



Alaska Supply Chain Analysis

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Introduction to the SCAN Project

SCAN: Supply Chain Analysis Network

Prime Contractor: Dewberry Engineers, Inc.

Subcontractors: CNA, MIT, ALAN, & DRG Technology Solutions

Task Order: Pacific Private Sector Supply Chain Baseline Risk Analysis

Timeline: December 2022 – July 2023

Scope: Provide FEMA leadership with analysis and advice on private sector supply chains that support the United States with critical life-sustaining commodities and systems. Geographies included are Alaska, Hawaii, American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands.

Lifelines & Systems for Alaska

Included in this Presentation:

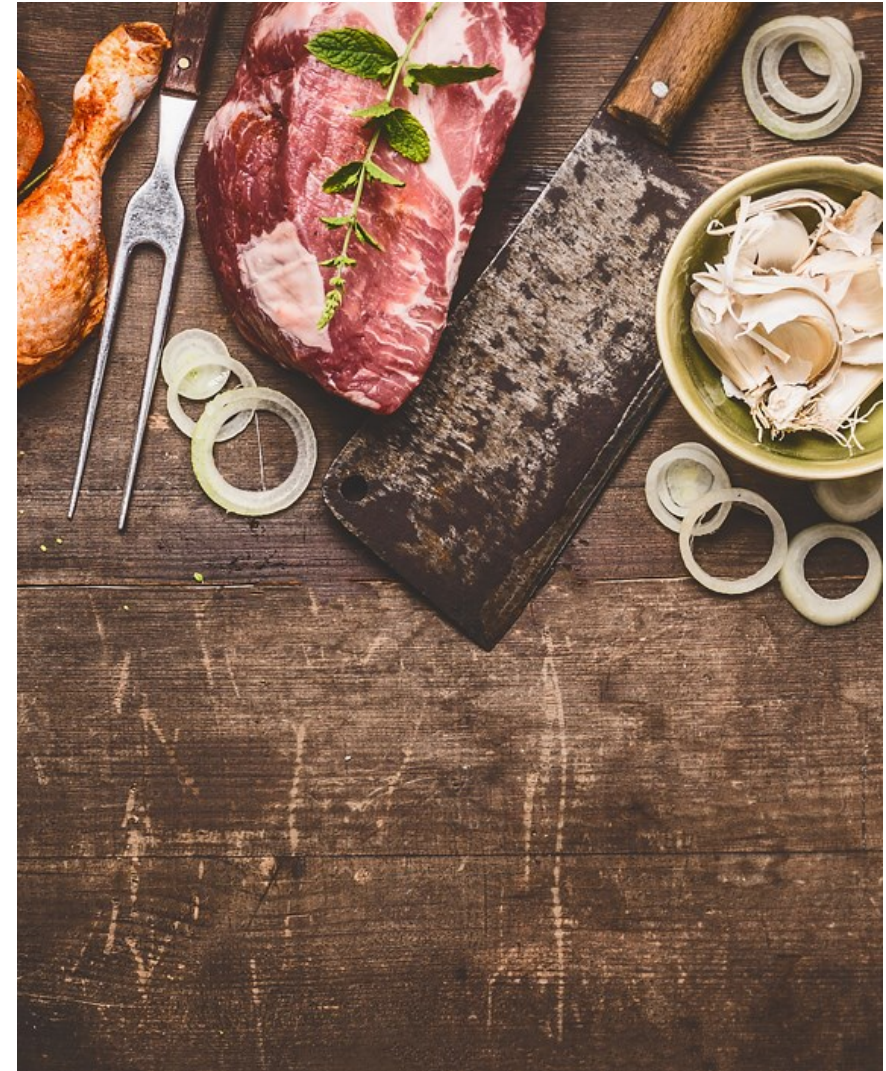
1. Food
2. Water
3. Fuel
4. Electric Power
5. Highway Freight
6. Ports & Intermodal Transportation



Alaska's Food Supply Chain

Food Facts

- ~**95%** of Alaska's food is imported
- **\$1.9** billion annually cost of food imports
- Alaska has only **6-10** days of food reserves
- Almost all imported food comes through the Port of Alaska, from the Port of Tacoma
- Roughly **60%** of Alaskans live within a 2-hour drive from the Port of Alaska
- **43%** of Alaskan farms are less than 10 acres
- **2** FDA certified dairies
- **3** USDA certified slaughter facilities (Palmer, North Pole, Delta Junction)
- **2** USDA certified mobile meat processing units (Kodiak & Nome)



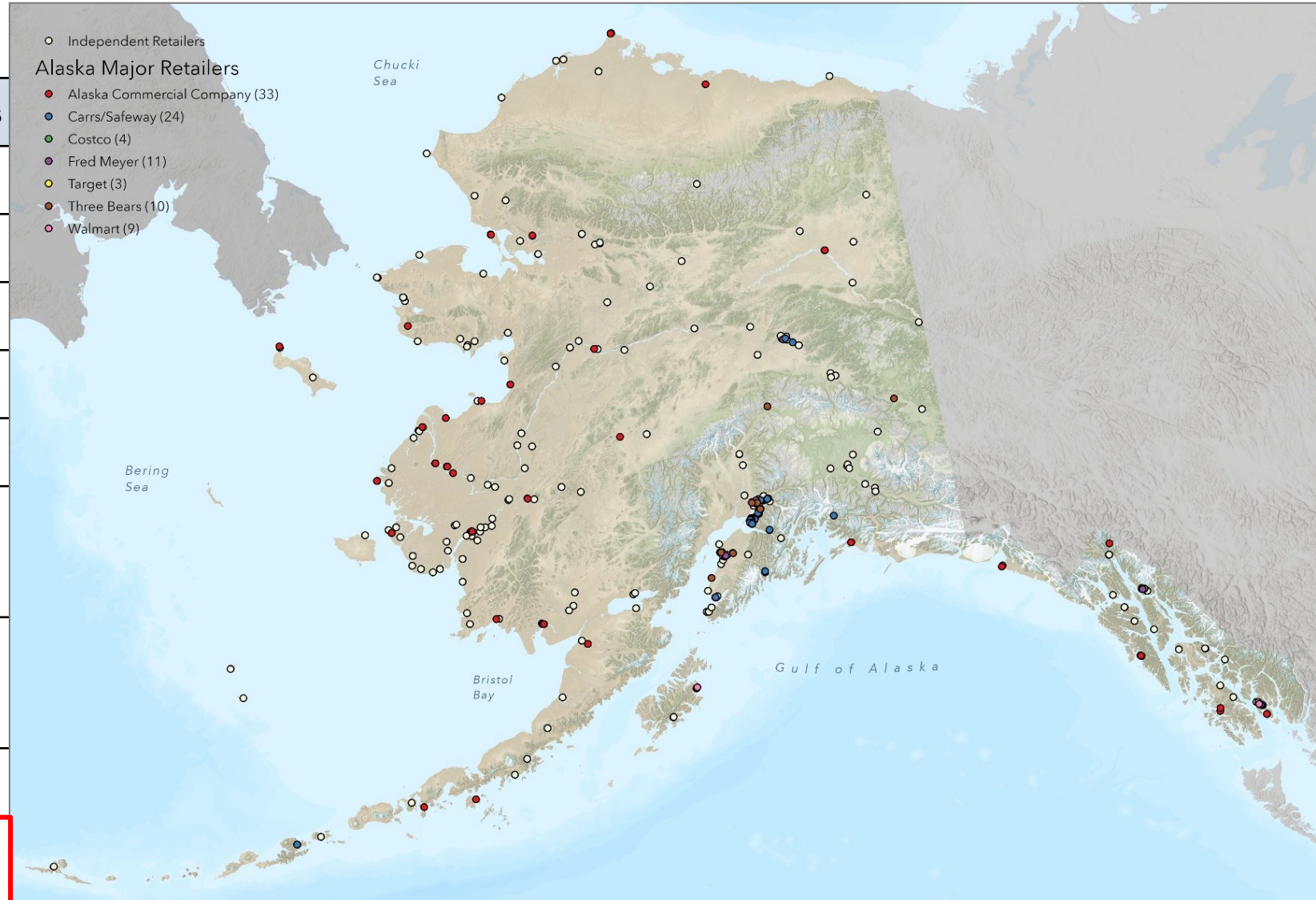
Food Facts

- Food insecurity rates in rural Alaska are often **2x** as high as those in urban areas of the state
- **10%** of Alaskans are food insecure
- Alaska's rural residents each harvest an average of **295** pounds of wild foods yearly
- To replace the food-value provided by subsistence harvests alone, would cost anywhere from **\$450—\$900 million dollars** annually



Food Retail

Grocer Brands	Total Locations
Carrs/Safeway	23
Fred Meyer	13
Walmart	7
Costco	4
Target	3
Joint Base Elmendorf Commissary	1
Alaska Commercial Company*	33
Three Bears*	10
Other retail grocers**	153+



Food Key Takeaways

- Alaska is dependent upon the Port of Alaska for its food supply chain.
- Impacts to The Alcan or Port of Tacoma would create food security risks within Alaska; Contingencies are limited and costly.
- Remote Alaska is very different from urban Alaska with respect to food distribution & retail.
- Seafood & fisheries play a large role in supplying food to vulnerable populations statewide.
- Subsistence is essential for remote community food accessibility and insecurity.



Alaska's Water Supply Chain

Rural Water Distribution System Types

Washeteria

Community facility for showering, doing laundry, and obtaining self-haul water that is later stored in homes.

Closed Haul

Trailers pulled by 4-wheeler or snowmachine are used to deliver potable water and remove sewage.

Individual Wells

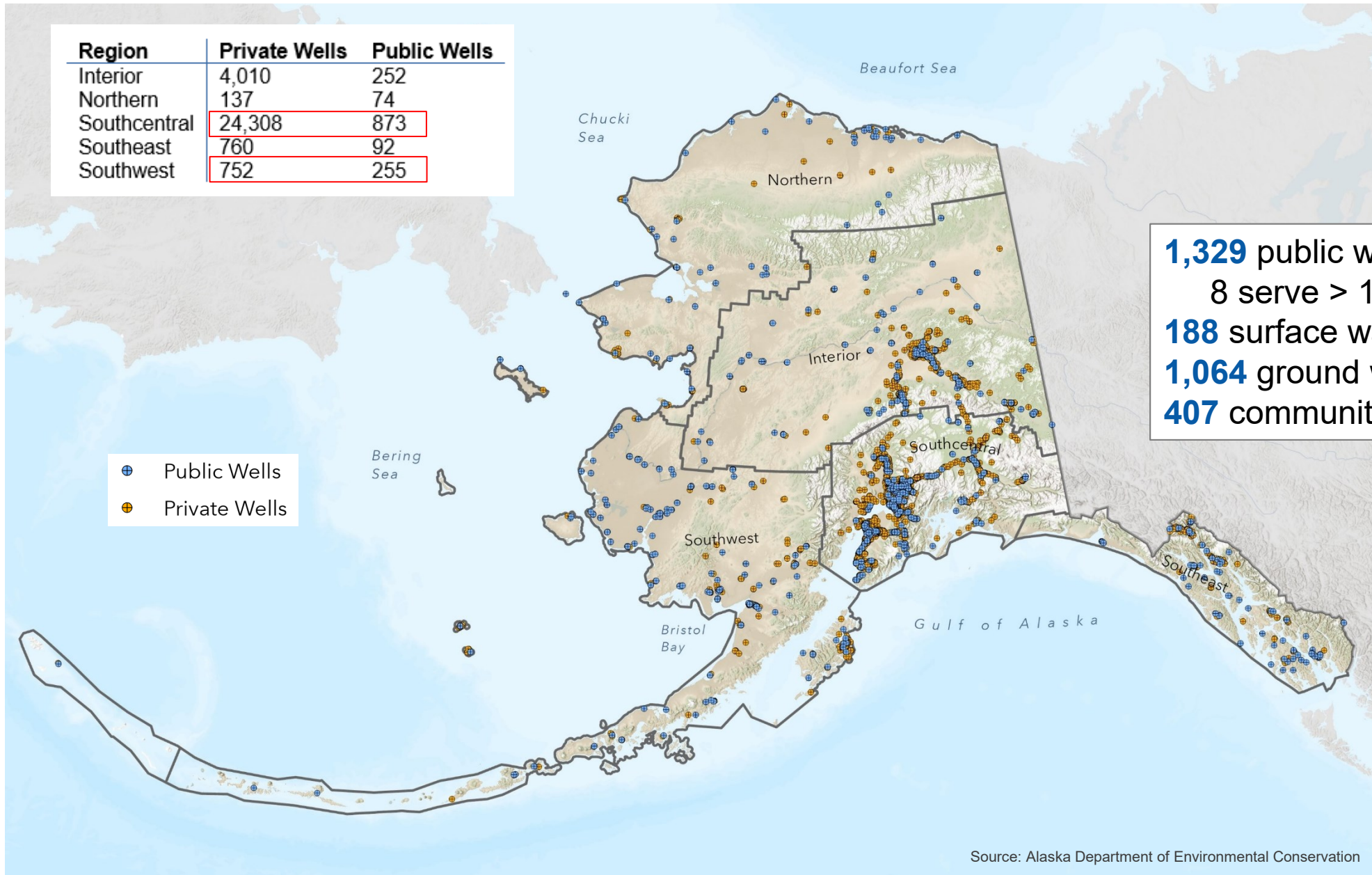
Provide water directly to homes from private wells that utilize groundwater resources.

Piped

Provide water directly to homes from a centralized source through a piped distribution system.

- 22% Alaska households (1 in 5) unserved by water utilities.
- Children living without running water are twice as likely to be hospitalized for pneumonia.
- Rural Alaskans pay some of the highest rates for water/sewer services in the country.
- Water utility services in Alaska require heating and are energy-intensive.
- Energy costs for water systems in rural Alaska are up to 260 times higher than in the Lower 48.

Region	Private Wells	Public Wells
Interior	4,010	252
Northern	137	74
Southcentral	24,308	873
Southeast	760	92
Southwest	752	255



 Public Wells
 Private Wells

1,329 public water systems
 8 serve > 10,000 people
188 surface water systems
1,064 ground water systems
407 community water systems

Source: Alaska Department of Environmental Conservation

Urban Water Distribution System Types

Individual Wells

Provide water directly to homes from private wells that utilize groundwater resources.

Community Wells

407 community wells serving at least 25 individuals year-round.

Piped

Provide water directly to homes from a centralized source through a piped distribution system.

Anchorage Water & Wastewater Utility Example

- 2 surface water treatment plants
 - Eklutna Lake & Ship Creek
- 14 active wells, 22 water reservoirs
- 34 booster stations & 7,200 fire hydrants
- 1,600 miles of underground pipeline
- 3 wastewater facilities

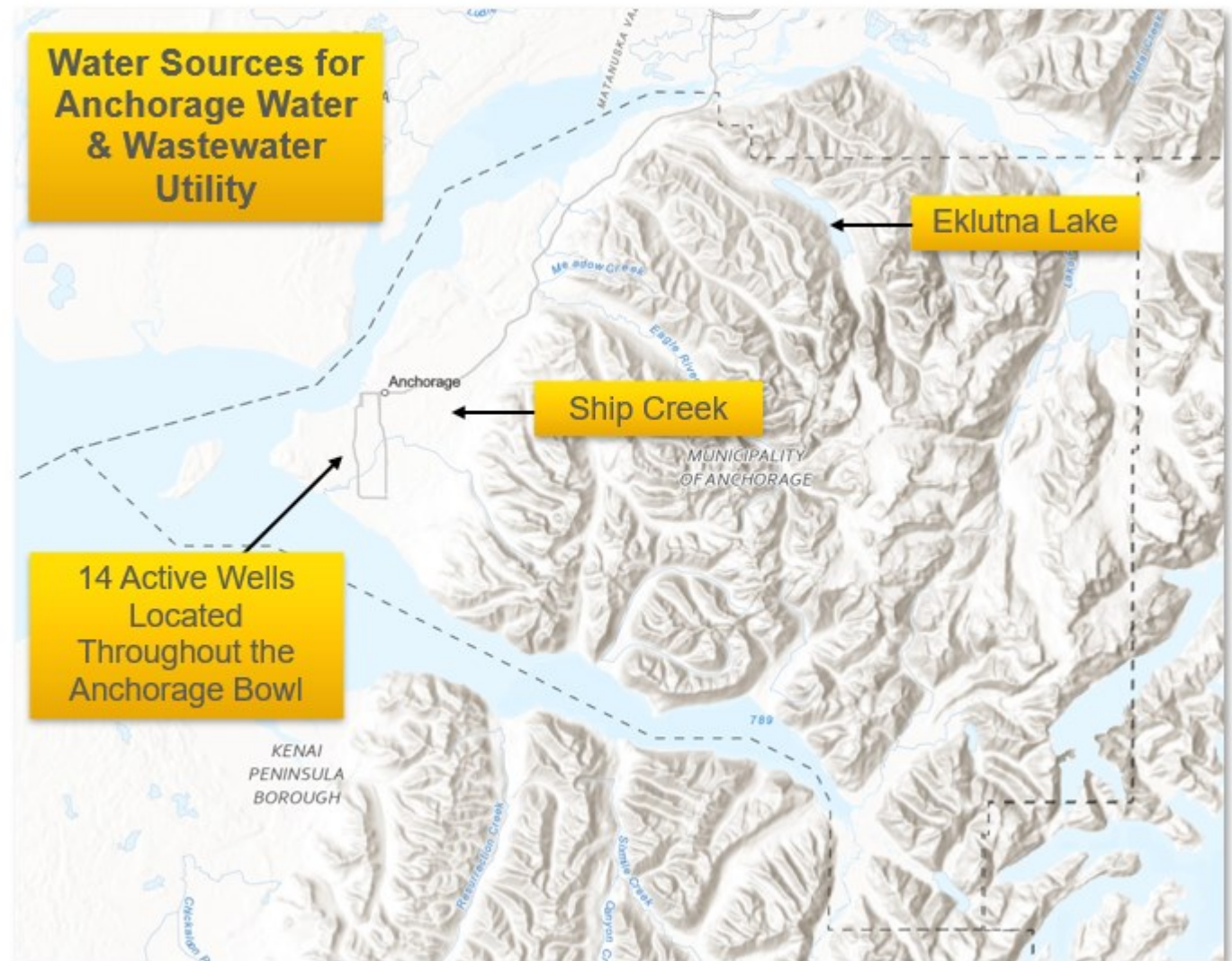
Urban System Risk Mitigation

Risk: Electrical Power Outages

- Causes: equipment failure; load balancing; component shortage
- Mitigation: maintain excess equipment supply; establish agreements with neighboring utilities; pre-approve engineered or fabricated alternatives for key components in case of emergency.

Risk: Treatment Plant Chemical Shortage

- Causes: supply limitation; shipping delay
- Mitigation: store excess supply reserves. AWWU is currently storing a 12-month excess supply.



Alaska's Fuel Supply Chain

Oil Facts

- Alaska's supplies 4% of America's crude oil
- TAPS was built 45 years ago & transports North Slope oil 800 miles to Valdez
- TAPS is currently operating at 25% of peak throughput in 1988
- 80% of oil produced in Alaska is refined in Washington and California
- Five refineries in Alaska

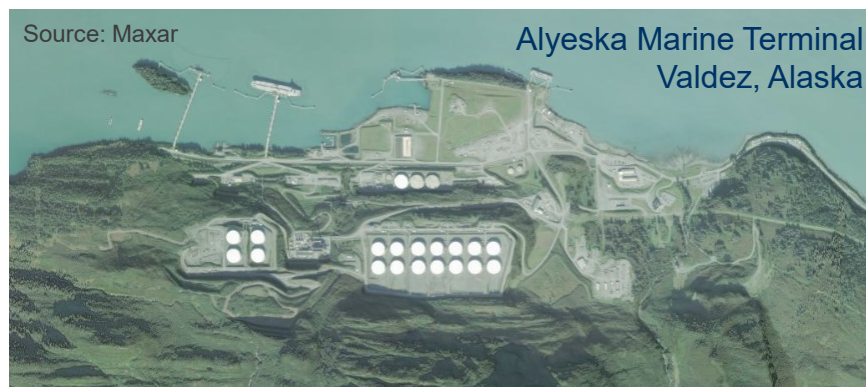
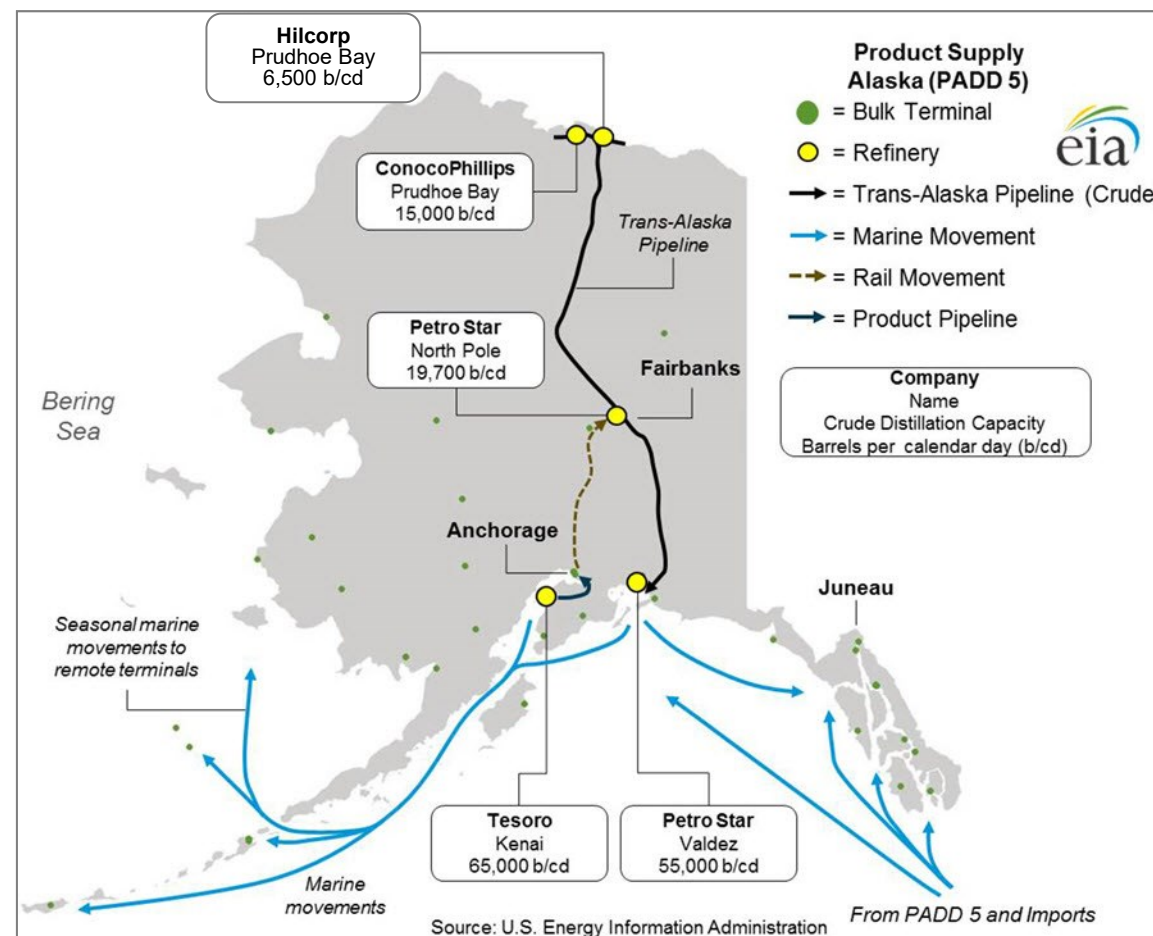


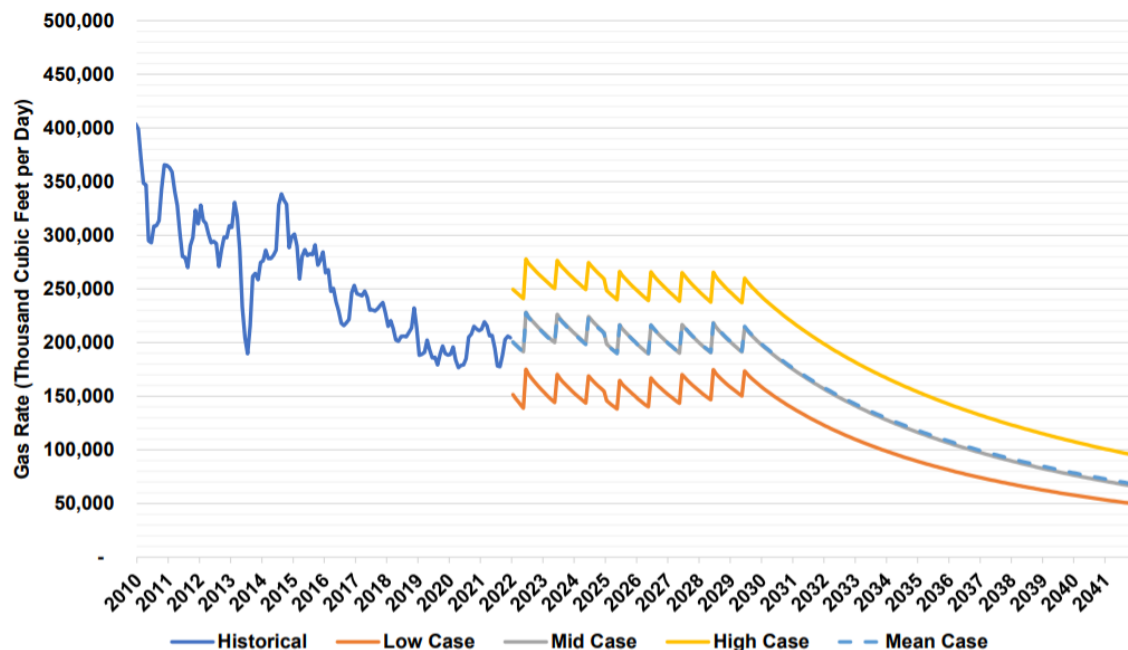
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Natural Gas Facts

- Most of Alaska’s electric power is generated by natural gas
- Most of the natural gas in use comes from deposits in Cook Inlet
- Cook Inlet natural gas reserves are projected to deplete by 2030

Cook Inlet Gas Forecast



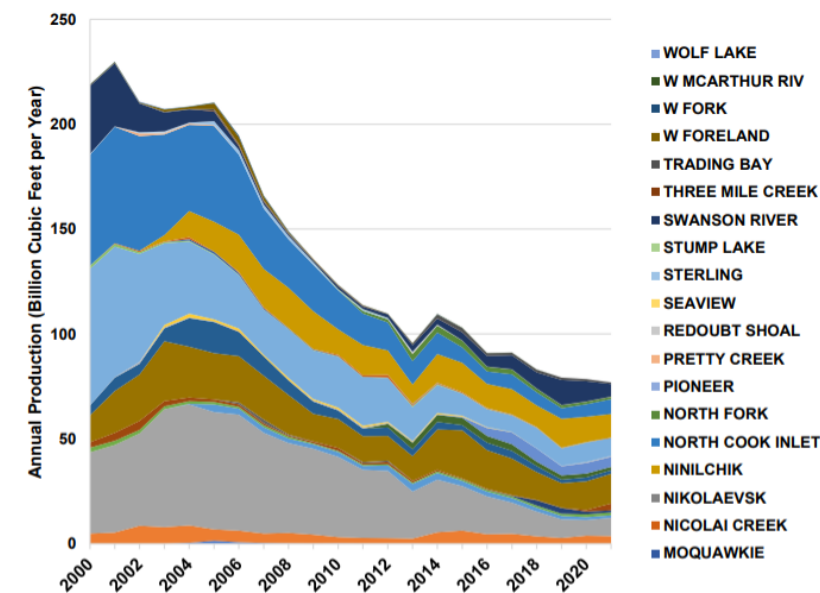
High Case (P1)	
Total Gas Reserves (bcf)	1,404.0
Gas (bcf)	1,361.7
Associated Gas (bcf)	42.3

Mid Case (P1)	
Total Gas Reserves (bcf)	1,101.4
Gas (bcf)	1,079.3
Associated Gas (bcf)	22.1

Low Case (P1)	
Total Gas Reserves (bcf)	843.2
Gas (bcf)	832.4
Associated Gas (bcf)	10.8

Mean Case (P1)	
Total Gas Reserves (bcf)	1,108.8
Gas (bcf)	1,085.2
Associated Gas (bcf)	23.6

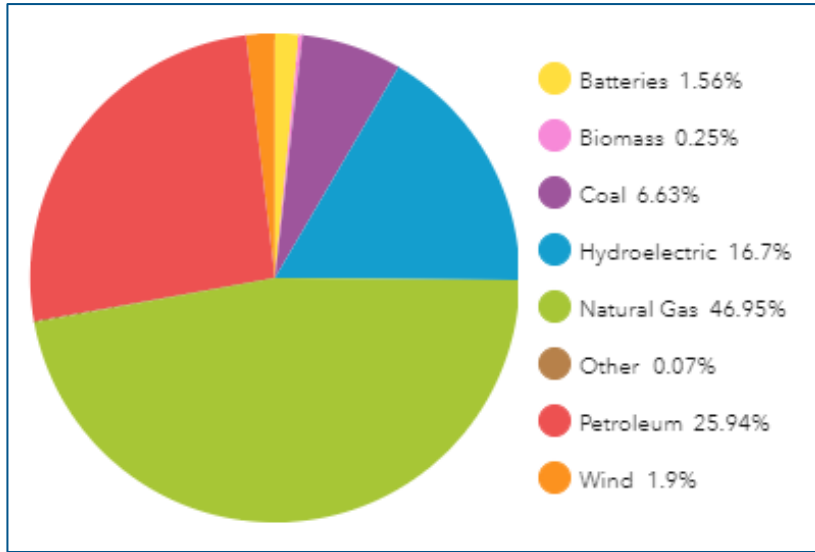
Cook Inlet Gas Production – Gross (BCF per year)



Note: State + Federal + Private Lands

Alaska's Electric Power Supply Chain

Electric Power Generation by Type

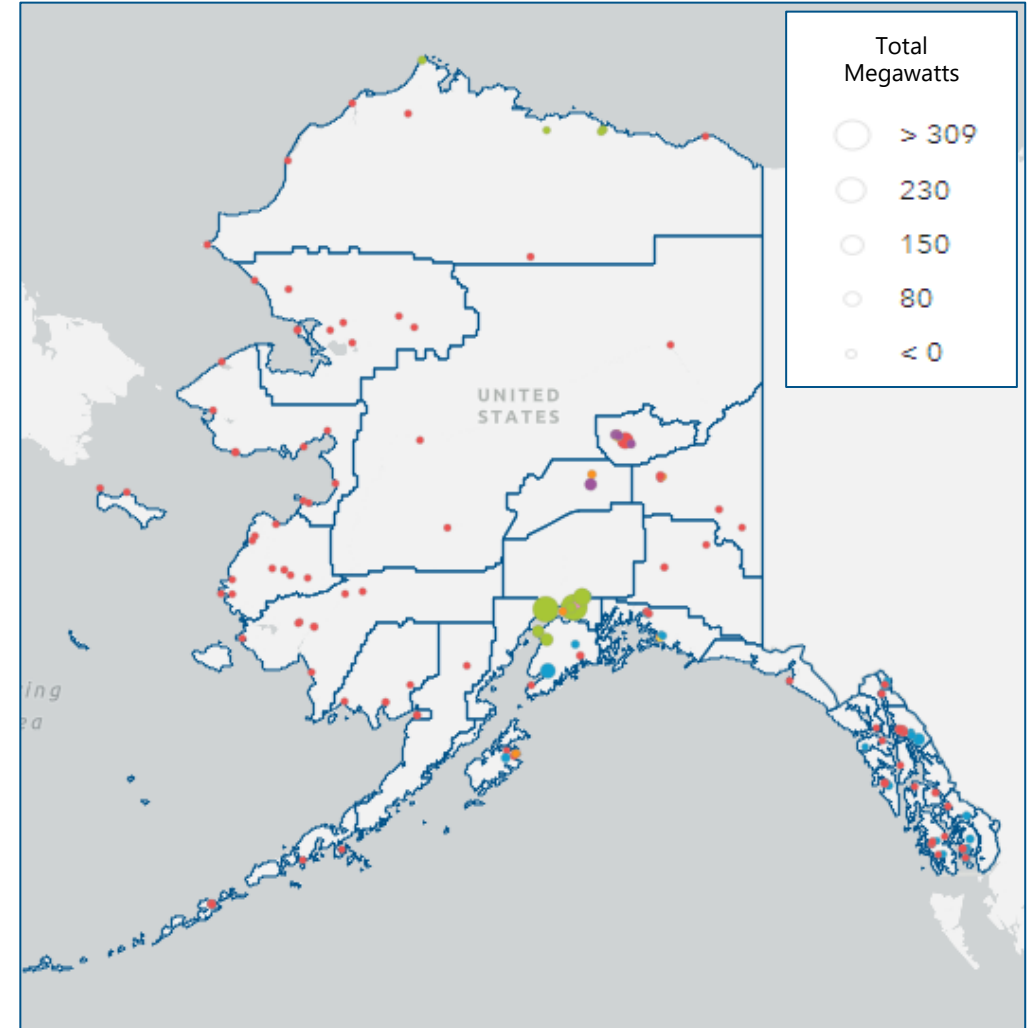
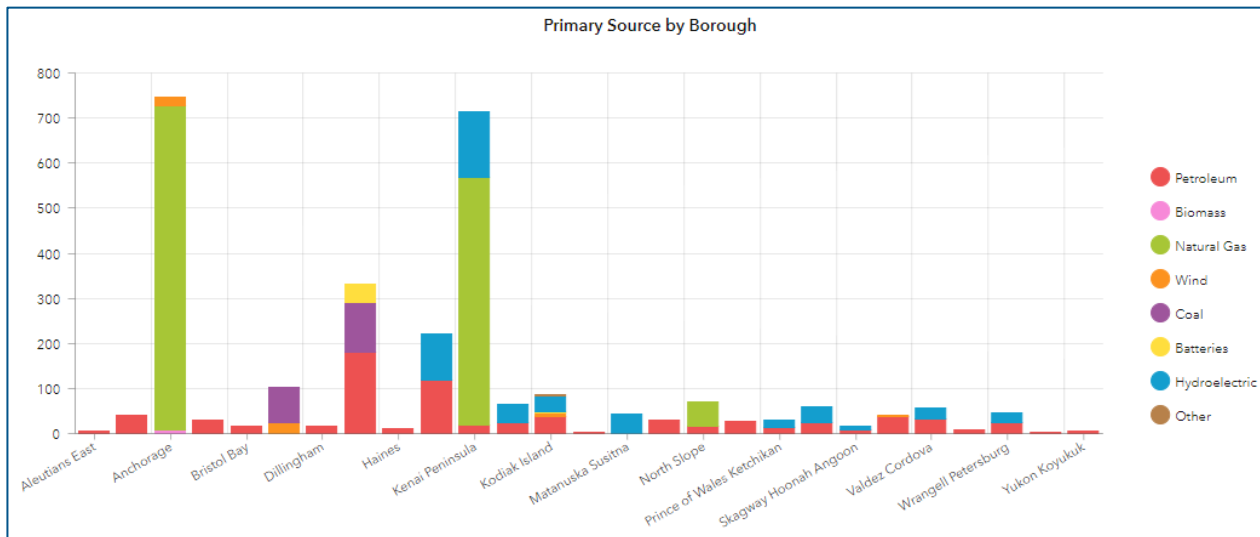


"Alaska is an oil and gas giant, but we are all in for every form of energy – wind, solar, hydro, tidal, geothermal, micronuclear, and hydrogen."

- Governor Mike Dunleavy

Total Megawatts
in all of Alaska

2,820



Ports & Intermodal Transportation

Port of Alaska – Critical Node

The Port of Alaska Handles:

- Half of Alaska's inbound fuel & freight, serving **90%** of the state's population
 - 1.66 million tons inbound
 - 174,000 tons outbound
- **1.47 million tons of refined petroleum products** in 2019
- **80%** of all cement used in Alaska



Seasonal Access



Interviewed:

- Private Cargo Shipping Companies
- Port Directors & Harbormasters
- NOAA Navigation Manager
- Barge Operators
- Coast Guard
- Tug Pilots

Result:

- Map & GIS dataset of Alaska’s major ports showing seasonal access limitations!

Other Key Findings:

- Kodiak has the largest crane in Alaska
- Road access + deep draft port = Seward, Valdez, Homer, MacKenzie, Anchorage.

Contingency Planning

Route analysis for cargo transport by land from ports in southcentral to Fairbanks

- also -

Port of Seward to Anchorage
Port of Valdez to Anchorage



From	To	Distance (Miles)	Bridge Count	Tunnel Count
Port Mackenzie	Fairbanks	355	78	
Port of Alaska	Fairbanks	360	92	
Port of Homer	Fairbanks	587	139	
Port of Seward	Fairbanks	487	138	
Port of Whittier	Fairbanks	513	113	2
Port of Valdez	Fairbanks	362	66	
Port of Seward	Anchorage	129	52	
Port of Valdez	Anchorage	301	62	

Source: Alaska Department of Transportation, Analysis & Map by Dewberry, 2023.

Thank you!
