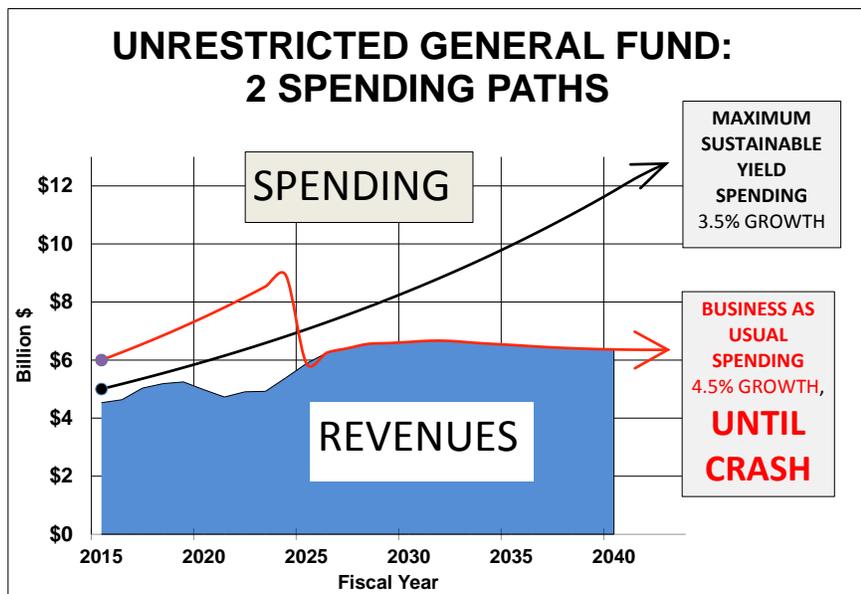


This is the third update of a series we began in 2012, estimating how much Alaska’s state government can afford to spend, without risking sudden big budget deficits and economic hardships for Alaskans in the near future. Those problems are looming because oil revenues currently pay almost all the bills for public services—and oil production has been dropping since the late 1980s. But Alaska can extend the benefits from oil, by adding to the Permanent Fund and other financial accounts—so the earnings from financial accounts can increasingly take the place of petroleum revenues. Those revenues are expected to keep dropping, even with revenues from new oil sources and from a potential gas pipeline.

Summary

- Alaska’s state government can afford to spend about \$5 billion from the unrestricted General Fund in fiscal year 2015, increasing with population growth and inflation in the following years.¹ That estimate is based on the state’s current \$139 billion petroleum nest egg—a combination of \$65 billion in financial accounts and \$74 billion in expected oil revenues.
- By saving any incoming oil revenues or financial earnings above that \$5 billion level, the state could build up the Permanent Fund and other financial assets faster than petroleum revenues decline.
- This estimate of sustainable spending is nearly 10% lower than our estimate of \$5.5 billion for fiscal year 2014, due to two factors—a big drop in the Alaska Department of Revenue’s projection of future



petroleum revenues from conventional oil, and a large draw on the state’s cash reserve to cover the actual fiscal year 2013 and anticipated fiscal year 2014 deficits.

The governor’s proposed budget for fiscal year 2015 is \$5.6 billion, down from \$7.2 billion last year. But assuming the final budget will be about \$6 billion, after legislative add-ons, it is still not sustainable. If this year’s spending is \$6 billion (“business as usual” in the graph), and it grows at an annual rate just 1% faster than population and inflation, the cash

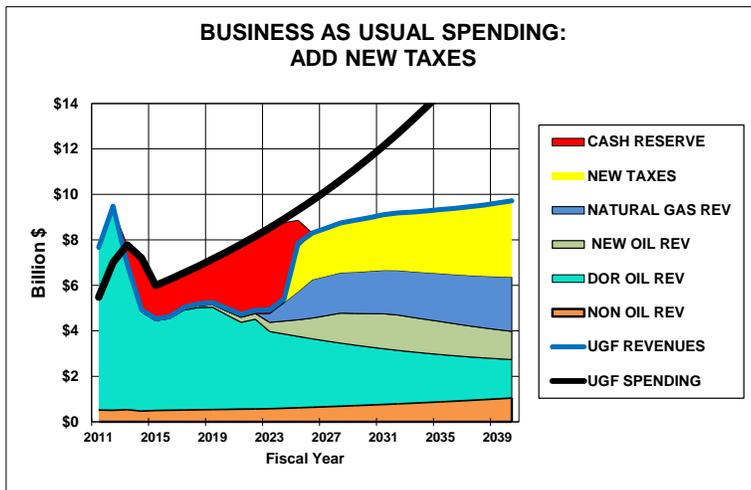
reserves (not including the Permanent Fund) would be exhausted by 2024 and the fiscal gap could reach \$3.5 billion.

But if the fiscal year 2015 budget were \$5 billion, and it grew only as fast as population and inflation (“maximum sustainable yield” in the graph), the cash reserves would last much longer and a growing petroleum nest egg could produce enough earnings to sustain the state budget long into the future.

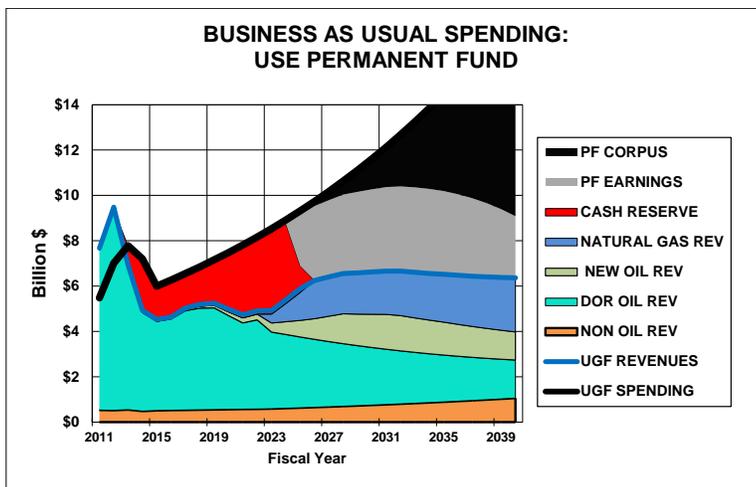
This research is part of ISER’s *Investing for Alaska’s Future* initiative, funded by a grant from Northrim Bank.

Business as Usual Spending

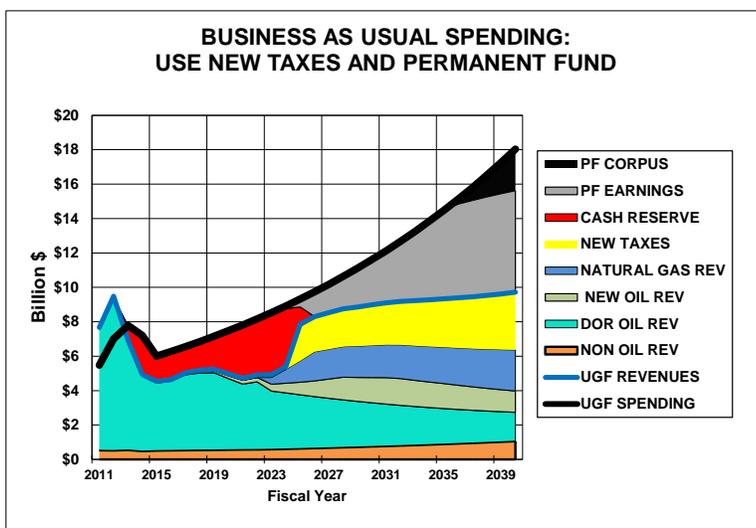
The state has two revenue sources available to continue on the Business as Usual spending path for the unrestricted General Fund after the cash balance runs out in 2024—new taxes and the Permanent Fund.



But adding both a statewide income and a statewide sales tax at rates comparable to other states would not bring in enough new revenue to offset the loss of the cash reserve. Spending would still need to fall to the level of available revenues. The simultaneous combination of new taxes and less public spending (because of the importance of state spending as an economic driver) would knock the economy into a sustained recession and put it permanently onto a slower growth path.



These negative impacts could be temporarily avoided instead by filling the gap with the undedicated earnings of the Permanent Fund (the earnings left after payment of the dividend and inflation proofing). But after a few years those earnings alone would be insufficient. Continued use of the Permanent Fund would require dipping into and drawing down the constitutionally protected corpus of the fund.ⁱⁱ

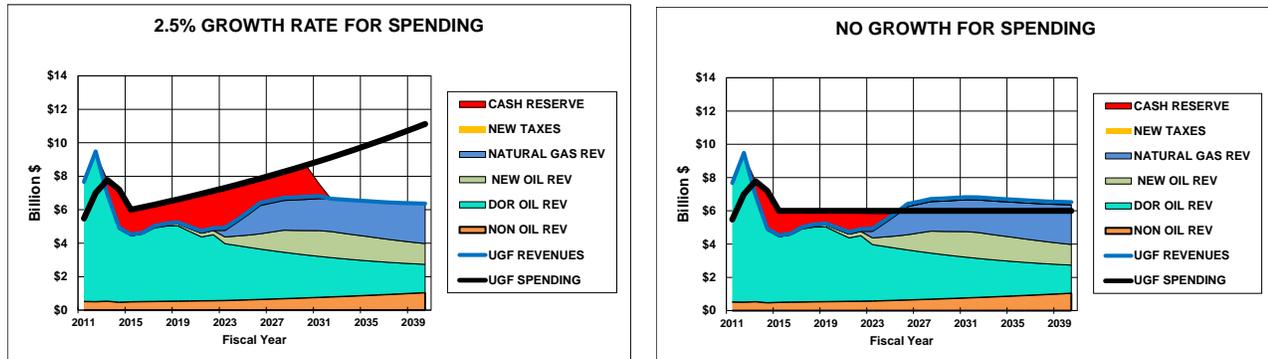


New taxes and the use of Permanent Fund earnings together would fill the hole in the budget for a longer period. But eventually even this alternative would require drawing down the corpus of the Permanent Fund.

Constrain Spending and Save More

The Business as Usual spending scenario is not sustainable because spending growth outstrips falling revenues, and earnings from the cash balance are not large enough to fill the deficit. The deficit can only be eliminated by reducing the level and growth rate of spending. Spending less and saving more today would allow time for the cash balance to grow large enough to support future spending.

For example, if the growth rate of spending were held to the rate of inflation--2.5% annually, the cash reserve would certainly last longer. And if the budget were not allowed to grow at all, the cash reserve might last forever.



Clearly less spending today reduces the likelihood of future deficits, but without some guideline, it is impossible to know how much reduction is needed. Insufficient cuts today put a burden on the future, but unnecessarily large cuts today burden the current generation. The Maximum Sustainable Yield framework for thinking about the fiscal future of the state provides that guideline.

What is Maximum Sustainable Yield (MSY) Spending?

Maximum Sustainable Yield is a method for determining how much the state can sustainably spend from its petroleum wealth by viewing that wealth as an endowment belonging to all Alaskans, including future generations. This endowment, or nest egg, consists of both future petroleum revenues and the state's financial assets accumulated from saving a portion of petroleum revenues collected in past years.

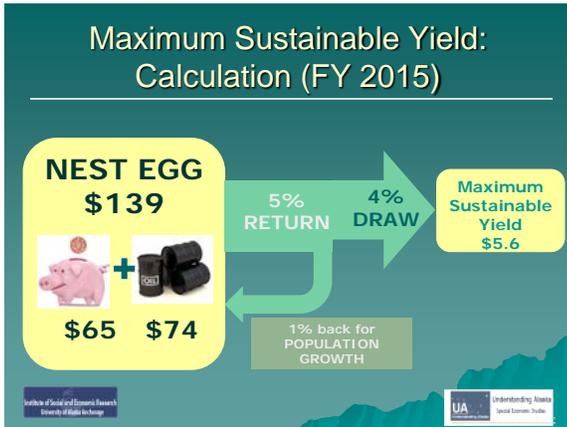
This nest egg should be managed to provide benefits equitably to current and future generations of Alaskans. This means that, over time, the flow of non-sustainable petroleum revenues would continue to be transformed into sustainable financial assets. The earnings from those financial assets would gradually replace petroleum revenues as the basis for funding state government.

Properly managed, the nest egg would, like any asset, generate an annual return which could be drawn off for current spending. By limiting this annual draw to the Maximum Sustainable Yield, the nest egg would be sustainable and future generations would share equitably with the current generation in the petroleum wealth of the state.

The problem of how much to save for future needs would be solved. All current petroleum revenue and financial earnings above the amount determined by the Maximum Sustainable Yield (MSY) calculation would be saved. This would ensure against future deficits and would be fair to all generations of Alaskans.

The draw each year from the nest egg would be limited to an amount that would sustain the value of the nest egg for future generations. This amount depends on the size of the nest egg, the return it can achieve through prudent management, and the time over which it will need to sustain public spending.

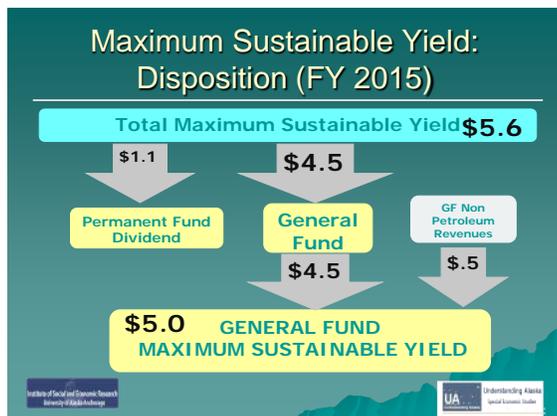
The estimated value of the nest egg at the start of FY2015 is \$139 billion--\$65 billion of financial assets and \$74 billion of petroleum revenues still in the ground. If it can be managed to generate a 5% sustainable return (net of inflation), and if it is to increase over time to account for population growth of 1%, the maximum sustainable yield draw in FY2015 would be \$5.6 billion.



FY2015 MAXIMUM SUSTAINABLE YIELD CALCULATION (BILLION \$)

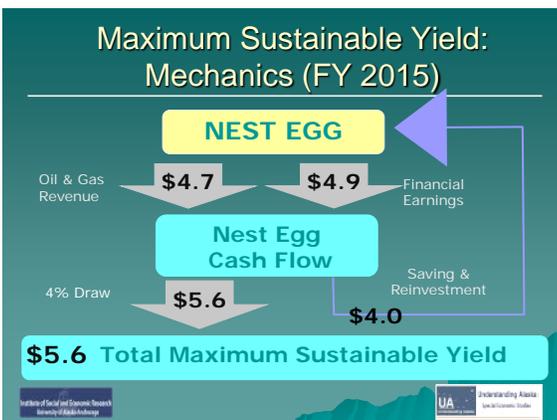
1	TOTAL NEST EGG (2+3)	\$139
2	Financial Assets	\$65
3	Petroleum Revenue in the Ground	\$74
4	Rate of Return (net of inflation)	5%
5	Minus: Reinvest for Population Growth (rate)	1%
6	Draw Rate (4-5)	4%
7	MSY FY2015 DRAW (1x6)	\$5.6

For FY2015 the \$5.6 billion draw would be allocated to pay the Permanent Fund dividend (\$1.1 billion) with the remainder (\$4.5 billion) available to pay the expenses of the unrestricted General Fund. Including the \$.5 billion of non-petroleum revenues, maximum sustainable yield spending for the unrestricted General Fund would be \$5.0 billion.ⁱⁱⁱ



FY2015 UNRESTRICTED GENERAL FUND MAXIMUM SUSTAINABLE YIELD SPENDING CALCULATION (BILLION \$)

1	MSY FY2015	\$5.6
2	Minus: Permanent Fund Dividend	\$1.1
3	Equals: Net to General Fund	\$4.5
4	Plus: GF Non Petroleum Revenues	\$.5
5	Equals: UNRESTRICTED GENERAL FUND MSY SPENDING FY2015	\$5.0



The annual return of the nest egg is not the same as the cash flow of the nest egg. The cash flow is the amount of cash the nest egg generates each year. Because it includes current non-sustainable petroleum revenues as well as financial earnings, it is larger than the annual draw. The difference between the cash flow and the annual draw is the reinvestment necessary to offset not only population growth, but also inflation and the depletion of the remaining petroleum revenues. In FY2015 the total cash flow of \$9.6 billion will consist of \$4.7 billion of oil and

gas revenues and \$4.9 billion of financial earnings. Of the total cash flow, \$5.6 billion would be available for the MSY draw and \$4 billion reinvested.

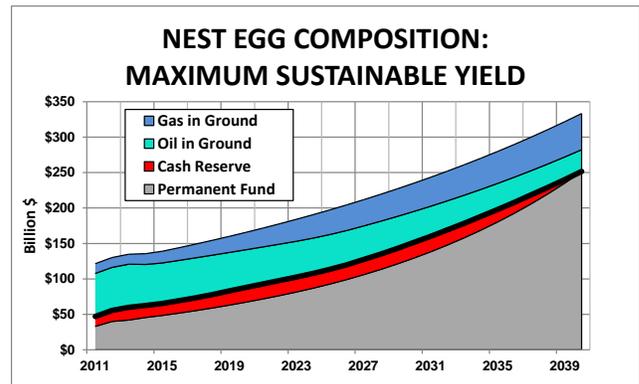
MSY Path in Future Years: The Importance of Financial Asset Management

The \$4 billion reinvested in FY2015 would increase the value of the financial accounts by more than the decline in value of future petroleum revenues, and the total value of the nest egg would grow by 3.5% to offset inflation(2.5%) and population growth (1%). This would allow the draw from the next egg in the following year, FY2016, also to grow with population and inflation to \$5.8 billion. The rest of the cash flow in FY2016, \$4.2 billion, would re-invested. A draw increasing at 3.5% in subsequent years would allow the nest egg to continue to grow at the same rate.

FISCAL YEAR	NEST EGG: DISPOSITION OF CASH FLOW (BILLION \$)					
	CASH FLOW (IN)			DISPOSITION (OUT)		
	TOTAL	Financial Earnings	Revenue	TOTAL	Draw (MSY)	Deposit in Nest Egg
2015	\$ 9.6	\$ 4.9	\$ 4.7	\$ 9.6	\$ 5.6	\$ 4.0
2016	\$ 10.0	\$ 5.2	\$ 4.8	\$ 10.0	\$ 5.8	\$ 4.2
2017	\$ 10.7	\$ 5.5	\$ 5.2	\$ 10.7	\$ 6.0	\$ 4.7
2018	\$ 11.2	\$ 5.9	\$ 5.3	\$ 11.2	\$ 6.2	\$ 4.9
2019	\$ 11.6	\$ 6.2	\$ 5.3	\$ 11.6	\$ 6.5	\$ 5.1
2020	\$ 11.6	\$ 6.6	\$ 5.0	\$ 11.6	\$ 6.7	\$ 4.9
2021	\$ 11.7	\$ 7.0	\$ 4.7	\$ 11.7	\$ 7.0	\$ 4.7
2022	\$ 12.2	\$ 7.3	\$ 4.8	\$ 12.2	\$ 7.2	\$ 5.0
2023	\$ 12.6	\$ 7.7	\$ 4.9	\$ 12.6	\$ 7.5	\$ 5.1
2024	\$ 13.5	\$ 8.1	\$ 5.4	\$ 13.5	\$ 7.7	\$ 5.7

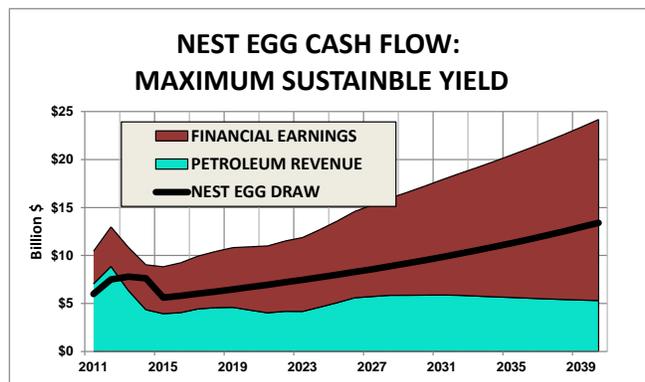
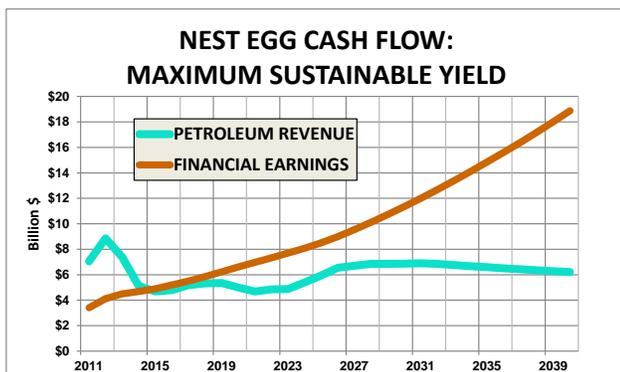
Over time the value of the petroleum revenues remaining in the ground (adjusted for inflation) would fall but be more than offset by the increase in the value of financial assets.

FISCAL YEAR	NEST EGG COMPOSITION (BILLION \$)					UGF MSY
	TOTAL	FINANCIAL ASSETS			PV REVENUES IN GROUND	
		TOTAL	PF	Other		
2015	\$ 139.0	\$ 65.3	\$ 48.5	\$ 16.8	\$ 73.8	\$ 5.0
2016	\$ 144.0	\$ 69.2	\$ 51.8	\$ 17.4	\$ 74.8	\$ 5.2
2017	\$ 149.2	\$ 73.4	\$ 55.3	\$ 18.1	\$ 75.8	\$ 5.4
2018	\$ 154.5	\$ 78.1	\$ 59.1	\$ 19.0	\$ 76.5	\$ 5.5
2019	\$ 160.1	\$ 83.0	\$ 63.1	\$ 19.9	\$ 77.1	\$ 5.7
2020	\$ 165.8	\$ 88.1	\$ 67.3	\$ 20.8	\$ 77.7	\$ 5.9
2021	\$ 171.7	\$ 93.0	\$ 71.8	\$ 21.2	\$ 78.7	\$ 6.2
2022	\$ 177.8	\$ 97.7	\$ 76.5	\$ 21.2	\$ 80.1	\$ 6.4
2023	\$ 184.1	\$ 102.7	\$ 81.6	\$ 21.1	\$ 81.5	\$ 6.6
2024	\$ 190.7	\$ 107.8	\$ 87.0	\$ 20.8	\$ 82.9	\$ 6.8



In FY2018 the share of the nest egg held as financial assets would exceed 50%, underscoring the importance of financial management to the success of a sustainable fiscal policy.

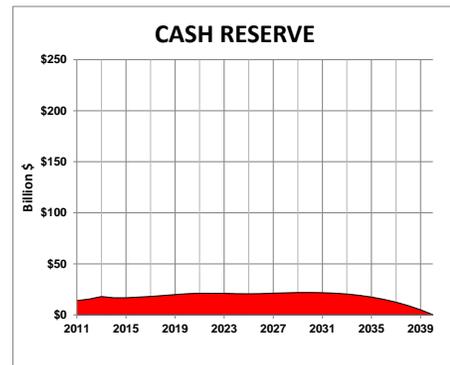
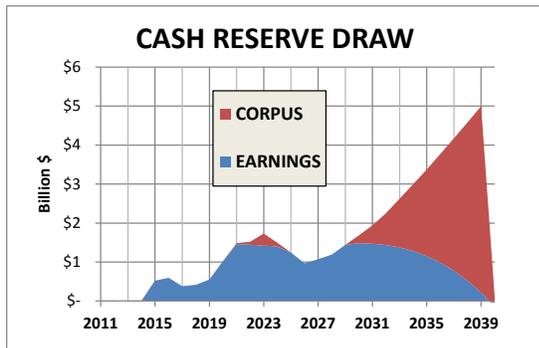
As financial resources became a larger share of the nest egg, their earnings would become a larger share



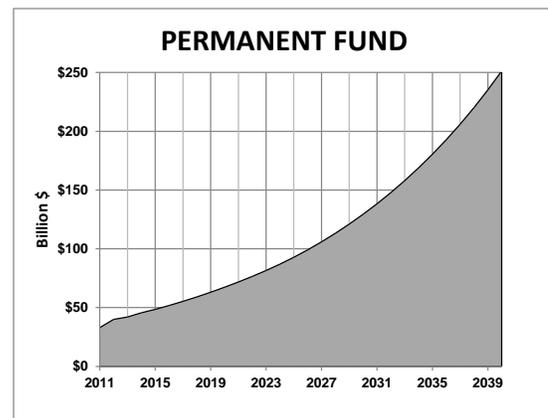
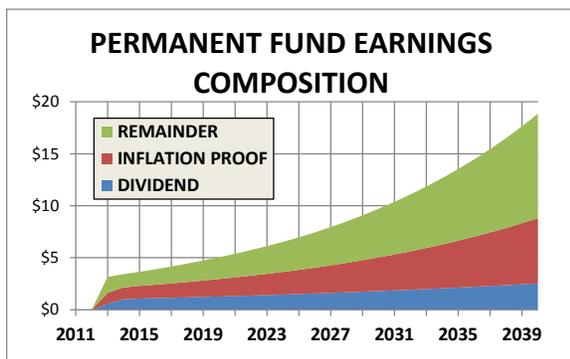
of the annual cash flow. And the annual draw would come increasingly from financial earnings as petroleum revenues declined in importance.

Implementation

State financial assets are currently divided into a cash reserve (the Constitutional Budget Reserve, Statutory Budget Reserve, and some smaller “designated reserves”) and the Permanent Fund. The following set of graphs show how those assets might change over time if MSY were implemented by relying on the cash reserve to cover the deficit as long as possible before turning to the earnings of the Permanent Fund. They show the cash reserve could cover the unrestricted General Fund deficit through FY2039. Initially only the earnings of the cash reserve would be used to cover the deficit, and the cash reserve would grow. Eventually however the corpus of the cash reserve would be spent.



Reliance on the cash reserve in the early years would allow time for the Permanent Fund to grow so that when needed, only the undedicated earnings would be used to cover the deficit. Payment of the dividend and inflation proofing would continue indefinitely.



Different schemes for managing the use of the state’s financial assets would not change the calculation of MSY. In the next few years the MSY draw would come from current petroleum revenues and only a portion of the state’s financial earnings. The portion of financial earnings used each year would grow, but never reach the point where spending of the corpus of total financial assets would occur.^{iv}

Full implementation of MSY requires that the cash reserve will be available to use when needed, that restrictions are in place to prevent overspending from the reserve until it is needed, and that the entire nest egg is managed as a long term asset for maximum return.

But currently most of the cash reserve is held in the Constitutional Budget Reserve (CBR), with restrictions on when and how it can be used (including earnings), as well a constitutional requirement that any withdrawals be repaid. The rest of the cash is held in accounts that can be immediately accessed like the Statutory Budget Reserve (SBR) or accessed through statutory change. There are no rules that limit the draw on these accounts to only their earnings. Furthermore, neither the CBR nor SBR are managed to maximize long run earnings.

The MSY Spending plan can be implemented (as described above) in spite of these institutional constraints. However its management would be easier – and the reserve would support a higher sustainable spending level -- if the CBR was downsized consistent with its original purpose, most of the cash reserve was deposited into the Permanent Fund, the Permanent Fund was managed according to the Percent of Market Value (POMV) rule, and the undedicated earnings of the Permanent Fund used as part of the MSY draw.

Then the draw on the financial asset would come from the annual return on the Permanent Fund, calculated using the percent of market value rule for the size of the draw available to fund spending, including both the dividend and the unrestricted General Fund. Since that amount would be relatively stable from year to year, the CBR, established to smooth out yearly fluctuations in revenues, could be smaller. With most of the cash balance deposited into the Permanent Fund, it would be managed, like the Permanent Fund is today, for maximum long term return.

With most of the cash balance deposited in the Permanent Fund, there would be less temptation to spend at a non-sustainable rate. Shifting money from the cash balance into the Permanent Fund would also increase the future size of the Permanent Fund dividend.^v

Transition to Sustainability (Avoiding the Tipping Point)

Transitioning to a sustainable spending path requires cutting spending—painful because it not only reduces public programs and but also negatively impacts the economy. So it seems rational to postpone the cuts for as long as possible.

But the longer we wait, the bigger the budget cuts must be and the larger their negative economic impacts. Small cuts are manageable, but at some size the cuts would produce “tipping points” that would change the whole structure of spending and the economy.

Consider the economic effects. State government spending of petroleum revenue puts “cash on the street” and is one of the drivers of economic growth, along with natural resource development and federal spending. Cutting the budget reduces the strength of that driver, putting a drag on employment growth.

A small cut in the budget would create only a small economic drag and the overall economy could continue to grow, albeit at a somewhat slower rate. But a large cut in the budget would create such a large economic drag that could not be offset by growth of our other economic drivers.

A few years of slower than average employment growth is undesirable but manageable without major dislocations. But a drop in employment would have more severe, far reaching, and long lasting consequences. Many Alaskans remember the outmigration, personal and business bankruptcies, and

collapse of the real estate market that resulted from the cut in state spending in 1986 that led to a drop in employment. Without the Exxon Valdez oil spill, the cleanup of which pumped several billion dollars into the economy, the impacts of going over the “tipping point” would have lasted into the decade of the 1990s.

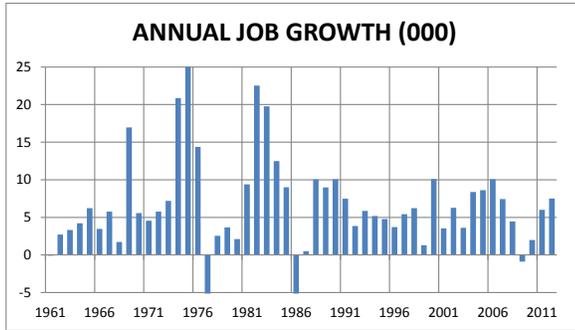
Most people would probably prefer a number of years of slower than average employment growth than re-experience the economic recession of the mid-1980s.

FY2015 UGF spending may end up in the range of \$6 billion (after legislative add-ons), more than \$1 billion less than the year before. The negative impacts of this reduction on public programs and the economy will be modest, although certainly not painless, because the biggest reduction is in the postponement for a year of an appropriation of more than \$600 million to the PERS/TRS retirement accounts.^{vi} Much of the rest is programs where the spending is spread over several years, cushioning the effect of a loss in a single year.

UNRESTRICTED GENERAL FUND (BILLION \$)	FY2014 Authorized	FY2015 Proposed	Change
TOTAL PRE TRANSFER AUTHORIZATION	\$7.207	\$5.570	(\$1.637)
TOTAL OPERATING	\$5.930	\$5.141	(\$0.789)
Agency Operations	\$4.386	\$4.369	(\$0.017)
Non-formula	\$2.297	\$2.265	(\$0.032)
Formula	\$2.089	\$2.104	\$0.0152
Statewide Operations	\$1.544	\$.772	(\$0.772)
Debt Service	\$.207	\$.232	\$0.025
Direct Appropriation to Retirement	\$.634	\$.010	(\$0.629)
Revenue Sharing	\$.060	\$.060	\$0.00
Oil and Gas Tax Credits	\$.600	\$.450	(\$0.150)
Other	\$.040	\$.030	(\$0.018)
TOTAL CAPITAL	\$1.276	\$.430	(\$0.846)
Projects	\$.769	\$.426	(\$0.343)
AGIA Reimbursement	\$.025	0	(\$0.025)
Sustainable Energy Fund	\$.125	0	(\$0.125)
In-state Gas Pipeline Fund	\$.355	\$.003	(\$0.352)
Other	\$.002	0	(\$0.002)
Source: Fiscal 2015 Governor Fiscal Summary, December 13, 2013. Excludes transfers.			

Taking the next step--transitioning from \$6 billion down to a Maximum Sustainable Yield spending level of \$5 billion--would be more difficult, both for maintaining public services and for maintaining the health of the economy. Stretching the transition over several years would eat up a little of the nest egg, but the loss would be a small price to pay to avoid the possibility of hitting a “tipping point” for public programs or the economy.

For example, if the budget were held constant at \$6 billion (nominal \$), after 5 years it would be close to the sustainable spending level. During that transition, inflation would eat away at the value of “cash on the street” coming from state spending at the rate of about \$200 million annually. Whether a drag on the economy of this size would be large enough to trigger a “tipping point” of negative growth would depend on the strength of the other economic drivers.



Through the last decade, economic growth has been adding about 5,000 jobs on average each year. The economy might be able to absorb \$200 million in cuts and continue to grow if those cuts created an economic drag of no more than 1,000 to 2,000 jobs lost each year.

What’s In the Nest Egg?

The nest egg consists of financial assets accumulated from past saving of petroleum revenues as well as the current value of the estimated revenues from future petroleum production.

FINANCIAL ASSETS (BILLION \$)	
TOTAL	\$65
PERMANENT FUND	\$48.5
CONSTITUTIONAL BUDGET RESERVE	\$12.0
STATUTORY BUDGET RESERVE	\$2.1
DESIGNATED RESERVES	\$2.7
Estimated balances at the start of FY2015.	

The current value of financial assets is estimated to be \$65 billion, mostly in the Permanent Fund, and in the cash reserve—the Constitutional Budget Reserve and the Statutory Budget Reserve as well as some “designated reserves”.^{vii}

The value of revenues from future production is \$74 billion. We determine this value by estimating future taxes and royalties for 50 years, assuming the current fiscal structure and energy prices as well as

estimates of economically recoverable reserves, both known and unknown. We convert these revenue flows to their net present value at a discount rate equal to the rate of return on financial investments. (This method is similar to monetizing the flow of revenues that assets can produce by calculating their net present value.)

The value of revenues from future production is broken into three categories—conventional oil in known fields, unconventional and new oil, and natural gas.

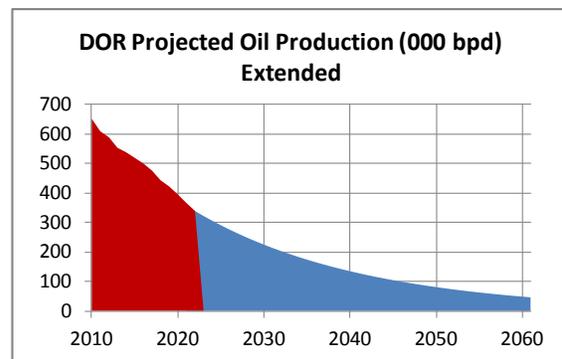
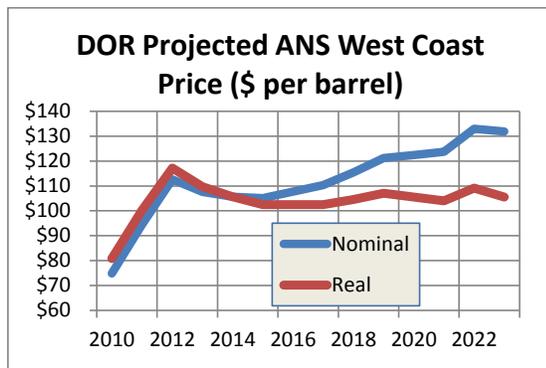
The present value of future revenues is modest for three reasons. Future production is likely to be more costly than current production on state lands. A larger share of production in the future will be on federal lands which generate no royalties directly for the state and are exempt from some state taxes. Therefore, the revenue “take” per barrel of future production will be lower than that on current production. Finally, the discounting of revenues that will not be received for many years reduces their value today.

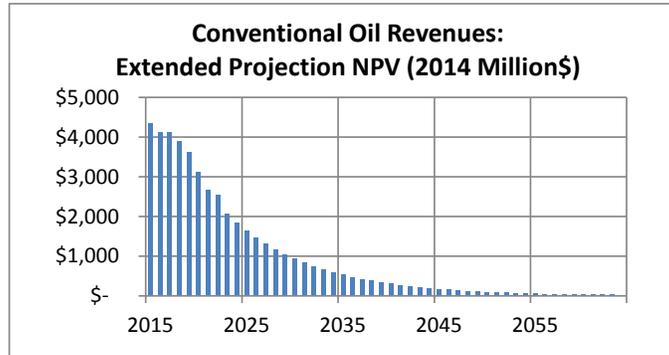
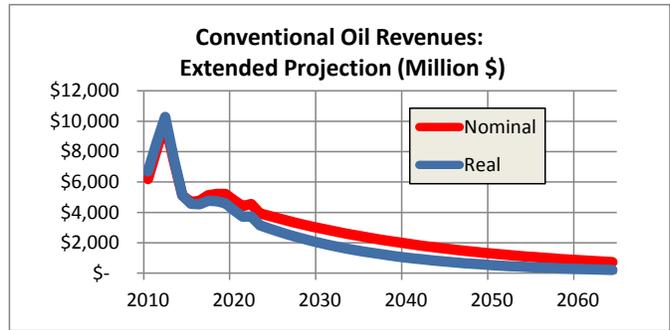
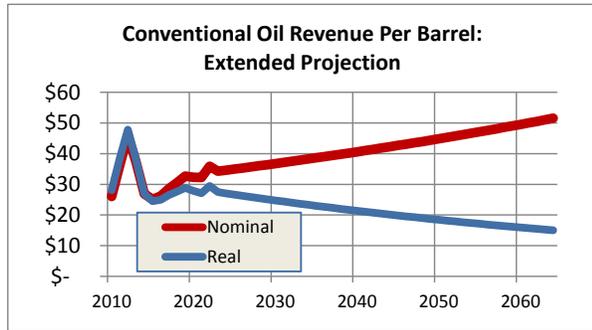
NET PRESENT VALUE: FUTURE PETROLEUM REVENUES (BILLION \$)

TOTAL	\$74
CONVENTIONAL OIL IN KNOWN FIELDS	\$47.4
2015-2023	\$30.5
2024-2064	\$16.9
UNCONVENTIONAL AND NEW OIL	\$9.8
Conventional from New Fields in Central North Slope	\$4.8
Shale Oil	\$1.8
Viscous and Heavy Oil	\$1.3
OCS	\$1.8
ANWR	0
NPRA	0
NATURAL GAS	\$16.5
Estimates based on 50 year time horizon beginning in FY2015.	

Conventional Oil in Known Fields is estimated through 2023 from the Fall 2013 forecast of the Alaska Department of Revenue (DOR) in Revenue Sources. This is almost entirely conventional oil on state lands, but also includes small amounts of production on federal lands (OCS and NPRA) and private lands, as well as some unconventional oil (viscous oil). After 2023, we project production to decline at 5% annually and revenue per barrel to increase at 1%—about half the rate of inflation (2.5%).

Based on these assumptions, the 50-year cumulative revenues would be \$119 billion, generated from production of 3.3 billion barrels of oil. The net present value of revenues would be \$47 billion.



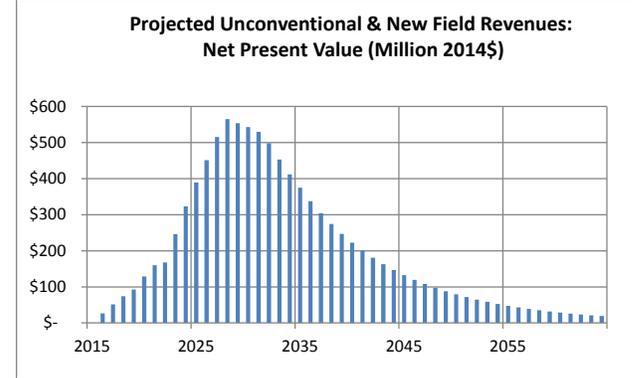
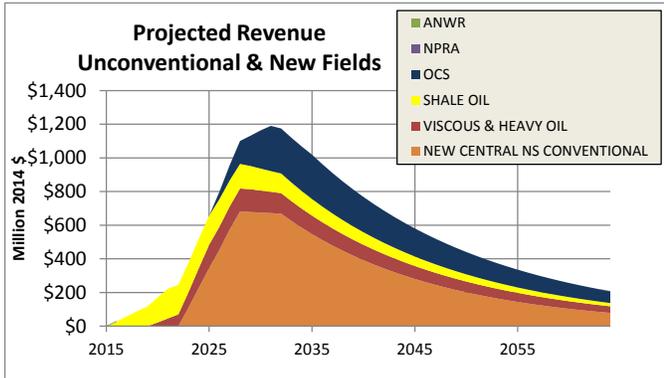
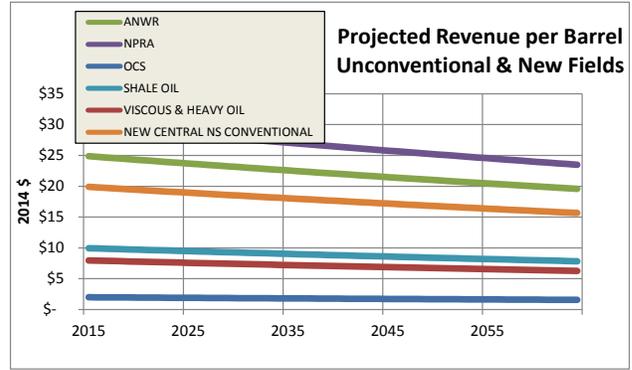
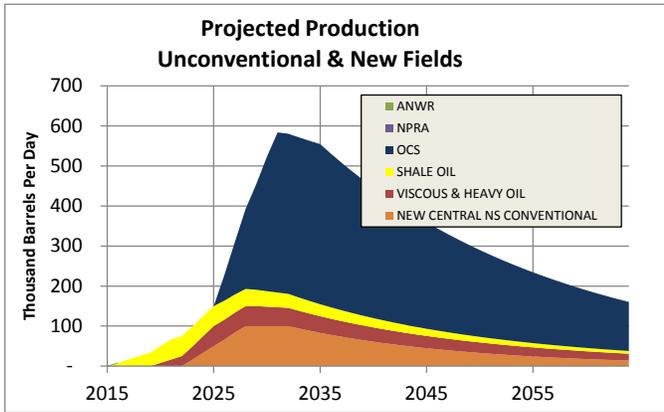


Unconventional and New Oil is divided into six categories, with revenues from each based on production and per barrel revenue—or “take”—assumptions summarized below.

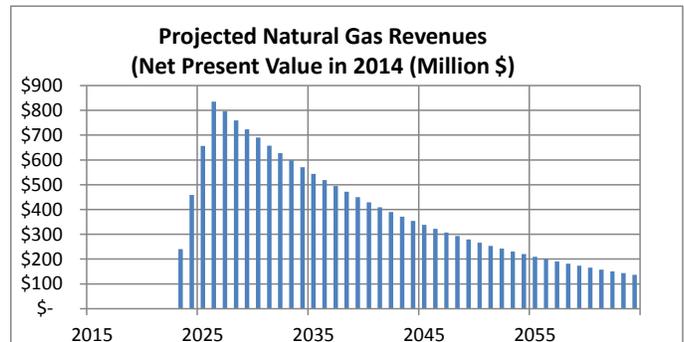
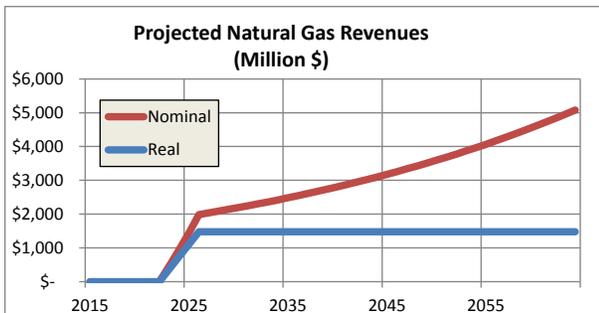
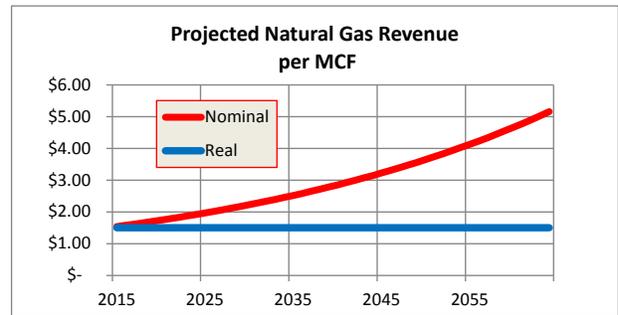
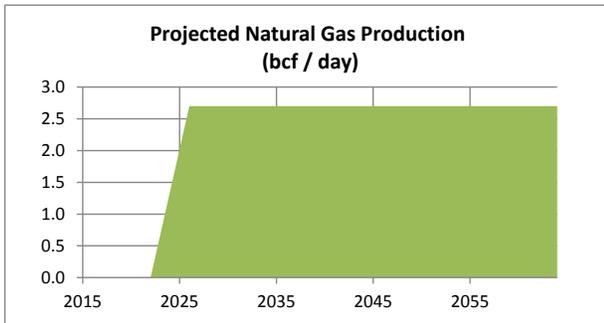
	OCS	Viscous & Heavy Oil	ANWR	NPRA	Shale Oil	New Central NS Conventional
START OF PRODUCTION	2026	2020	2200	2200	2016	2023
PEAK PRODUCTION IN BPD (000)	400	50	500	0	50	100
ANNUAL DECLINE RATE	4.0%	3.0%	5.0%	5.0%	5.0%	6.0%
FIRST YEAR REVENUE PER BARREL IN 2014 \$ (net of property tax share to local govts)	\$ 2	\$ 8	\$ 25	\$ 30	\$ 10	\$ 20
REVENUE PER BARREL GROWTH RATE (Nominal)	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%

Estimated revenues assume no production from ANWR. OCS revenues exclude royalties and production taxes. And although there is no production separately indicated for NPRA, there is NPRA production, as well as a small amount of viscous oil production, built into the DOR forecast. These assumptions produce an estimate of \$52 billion in revenues over the next 50 years, based on production, both on and offshore, of 5.3 billion barrels of oil. The net present value of revenues would be \$10 billion.

	TOTAL	OCS	Viscous & Heavy Oil	ANWR	NPRA	Shale Oil	New Central NS Conventional
CUMULATIVE 2015-2064 (50 YEARS)							
PRODUCTION FOR 50 YEARS (Billion Barrels)	5.25	3.52	0.52	-	-	0.44	0.77
REVENUES (Billion \$)	\$ 51.6	\$ 12.6	\$ 7.1	\$ -	\$ -	\$ 6.6	\$ 25.3
NET PRESENT VALUE OF REVENUES (Billion \$)	\$ 9.8	\$ 1.8	\$ 1.3	\$ -	\$ -	\$ 1.8	\$ 4.8



Natural Gas is monetized through a pipeline to tidewater, exporting 2.7 bcf of LNG per day starting in 2023. Because of the high cost of getting the gas to market, the netback value on the North Slope—which is the basis for taxes and royalties—is modest. So the “take” at start-up is \$1.50 per mcf. Over the 50 year life of the project, LNG sales would be 40 tcf generating \$132 billion in revenues. The net present value of those revenues would be \$16.5 billion.



Sensitivity of Estimates

This next table shows how estimates of the size of the nest egg and MSY have changed over the last 4 years. This year to year change is due mostly to changes in assumptions about future petroleum revenues, but also to the effect of overspending eroding the value of the nest egg, and refinements of the MSY methodology. For example the change from FY2014 to FY2015 is mostly the result of the lower petroleum revenue projection of the Alaska Department of Revenue^{viii}.

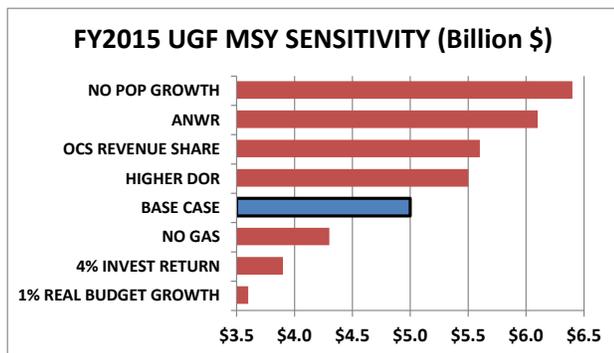
NEST EGG AND MAXIMUM SUSTAINABLE YIELD ESTIMATES OVER TIME

Calculation Year	Nest Egg			General Fund		Fiscal Burden	Source
	Total	Financial Assets	Revenue from Petroleum in the Ground	MSY	Actual Spend		
FY2012	\$126	\$45	\$81	\$5.0	\$7.0	\$2.0	Feb 2011, Web Note 7 & May 2011, Web Note 8
FY2012	\$155	\$55	\$100	\$6.2	\$7.0	\$.8	March 2012, Web Note 10
FY2013	\$160	\$60	\$100	\$6.4	\$7.6	\$1.2	August 2012, Web Note 13
FY2014	\$149	\$60	\$89	\$5.5	\$7.2	\$1.7	Jan. 2013, Web Note 14
FY2015	\$139	\$65	\$74	\$5.0	?	?	Jan. 2014, Web Note 15

The dollar value change in the assumption of future petroleum revenues during this 4 year period has been much larger than the change in MSY. This of course is partly because the MSY depends on the value of financial assets as well as future petroleum revenues. As time goes by and financial assets make up a larger share of the nest egg, the MSY should become more stable compared to variations in future petroleum revenue projections.

Nonetheless the MSY variation from year to year underscores the fact that it should be used as a general guideline for spending rather than a hard rule. Its average value over a number of years would be a better guide to spending than the value from a single year.

Because of uncertainties about not only future petroleum revenues, but also development of a gas line, federal energy policy, future spending needs, financial markets, and other variables, analysts will differ in their estimates of the size of the nest egg and the MSY draw. It has even been suggested that this uncertainty makes it impossible or useless to try to estimate the size of the nest egg and develop a fiscal strategy around that estimate.



However, sensitivity analysis allows us to gauge the range of uncertainty around the current unrestricted General Fund MSY estimate of \$5 billion and suggests that the recent budgets of \$7.8 billion and \$7.2 billion would only be sustainable under very optimistic circumstances. It would be very risky to continue to spend at that level.

For example, if the revised oil tax resulted in a 25% increase in future conventional petroleum revenues, the MSY would increase to \$5.5 billion. State sharing

of federal royalties from OCS (Outer Continental Shelf) oil production in the Beaufort and Chukchi Seas would have a similar sized impact on the MSY. Production from ANWR could make a bigger difference, but not adjusting spending growth to account for increasing population would have the largest positive effect on the MSY.

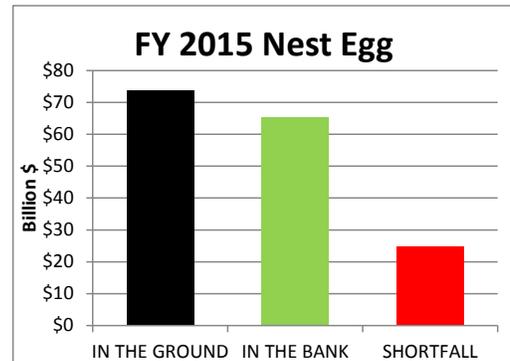
Without the revenues from a gas line, the MSY would drop to between \$4 and \$4.5 billion. A lower than 5% real return on state financial assets would have a more pronounced negative impact, and if the budget were to grow 1% faster than inflation and population, the MSY would drop to about \$3.5 billion.

Fiscal Burden and Nest Egg Shortfall

The difference between the actual unrestricted General Fund appropriation and the maximum sustainable yield is the “fiscal burden” passed to a future generation of Alaskans. It is the amount future generations will pay—either in reduced services or higher taxes--because the current generation spent above the sustainable level. The “nest egg deficit” is the amount the nest egg falls short of being able to support a sustainable spending path.

For example, as shown below, if FY2015 General Fund spending were to be \$6 billion, the fiscal burden on future generations would be \$1.0 billion. Furthermore, it would take an additional \$25 billion in the petroleum nest egg for that higher level of spending to be sustainable into the future.

FISCAL BURDEN CALCULATION (BILLION \$)						
FY2015 UGF Spending	\$5.5	\$6.0	\$6.5	\$7.0	\$7.5	\$8.0
Fiscal Burden	\$0.5	\$1.0	\$1.5	\$2.0	\$2.5	\$3.0
Nest Egg Shortfall	\$12.5	\$25	\$37.5	\$50	\$62.5	\$75
Fiscal Burden and Nest Egg Deficit assume future budget growth constrained to be the combined rate of inflation and population increase.						



Other Forms of Petroleum Wealth

The state has put \$45 billion of the \$182 billion of petroleum revenues collected through FY2013 into financial assets that today have a value of \$65 billion.

The state has spent much of the rest to enhance the well-being of Alaskans through investments in physical capital like roads, harbors, and utility systems, and in human capital through spending on health care, education, and other services. Estimates of the value of those investments are not available, but they certainly enhance the size of the petroleum nest egg.

And although the value of those investments has not been quantified, the MSY fiscal strategy does not ignore them: the sustainable flow of earnings from the financial nest egg provides the state with the funding to continue to invest in the well-being of both present and future generations of Alaskans.

The strategy also provides a framework for deciding when an investment in physical or human capital would provide more benefit than a financial investment. That would be the case when it could be demonstrated that the flow of benefits from such an investment would exceed the flow of benefits that would come from spending the income from the financial investment.

PETROLEUM WEALTH MANAGEMENT WORKSHEET (BILLION \$)						
		FY 2013	FY 2014	FY 2015	3 YEAR AVG*	CHANGE FY14 to FY15
PETROLEUM WEALTH (NEST EGG)						
1	FINANCIAL ASSETS (2+3+4+5)	\$ 60.00	\$ 60.00	\$ 65.27	\$ 62.96	\$ 5.3
2	Permanent Fund Balance	\$ 42.00	\$ 43.00	\$ 48.50	\$ 45.35	\$ 5.5 a
3	+ Constitutional Budget Reserve	\$ 16.00	\$ 11.00	\$ 12.00	\$ 13.29	\$ 1.0 b
4	+ Statutory Budget Reserve	\$ 2.00	\$ 5.00	\$ 2.07	\$ 3.08	\$ (2.9) c
5	+ Other	\$ -	\$ 1.00	\$ 2.70	\$ 1.24	\$ 1.7 d
6	PETROLEUM REVENUES IN GROUND (7+10+17)-Net Present Value discounted @ 5.0%	\$ 100.68	\$ 88.69	\$ 73.76	\$ 89.64	\$ (14.9)
7	Conventional North Slope-State Lands	\$ 80.54	\$ 67.11	\$ 47.44	\$ 66.55	\$ (19.7)
8	DOR projection (thru 2022)	\$ 50.89	\$ 43.11	\$ 30.52	\$ 42.47	\$ (12.6) e
9	DOR extended	\$ 29.65	\$ 24.00	\$ 16.92	\$ 24.08	\$ (7.1) f
10	+ Other Oil	\$ 6.75	\$ 9.85	\$ 9.82	\$ 8.97	\$ (0.0)
11	Conventional	\$ 2.14	\$ 4.75	\$ 4.85	\$ 3.97	\$ 0.1 g
12	Viscous/Heavy Oil	\$ 1.56	\$ 1.72	\$ 1.33	\$ 1.57	\$ (0.4) h
13	Shale Oil	\$ 1.57	\$ 1.72	\$ 1.85	\$ 1.74	\$ 0.1 i
14	OCS	\$ 1.49	\$ 1.67	\$ 1.80	\$ 1.68	\$ 0.1 j
15	ANWR	\$ -	\$ -	\$ -	\$ -	\$ -
16	NPRA	\$ -	\$ -	\$ -	\$ -	\$ -
17	+ Gas	\$ 13	\$ 12	\$ 17	\$ 14.13	\$ 4.8 k
18	= TOTAL PETROLEUM WEALTH (1+6)	\$ 160.68	\$ 148.69	\$ 139.0	\$ 152.6	\$ (9.7)
SUSTAINABLE DRAW RATE						
19	Real Rate of Return Net of Inflation	5.0%	5.0%	5.0%	5.0%	
20	- Projected Population Growth Adjustment	1.0%	1.0%	1.0%	1.0%	
21	- Projected Real Per Capita Budget Growth Adjustment	0.0%	0.0%	0.0%	0.0%	
22	= SUSTAINABLE DRAW RATE (19-20-21)	4.0%	4.0%	4.0%	4.0%	
23	= MAXIMUM SUSTAINABLE YIELD (18 x 22)	\$ 6.43	\$ 5.95	\$ 5.56	\$ 6.10	\$ (0.4)
UNRESTRICTED GENERAL FUND MSY SPENDING CAP						
24	Maximum Sustainable Yield (=23)	\$ 6.43	\$ 5.95	\$ 5.56	\$ 6.10	\$ (0.4)
25	- Permanent Fund Dividend Distribution	\$ 0.57	\$ 0.96	\$ 1.07	\$ 0.88	\$ 0.1 l
26	= General Fund Nest Egg Spending Cap (24-25)	\$ 5.86	\$ 4.99	\$ 4.49	\$ 5.22	\$ (0.5)
27	Item: General Fund Earnings Spending (from Petroleum Wealth)	\$ 0.18	\$ 0.07	\$ 0.08	\$ 0.11	\$ 0.0
28	Item: GENERAL FUND CURRENT PETROLEUM REVENUE SPENDING CAP	\$ 5.68	\$ 4.92	\$ 4.41	\$ 5.11	\$ (0.5)
29	+ General Fund Non-Petroleum Revenues (excluding GF earnings)	\$ 0.56	\$ 0.54	\$ 0.51	\$ 0.55	\$ (0.0)
30	= UGF MSY SPENDING (26+29)	\$ 6.42	\$ 5.53	\$ 5.00	\$ 5.77	\$ (0.5)
ACTUAL (PROJECTED) UGF APPROPRIATIONS						
31	UNRESTRICTED GENERAL FUND APPROPRIATIONS	\$ 7.80	\$ 7.20	\$ 6.00	\$ 7.15	\$ (1.2)
32	OVERSPEND = EXCESS BURDEN (31-30)	\$ 1.38	\$ 1.67	\$ 1.00	\$ 1.38	\$ (0.7)
33	PETROLEUM WEALTH DEFICIT (32/22)	\$ 34.6	\$ 41.9	\$ 24.9	\$ 34.5	\$ (16.9)
34	PETROLEUM WEALTH DEFICIT PERCENT (32/18)	22%	28%	18%	23%	
PETROLEUM WEALTH NEEDED TO OFFSET DEFICIT**						
35	IN THE GROUND	\$ 101	\$ 89	\$ 74	\$ 90	
36	IN THE BANK	\$ 60	\$ 60	\$ 65	\$ 63	
37	SHORTFALL	\$ 35	\$ 42	\$ 25	\$ 35	
38	= NEST EGG TO SUPPORT ACTUAL UGF APPROPRIATIONS (35+36+37)	\$ 195	\$ 191	\$ 164	\$ 187	
MSY Assumptions: No new taxes Growth of General Fund spending and Permanent Fund Dividend account at the combined rate of population increase and inflation All financial assets earn maximum rate of return 50 years of future petroleum revenues included in NPV analysis						
** PETROLEUM WEALTH DEFICIT CALCULATION ASSUMES FUTURE GROWTH IN APPROPRIATIONS EQUAL TO POPULATION AND INFLATION * 3 YEAR AVERAGE ADJUSTS EARLIER YEARS WITH THE ANCHORAGE CPI						
a	PF earnings higher than expected trend.					
b	Retained earnings in CBR.					
c	Balance reduced to cover FY2013 and FY2014 deficits.					
d	Inclusion of dedicated funds.					
e	Lower forecast from DOR Fall 2013 Revenue Sources.					
f	Projection starting from lower base.					
g	Higher NPV because first production now one year sooner.					
h	Production postponed and take reduced.					
i	Higher NPV because first production now one year sooner.					
j	Higher NPV because first production now one year sooner.					
k	Throughput reduced and take increased.					
l	Dividend formula incorporates higher earning years.					

ⁱ The state's fiscal year runs from July 1 through June 30; fiscal year 2015 begins July 1, 2014 and ends June 30, 2015.

ⁱⁱ Reallocation of the Permanent Fund dividend to general fund spending could postpone the need to break into the corpus of the fund.

ⁱⁱⁱ MSY is not a spending cap. It is a cap on UGF spending from petroleum wealth and current recurring non petroleum revenue. A new sustainable revenue source could be used to fund a higher sustainable spending level.

^{iv} For example setting aside \$3 billion in a special account to pay a share of the costs of the unfunded PERS/TRS retirement funds would not change the analysis. Creating this new account does not change the total value of the financial assets of the state.

^v The UGF MSY calculation assumes the PFD is converted to a constant real per capita payment. Continuing its current formula means the dividend slowly crowds out some of the draw going to the UGF.

^{vi} This does not impact the current level of purchasing power in the economy.

^{vii} These include the forward funding of education, the power cost equalization endowment, municipal revenue sharing, the Alaska Capital Income Fund, the higher education investment fund, and the AHFC CC fund.

^{viii} A partial offset to this decline was that the Permanent Fund grew faster than normal during 2013 because of the strength of financial markets.