



# RESEARCH SUMMARY

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## MARKET FACTORS AND CHARACTERISTICS INFLUENCING RURAL ALASKA FUEL PRICES

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Alaskans in rural places—especially the smallest, most remote places—face very high and volatile fuel prices. Since the spike in fuel prices started, Alaska policymakers have been asking why prices are so much higher in rural places, why they vary so much among rural communities, and whether there might be ways to reduce them.

Little is known about the structure of Alaska's rural fuel markets, or what drives prices at the community level. So the Alaska Legislature's Senate Finance Committee asked economists at the University of Alaska Anchorage's Institute of Social and Economic Research (ISER) to examine rural fuel markets. "Fuel" means mostly the fuel oil that rural communities use for generating heat and electricity.<sup>1</sup>

Here we summarize our findings. The full report is available on ISER's Web site ([www.iser.uaa.alaska.edu](http://www.iser.uaa.alaska.edu)). Our analysis did not include communities accessible by road. Communities that are not accessible by road fall into two distinct regional fuel markets: the Western Alaska market and the ice-free coastal market.

These markets are different in many ways, but the most important are that Western Alaska is much more remote, and winter ice limits fuel deliveries to the short ice-free season. All communities in Western Alaska have to build, operate, and maintain expensive fuel storage facilities large enough to get them through the winter. The region also has shallow ports and rivers, and navigation is quite challenging.

Another less-obvious cost factor is that in Western Alaska distributors have to maintain well-trained, highly paid crews able to safely navigate the region's often treacherous rivers. These challenges have historically made fuel prices in Western Alaska high. But what has recently driven prices even higher? Here's what we found.

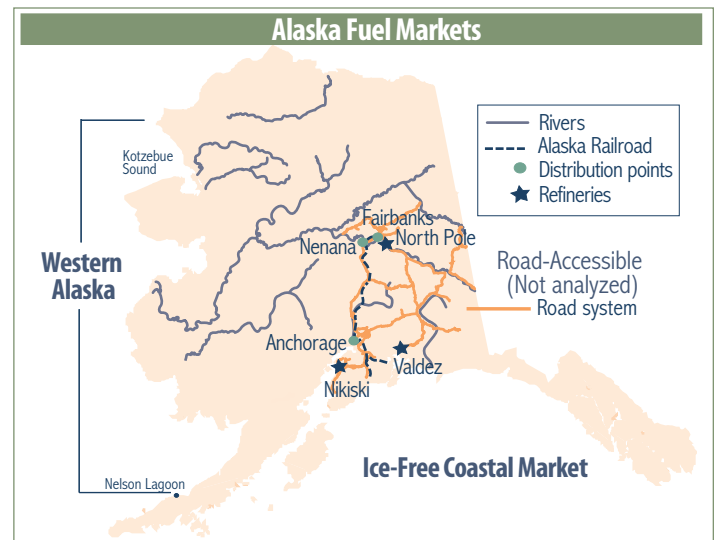
- It doesn't appear that fuel distributors operating in Western Alaska are charging excessive prices or making excess profits. If that were the case, Delta Western—a major distributor that was previously very active in the small-delivery market—would likely re-enter.
- Recent higher prices for fuel in Western Alaska communities seem to result from the sudden convergence of several things:

*Higher crude oil prices*

*Price recovery among fuel distributors, after earlier competition for market share pushed prices below sustainable levels*

*Repair and replacement of aging tugs and barges, including federally required use of double-hulled tankers*

*Construction of new fuel tank farms in many communities, with business plans that require pricing to include costs of tank repair and replacement*



- After accounting for those factors, most of the remaining variation in retail fuel prices among Western Alaska communities appears to result from price-setting practices at the community level. The distributors own tank farms in the larger hub communities, but in most of the smaller places either city governments or tribal entities typically own the tank farms. Information on retail mark-up practices is proprietary, and most of the local tank farm owners we contacted would not give us that information. But potential reasons for the retail price variations include differences in:

*Operating hours and costs for community fuel tank farms*

*Levels of local compliance with safety and environmental requirements for fuel storage, which increase for large tanks*

*Collections for tank farm repair and replacement, as well as operation and maintenance*

*Debt repayment on bulk fuel loans*

*Price mark-ups to collect revenues for other community purposes*

Delivering fuel in the ice-free coastal areas—while still posing some challenges—is typically not as difficult as in Western Alaska. Deliveries are made year-round, and communities don't have to maintain as much expensive storage capacity. We also found a central difference in the structure of the ice-free fuel market:

- Distributors in the ice-free coastal area are much more likely to also own retail stores in communities and could exercise more power to set higher prices. But according to an analysis by the Alaska Department of Law, they are not using that power.<sup>2</sup>

## SOURCES OF DATA

To conduct this analysis, ISER researchers got help and cooperation from a number of participants in Alaska's rural fuel markets, including refineries, distributors, retailers, fuel-purchasing cooperatives, and government agencies that make community fuel purchases.

In particular, people previously active in the Western Alaska fuel market provided detailed cost information about the downstream fuel market in Western Alaska. That information reflects their best estimates and memories of historical costs—but we do not have confirming data from current fuel distributors, who consider such information proprietary. We weren't able to get recent or current cost information for the ice-free coastal market.

## MOVING FUEL TO COMMUNITIES

The text box above compares characteristics of the Western Alaska and ice-free coastal fuel markets. The process of moving fuel to rural communities is similar in both rural markets—although in Western Alaska the distances are longer, deliveries are limited to the ice-free season, and getting to many communities is more challenging. The map on the facing page provides detail on delivery routes of the major fuel distributors, but there are some common elements.

- *Distributors buy fuel from refineries.* Most fuel for Western Alaska comes from Alaska refineries. Communities on the Upper Yukon River get fuel produced at a North Pole refinery and trucked to Nenana, where it is loaded on barges. Fuel for the ice-free coastal areas comes from U.S. West Coast, Alaska, or Asian refineries, depending on who has the lowest price. Most of the fuel for Southeast Alaska comes from the West Coast, and other parts of the ice-free area get fuel from Alaska or Asia.
- *Ocean-going barges transport fuel to regional fuel hubs,* where it is loaded into large storage tanks.
- *Fuel is loaded onto smaller barges at regional hubs,* and the smaller barges deliver to tank farms in each community. Locations of some communities in Western Alaska require additional fuel transfers enroute.
- *Local tank farm owners set retail prices,* selling fuel at the site or distributing by truck. In most small Western Alaska communities, city governments or tribal entities generally own the tank farms. In ice-free coastal areas, fuel distributors are often also retailers.

## WESTERN ALASKA FUEL MARKET

The Western Alaska fuel market is comprised of North Aleutian villages beginning with Nelson Lagoon and proceeding north along the coast to Kotzebue Sound (see map on front page).<sup>3</sup> Also included are ports of call on tributary rivers, the most prominent being the Yukon and Kuskokwim Rivers.

It is possible to fly fuel to most locations in Western Alaska, but it is only cost effective for communities within a few hundred miles of refineries in Nikiski or North Pole, and then only in quantities of less than five thousand gallons. The locations of a few communities mean they must have fuel delivered by air, but others will only do so if they face a fuel shortage at a time when barges can't deliver.

## Characteristics of Rural Alaska Fuel Markets

### Western Alaska

- Short shipping season
- Fuel transported long distances
- Fuel primarily from Alaska refineries
- Fuel sometimes transferred several times
- River navigation difficult
- Storage capacity to get through winter
- Fuel contracts determine delivered price to community
- Local entities own tank farms, set retail prices in small places

### Ice-Free Coastal

- Year-round shipping
- Shorter shipping distances
- Fuel from West Coast and Alaska
- Fewer fuel transfers required
- No river navigation
- Less local storage capacity needed
- No fuel contracts
- Fuel distributors often also operate retail stores, set retail prices

Marine transportation remains the most cost-effective way to deliver fuel to almost all Western Alaska communities. Fuel is delivered to regional hubs on ocean-going (linehaul) barges. But from the regional hubs to most ports of call, the only viable method of delivery is a smaller tug and barge combination.

### Competitive Forces in Western Alaska

One of the factors driving recent fuel prices in Western Alaska is that distributors there have been recovering from competitive battles that had previously pushed wholesale prices below sustainable levels.

Three major competitors currently distribute fuel in Western Alaska—Crowley Marine Services, Ruby Marine, and Delta Western. (Historically, Yukon Fuel Company also served Western Alaska; Crowley bought Yukon Fuel in 2005. Ruby Marine began operation in 2007.)

The competitive landscape in Western Alaska's delivery market has changed significantly over the last 15 years. In the mid-1990s, Yukon Fuel's activity was mostly on the Yukon River, while Delta Western and Crowley served the rest of the Western Alaska market.

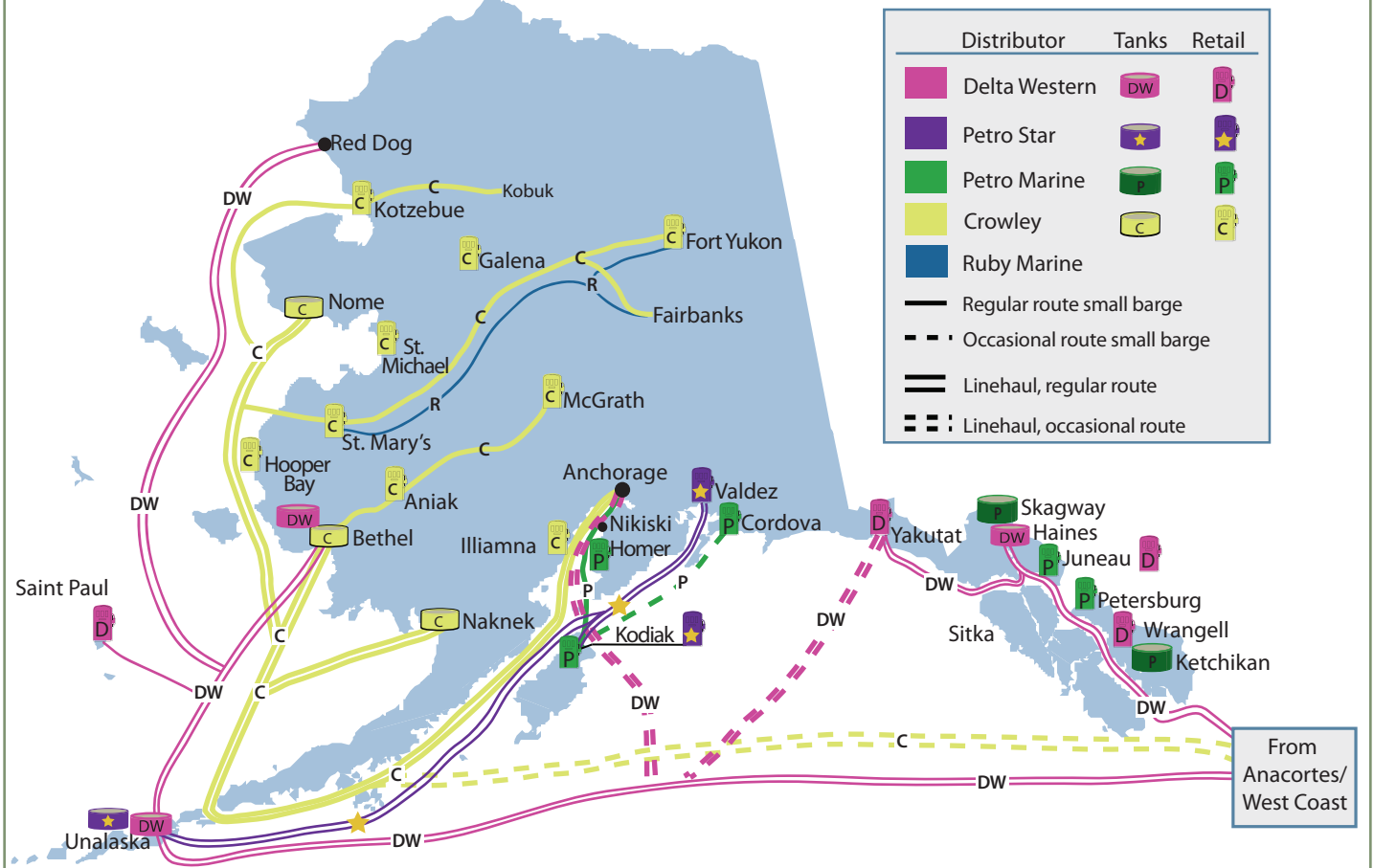
Beginning in the late 1990s—and after a failed attempt to buy Yukon Fuel—Delta Western began to withdraw from the small-delivery market to focus on linehaul and tank farm operations. At the same time, Yukon Fuel started an aggressive pricing program to expand its service territory. Both Crowley and Yukon Fuel charged some customers below-cost rates, trying to secure more market share.

By 2002 that strategy had increased Yukon Fuel's market share, but resulted in relatively low profitability. In 2005, Yukon Fuel was sold to Crowley. As a direct result of very low profits, the market saw almost none of the reinvestment in equipment that would be expected to occur in a healthy market.

Since 2005, prices have been increasing. But evidence of prices remaining at depressed levels is the continued absence of Delta Western in direct deliveries to communities. Delta has the capital and operational knowledge to compete for fuel sales in small Western Alaska communities—yet it had a relatively small role in the market from 2006 to 2009.

When comparing current fuel delivery prices with prices from more than five years ago, we must take into account that prices from that period were not sustainable—as evidenced by the sale of Yukon Fuel and the lack of participation by Delta Western.

## Fuel Distribution Routes in Rural Alaska Markets



### Factors in Fuel Costs for Western Alaska Communities

Companies that distribute fuel to Western Alaska typically do so under fuel contracts. The contract price is determined by a formula that takes into account both the current market price of the fuel, which is reflected in the “lift” price—the price paid at the refinery—and the cost of transporting fuel to the community.

After distributors buy the fuel, the next stage is transporting it from Cook Inlet to a fuel hub. It isn’t cost-effective to take smaller barges to Cook Inlet to pick up fuel. Instead, distributors use large linehaul barges, with typical capacity of 2.5 million to 3.5 million gallons.

The linehaul barges transport fuel to hub tank farms that can accept linehaul barges—Dillingham, Naknek, Bethel, Nome, and Kotzebue. Not all fuel goes through these terminals. Some is off-loaded directly to small barges, thus avoiding some fees. But it’s often necessary to use terminals—otherwise, the distributors would need many more small barges, for a season that lasts only a few months each year.

Finally, small barges deliver fuel to communities. That’s the most expensive distribution cost—getting to communities is risky and time-consuming. Some communities also have poor moorage and unloading equipment, which adds to the costs and risks of delivering fuel.

Overall, we estimate distribution costs may add about \$1 per gallon to fuel prices in Western Alaska—but costs can vary sharply, depending on the difficulties of reaching a community and unloading the fuel.

Once the fuel is delivered to a community, local costs start adding up. Local tank farm owners buy many months’ worth of fuel, which is a big expense—and they often have to take out state loans to pay for it. Many tanks have also fallen into disrepair over the

### Factors Contributing to Fuel Prices in Western Alaska

#### Estimated Distribution Costs to Average Community (Per Gallon)

- Fuel from refinery: current market price (can vary from day to day)
- Fuel lifting-fee at refinery: 6 cents
- Cost of transporting from refinery to regional hub: 19 cents
- Fee for use of hub facilities: 3 cents
- Cost of transporting fuel from hub to community: 60 cents
- Distributor’s costs of working capital and administration: 10 cents
- Factors that delay or make delivery more complicated: Variable

**Approximate price delivered to community: Market price of fuel plus \$1.00 per gallon distribution costs**

#### Estimated Additional Costs Added in Community (Per Gallon)

- Tank farm capital cost: 61 cents
- Working capital: 10 cents
- Tank farm operations: 83 cents
- Charges for other purposes: Unknown

**Approximate local retail price: Delivered price plus \$1.60 per gallon**

years, because owners didn’t have or didn’t collect the money needed for maintenance. Since 1999, the Denali Commission has replaced tanks in about 100 locations—but it requires local owners to collect money to repair and maintain those tanks.

Local owners also have other costs associated with operating the tank farms (for instance, costs of labor, insurance, and regulatory compliance) and selling fuel. In general, we estimate costs for local tank farm owners would add about \$1.60 per gallon to fuel prices.

But that’s simply a generalization. In reality, retail mark-ups vary sharply by community, and prices are inconsistent across communities. To hold down fuel prices, some owners probably don’t collect for all the expenses they should; others may collect more, to help pay for other community expenses.

## ICE-FREE COASTAL MARKET

We weren't able to get the kind of cost information for the ice-free coastal market that we did for the Western Alaska market, but current employees and agents supplied generous amounts of information on the market structure. This market region spans Southeast Alaska, Prince William Sound, Kodiak Island, the Alaska Peninsula, and the Aleutian Islands. The costs of transporting, storing, and retailing fuel in this region are all less than the costs of similar activities in Western Alaska, but higher than costs on the Alaska road system.

A big difference from the situation in Western Alaska is that fuel distributors in this region are more likely to operate retail stores. Also, when the distributors do sell to independent retailers, those sales aren't typically under fuel contracts with a predetermined pricing formula, as is generally the case in Western Alaska.

Another difference is that most ice-free communities receive fuel shipments throughout the year. Communities with large fuel markets generally receive at least one fuel shipment per week, while smaller communities may receive a fuel delivery every few months. Frequent deliveries reduce storage costs, and also help reduce retail prices, by spreading the fixed cost of storage over more gallons of fuel.

Three companies distribute most of the fuel: Harbor Enterprises (Petro Marine, Petro Express, and Shoreside Petroleum), Delta Western, and Petro Star. In most communities, there is only one distributor. Distributors can price their fuel to reflect the cost of buying the fuel, or the cost to replace it at current prices. The lack of fuel contracts allows distributors to price their inventory either way, at any time.

Independent retailers exist in the ice-free region, but most are supplied by one of the large distributors. (The only significant exceptions appear to be Anderes Oil in Ketchikan and Taku Oil in Juneau.) As a result, the distributors determine the price most independent retailers pay for fuel. The distributors also know the retail mark-up of independent retailers they supply: it is simply the price of the fuel they sold the retailer, subtracted from the retailer's posted price.

This knowledge allows a distributor to essentially determine the retail price of an independent fuel retailer. The distributor can decide what final retail price it wants, and then sell fuel to the independent retailer at that price, minus the retailer's known mark-up. That means a fuel distributor could exert monopoly pricing power in a market where it is the only fuel distributor but not the only fuel retailer. But a recent investigation by the state Attorney General's Office suggests that fuel distributors in this region are *not* exercising their market power to price fuel significantly higher than would be expected in a competitive market.<sup>4</sup>

## STUDY COMMUNITIES

In our 2008 work on components of fuel prices in Alaska, we collected fuel price information from 10 rural communities around the state.<sup>5</sup> We surveyed the same communities in 2009 and again in 2010 for this analysis. From our third round of surveys we found:

- Fuel price increases persisted from January 2009 to January 2010, even though the price of crude oil was lower in most of 2009.<sup>6</sup> But because the crude oil and refinery costs make up a relatively small

portion of final fuel prices (less than 50% in Western Alaska), declines in crude oil prices don't translate into the same level of decline in retail prices, even if they are passed on to customers.

- Fuel prices in rural Alaska vary sharply and are inconsistent across communities at the retail level.
- Some communities have much larger retail mark-ups than others.
- Delivery costs and retail mark-ups are a large part of the fuel price in some communities.
- Getting reliable local information on fuel sales and practices remains a challenge.
- Residents of surveyed communities are frustrated because they have limited options for coping with high fuel prices.

## POLICY OPTIONS

What could policymakers do about high fuel prices in rural Alaska? Conventional interventions aren't likely to produce optimal results. There is currently enough competition—or threat of new competition—to cause businesses to minimize costs. Regulating fuel prices would be administratively burdensome, and could even drive prices higher—because distributors would feel free to replace aging equipment, with a more certain return on investment. Fuel price subsidies, another potential option, remove the market signals that cause people to conserve energy when prices rise.

But maintaining and funding the Low-Income Home Energy Assistance program is critical, especially during price spikes that have in the recent past caused some rural families to spend close to half their income for home energy use. Also, continued funding of the weatherization program provides both short- and long-term relief, by reducing the amount of fuel households have to buy. Infrastructure improvements, such as replacing marine headers and interconnecting clustered communities with transmission lines and roads, may provide the most benefits in the long-term—by helping hold down energy prices, and thus helping maintain rural communities.

## NOTES

1. Some gasoline is also transported to rural communities.
2. Alaska Department of Law, *Rural Fuel Pricing in Alaska: A Supplement to the 2008 Attorney General's Gasoline Pricing Investigation*, February 2010.
3. Communities of the North Slope Borough are not included in this analysis, because they are not subject to the same fuel market forces as other remote rural places. The borough government takes an active part in acquiring fuel for its communities and also subsidizes the costs.
4. See note 2.
5. Meghan Wilson, et al., "Dollars of Difference," *Research Summary* No. 68, Institute of Social and Economic Research, University of Alaska Anchorage, May 2008.
6. From January 2009 to January 2010 crude oil prices decreased an average 37%. Refinery gate prices in Anchorage increased 13% for gasoline and decreased 7% for diesel for heating. In Anacortes, refinery prices decreased 7% for gasoline and 54% for diesel. On average across the surveyed communities, retail prices for gasoline decreased 6% and diesel for heating decreased 13%. But only five of the study communities paid less for gasoline and diesel.

The findings in this summary and the accompanying report are those of the authors. Ginny Fay is an assistant professor of economics at ISER, and Nick Szymoniak and Alexandra Villalobos Menendez are research associates at ISER. Justine Charon and Mark Smith are with Pacific Fishing Assets. The full report, *Components of Alaska Fuel Costs: An Analysis of the Market Factors and Characteristics that Influence Rural Fuel Prices*, is available on ISER's Web site and in printed copies from ISER's offices in Anchorage (907-786-7710), for a copying charge of \$6.00.

**Editor: Linda Leask • Graphics: Clemencia Merrill and Molly Ridout**