Before starting I want to thank Northrim Bank for its longstanding and generous support of the economic research at the Institute of Social and Economic Research and for helping to broadcast the results to a wide audience. That support has allowed us to investigate questions of importance to all Alaskans that would otherwise not have been possible.

Now my remarks today have two objectives:

First to demonstrate the transformative impact of petroleum on the Alaska economy,

and second to answer this question—Is petroleum an industry in decline in Alaska, or can it continue to sustain the prosperity we have come to enjoy and expect, for another 50 years or more?
Let’s start by looking back 50 years to when Alaska became a state.

This is important in helping us understand how far we have come as an economy, but it is difficult for most of us to see back to Alaska in 1959, either because we are too young, or because, like me, we are more recent arrivals in the state.

For 90 percent of us, the Alaska economy we see today is the only Alaska economy we have ever known and we take it to be “normal.” In fact it is anything but normal, but I’m getting ahead of myself.

Here is a list of some of the important features of the economy at the time of statehood.

These economic characteristics were largely the result of the economic structure of the time, or the “economic base”—those activities that brought money into Alaska from outside.
Although we tend to think of natural resources providing the economic foundation of the state, in 1960 80% of all market-based jobs could trace their existence, directly or indirectly, to the activities of the federal government. The federal government pumped money in for the military payroll, for a large construction program that supported private construction and other infrastructure workers, and for the management of federal lands and other programs. Most trade and services jobs were supported by the payrolls of federal workers and their private infrastructure partners.

Seafood was the largest private natural resource industry, but together with mining and timber, accounted for only 15% of all jobs on an annual basis. Because fishing was—and still is—seasonal, most activity was concentrated during the short Alaska summer.

Tourism was in its infancy, and not much else of any consequence was going on.
Now let’s fast forward to this decade, use our imagination, and conduct what I call a “thought experiment” or “what if” experiment. What if the economy had developed as it has, except for the total absence of the petroleum industry?

No two people would conduct this experiment in a similar fashion, but I think the broad outlines of what the economy would look like today are clear.

The economy would have twice the number of jobs today as in 1960—187k vs 90k.

But its other characteristics would be remarkably similar to those at the time of statehood.

Why?
The economic characteristics would be similar because the economic structure would be similar.

Private sector job growth would have come from development of our abundant natural resources. First we would have built on existing industries like fishing, mining, and timber. We would have taken advantage of the rise of tourism. Our locational advantage would have resulted in an air cargo industry.

But growth in these sectors would not have come easily, as I will explain further shortly, and the economy would still be dominated by federal spending—both military and civilian programs.

On occasion I have suggested the Alaska economy today without petroleum would look like that of Maine—dependent on natural resources, tourists, and federal spending, with a limited tax base, aging infrastructure, and aging population.

Why doesn’t this thought experiment produce a more up-beat picture of the economy of the state? The simple reason is that Alaska is an island economy.
The map makers have figured this out, but we tend to forget it. Alaska, like Hawaii and many other islands, has two important characteristics that are largely determined by geography over which we have no control.

We are remote. We have a small population.

Remoteness means the cost of moving goods in from suppliers and moving goods out to markets is high compared with other places, and small size means we lack economies of scale in the production of goods for export.

Together these put us at a competitive disadvantage that is virtually impossible to overcome except for some niche markets. Think about your favorite island. Its niche markets tend to be tourism, seafood, and in some cases mining. Occasionally strategic location (generally in the middle of nowhere) can also confer an advantage. For many island economies these niche markets are not sufficiently large to provide an economic base for the entire population, which then must depend on a combination of subsistence activities and foreign aid for their well-being. Incomes are low.

We were an island economy at statehood, and geography dictates that we are an island economy today. Tomorrow we will still be an island.
What sets us apart from other islands is our good fortune in sitting atop huge reserves of petroleum. Because of this our economy is twice as big. Let’s look at the 3 reasons.

First is its most obvious contribution, through activity in the oil patch.

A recent study estimated that 42k jobs in Alaska are attributable to oil patch activities—exploration, development, production, transportation, and processing.

By my own estimate, that is estimate is low by about 20k. Here are a couple of reasons.
The number of workers involved in the production of oil is small—about 3 thousand working for BP, Conoco Phillips, and the other oil companies, but their impact is large. These petroleum industry jobs support an inverted pyramid of workers throughout the economy. The producer jobs at the bottom support a larger number of jobs in businesses like drilling companies that do the actual field development. These in turn make purchases from and support a broader range of transportation, engineering, warehousing, utility, financial, legal, fabrication, camp supply and other businesses. At the very top of the pyramid are the businesses in the rest of the economy supported by the payrolls paid in the lower parts of the pyramid.

Our other economic drivers have shorter and skinnier job pyramids.
And second, the petroleum payroll is much more significant than the job count would suggest. This graph shows, in black, the petroleum payroll compared with payrolls of our other resource industries like fishing and tourism (the next largest segments), each of which directly employs many more workers.

Jobs in petroleum are the highest paying in the state—averaging over $100 thousand per year. In contrast, the average annual wage in the tourism sector is $29k, and since many tourism jobs last for only 4 months a year, the wage for each of those seasonal jobs is more like $10k.

High wages mean lots of purchasing power cascading through the rest of the economy, supporting jobs in the trade and service sectors.
The second component of the petroleum contribution to the economy comes from the revenues it generates for state and local governments.

We are all familiar with this graph. The red bar is state general fund oil revenues, now running $5-$6 billion annually, and the black line is the petroleum share of total revenues. The direct share is now 90%.

But that actually underestimates the importance of petroleum for state general fund revenues. If we add in revenues from activities that support petroleum production—like corporate taxes paid by drillers, construction and engineering firms and so on—our dependence on petroleum revenues would probably be closer to 95%.

Incidentally, since Alaska became a state, 98% of resource revenues have been from petroleum, with our other natural resources contributing 2%.
When that $5-$6 billion is spent, it creates jobs—jobs in state government, jobs in local government, jobs in construction, and jobs for other businesses doing business with state government.

These jobs also tend to be high-paying and year-round, again distinguishing them from fishing or tourism jobs. This payroll also cascades through the economy, creating support sector jobs.

That all adds up to about 50 K jobs, and these are shared across the state, in every community,

If we add in jobs created by spending of Permanent Fund dividends, the total comes closer to 60K.
The third category is what I call spinoffs from oil wealth.

There are several that together account for 60k additional jobs, but let me mention 4—

a light tax burden on resource industries, public spending in support of economic development, services to senior citizens, and seasonal stability.
As this graphic shows, most petroleum revenues the state has collected over the years have been allocated to lifting the tax burden on households and businesses and expanding public spending.
Without revenues from oil, we might expect that the household tax burden would be $2,300 per capita today, based on national average state income and sales tax rates. For a family of four that would be $9,200 per year. The total revenues from households would be about $1.6 billion, barely 25% of the $5.4 billion the governor is proposing for the fiscal year 2012 general fund budget.
Business taxes would need to supplement these household taxes if we were to generate enough revenue to support a level of public spending comparable with other states. Unfortunately the federal government is exempt from direct taxation by the state, so much of this burden to contribute to the cost of government would fall on our resource industries of seafood, tourism, mining, and timber.

If taxes on our resource industries were increased to make up the shortfall between household tax revenues and the national average level of public spending, their tax burden would quadruple, from about $200 million to $900 million.

An increase of that size is not possible without decimating these industries. But they would need to contribute more than they currently do to help cover the necessary costs of government.

And since higher taxes reduce profitability, our non-petroleum natural resource industries would have suffered and some of the growth they have enjoyed since statehood would not have taken place. It is safe to say they are larger and in better shape today because petroleum has taken some of the tax burden off their shoulders.
Increased public spending has been good for businesses and good for the quality of life for all Alaskans. You can probably find some public expenditure on this slide that you have enjoyed. If you are a business it has reduced your costs or increased your customer base. If you are an employer it has helped keep your labor costs down. A significant share of our enhanced public spending has funded programs to stimulate economic growth of particular industries or economic development generally.

Furthermore, these goods and services make Alaska more attractive for seniors, who used to leave the state upon retirement, but who now comprise the fastest growing segment of the population. They are an increasingly important driver industry—essentially year-round tourists.
Another spinoff is seasonal stability of employment.

As I indicated, when Alaska became a state there were lots of jobs in the summer, but the economy essentially closed down in winter. Under those circumstances businesses supporting the resource industries or Alaska households had a hard time taking root.

On the left are the graphs of monthly employment levels in 2007 in two Alaska boroughs—the Bristol Bay Borough, dominated by seafood, and the Denali Borough, dominated by tourism. There is almost no employment at the start of the year, a dramatic run-up for a few summer months, and then a sharp drop back down. It is no wonder that non-residents account for a large share of the jobs in those regions.

These seasonal industries account for just a small share of jobs today—thanks to petroleum.

Jobs in the oil patch, as well as those paid for with oil revenues, are year-round—or even counter cyclical. In an environment of stable year-round employment, support businesses can prosper.
So if we add together the oil patch jobs, the petroleum revenue jobs, and the spinoff jobs, half the 374k jobs in Alaska today can be traced to petroleum.

With petroleum, our economic structure is more diversified, as shown in the right-hand pie, reflecting the notion of the three-legged stool—where petroleum and federal government each represent one leg, and all other drivers, with the help of the petroleum spinoffs, comprise the third leg.

And the characteristics of the economy are much more positive.

- Depth—lots of support businesses
- Non-seasonal
- Less transient
- Less dependent on federal jobs
- Rich infrastructure
- Large tax base
- Prosperous—both households and businesses
But in the midst of this transformation, oil production has been falling. Shown here is per capita daily production, which has dropped from 4 barrels a day twenty years ago to 1 barrel today.

This message has been slow to get out for at least 3 reasons.

First, state employment has continued to grow even as production has fallen, so people underestimate the importance of petroleum for the health of the economy. But this growth can be traced to non-sustainable factors like the boom in federal government spending in the last decade.

Second, the high price of oil has diverted attention from the decline in production.
And third, we tend to have a myopic view of the future. Here are projections of oil production in the back and revenues in the front. The first 10 years of these projections look rosy, with little production decline and an actual increase in revenues.

But independent of whether those short-term forecasts are reasonable, if we extend them out past 2020, the production and revenue numbers tell a story of significant decline.

Does the inevitable production and revenue decline portend a return of Alaska to its original island economy status?
There are a number of strategies generally proposed to keep the economy strong in light of falling petroleum production and revenues. Let me review 5. All have some merit, but none is strong enough to offset declining petroleum. Even all of them together would not be enough.

The first is commercialization of gas. This would create jobs and give oil production a boost, but it would not be a big revenue generator.

That is because on an equivalent energy basis, the tax base for gas is much less than for oil. Here I have compared a million BTUs of gas with a market value of about $6 to the equivalent amount of oil, about 1/6 of a barrel—which has a market value of $14.

It takes about $4 to move a million BTUs of gas to market from the North Slope, but only about $1 to move that much energy as oil. So at the wellhead on the North Slope, where taxes are calculated, a million BTUs of gas would be worth only $2, compared with the equivalent amount of oil, which would have a value of $13.
Can growth of our non-petroleum natural resource drivers fill any void created by declining petroleum?

If we take the growth in jobs of the big 3—seafood, tourism, and mining—over the past 20 years and assume the same growth during the next 20 (not a prediction, but rather just an exercise to show the scale of things), we get only 11 thousand direct jobs, mostly tourism related.

And these drivers don’t pack any revenue punch.

I have estimated how much the state would need to collect per unit of output for each of these industries in order to replace $3 billion of petroleum revenues. For example, we would need to shake $2,000 in taxes and fees out of the pockets of each tourist. That is more than each currently spends during his visit to the state.

And given the characteristics of these sectors, particularly low wages and seasonality, it is unlikely they could sustain the positive spinoffs that petroleum has generated for support businesses in the state.
Alaskans have long been lured by the pursuit of economic development strategies used in other states—value added and economic diversification. Examples include fish processing plants, the Alpetco petrochemical plant, aluminum reduction, server farms, and dairy farming.

These have generally not worked for a variety of reasons I will not discuss today. But—

Past experience and economic realities will not deter economic boosters (there is a compelling urge to “do something”), and they should not. We should be looking for every economic advantage. But we should also be extremely cautious about spending state revenues on projects that promise to replace petroleum but end up as white elephants.

A Google search on “Alaska Economic Development Strategic Plans” turned up 374k results—one for every 2 Alaskans!

A lot of economic develop strategizing in Alaska, and there is a LOT of it, only creates jobs for those doing it, and for only as long as they are doing it. I’m not aware of any that has produced revenues for the state general fund.
The idea here is to emulate the Norwegian model. If we invest in infrastructure to reduce the price of energy and transportation, this will open a cornucopia of profitable investment opportunities for development of our non-petroleum resource industries.

It sounds seductively attractive, but we are not Norway and the likely result of pursuing this policy would be an empty cornucopia, with the investment spent on a temporary feast with no long-term return to the state, either of jobs or revenues.
One newly suggested strategy is to develop our abundant renewable energy resources. This would certainly be good for the environment and help stabilize prices for consumers and businesses. It could temporarily generate employment opportunities.

But shifting to renewables will not bring new money into the state to replace the sales of petroleum, unless the energy is exported or embodied in produced goods that are exported. For that reason, renewables are not economic drivers and will not contribute to either sustained employment opportunities or revenues to replace petroleum.
If these strategies are inadequate to offset the decline in petroleum, it looks like we have one of the following three futures as a state:

**WE ARE THE CHOSEN ONES or NO ROOM AT THE FISHING HOLE:** Those who think good luck will keep the good times coming can point to a number of times in the past when luck did save the day for Alaska—say, the Prudhoe Bay oil discovery, or the high oil prices that have spared us from most of the effects of the current national recession. So it’s possible to be optimistic and believe that the state’s luck will hold—with rising oil prices driving future developments and keeping the economy healthy and the state treasury full.

**THE BIG CRASH or I CAN HANDLE THE HANGOVER BECAUSE THE PARTY WAS AWESOME:** Alaskans who know the state’s history as a boom-and-bust economy—and especially the economic turmoil Alaska went through when oil prices crashed in the mid-1980s—have reason to believe it could happen again. World oil markets are nothing if not volatile. So it’s possible to be pessimistic and think plummeting oil prices could dry up investment in petroleum development and blindside Alaska’s economy again.

**THE SLOW SQUEEZE or UP A LAZY RIVER:** The economy enjoyed moderate, steady growth in the 1990s. But at the same time flat oil prices and falling oil production were eating away the state’s oil revenues. The state balanced the budget during most of the 1990s by using the Constitutional Budget Reserve—and if it hadn’t been for that rainy-day account, the need for dramatic budget cuts and tax increases would have put the brakes on the economy. So it’s not unreasonable to think that if future oil prices flattened and there was little new exploration and development, both state spending and the economy could dwindle.
But there is a 4th possibility.

We still are resource rich in petroleum. The production decline figures we always see are based on production of conventional reserves on state lands in Cook Inlet and on the central North Slope, between the Colville and Canning rivers. Production to date has been 17 billion barrels, and 4.5 billion barrels are forecast to remain in known and unknown fields, suggesting we have sent 80% of our oil to market. The picture changes if we consider the market value of the oil produced and the oil still in the ground. The market value of that 17 billion barrels produced was $500 billion in 2010 $, while the estimated market value of the remaining oil might be $450 billion. From that perspective, we may only be halfway through our inventory.

And that is only conventional oil on state lands. About 34 billion barrels of technically recoverable oil are estimated to be on federal lands.

And unconventional reserves—heavy and viscous oil as well as shale oil—are not included in these estimates.

And there is lots of gas as well.
Before we get too excited, however, we need to remember that getting Alaska oil and gas to market is expensive, and the oil not yet produced will be more costly to get out of the ground for 3 reasons.

Size: New conventional production on state lands will be from smaller fields lacking the economies of scale of the Prudhoe, Kuparak, and Alpine fields.

Distance: New production from federal lands will be further from the trans-Alaska pipeline system. OCS will be offshore.

Physics: Heavy and viscous oil will be technically challenging to produce. Shale oil is too new to even speculate about. And squeezing more out of the legacy fields will involve expensive new technologies.

Some analysts think the costs will be too high to justify further production. A recent book by an Alaska oil industry veteran concludes that “In a nutshell, Arctic Alaska holds the largest potential resource of inaccessible and noncommercial petroleum left in the United States. Decades from now, it probably still will.”

But the potential production from these reserves is huge and worth going after.
Production from these resources could mean continuation of the oil patch jobs that have been so important for the economy.

Historically, even as production has fallen by 2/3, employment in the oil patch has been steady. This is because production per employee has fallen (the smaller graph).

This is both bad news and good news. The bad news is that the cost of getting each barrel out of the ground, measured in worker time, has increased—a reflection of the fact that the costs are increasing. But the good news is that as production has declined employment has not fallen.
If we could successfully commercialize these resources, it could mean thousand of oil patch jobs, spread over decades.

This projection of oil-patch-related employment comes from a recent study of the potential impacts of strong OCS development. It shows that OCS-driven employment could be as large as the current level of oil-patch employment generated by North Slope activity.
These jobs are not guaranteed. But this two-pronged approach to maximize the chances of realizing them is obvious.

Work to open federal lands to responsible development—OCS, ANWR, NPRA. Make the national security case and the economic health of the nation case better.

Adopt a rational and positive attitude with the industry to foster continued developments on state lands. Consider formation of a state oil company to gain better information about costs and opportunities.
Can development of these resources generate the public revenues we have grown accustomed to?

No. This table shows the fiscal terms associated with production from lands under different ownership.

I won’t go into the details of this matrix, but the bottom line is that production on federal lands generates less revenue per barrel than production on state lands.
If we run a hypothetical oil field through each of the various land ownership alternatives, we can see this variation. Most dramatic is the difference between $838 million annually from a field on state land (left column) and $0 from a field in the OCS more than 6 miles offshore (far right column). The state would get some revenues from OCS production, but it would be from the onshore activity associated with the offshore production.
How then should we deal with the fact that future petroleum production will generate only modest state revenues? We want to maintain our current level of public spending and to sustain the jobs and economic boost created by that spending.

We need to change the way we think about petroleum revenues.

We cannot continue to mindlessly collect the revenues, pat ourselves on the back when we put a few dollars away in a savings account, spend a few more dollars when we have a short-term surplus, and hope for the best.

First we need to inventory our petroleum wealth.

My estimate of our wealth is $126 billion, consisting of $45 billion of financial assets derived from past revenues and $81 billion in likely tax and royalty revenues from petroleum still in the ground. This is the present value of those future revenues.

Then we need to decide how to manage it.

We always say our natural resources belong to all Alaskans. If we really believe that, then every Alaskan should have an equal right to a share of this net worth.

Let’s assume we care about all future generations of Alaskans, that population is growing 1% a year sustained by the petroleum industry, and that future generations of Alaskans will be neither richer nor poorer than we are today.
Then I can calculate the maximum amount we can distribute from our wealth this year to each Alaskan and still maintain its value for future generations.

It is $7,200.

If we constrain the distribution to that amount, we can give each Alaskan that same amount, adjusted for inflation, next year, and the next year, and so on as long as necessary until some other economic driver can replace petroleum jobs and revenues.
Since there are 700 thousand Alaskans, that means we can spend $5 billion this year and preserve our net worth for future generations. Any additional spending would need to come from sources other than our petroleum wealth.

The flip side of sustainable spending is savings. If spending is preserving our net worth, then whatever petroleum revenues are not spent must go into income-generating investments.

As it turns out, this year we will spend somewhat more than $5 billion from petroleum wealth—the combination of general fund spending financed by oil revenues, and the Permanent Fund dividend financed by financial assets ultimately generated from petroleum.

But on the other hand, the price of oil is running higher than anticipated so we find ourselves in the position—totally by accident and good luck—of being on a sustainable spending path at the moment.

A shift to net asset fiscal management would require a complete change in the way we think about budgeting, away from our focus on current petroleum revenues—not an easy task.

But without such a shift we are clearly on a non-sustainable path toward a fiscal crash.

And a shift would mean alignment between those who pay and those who benefit from public services (no shifting of fiscal burden to future generations), it would demonstrate our ability to manage our wealth responsibly, and it would de-couple wealth management from the annual budget cycle, which demands ever increasing revenues from petroleum to feed the state budget.
This is how our wealth management plan would look over time—from the date of discovery of oil, when it was all in the ground, until the date when all the oil has been produced. With this strategy, the net asset value of combined assets grows over time with population.
So in closing my answer to the question of whether our petroleum economy is sustainable is—MAYBE?

Petroleum offers the best chance for continued prosperity, but comes with no guarantee. We can’t be complacent like the frog in the pot of boiling water. We need to jump out before it’s too late and become proactive in the creation of our own future.

We have been both smart and lucky. But looking forward we need to be smarter because we cannot count on good luck. We need to take to heart the words of Yogi Berra “The future ain’t what it used to be.”

Thank you for your kind attention.
Alaska’s Petroleum Industry: Sustainable—If We Take Action.

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