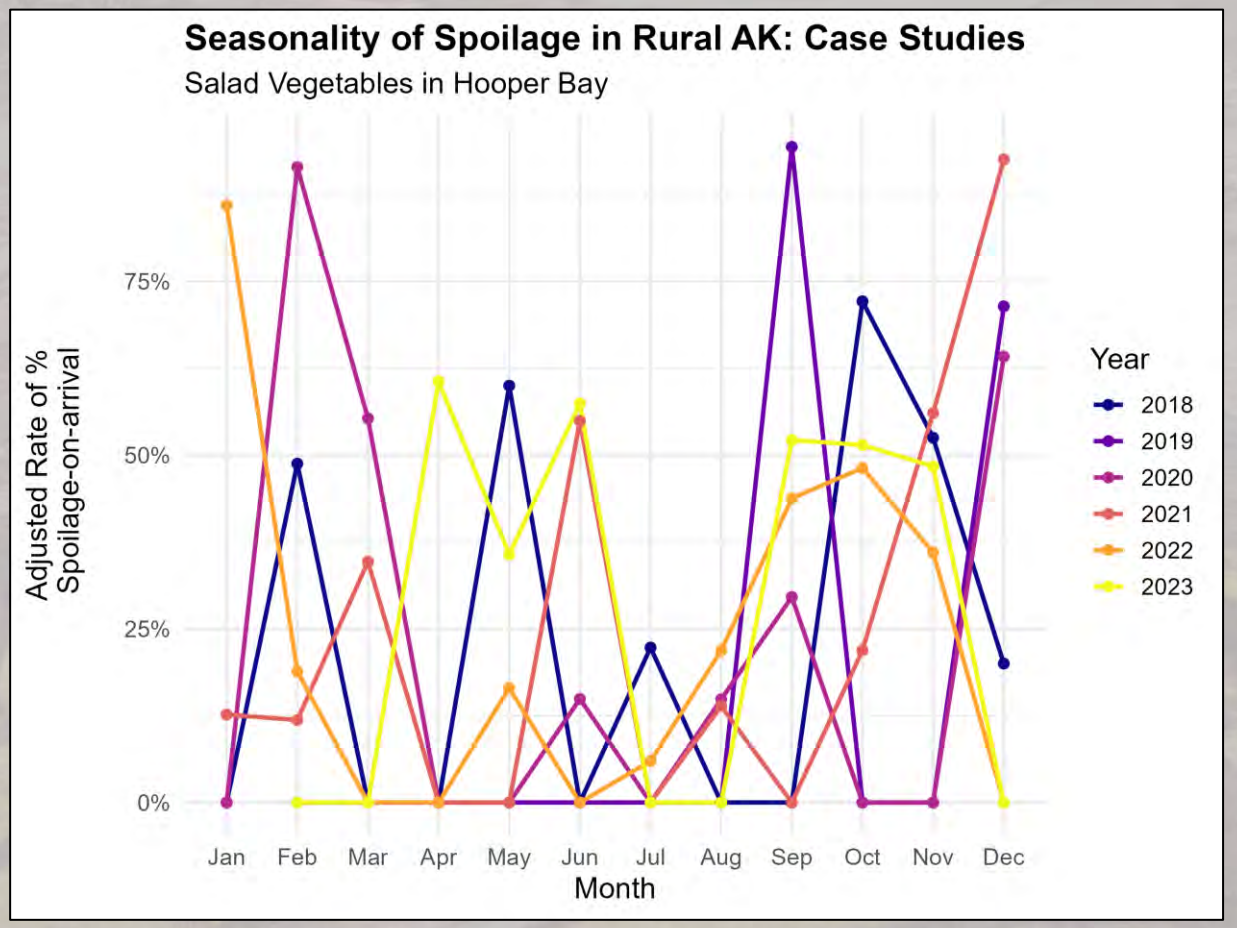
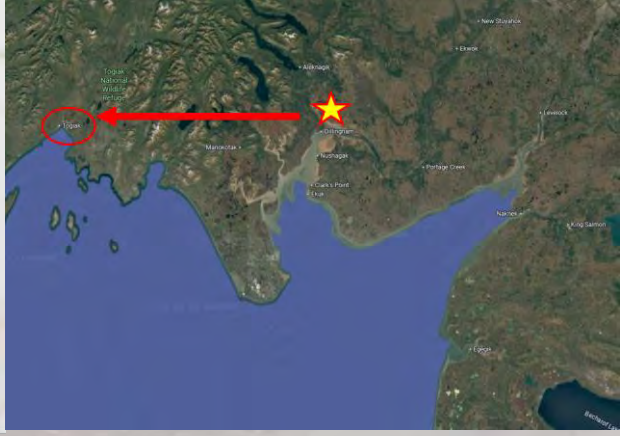
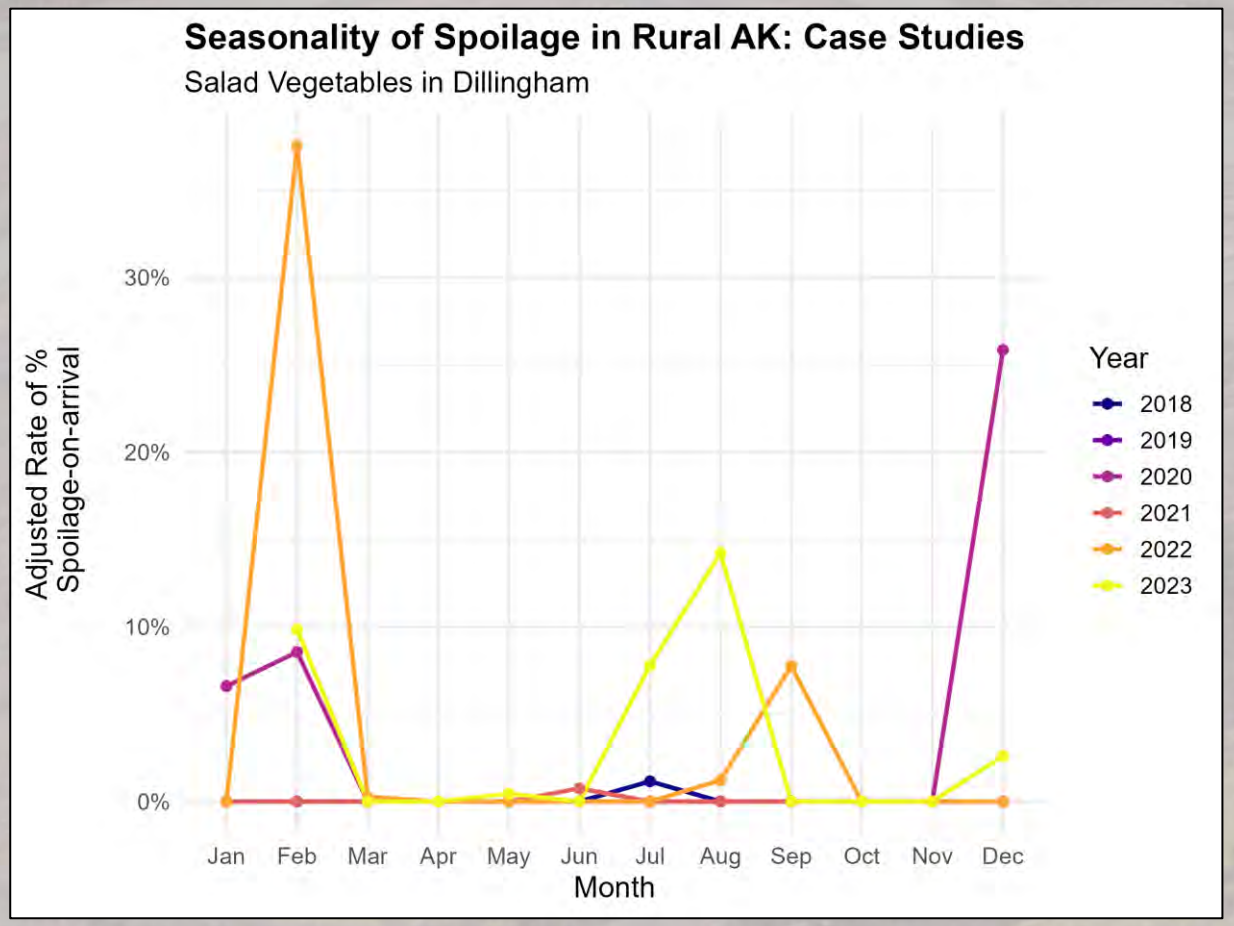




# DLG (hub) vs. Togiak (spoke)



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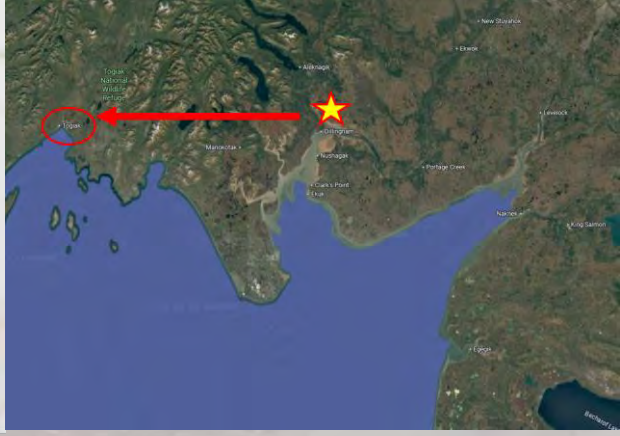
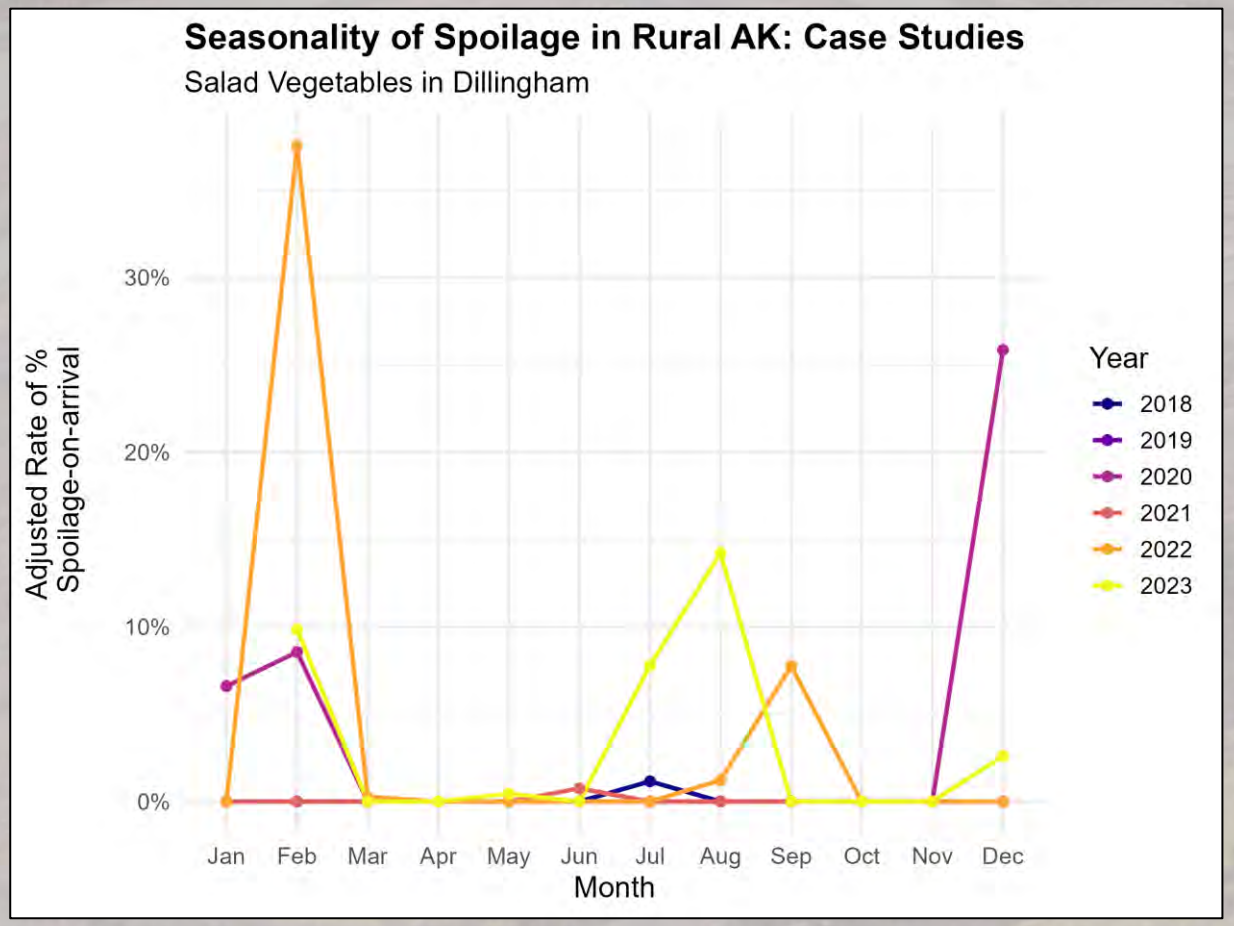
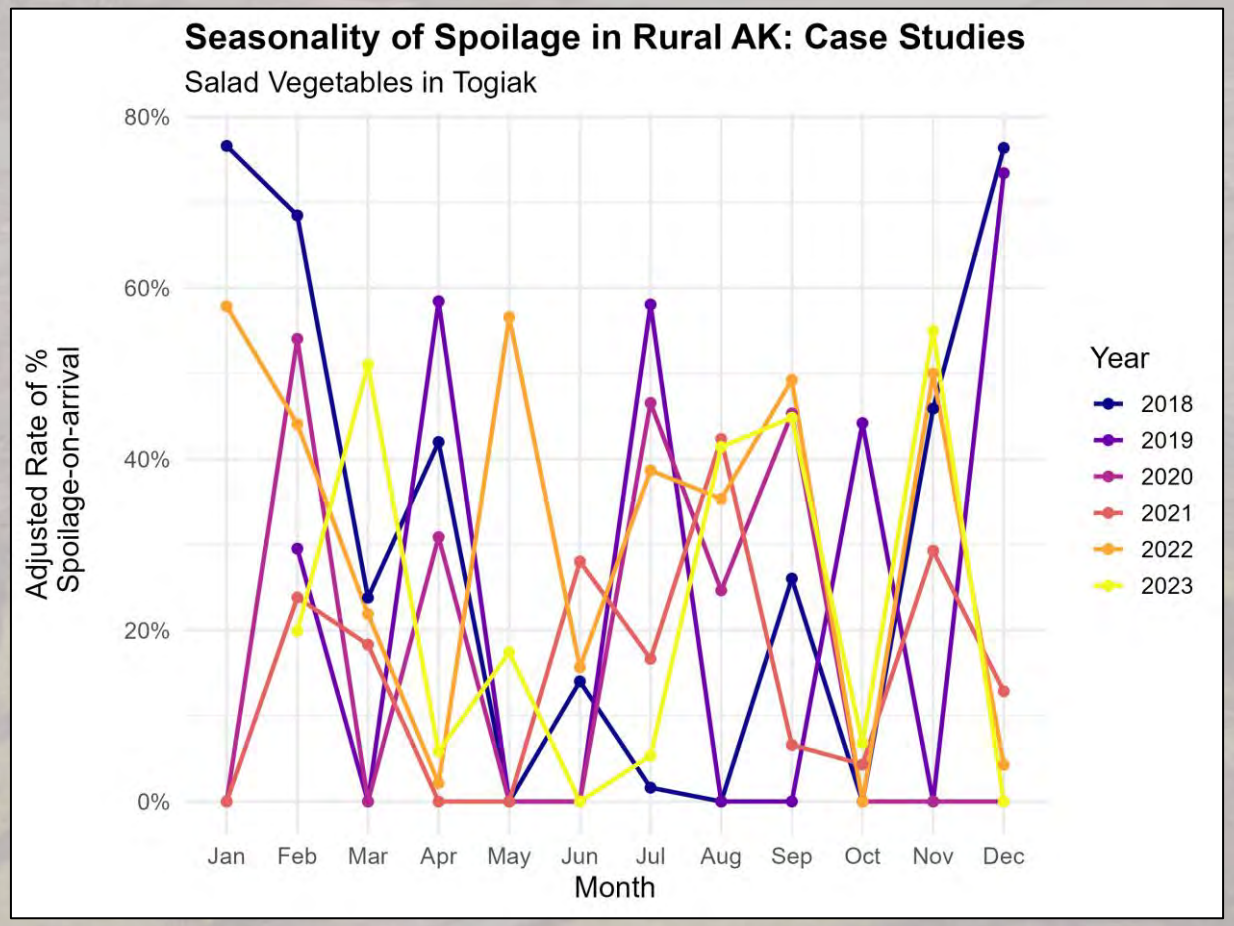
# DLG (hub) vs. Togiak (spoke)





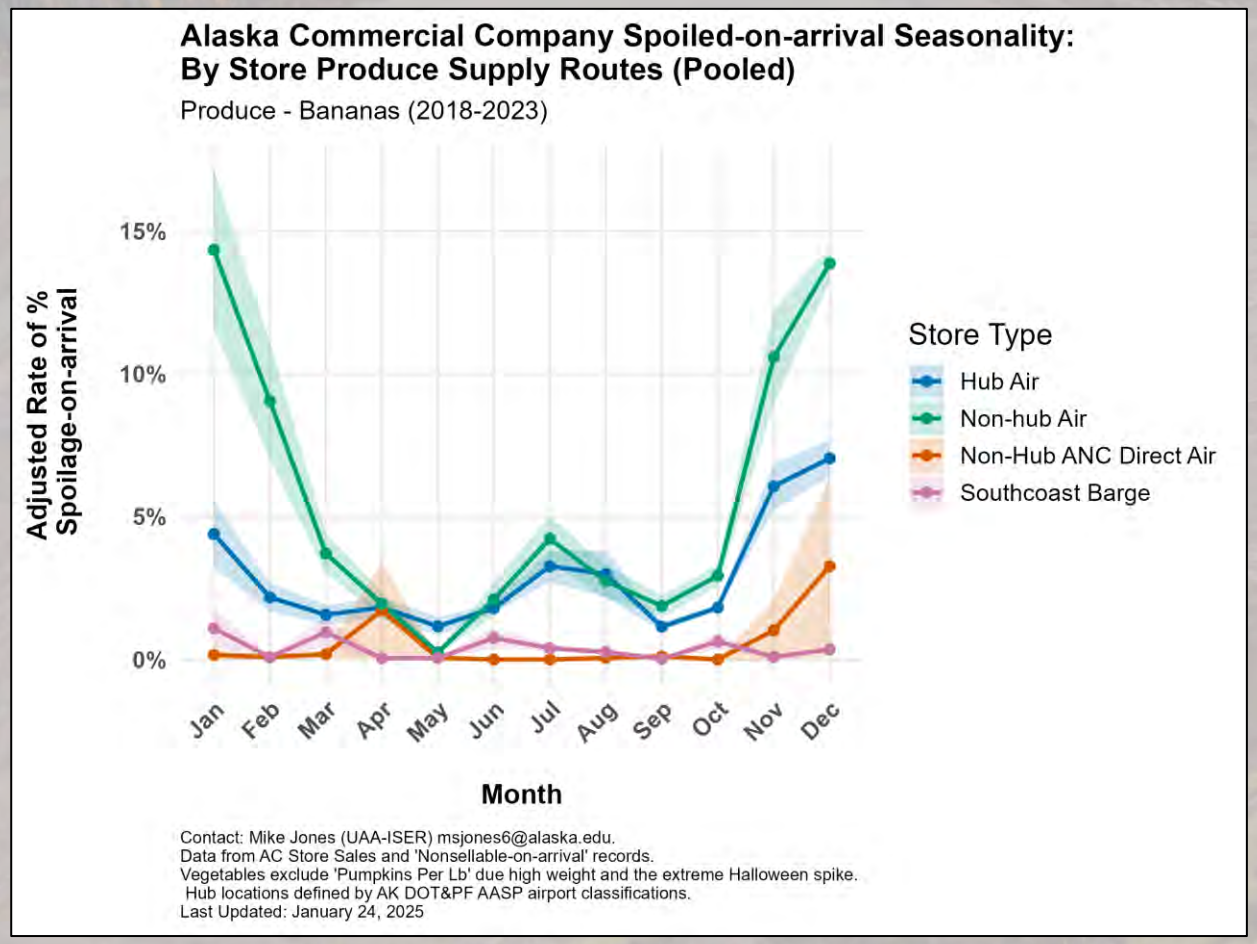




Major off-road grocery store locations grouped by produce supply mode (air/barge) and remoteness (hub/non-hub)

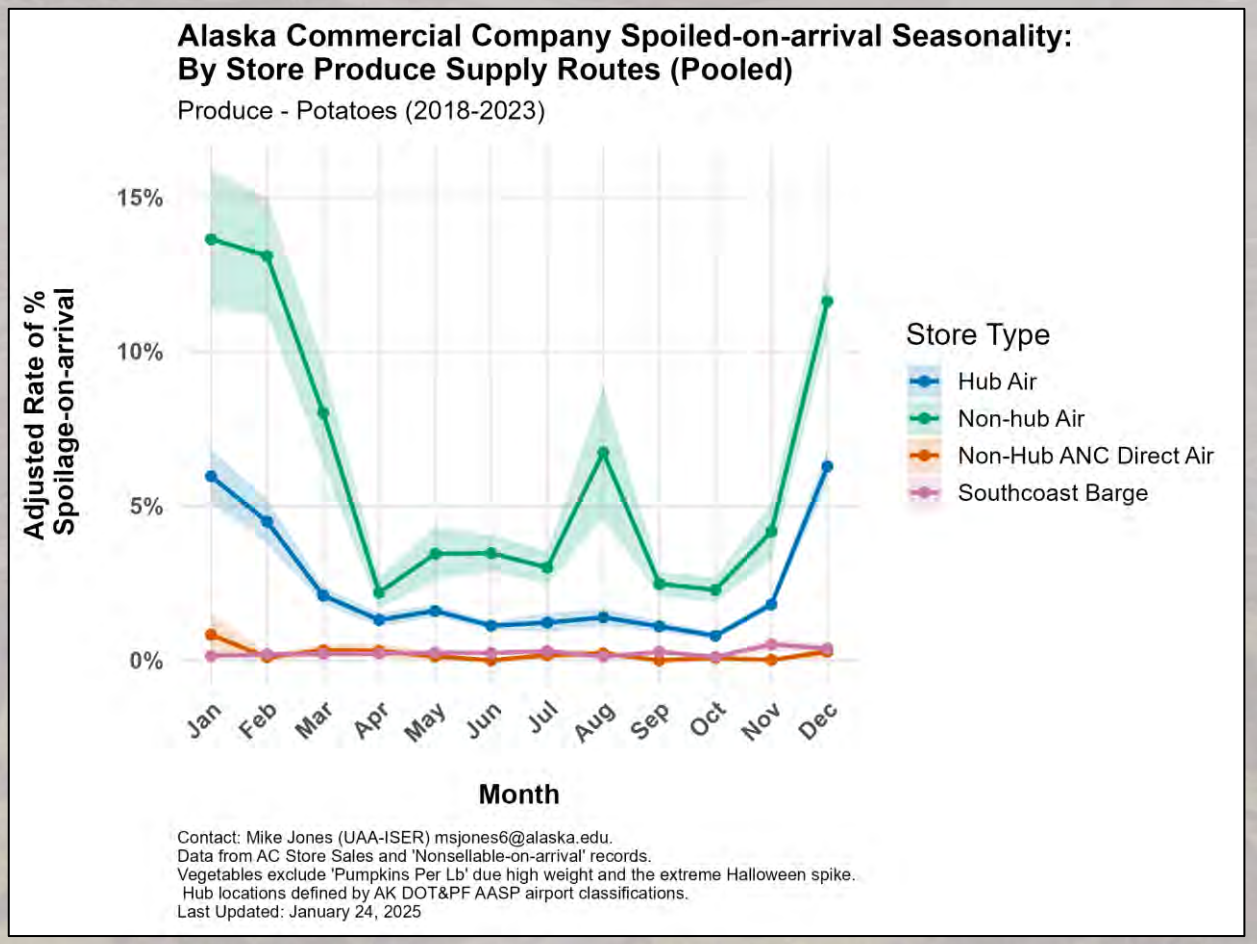
1) Southcoast barge
2) Direct ANC charters (non-hub)
3) Hub Air [ADOT Class]
4) Non-hub Air (villages)

Dashboard Developed

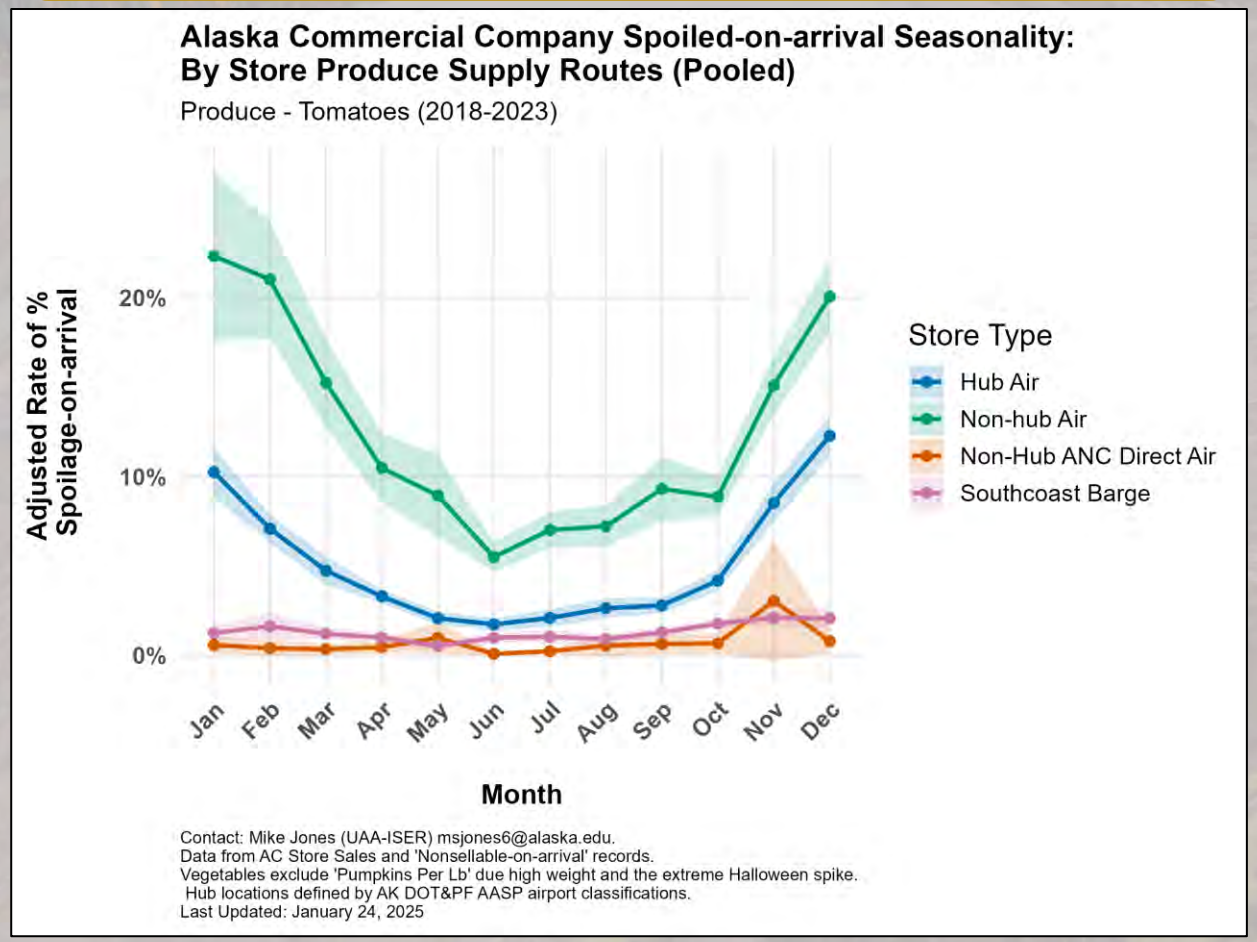
# Bananas



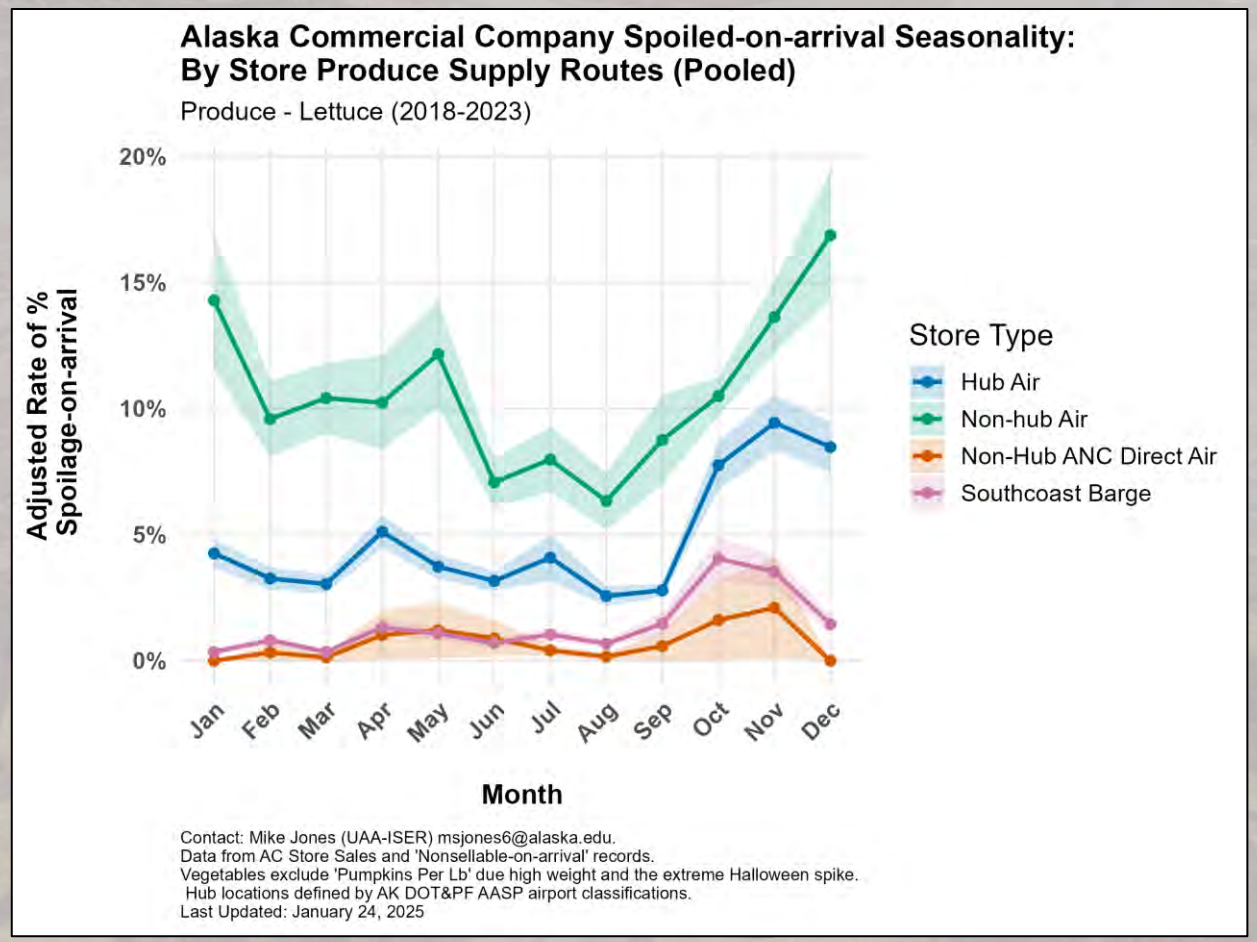

# Potatoes



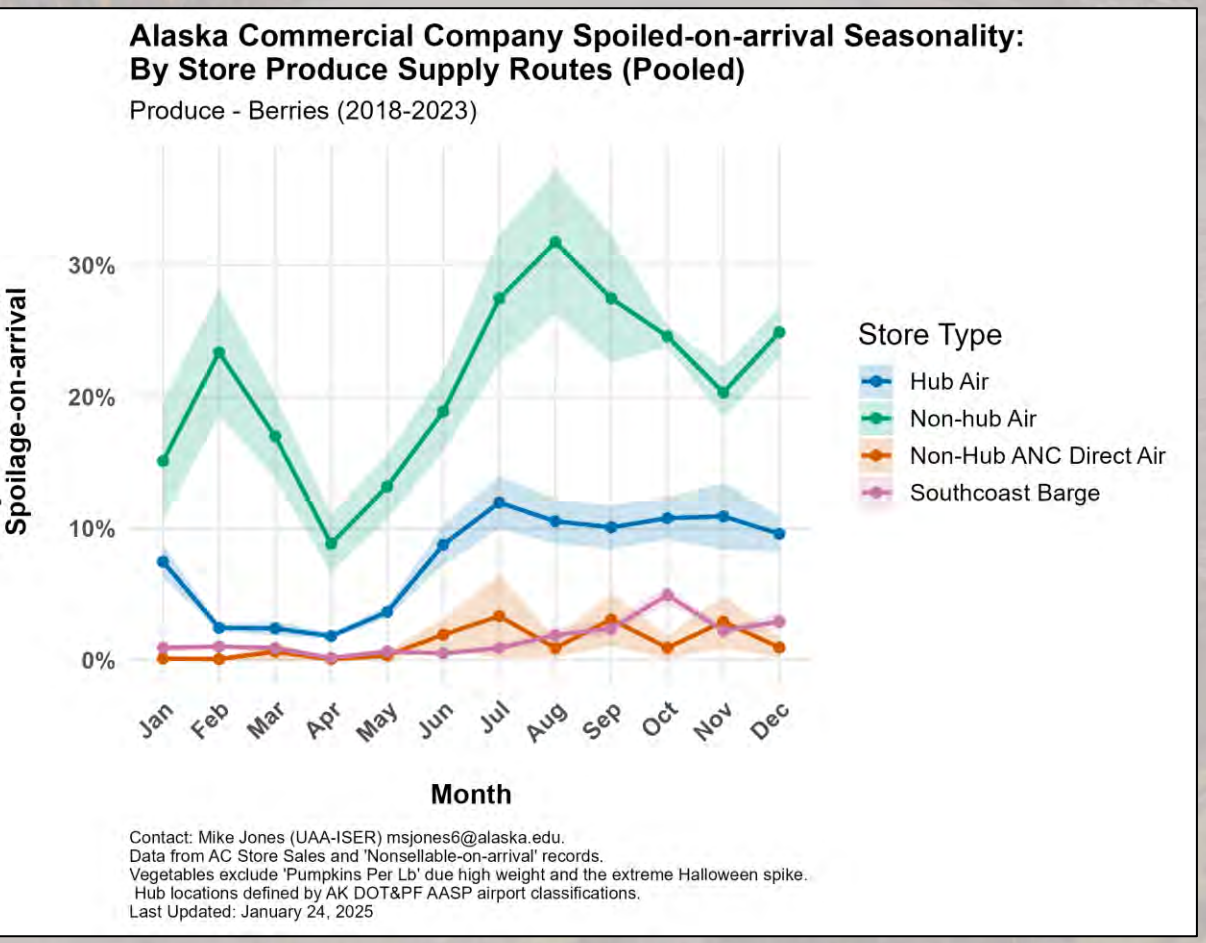
# Tomatoes



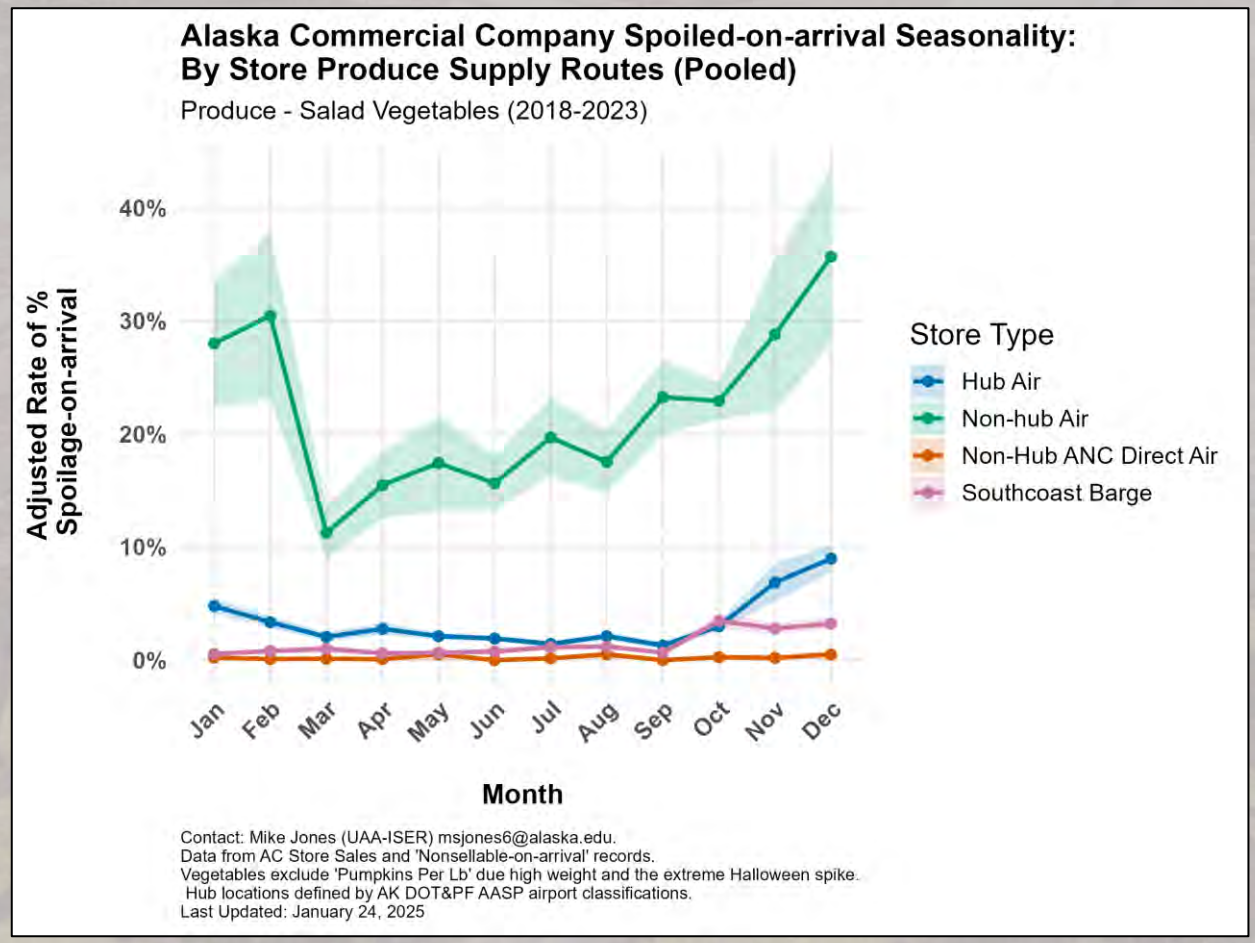

# Lettuce



# Berries




# Salad Veg.



# Pharmaceutical shipping data - initial insights

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# Pharmaceutical shipping data - initial insights

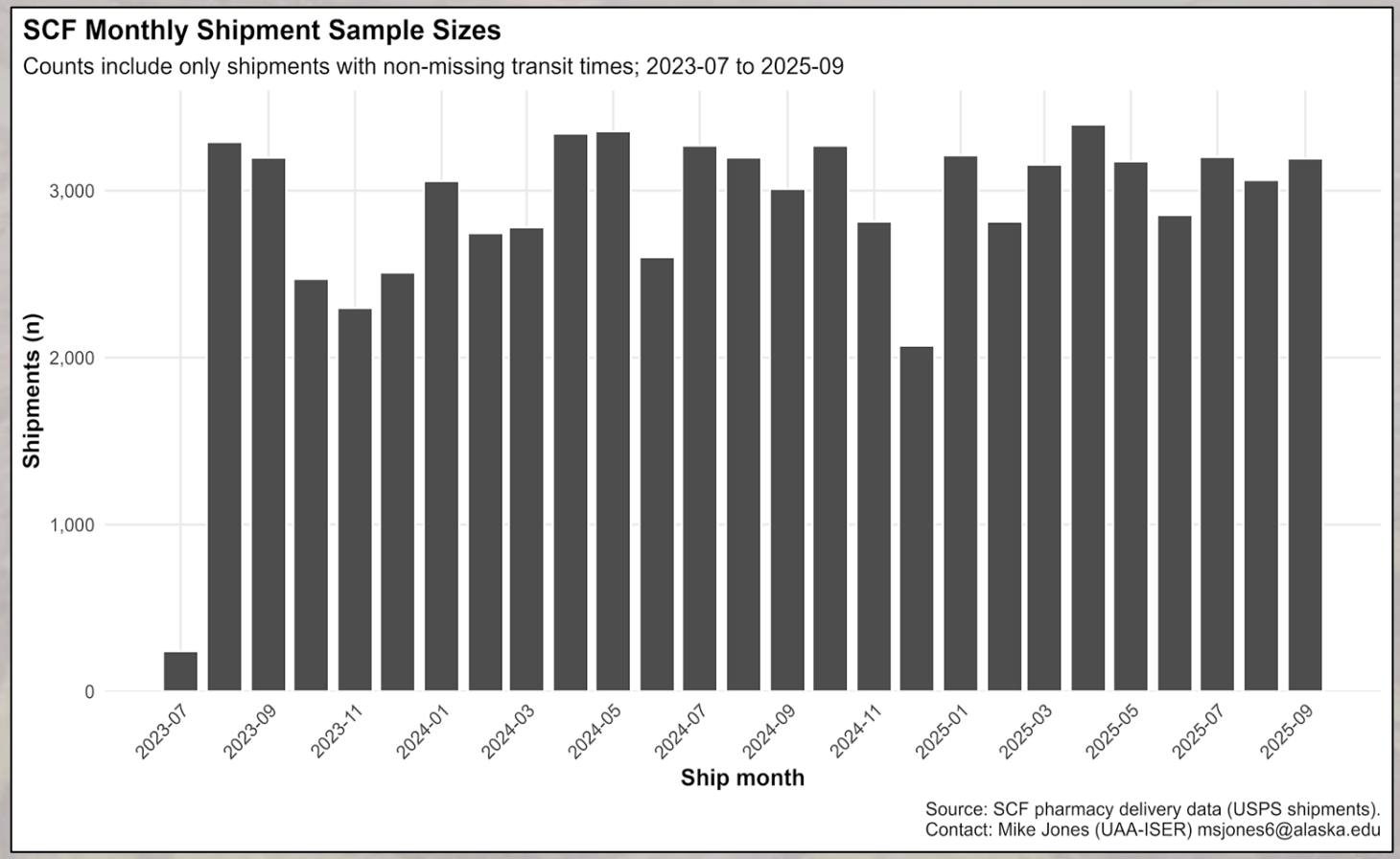
## Structure: USPS Shipments

**Current total: 77,758 with full transit data to 77 communities**

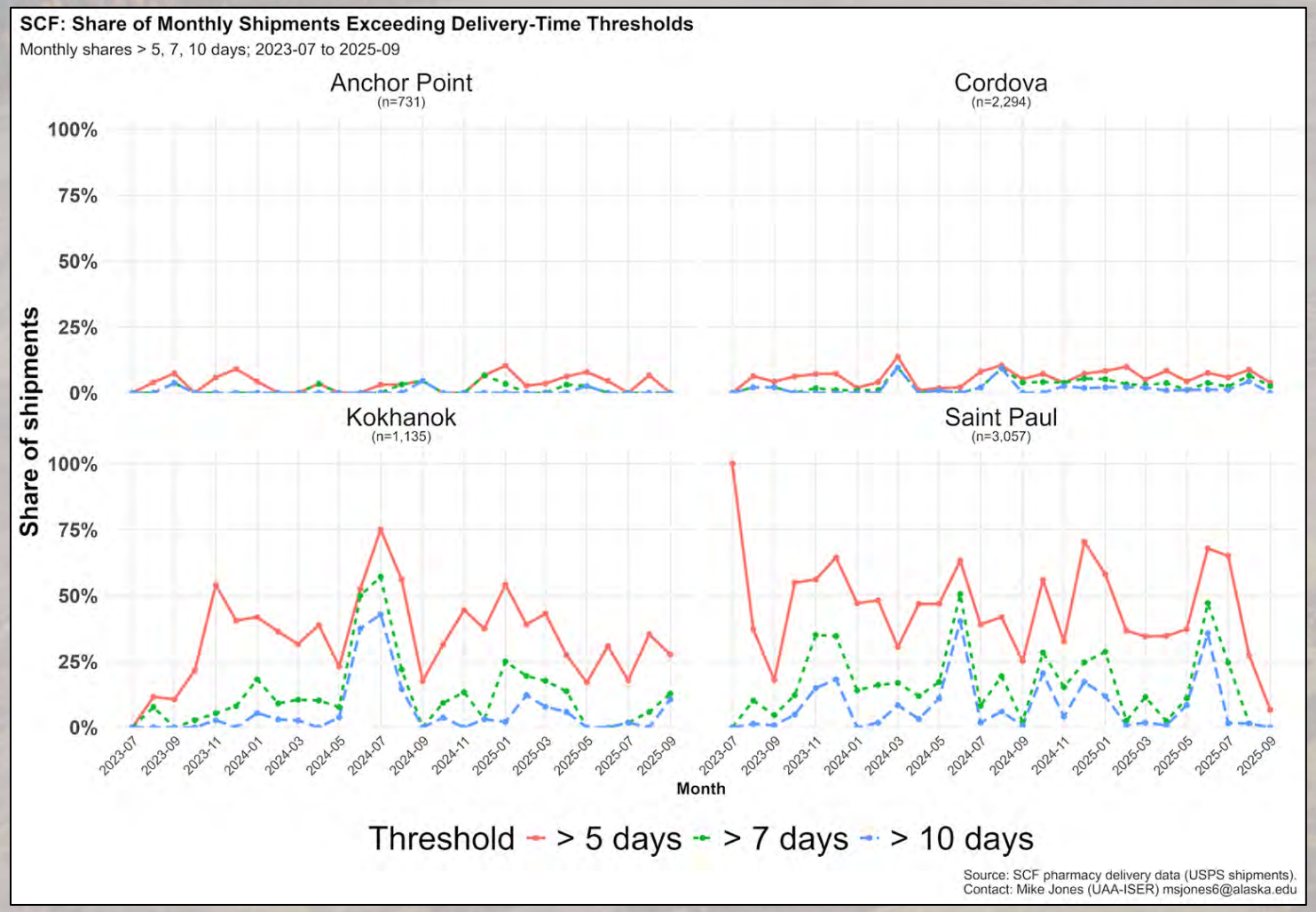
(93.1% with date shipped & arrived)

- Origin community
- Date shipped
- Destination community
- Date arrived
- Signature requirements

**All de-identified before transfer*



# Transit time patterns, delay frequency

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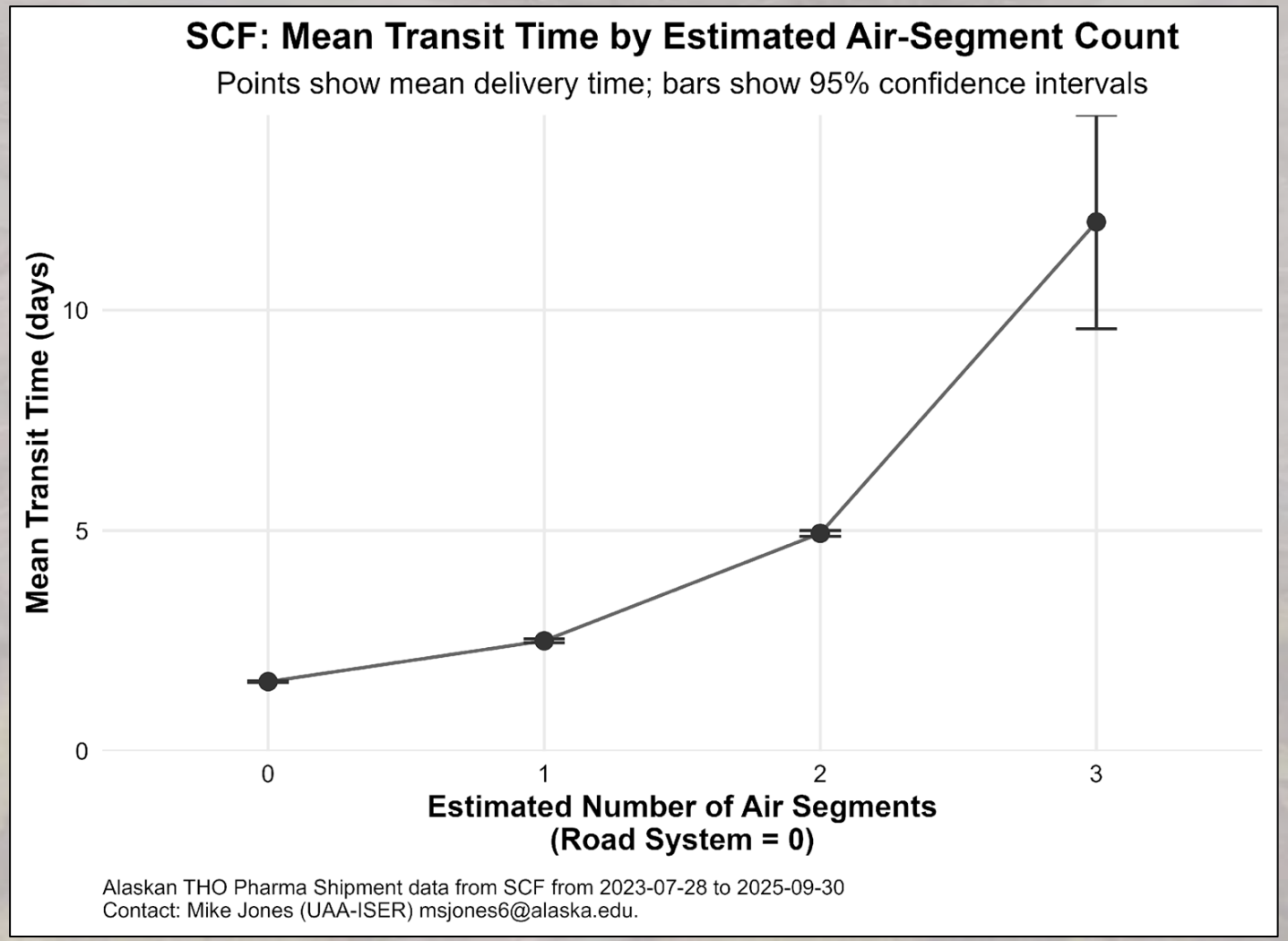
# Transit time patterns, delay frequency

Clear separation between road and the very first flight

The second flight doubles the mean transit time (vs. 1); a third flight more than doubles it again

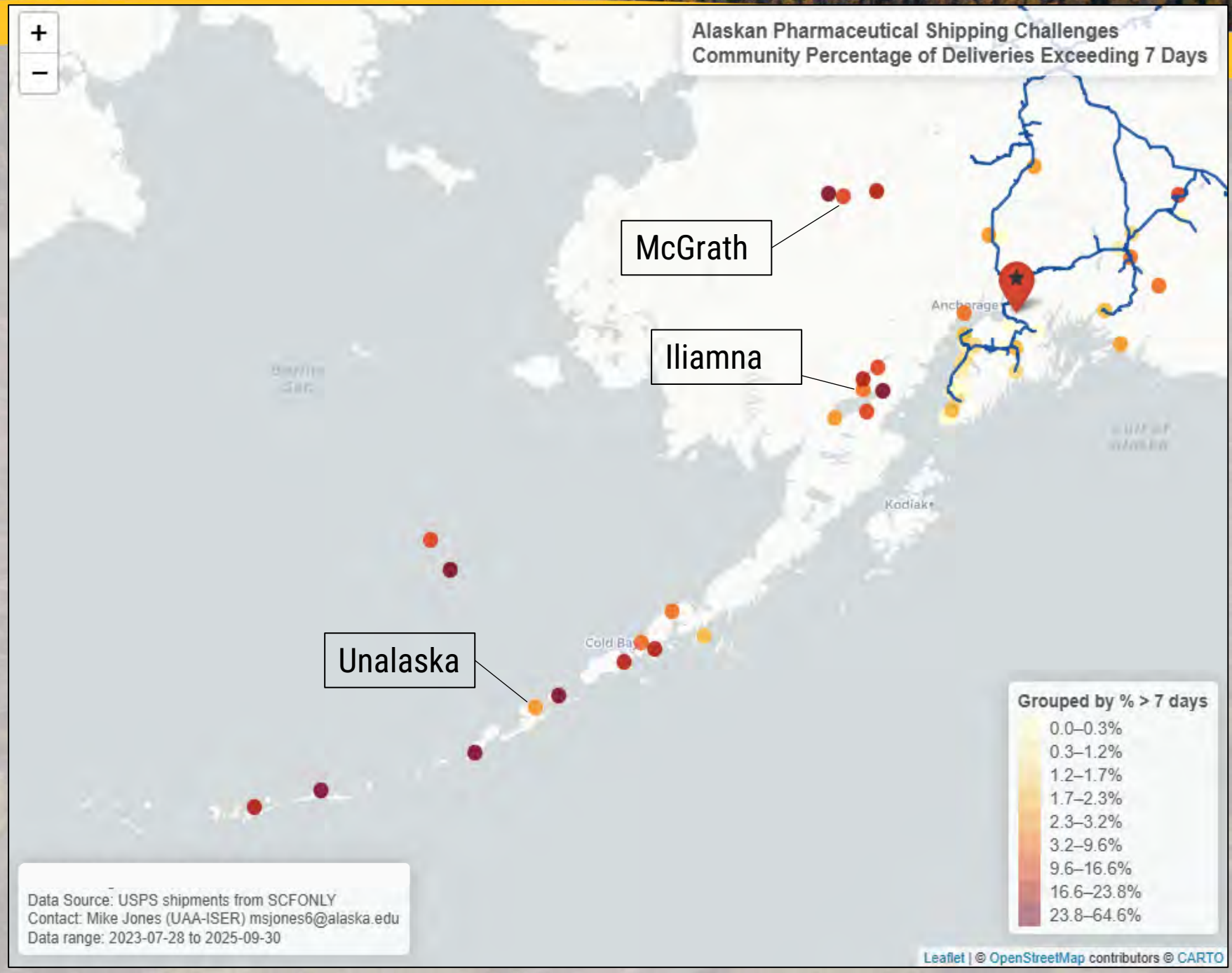


# Visualizing geographic patterns of delays

Clear separation between road system and off-road transit times

Quick accenting of ‘problem regions’ for risk management, inventory planning, and cross-referencing with other factors

**n≥10 per community for map inclusion*



# Ongoing construction of statistical model

**Drivers of transit time (Date arrived – Date shipped) and delay (>7 days):**

- Weather restrictions
  - High winds (30kt+ propensity in transit window)
  - Low visibility conditions (IFR+ propensity in transit window)
- Infrastructure outages
  - AWOS/ASOS units (can infer from METAR gaps in public databases)
  - Others – precision landing systems, Nav-aids (FAA FOIA; in appeal)
- Cargo Congestion
- Flight windows (civil twilight hours)

***Also: Onboard BBAHC data (others?); build min. 1yr each***

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# Our team at ISER


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Carolyn Tix, MS

Research Professional; Data Engineer



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# Thank you!

Questions, discussion?

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# Additional slides for reference

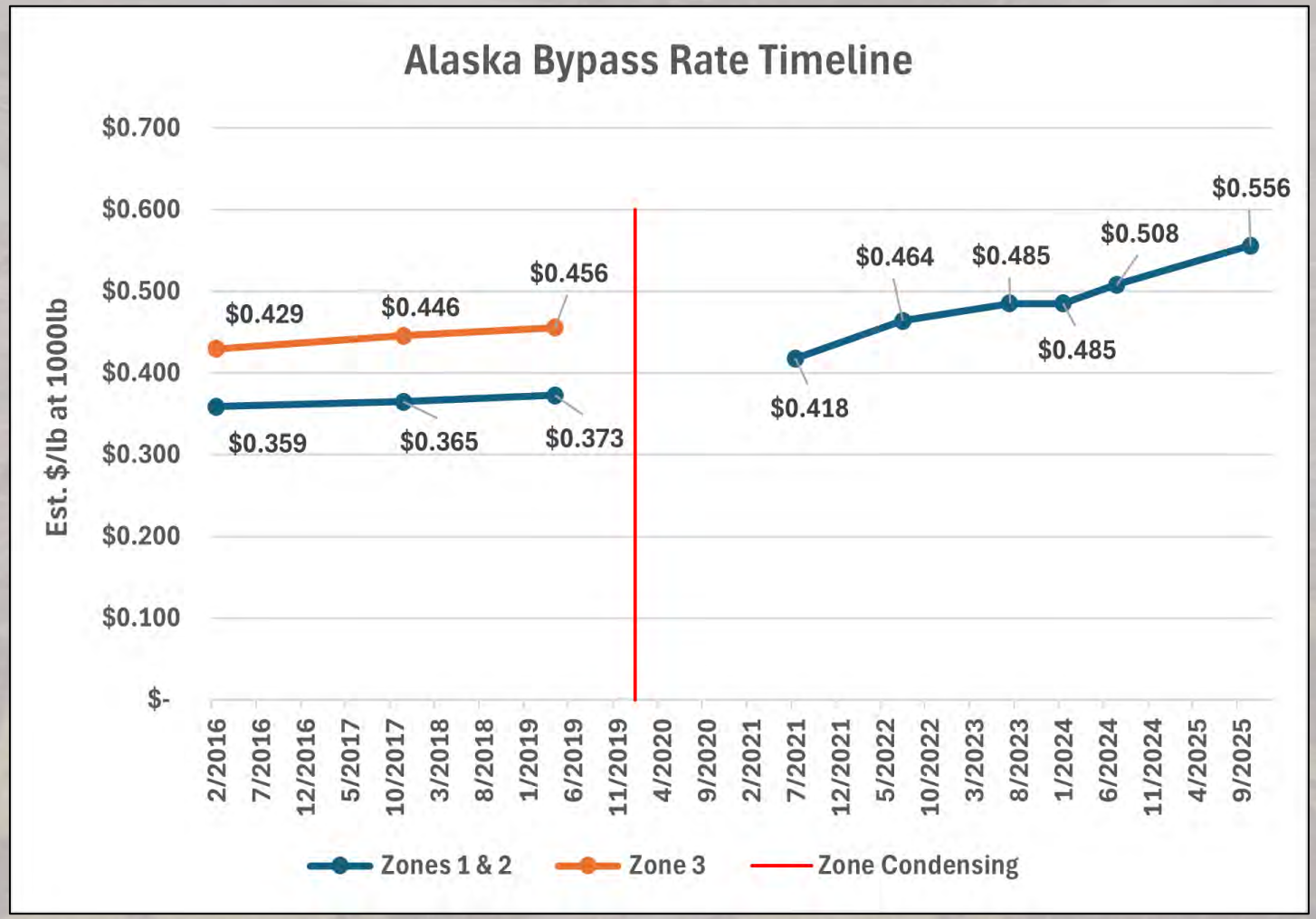
# Bypass Rate History (publicly available)

Rates set per 70lb, even with minimum 1000lb induction

Previous tiered zone model for pricing, condensed in 2020

General CPI increased 37% from Feb ‘16 to Sep ’25, but…

- CPI Transport, W. US up 51.5%
- Bypass shipper rate up 54.9%




***These are point in time rates, not the exact date of changes. Only records found that were web searchable.

# Rural Food Costs and program support:

## USDA SNAP based on assumptions from 1980s-era community categorizations