



Quarterly Investment Performance Analysis

Montana Board of Investments

Period Ended: September 30, 2018



Montana Board of Investments
Comparative Performance
Retirement Plans

As of September 30, 2018

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	20 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Public Employees' Retirement - Net	2.79	4.54	8.21	9.92	8.40	10.22	8.07	6.44	14.80	7.32	1.86	8.07	17.38	7.78	07/01/1994
Public Employees' Benchmark	3.20	4.54	8.61	10.52	9.00	10.69	N/A	N/A	15.35	9.09	1.40	9.08	17.94	N/A	
Difference	-0.41	0.00	-0.40	-0.60	-0.60	-0.47	N/A	N/A	-0.55	-1.77	0.46	-1.01	-0.56	N/A	
Public Employees' Retirement - Gross	2.92	5.02	8.85	10.46	8.92	10.76	8.63	6.79	15.34	7.78	2.31	8.61	17.96	8.07	07/01/1994
All Public Plans > \$3B Total Fund Median	2.48	3.91	7.87	9.84	7.68	9.34	7.91	6.99	16.05	7.98	0.52	6.78	14.60	8.32	
Rank	30	11	18	28	4	13	7	73	64	58	5	7	7	61	
Teachers' Retirement - Net	2.78	4.54	8.20	9.91	8.40	10.22	8.08	6.44	14.76	7.33	1.86	8.09	17.38	7.80	07/01/1994
Teachers' Benchmark	3.19	4.54	8.60	10.51	9.00	10.69	N/A	N/A	15.32	9.08	1.40	9.11	17.94	N/A	
Difference	-0.41	0.00	-0.40	-0.60	-0.60	-0.47	N/A	N/A	-0.56	-1.75	0.46	-1.02	-0.56	N/A	
Teachers' Retirement - Gross	2.91	5.02	8.85	10.45	8.93	10.77	8.64	6.79	15.31	7.80	2.32	8.63	17.96	8.09	07/01/1994
All Public Plans > \$3B Total Fund Median	2.48	3.91	7.87	9.84	7.68	9.34	7.91	6.99	16.05	7.98	0.52	6.78	14.60	8.32	
Rank	30	11	18	28	4	13	6	73	65	58	5	7	7	60	
Police Retirement - Net	2.80	4.55	8.22	9.92	8.40	10.22	8.05	6.34	14.79	7.32	1.86	8.07	17.41	7.64	07/01/1994
Police Benchmark	3.20	4.55	8.62	10.52	9.00	10.68	N/A	N/A	15.33	9.08	1.41	9.10	17.92	N/A	
Difference	-0.40	0.00	-0.40	-0.60	-0.60	-0.46	N/A	N/A	-0.54	-1.76	0.45	-1.03	-0.51	N/A	
Police Retirement - Gross	2.94	5.03	8.87	10.46	8.92	10.76	8.61	6.69	15.33	7.78	2.31	8.61	18.00	7.93	07/01/1994
All Public Plans > \$3B Total Fund Median	2.48	3.91	7.87	9.84	7.68	9.34	7.91	6.99	16.05	7.98	0.52	6.78	14.60	8.32	
Rank	30	11	17	28	4	13	7	75	64	58	5	7	7	72	

Net performance shown is net of all manager fees and expenses (Net-All). All Public Plans > \$3B Total Fund Median is reported gross of fees. Benchmark returns reflect unmanaged indices which are not impacted by management fees. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences. Retirement plan benchmarks' inception dates were updated to 1/1/2011.

Montana Board of Investments
Comparative Performance
Retirement Plans

As of September 30, 2018

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	20 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Firefighters' Retirement - Net	2.80	4.55	8.22	9.92	8.40	10.22	8.06	6.35	14.79	7.32	1.87	8.07	17.41	7.63	07/01/1994
Firefighters' Benchmark	3.20	4.55	8.62	10.52	9.00	10.68	N/A	N/A	15.33	9.09	1.41	9.10	17.92	N/A	
Difference	-0.40	0.00	-0.40	-0.60	-0.60	-0.46	N/A	N/A	-0.54	-1.77	0.46	-1.03	-0.51	N/A	
Firefighters' Retirement - Gross	2.94	5.03	8.87	10.46	8.93	10.76	8.62	6.70	15.34	7.78	2.32	8.61	17.99	7.92	07/01/1994
All Public Plans > \$3B Total Fund Median	2.48	3.91	7.87	9.84	7.68	9.34	7.91	6.99	16.05	7.98	0.52	6.78	14.60	8.32	
Rank	30	10	17	28	4	13	7	75	64	58	5	7	7	73	
Sheriffs' Retirement - Net	2.79	4.54	8.20	9.92	8.39	10.20	8.06	6.38	14.80	7.33	1.86	8.05	17.35	7.67	07/01/1994
Sheriffs' Benchmark	3.20	4.54	8.61	10.52	8.99	10.68	N/A	N/A	15.34	9.10	1.40	9.07	17.91	N/A	
Difference	-0.41	0.00	-0.41	-0.60	-0.60	-0.48	N/A	N/A	-0.54	-1.77	0.46	-1.02	-0.56	N/A	
Sheriffs' Retirement - Gross	2.92	5.02	8.85	10.46	8.92	10.75	8.62	6.73	15.34	7.79	2.32	8.59	17.93	7.96	07/01/1994
All Public Plans > \$3B Total Fund Median	2.48	3.91	7.87	9.84	7.68	9.34	7.91	6.99	16.05	7.98	0.52	6.78	14.60	8.32	
Rank	30	11	18	28	4	13	7	75	64	58	5	7	8	71	
Highway Patrol Retirement - Net	2.78	4.55	8.22	9.92	8.40	10.22	8.08	6.36	14.79	7.30	1.87	8.08	17.38	7.66	07/01/1994
Highway Patrol Benchmark	3.20	4.55	8.61	10.52	9.00	10.69	N/A	N/A	15.34	9.09	1.41	9.10	17.94	N/A	
Difference	-0.42	0.00	-0.39	-0.60	-0.60	-0.47	N/A	N/A	-0.55	-1.79	0.46	-1.02	-0.56	N/A	
Highway Patrol Retirement - Gross	2.92	5.03	8.87	10.46	8.92	10.76	8.64	6.71	15.33	7.77	2.32	8.62	17.96	7.96	07/01/1994
All Public Plans > \$3B Total Fund Median	2.48	3.91	7.87	9.84	7.68	9.34	7.91	6.99	16.05	7.98	0.52	6.78	14.60	8.32	
Rank	30	10	17	28	4	13	6	75	64	58	5	7	7	71	

Net performance shown is net of all manager fees and expenses (Net-All). All Public Plans > \$3B Total Fund Median is reported gross of fees. Benchmark returns reflect unmanaged indices which are not impacted by management fees. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences. Retirement plan benchmarks' inception dates were updated to 1/1/2011.

Montana Board of Investments
Comparative Performance
Retirement Plans

As of September 30, 2018

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	20 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Game Wardens' Retirement - Net	2.78	4.54	8.21	9.92	8.39	10.20	8.04	6.36	14.81	7.31	1.88	8.03	17.34	7.68	07/01/1994
Game Wardens' Benchmark	3.20	4.55	8.61	10.53	9.00	10.68	N/A	N/A	15.36	9.11	1.41	9.06	17.90	N/A	
Difference	-0.42	-0.01	-0.40	-0.61	-0.61	-0.48	N/A	N/A	-0.55	-1.80	0.47	-1.03	-0.56	N/A	
Game Wardens' Retirement - Gross	2.92	5.02	8.86	10.46	8.92	10.74	8.60	6.71	15.35	7.78	2.33	8.57	17.92	7.97	07/01/1994
All Public Plans > \$3B Total Fund Median	2.48	3.91	7.87	9.84	7.68	9.34	7.91	6.99	16.05	7.98	0.52	6.78	14.60	8.32	
Rank	30	11	18	28	4	13	7	75	63	58	5	7	8	70	
Judges' Retirement - Net	2.79	4.54	8.21	9.93	8.40	10.21	8.07	6.37	14.82	7.32	1.86	8.06	17.36	7.68	07/01/1994
Judges' Benchmark	3.20	4.55	8.62	10.53	9.00	10.68	N/A	N/A	15.37	9.10	1.40	9.08	17.92	N/A	
Difference	-0.41	-0.01	-0.41	-0.60	-0.60	-0.47	N/A	N/A	-0.55	-1.78	0.46	-1.02	-0.56	N/A	
Judges' Retirement - Gross	2.92	5.02	8.86	10.47	8.93	10.75	8.63	6.72	15.36	7.79	2.32	8.60	17.94	7.97	07/01/1994
All Public Plans > \$3B Total Fund Median	2.48	3.91	7.87	9.84	7.68	9.34	7.91	6.99	16.05	7.98	0.52	6.78	14.60	8.32	
Rank	30	11	18	27	4	13	6	75	63	58	5	7	8	70	
Volunteer Firefighters' Retirement - Net	2.80	4.55	8.22	9.87	8.39	10.20	8.06	6.57	14.79	7.16	1.91	8.09	17.42	7.46	07/01/1994
Volunteer Firefighters' Benchmark	3.19	4.54	8.61	10.51	9.00	10.68	N/A	N/A	15.33	9.08	1.42	9.11	17.97	N/A	
Difference	-0.39	0.01	-0.39	-0.64	-0.61	-0.48	N/A	N/A	-0.54	-1.92	0.49	-1.02	-0.55	N/A	
Volunteer Firefighters' Retirement - Gross	2.93	5.02	8.87	10.40	8.91	10.75	8.61	6.92	15.34	7.63	2.36	8.63	18.00	7.75	07/01/1994
All Public Plans > \$3B Total Fund Median	2.48	3.91	7.87	9.84	7.68	9.34	7.91	6.99	16.05	7.98	0.52	6.78	14.60	8.32	
Rank	30	11	17	31	4	13	7	64	64	65	5	7	7	84	

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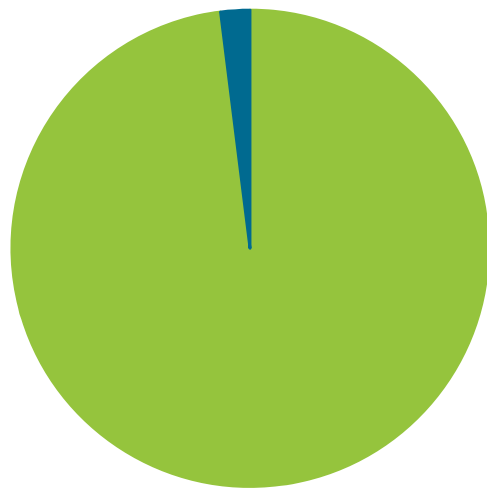


Montana Board of Investments
 Asset Allocation by Segment
 Retirement Plans

As of September 30, 2018

	Consolidated Asset Pension Pool (CAPP)		Short Term Investment Pool (STIP)		Total Fund	
	(\$)	%	(\$)	%	(\$)	%
Public Employees' Retirement	5,766,889,937	49.80	116,273,832	49.52	5,883,163,769	49.79
Teachers' Retirement	4,121,560,928	35.59	84,510,430	35.99	4,206,071,358	35.60
Police Retirement	416,345,538	3.60	8,324,571	3.55	424,670,108	3.59
Firefighters' Retirement	432,857,166	3.74	8,644,451	3.68	441,501,616	3.74
Sheriffs' Retirement	359,807,365	3.11	7,401,408	3.15	367,208,773	3.11
Highway Patrol Retirement	148,334,515	1.28	2,918,371	1.24	151,252,886	1.28
Game Wardens' Retirement	194,731,419	1.68	3,932,865	1.67	198,664,284	1.68
Judges' Retirement	102,162,259	0.88	2,048,644	0.87	104,210,903	0.88
Volunteer Firefighters' Retirement	37,887,214	0.33	769,699	0.33	38,656,914	0.33
Retirement Plans Total Fund Composite	11,580,576,341	98.01	234,824,271	1.99	11,815,400,612	100.00

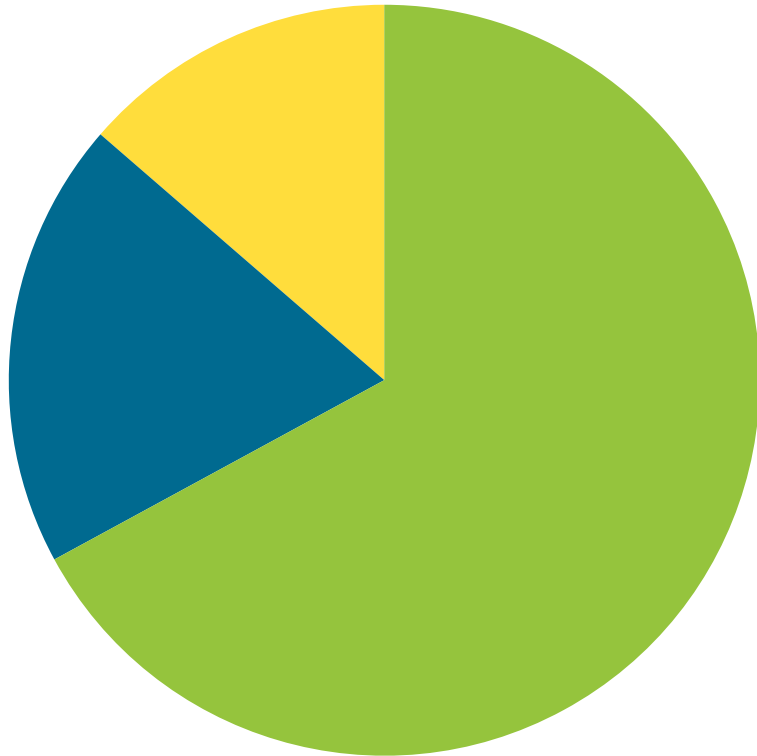
September 30, 2018 : \$11,815,400,612



Segments	Market Value (\$)	Allocation (%)
Consolidated Asset Pension Pool (CAPP)	11,580,576,341	98.01
Short Term Investment Pool (STIP)	234,824,271	1.99

Allocations shown may not sum up to 100% exactly due to rounding. Retirement Plan market values may differ from State Street due to uninvested amounts not included in segment totals.

September 30, 2018 : \$17,265,364,091



	Market Value (\$)	Allocation (%)
Consolidated Asset Pension Pool (CAPP)	11,580,576,359	67.07
Short Term Investment Pool	3,329,467,459	19.28
Trust Funds Investment Pool	2,355,320,273	13.64

Allocations shown may not sum up to 100% exactly due to rounding.

Montana Board of Investments
Comparative Performance
Investment Pools

As of September 30, 2018

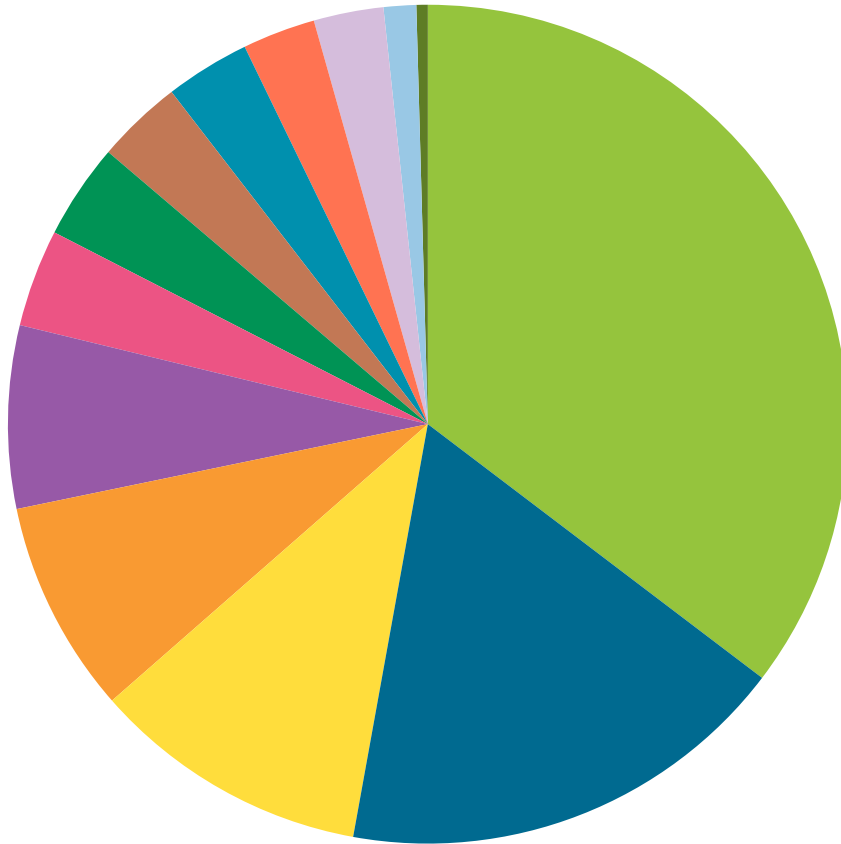
	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Consolidated Asset Pension Pool (CAPP)	2.84	4.61	8.35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10.15	04/01/2017
CAPP Custom Benchmark	3.26	4.61	8.77	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10.33	
Difference	-0.42	0.00	-0.42	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-0.18	
Trust Funds Investment Pool	0.26	-0.85	-0.40	2.19	3.27	3.45	5.23	4.01	4.02	1.83	6.96	-0.25	6.04	04/01/1997
Bloomberg US Agg Bond Index	0.02	-1.60	-1.22	1.31	2.16	2.02	3.77	3.54	2.65	0.55	5.97	-2.02	5.03	
Difference	0.24	0.75	0.82	0.88	1.11	1.43	1.46	0.47	1.37	1.28	0.99	1.77	1.01	
Short Term Investment Pool	0.52	1.39	1.71	1.06	0.69	0.57	0.58	1.11	0.61	0.22	0.10	0.19	2.47	04/01/1997
Short Term Custom Index	0.49	1.37	1.73	1.04	0.69	0.56	0.51	1.15	0.52	0.21	0.16	0.19	N/A	
Difference	0.03	0.02	-0.02	0.02	0.00	0.01	0.07	-0.04	0.09	0.01	-0.06	0.00	N/A	
iMoney.net Money Fund (Gross) Median	0.56	1.52	1.86	1.14	0.76	0.62	0.61	1.21	0.61	0.25	0.17	0.22	2.44	
Difference	-0.04	-0.13	-0.15	-0.08	-0.07	-0.05	-0.03	-0.10	0.00	-0.03	-0.07	-0.03	0.03	

Performance shown is net of all manager fees and expenses (Net-All). Benchmark returns reflect unmanaged indices which are not impacted by management fees. Fiscal year ends on 06/30. See the Addendum for custom index specification. Since inception performance may vary from State Street reported performance due to calculation methodology differences.

Montana Board of Investments
 Asset Allocation
 Consolidated Asset Pension Pool (CAPP)

As of September 30, 2018

September 30, 2018 : \$11,580,576,384



	Market Value (\$)	Allocation (%)
Domestic Equity	4,092,652,141	35.34
International Equity	2,026,876,940	17.50
Private Equity	1,239,449,899	10.70
US Treasury & Agency	950,629,964	8.21
Real Estate	815,592,286	7.04
Mortgage - Backed	435,139,576	3.76
Cash Pension	426,083,213	3.68
TIPS	383,754,645	3.31
Investment Grade Credit	378,191,894	3.27
High Yield	325,162,965	2.81
Natural Resources	311,432,610	2.69
Broad Fixed Income	145,053,848	1.25
Diversifying Strategies	50,556,404	0.44

Allocations shown may not sum up to 100% exactly due to rounding.



Montana Board of Investments
Comparative Performance
Consolidated Asset Pension Pool (CAPP)

As of September 30, 2018

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Domestic Equity	6.29	10.03	16.65	16.36	13.14	16.56	11.79	20.80	11.46	0.86	12.28	34.19	9.55	05/01/2003
Domestic Equity Custom Index	7.08	10.65	17.65	17.29	13.79	16.94	12.05	21.05	13.03	1.01	13.08	32.80	10.30	
Difference	-0.79	-0.62	-1.00	-0.93	-0.65	-0.38	-0.26	-0.25	-1.57	-0.15	-0.80	1.39	-0.75	
International Equity	0.17	-3.13	1.94	10.35	4.68	7.80	5.04	28.67	3.87	-3.57	-4.00	16.39	4.85	04/01/1997
International Equity Custom Index	0.39	-3.27	1.79	10.14	4.36	7.45	5.50	27.81	4.41	-4.60	-4.03	15.62	5.19	
Difference	-0.22	0.14	0.15	0.21	0.32	0.35	-0.46	0.86	-0.54	1.03	0.03	0.77	-0.34	
Broad Fixed Income	-0.35	-0.95	-0.66	1.48	2.45	2.85	4.86	2.41	3.98	0.48	6.19	-0.95	5.74	04/01/1997
Bloomberg US Agg Bond Index	0.02	-1.60	-1.22	1.31	2.16	2.02	3.77	3.54	2.65	0.55	5.97	-2.02	5.03	
Difference	-0.37	0.65	0.56	0.17	0.29	0.83	1.09	-1.13	1.33	-0.07	0.22	1.07	0.71	
Investment Grade Credit	0.81	-0.80	-0.55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.36	04/01/2017
Bloomberg US Corp Int Bond Index	0.80	-0.81	-0.64	2.22	2.66	3.23	5.51	3.92	4.04	1.08	4.35	0.08	1.26	
Difference	0.01	0.01	0.09	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.10	
US Treasury & Agency	-0.03	-0.72	-1.09	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.04	04/01/2017
Bloomberg US Trsy Int Trm Index	-0.12	-0.81	-1.22	0.17	0.93	0.88	2.20	1.14	1.06	1.18	2.57	-1.34	-0.15	
Difference	0.09	0.09	0.13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.19	
High Yield	2.23	1.92	1.97	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.74	04/01/2017
Bloomberg US HY 2% Issuer Cap Index	2.40	2.57	3.05	8.15	5.55	7.65	9.46	7.50	17.13	-4.43	2.46	7.44	4.85	
Difference	-0.17	-0.65	-1.08	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-1.11	
Mortgage - Backed	-0.01	-0.71	-0.57	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.95	04/01/2017
Bloomberg US MBS Index	-0.12	-1.07	-0.92	0.98	2.02	1.79	3.33	2.47	1.67	1.51	6.08	-1.41	0.60	
Difference	0.11	0.36	0.35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.35	
TIPS	-0.37	-0.10	0.36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.48	04/01/2017
Bloomberg US Trsy Infl Notes 1-10 Yr Index	-0.42	-0.20	0.33	1.65	0.94	0.98	2.52	1.90	4.01	-0.52	0.91	-5.58	0.42	
Difference	0.05	0.10	0.03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.06	
Natural Resources	3.87	5.99	7.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.13	04/01/2017
MSCI ACW Cmtty Producers Index (USD) (Net)	1.49	6.54	15.47	16.80	1.17	2.38	1.70	13.70	32.44	-25.83	-14.69	3.31	14.83	
Difference	2.38	-0.55	-8.07	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-6.70	
Real Estate	2.63	7.16	8.55	9.47	10.88	10.54	3.75	9.17	8.82	14.27	12.13	10.16	3.84	06/01/2006
Real Estate Custom Index	1.09	2.30	3.74	6.95	9.16	9.74	3.92	5.99	9.08	13.86	11.36	11.97	5.65	
Difference	1.54	4.86	4.81	2.52	1.72	0.80	-0.17	3.18	-0.26	0.41	0.77	-1.81	-1.81	

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Montana Board of Investments
 Comparative Performance
 Consolidated Asset Pension Pool (CAPP)

As of September 30, 2018

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Diversifying Strategies	-3.46	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.03	03/01/2018
Bloomberg US Trsy Int Trm Index	-0.12	-0.81	-1.22	0.17	0.93	0.88	2.20	1.14	1.06	1.18	2.57	-1.34	0.47	
Difference	-3.34	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-0.44	
Cash Pension	0.40	1.43	1.75	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.49	05/01/2017
Short Term Custom Index	0.49	1.37	1.73	1.04	0.69	0.56	0.51	1.15	0.52	0.21	0.16	0.19	1.57	
Difference	-0.09	0.06	0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-0.08	

Performance shown is net of all manager fees and expenses (Net-All). Benchmark returns reflect unmanaged indices which are not impacted by management fees. Fiscal year ends on 06/30. Please see Addendum for custom index specification. Since inception performance may vary from State Street reported performance due to calculation methodology differences.



Montana Board of Investments
 Comparative Performance
 Consolidated Asset Pension Pool (CAPP)

As of September 30, 2018

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Private Equity Pool*	1.89	9.17	13.26	10.61	11.73	11.51	9.23	15.20	7.37	7.20	15.47	14.52	12.27	05/01/2002
Private Equity Custom Index	4.22	10.83	16.20	14.33	16.69	16.80	14.09	19.15	20.11	3.68	23.31	25.24	11.91	
<i>Difference</i>	<i>-2.33</i>	<i>-1.66</i>	<i>-2.94</i>	<i>-3.72</i>	<i>-4.96</i>	<i>-5.29</i>	<i>-4.86</i>	<i>-3.95</i>	<i>-12.74</i>	3.52	<i>-7.84</i>	<i>-10.72</i>	0.36	

Performance shown is net of all manager fees and expenses (Net-All). For additional information on the Private Equity Custom Index, please see the Addendum.

*Performance is based on prior quarter's fair market value adjusted for cash flows during the most recent quarterly period.

Benchmark returns reflect unmanaged indices that are not impacted by management fees. Fiscal year ends on 06/30.

Since Inception performance may vary from State Street reported performance due to calculation methodology differences.

Montana Board of Investments
Comparative Performance
Investment Pools

As of September 30, 2018

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Domestic Equity	6.44	10.52	17.35	16.82	13.53	16.96	12.20	21.31	11.76	1.14	12.59	34.61	9.86	05/01/2003
All Public Plans-US Equity Segment Median	6.42	10.52	16.83	16.71	12.90	16.54	11.73	20.32	12.98	0.21	11.42	33.76	9.93	
Rank	50	51	45	42	23	22	20	31	76	25	21	42	54	
Population	73	71	68	65	60	50	34	93	95	86	48	46	13	
International Equity	0.25	-2.91	2.25	10.65	4.95	8.10	5.39	29.01	4.15	-3.35	-3.77	16.80	5.24	04/01/1997
All Public Plans-Intl. Equity Segment Median	0.71	-2.03	2.76	10.78	5.39	8.86	6.44	28.61	3.99	-2.60	-2.99	18.71	N/A	
Rank	73	69	65	59	77	81	92	45	47	64	77	77	N/A	
Population	75	74	73	69	60	46	34	89	91	80	46	43	N/A	
Broad Fixed Income	-0.23	-0.60	-0.21	1.80	2.70	3.06	5.04	2.91	4.09	0.59	6.30	-0.83	5.96	04/01/1997
All Public Plans-US Fixed Income Segment Median	0.41	-0.89	-0.20	2.75	2.92	3.24	5.26	4.54	4.54	0.26	6.01	-1.39	N/A	
Rank	86	36	51	79	65	56	54	83	60	35	39	38	N/A	
Population	77	77	76	72	67	56	38	86	92	80	49	49	N/A	
Trust Funds Investment Pool	0.28	-0.79	-0.31	2.28	3.36	3.55	5.32	4.10	4.12	1.89	7.08	-0.14	6.05	10/01/1995
All Public Plans-US Fixed Income Segment Median	0.41	-0.89	-0.20	2.75	2.92	3.24	5.26	4.54	4.54	0.26	6.01	-1.39	N/A	
Rank	60	48	55	59	42	40	47	63	59	5	26	27	N/A	
Population	77	77	76	72	67	56	38	86	92	80	49	49	N/A	
Real Estate	2.98	8.74	10.62	11.13	12.44	12.11	5.25	10.91	10.26	15.68	13.51	11.73	5.28	06/01/2006
All Public Plans-Real Estate Segment Median	2.12	6.44	9.09	10.29	11.39	12.09	6.28	8.92	9.78	13.42	14.67	13.69	N/A	
Rank	14	19	30	32	32	50	66	27	44	13	68	67	N/A	
Population	46	39	37	26	22	17	11	35	30	27	16	15	N/A	

Performance shown is gross of fees. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences.

Montana Board of Investments
Comparative Performance
Equity Composites

As of September 30, 2018

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Domestic Large Cap Equity - Net	7.63	10.75	18.06	17.14	13.97	16.91	11.95	21.66	11.30	1.76	13.82	33.14	8.19	07/01/2007
S&P 500 Index (Cap Wtd)	7.71	10.56	17.91	17.31	13.95	16.91	11.97	21.83	11.96	1.38	13.69	32.39	8.35	
Difference	-0.08	0.19	0.15	-0.17	0.02	0.00	-0.02	-0.17	-0.66	0.38	0.13	0.75	-0.16	
Domestic Large Cap Equity - Gross	7.69	10.90	18.27	17.31	14.14	17.10	12.19	21.82	11.45	1.91	13.99	33.34	8.43	07/01/2007
IM U.S. Large Cap Equity (SA+CF) Median	7.10	9.71	17.06	16.34	13.47	16.79	12.03	21.68	10.98	0.94	12.91	33.50	8.62	
Rank	36	38	38	35	35	40	44	49	46	40	32	53	57	
Domestic Large Cap Active - Net	7.89	10.87	18.34	16.77	13.96	17.00	11.97	21.85	9.63	2.40	14.01	34.90	8.05	07/01/2007
S&P 500 Index (Cap Wtd)	7.71	10.56	17.91	17.31	13.95	16.91	11.97	21.83	11.96	1.38	13.69	32.39	8.35	
Difference	0.18	0.31	0.43	-0.54	0.01	0.09	0.00	0.02	-2.33	1.02	0.32	2.51	-0.30	
Domestic Large Cap Active - Gross	8.03	11.30	18.96	17.32	14.50	17.55	12.49	22.40	10.12	2.88	14.56	35.55	8.54	07/01/2007
IM U.S. Large Cap Equity (SA+CF) Median	7.10	9.71	17.06	16.34	13.47	16.79	12.03	21.68	10.98	0.94	12.91	33.50	8.62	
Rank	26	34	34	35	30	30	37	43	56	32	25	33	53	
Domestic Mid Cap Equity - Net	3.97	7.78	13.37	13.94	10.26	15.26	11.64	19.29	12.29	-3.31	6.45	38.18	9.00	01/01/2005
Russell Mid Cap Index	5.00	7.46	13.98	14.52	11.65	16.09	12.31	18.52	13.80	-2.44	13.22	34.76	9.59	
Difference	-1.03	0.32	-0.61	-0.58	-1.39	-0.83	-0.67	0.77	-1.51	-0.87	-6.77	3.42	-0.59	
Domestic Mid Cap Equity - Gross	4.10	8.20	13.97	14.59	10.91	15.91	12.27	20.01	12.96	-2.74	7.07	38.95	9.53	01/01/2005
IM U.S. Mid Cap Equity (SA+CF) Median	5.10	8.74	15.71	15.33	12.08	16.54	12.87	19.91	12.76	-1.15	9.78	36.41	10.40	
Rank	63	54	62	63	75	72	74	50	50	68	74	34	84	
Domestic Small Cap Equity - Net	4.41	11.26	16.19	16.54	11.69	16.74	11.97	15.65	19.31	-1.61	5.44	40.65	12.66	03/01/2003
Russell 2000 Index	3.58	11.51	15.24	17.12	11.07	16.43	11.11	14.65	21.31	-4.41	4.89	38.82	11.93	
Difference	0.83	-0.25	0.95	-0.58	0.62	0.31	0.86	1.00	-2.00	2.80	0.55	1.83	0.73	
Domestic Small Cap Equity - Gross	4.52	11.66	16.78	17.17	12.35	17.43	12.68	16.27	19.97	-0.93	6.16	41.54	13.22	03/01/2003
IM U.S. Small Cap Equity (SA+CF) Median	3.90	10.41	14.77	17.18	11.88	17.29	12.71	15.14	20.87	-2.31	5.36	41.32	13.12	
Rank	43	43	42	51	42	48	51	44	57	36	43	49	47	

Net performance shown is net of all manager fees and expenses (Net-All). Gross returns are compared to median performance of similar managers. A peer group of similar managers may not exist for all composites. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences.

Montana Board of Investments
Comparative Performance
Equity Composites

As of September 30, 2018

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
International Large Cap Passive - Net	0.69	-3.07	1.84	10.63	4.53	7.53	N/A	27.79	4.87	-4.71	-3.70	14.95	7.07	06/01/2009
MSCI ACW Ex US Index (USD) (Net)	0.71	-3.09	1.76	9.97	4.12	7.25	5.18	27.19	4.50	-5.66	-3.87	15.29	6.83	
Difference	-0.02	0.02	0.08	0.66	0.41	0.28	N/A	0.60	0.37	0.95	0.17	-0.34	0.24	
International Large Cap Passive - Gross	0.71	-3.02	1.90	10.71	4.61	7.61	N/A	27.88	4.96	-4.63	-3.62	15.05	7.15	06/01/2009
International Equity Active - Net	-0.13	-2.91	2.25	11.04	5.67	8.93	5.77	30.82	2.63	0.41	-4.39	19.23	3.68	04/01/1997
MSCI ACW Ex US Index (USD) (Net)	0.71	-3.09	1.76	9.97	4.12	7.25	5.18	27.19	4.50	-5.66	-3.87	15.29	N/A	
Difference	-0.84	0.18	0.49	1.07	1.55	1.68	0.59	3.63	-1.87	6.07	-0.52	3.94	N/A	
International Equity Active - Gross	0.00	-2.53	2.79	11.62	6.20	9.46	6.30	31.50	3.17	0.90	-3.94	19.75	4.20	04/01/1997
IM International Large Cap Core Equity (SA+CF) Median	1.01	-1.36	2.37	9.95	5.52	9.71	6.86	26.49	1.38	0.33	-3.83	23.39	6.89	
Rank	83	64	46	18	31	60	76	11	28	43	51	73	100	
International Value - Net	0.75	-2.41	3.46	11.75	5.70	8.27	4.97	30.72	5.59	-5.94	-1.49	17.15	2.30	11/01/2006
MSCI ACW Ex US Val Index (USD) (Net)	1.72	-3.66	0.42	9.30	2.87	6.24	4.50	22.66	8.92	-10.06	-5.10	15.04	2.29	
Difference	-0.97	1.25	3.04	2.45	2.83	2.03	0.47	8.06	-3.33	4.12	3.61	2.11	0.01	
International Value - Gross	0.87	-2.04	3.99	12.34	6.26	8.86	5.57	31.39	6.17	-5.46	-0.94	17.82	2.88	11/01/2006
IM International Large Cap Value Equity (SA+CF) Median	0.88	-2.91	1.46	9.32	5.03	8.81	6.67	26.13	3.92	-1.91	-4.28	23.25	4.11	
Rank	51	29	22	20	23	49	70	12	27	83	15	76	91	
International Growth - Net	0.51	-3.28	0.92	10.01	4.40	8.31	5.34	28.01	0.51	1.69	-6.15	18.55	3.01	11/01/2006
MSCI ACW Ex US Grth Index (USD) (Net)	-0.26	-2.54	3.08	10.59	5.32	8.21	5.83	32.01	0.12	-1.25	-2.65	15.49	3.99	
Difference	0.77	-0.74	-2.16	-0.58	-0.92	0.10	-0.49	-4.00	0.39	2.94	-3.50	3.06	-0.98	
International Growth - Gross	0.65	-2.87	1.48	10.66	4.96	8.86	5.91	28.74	1.12	2.21	-5.72	19.09	3.55	11/01/2006
IM International Large Cap Growth Equity (SA+CF) Median	0.95	-0.33	4.89	11.27	6.66	10.26	7.81	31.37	-0.07	2.18	-3.34	20.63	5.48	
Rank	56	88	87	59	84	88	83	69	34	50	79	69	89	
International Small Cap - Net	-2.22	-4.19	1.72	10.95	6.70	10.10	7.90	33.61	1.84	5.16	-4.87	25.30	4.93	09/01/2006
MSCI ACWI Ex US Sm Cap Index IMI (USD) (Net)	-1.51	-4.41	1.86	11.24	6.14	9.05	8.73	31.65	3.91	2.60	-4.03	19.73	5.53	
Difference	-0.71	0.22	-0.14	-0.29	0.56	1.05	-0.83	1.96	-2.07	2.56	-0.84	5.57	-0.60	
International Small Cap - Gross	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	09/01/2006
IM International Small Cap Equity (SA+CF) Median	-1.35	-2.21	3.76	13.03	8.24	12.45	11.05	34.98	1.13	10.15	-3.40	31.13	7.54	
Rank	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

Gross of fees performance is not available (N/A) for the International Small Cap composite which currently consists of DFA Intl Sm Co;I (DFISX), DFA Emg Mkts Sm Cap;I (DEMSX), BlackRock ACWI Ex-US Small Cap (CF), Templeton Investment Counsel (SA), and American Century Investment Mgmt (SA).

Net performance shown is net of all manager fees and expenses (Net-All). Gross returns are compared to median performance of similar managers. A peer group of similar managers may not exist for all composites. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences.

Montana Board of Investments
Comparative Performance
Equity Sub Composites

As of September 30, 2018

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Domestic Large Cap Passive - Net	7.50	10.62	17.87	16.95	13.76	16.79	11.95	21.34	12.01	0.83	13.73	32.41	5.88	05/01/2000
S&P 500 Index (Cap Wtd)	7.71	10.56	17.91	17.31	13.95	16.91	11.97	21.83	11.96	1.38	13.69	32.39	5.90	
Difference	-0.21	0.06	-0.04	-0.36	-0.19	-0.12	-0.02	-0.49	0.05	-0.55	0.04	0.02	-0.02	
Domestic Large Cap Passive - Gross	7.50	10.62	17.89	16.96	13.77	16.80	11.95	21.35	12.03	0.84	13.74	32.42	5.91	05/01/2000
IM U.S. Large Cap Index Equity (SA+CF) Median	7.40	10.57	17.76	17.12	13.72	16.90	12.05	21.73	12.03	0.94	13.27	32.58	6.13	
Rank	42	32	40	73	47	70	72	57	51	55	18	65	77	
Domestic Large Cap Enhanced - Net	7.17	10.95	18.21	17.51	14.38	17.35	12.33	24.21	9.73	3.18	13.19	32.89	8.91	06/01/2006
S&P 500 Index (Cap Wtd)	7.71	10.56	17.91	17.31	13.95	16.91	11.97	21.83	11.96	1.38	13.69	32.39	9.25	
Difference	-0.54	0.39	0.30	0.20	0.43	0.44	0.36	2.38	-2.23	1.80	-0.50	0.50	-0.34	
Domestic Large Cap Enhanced - Gross	7.24	11.16	18.51	17.83	14.70	17.69	12.66	24.53	10.05	3.50	13.54	33.31	9.22	06/01/2006
IM U.S. Large Cap Core Equity (SA+CF) Median	7.11	9.76	17.33	16.11	13.57	16.81	12.03	21.82	10.52	1.41	13.42	32.98	9.48	
Rank	47	30	32	20	20	26	27	19	57	24	48	48	64	
Domestic Large Cap 130/30 - Net	8.41	11.20	18.95	16.42	13.77	17.21	12.23	20.28	9.54	1.61	14.84	36.94	10.20	03/01/2008
S&P 500 Index (Cap Wtd)	7.71	10.56	17.91	17.31	13.95	16.91	11.97	21.83	11.96	1.38	13.69	32.39	10.02	
Difference	0.70	0.64	1.04	-0.89	-0.18	0.30	0.26	-1.55	-2.42	0.23	1.15	4.55	0.18	
Domestic Large Cap 130/30 - Gross	8.63	11.88	19.93	17.23	14.54	18.00	12.98	21.10	10.22	2.26	15.59	37.83	10.93	03/01/2008
IM U.S. Large Cap Core Equity (SA+CF) Median	7.11	9.76	17.33	16.11	13.57	16.81	12.03	21.82	10.52	1.41	13.42	32.98	10.12	
Rank	9	21	20	30	24	21	19	62	55	38	21	13	21	

Net performance shown is net of all manager fees and expenses (Net-All). Gross returns are compared to median performance of similar managers. A peer group of similar managers may not exist for all composites. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences.

Montana Board of Investments
Comparative Performance
Domestic Equity Managers

As of September 30, 2018

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Domestic Large Cap Equity														
BlackRock MSCI US Equity Index (CF) - Net	7.50	10.61	17.85	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	18.10	07/01/2017
MSCI US Index (USD) (Gross)	7.51	10.63	17.87	17.14	13.78	16.85	11.98	21.90	11.61	1.32	13.36	32.61	18.11	
Difference	-0.01	-0.02	-0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-0.01	
BlackRock MSCI US Equity Index (CF) - Gross	7.50	10.62	17.87	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	18.11	07/01/2017
SPDR S&P 500 ETF (SPY) - Net	8.12	9.61	17.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	17.37	07/01/2017
S&P 500 Index (Cap Wtd)	7.71	10.56	17.91	17.31	13.95	16.91	11.97	21.83	11.96	1.38	13.69	32.39	18.16	
Difference	0.41	-0.95	-0.90	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-0.79	
Domestic Equity Pool STIF - Net	0.61	1.43	1.77	0.99	N/A	N/A	N/A	1.00	0.50	N/A	N/A	N/A	0.87	04/01/2015
Short Term Custom Index	0.49	1.37	1.73	1.04	0.69	0.56	0.51	1.15	0.52	0.21	0.16	0.19	0.92	
Difference	0.12	0.06	0.04	-0.05	N/A	N/A	N/A	-0.15	-0.02	N/A	N/A	N/A	-0.05	
T. Rowe U.S. Structured Research (SA) - Net	7.17	10.95	18.20	17.97	14.40	17.36	12.43	23.94	10.68	3.30	12.58	33.23	9.77	06/01/2006
S&P 500 Index (Cap Wtd)	7.71	10.56	17.91	17.31	13.95	16.91	11.97	21.83	11.96	1.38	13.69	32.39	9.25	
Difference	-0.54	0.39	0.29	0.66	0.45	0.45	0.46	2.11	-1.28	1.92	-1.11	0.84	0.52	
T. Rowe U.S. Structured Research (SA) - Gross	7.24	11.16	18.50	18.27	14.71	17.69	12.76	24.24	10.98	3.61	12.92	33.63	10.09	06/01/2006
IM U.S. Large Cap Core Equity (SA+CF) Median	7.11	9.76	17.33	16.11	13.57	16.81	12.03	21.82	10.52	1.41	13.42	32.98	9.48	
Rank	47	30	32	14	20	26	24	22	46	24	59	44	22	
Jacobs Levy 130/30 (SA) - Net	7.76	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12.24	04/01/2018
MSCI US Index (USD) (Gross)	7.51	10.63	17.87	17.14	13.78	16.85	11.98	21.90	11.61	1.32	13.36	32.61	11.32	
Difference	0.25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.92	
Jacobs Levy 130/30 (SA) - Gross	7.97	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12.73	04/01/2018
IM U.S. Large Cap Core Equity (SA+CF) Median	7.11	9.76	17.33	16.11	13.57	16.81	12.03	21.82	10.52	1.41	13.42	32.98	10.30	
Rank	22	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9	
J.P. Morgan 130/30 (SA) - Net	8.76	10.78	18.49	17.17	14.06	17.65	13.09	22.86	10.30	0.01	15.38	37.55	11.20	03/01/2008
S&P 500 Index (Cap Wtd)	7.71	10.56	17.91	17.31	13.95	16.91	11.97	21.83	11.96	1.38	13.69	32.39	10.02	
Difference	1.05	0.22	0.58	-0.14	0.11	0.74	1.12	1.03	-1.66	-1.37	1.69	5.16	1.18	
J.P. Morgan 130/30 (SA) - Gross	8.98	11.47	19.48	18.05	14.90	18.51	13.91	23.79	11.09	0.72	16.21	38.53	12.01	03/01/2008
IM U.S. Large Cap Core Equity (SA+CF) Median	7.11	9.76	17.33	16.11	13.57	16.81	12.03	21.82	10.52	1.41	13.42	32.98	10.12	
Rank	5	24	23	18	18	12	6	26	45	59	15	11	6	

Net performance shown is net of all manager fees and expenses (Net-All). Gross returns are compared to median performance of similar managers. A peer group of similar managers may not exist for all funds. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences. Voya Investment Management (SA) was liquidated during Q3 2018.



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	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Domestic Mid Cap Equity														
Artisan Partners (SA) - Net	2.66	4.10	9.33	13.57	7.78	13.01	10.63	13.81	23.60	-9.68	2.12	37.20	8.34	03/01/2007
Russell Mid Cap Val Index	3.30	3.13	8.81	13.09	10.72	15.54	11.29	13.34	20.00	-4.78	14.75	33.46	7.62	
Difference	-0.64	0.97	0.52	0.48	-2.94	-2.53	-0.66	0.47	3.60	-4.90	-12.63	3.74	0.72	
Artisan Partners (SA) - Gross	2.81	4.57	9.99	14.28	8.47	13.75	11.38	14.51	24.41	-9.09	2.79	38.11	9.09	03/01/2007
IM U.S. Mid Cap Value Equity (SA+CF) Median	3.39	4.48	9.56	14.19	11.17	16.39	12.51	15.63	18.48	-3.23	11.73	36.41	9.16	
Rank	70	48	49	48	95	87	77	58	16	89	97	41	53	
Iridian Asset Management (SA) - Net	-3.06	-5.09	-2.21	8.90	8.75	N/A	N/A	24.06	3.29	-1.62	12.84	N/A	10.44	05/01/2013
Russell Mid Cap Val Index	3.30	3.13	8.81	13.09	10.72	15.54	11.29	13.34	20.00	-4.78	14.75	33.46	11.13	
Difference	-6.36	-8.22	-11.02	-4.19	-1.97	N/A	N/A	10.72	-16.71	3.16	-1.91	N/A	-0.69	
Iridian Asset Management (SA) - Gross	-2.89	-4.58	-1.50	9.71	9.57	N/A	N/A	24.96	4.07	-0.87	13.73	N/A	11.28	05/01/2013
IM U.S. Mid Cap Value Equity (SA+CF) Median	3.39	4.48	9.56	14.19	11.17	16.39	12.51	15.63	18.48	-3.23	11.73	36.41	12.38	
Rank	100	99	100	96	79	N/A	N/A	4	100	23	24	N/A	72	
iShares:Core S&P Md-Cp (IJH) - Net	3.77	4.00	10.60	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	11.17	07/01/2017
S&P Mid Cap 400 Index (Cap Wtd)	3.86	7.49	14.21	15.68	11.91	16.31	12.49	16.24	20.74	-2.18	9.77	33.50	14.07	
Difference	-0.09	-3.49	-3.61	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.90	
Congress Mid Cap Growth (SA) - Net	7.89	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.28	03/01/2018
Russell Mid Cap Grth Index	7.57	13.38	21.10	16.65	13.00	16.86	13.46	25.27	7.33	-0.20	11.90	35.74	10.79	
Difference	0.32	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.51	
Congress Mid Cap Growth (SA) - Gross	8.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.58	03/01/2018
IM U.S. Mid Cap Growth Equity (SA+CF) Median	7.48	14.67	22.02	16.23	12.86	16.82	13.32	25.43	5.59	0.79	8.63	36.40	11.56	
Rank	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	86	
TimesSquare Capital Management (SA) - Net	6.81	13.06	19.89	15.56	12.35	16.86	12.84	23.02	7.91	0.96	5.69	37.79	10.03	03/01/2007
Russell Mid Cap Grth Index	7.57	13.38	21.10	16.65	13.00	16.86	13.46	25.27	7.33	-0.20	11.90	35.74	9.69	
Difference	-0.76	-0.32	-1.21	-1.09	-0.65	0.00	-0.62	-2.25	0.58	1.16	-6.21	2.05	0.34	
TimesSquare Capital Management (SA) - Gross	6.98	13.61	20.68	16.34	13.11	17.66	13.63	23.84	8.65	1.65	6.42	38.75	10.80	03/01/2007
IM U.S. Mid Cap Growth Equity (SA+CF) Median	7.48	14.67	22.02	16.23	12.86	16.82	13.32	25.43	5.59	0.79	8.63	36.40	10.52	
Rank	61	55	54	48	45	30	42	60	23	42	71	36	43	

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	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Domestic Small Cap Equity														
Vaughan Nelson Management (SA) - Net	3.11	4.76	8.48	11.10	9.98	14.97	11.50	6.83	20.50	0.16	9.09	39.30	9.85	03/01/2007
Russell 2000 Val Index	1.60	7.14	9.33	16.12	9.91	15.26	9.52	7.84	31.74	-7.47	4.22	34.52	6.68	
Difference	1.51	-2.38	-0.85	-5.02	0.07	-0.29	1.98	-1.01	-11.24	7.63	4.87	4.78	3.17	
Vaughan Nelson Management (SA) - Gross	3.30	5.32	9.29	11.97	10.87	15.91	12.43	7.66	21.49	0.98	10.00	40.47	10.77	03/01/2007
IM U.S. Small Cap Value Equity (SA+CF) Median	1.69	5.35	9.02	15.00	10.76	16.32	12.12	11.60	26.17	-4.29	5.71	38.07	8.87	
Rank	26	51	48	87	47	61	40	77	76	9	10	35	13	
BlackRock MSCI US Sm Cap Equity Index (CF) - Net	4.21	10.84	16.17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	17.73	07/01/2017
MSCI US Sm Cap Index (USD) (Net)	4.11	10.46	15.68	16.58	11.41	16.56	12.47	16.75	19.15	-4.11	7.07	37.64	17.21	
Difference	0.10	0.38	0.49	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.52	
BlackRock MSCI US Sm Cap Equity Index (CF) - Gross	4.21	10.87	16.24	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	17.79	07/01/2017
DFA US Small Cap Trust (CF) - Net	3.24	9.00	13.01	15.98	11.30	16.98	12.27	11.86	24.42	-2.64	4.75	42.42	12.88	03/01/2003
Russell 2000 Index	3.58	11.51	15.24	17.12	11.07	16.43	11.11	14.65	21.31	-4.41	4.89	38.82	11.93	
Difference	-0.34	-2.51	-2.23	-1.14	0.23	0.55	1.16	-2.79	3.11	1.77	-0.14	3.60	0.95	
DFA US Small Cap Trust (CF) - Gross	3.33	9.29	13.41	16.39	11.69	17.39	12.65	12.25	24.85	-2.29	5.12	42.90	13.20	03/01/2003
IM U.S. Small Cap Core Equity (SA+CF) Median	3.96	10.71	14.73	17.18	12.29	17.50	12.46	15.18	20.68	-1.35	6.57	41.26	13.07	
Rank	65	66	65	58	63	52	46	72	21	63	64	41	43	
iShares:Russ 2000 ETF (IWM) - Net	3.56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10.62	05/01/2018
Russell 2000 Index	3.58	11.51	15.24	17.12	11.07	16.43	11.11	14.65	21.31	-4.41	4.89	38.82	10.65	
Difference	-0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-0.03	
Alliance Bernstein (SA) - Net	9.16	28.03	37.75	24.76	14.33	N/A	N/A	34.73	6.82	-0.84	-1.61	45.22	15.47	04/01/2012
Russell 2000 Grth Index	5.52	15.76	21.06	17.98	12.14	17.52	12.65	22.17	11.32	-1.38	5.60	43.30	14.25	
Difference	3.64	12.27	16.69	6.78	2.19	N/A	N/A	12.56	-4.50	0.54	-7.21	1.92	1.22	
Alliance Bernstein (SA) - Gross	9.37	28.79	38.88	25.84	15.34	N/A	N/A	35.88	7.80	0.05	-0.71	46.52	16.49	04/01/2012
IM U.S. Small Cap Growth Equity (SA+CF) Median	7.72	21.03	27.11	19.63	13.40	18.72	14.04	23.91	11.40	-0.74	4.13	45.47	15.50	
Rank	27	18	11	12	19	N/A	N/A	8	69	42	81	46	34	

Gross of fees performance is not available (N/A) for the following funds: SPDR S&P 500 ETF (SPY), Domestic Equity Pool STIF, iShares:Core S&P Md-Cp (IJH), and iShares:Russ 2000 ETF (IWM).

The current annual expense ratios for the SPDR S&P 500 ETF (SPY), Domestic Equity Pool STIF, iShares:Core S&P Md-Cp (IJH), and iShares:Russ 2000 ETF (IWM) are 0.09%, 0.15%, 0.07%, and 0.20%, respectively.

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	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
International Developed Large Cap Equity														
Acadian Asset Non-US Equity (SA) - Net	1.20	-0.05	6.00	15.93	8.20	10.57	6.67	34.76	12.40	-7.75	0.00	17.60	3.62	11/01/2006
MSCI ACW Ex US Val Index (USD) (Net)	1.72	-3.66	0.42	9.30	2.87	6.24	4.50	22.66	8.92	-10.06	-5.10	15.04	2.29	
Difference	-0.52	3.61	5.58	6.63	5.33	4.33	2.17	12.10	3.48	2.31	5.10	2.56	1.33	
Acadian Asset Non-US Equity (SA) - Gross	1.33	0.33	6.55	16.53	8.76	11.16	7.26	35.45	13.01	-7.26	0.52	18.22	4.20	11/01/2006
IM ACWI Ex US Value (SA+CF) Median	0.82	-2.61	1.85	10.08	5.16	8.69	6.62	26.02	4.87	-3.25	-3.87	20.09	3.99	
Rank	23	15	2	2	7	15	42	8	10	85	15	61	45	
Lazard Asset Management (SA) - Net	0.43	-4.00	1.69	8.45	N/A	N/A	N/A	27.00	0.22	N/A	N/A	N/A	3.26	06/01/2015
Lazard Custom Index	0.71	-4.61	-0.58	8.93	2.67	6.09	4.39	22.66	8.92	-10.06	-5.10	15.04	2.44	
Difference	-0.28	0.61	2.27	-0.48	N/A	N/A	N/A	4.34	-8.70	N/A	N/A	N/A	0.82	
Lazard Asset Management (SA) - Gross	0.55	-3.63	2.20	9.02	N/A	N/A	N/A	27.65	0.77	N/A	N/A	N/A	3.80	06/01/2015
IM ACWI Ex US Value (SA+CF) Median	0.82	-2.61	1.85	10.08	5.16	8.69	6.62	26.02	4.87	-3.25	-3.87	20.09	4.11	
Rank	64	74	47	64	N/A	N/A	N/A	38	86	N/A	N/A	N/A	55	
BlackRock ACWI Ex-US SuperFund A (CF) - Net	0.72	-2.86	2.01	10.24	4.34	7.47	N/A	27.49	4.77	-5.49	-3.73	15.51	7.05	06/01/2009
MSCI ACW Ex US Index (USD) (Net)	0.71	-3.09	1.76	9.97	4.12	7.25	5.18	27.19	4.50	-5.66	-3.87	15.29	6.83	
Difference	0.01	0.23	0.25	0.27	0.22	0.22	N/A	0.30	0.27	0.17	0.14	0.22	0.22	
BlackRock ACWI Ex-US SuperFund A (CF) - Gross	0.74	-2.81	2.08	10.32	4.43	7.55	N/A	27.58	4.86	-5.42	-3.65	15.61	7.13	06/01/2009
IM All ACWI Ex US (SA+CF) Median	0.67	-1.68	3.12	10.52	6.17	9.68	7.28	28.74	2.09	-0.53	-3.38	20.39	9.04	
Rank	49	72	63	51	84	88	N/A	60	25	85	54	84	89	
iShares:MSCI EAFE ETF (EFA) - Net	1.52	-0.38	3.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.82	07/01/2017
MSCI EAFE Index (USD) (Net)	1.35	-1.43	2.74	9.23	4.42	8.30	5.38	25.03	1.00	-0.81	-4.90	22.78	6.58	
Difference	0.17	1.05	0.66	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.24	
Baillie Gifford (SA) - Net	-1.18	-1.70	3.33	12.13	N/A	N/A	N/A	31.99	0.73	N/A	N/A	N/A	5.98	06/01/2015
MSCI ACW Ex US Grth Index (USD) (Net)	-0.26	-2.54	3.08	10.59	5.32	8.21	5.83	32.01	0.12	-1.25	-2.65	15.49	4.97	
Difference	-0.92	0.84	0.25	1.54	N/A	N/A	N/A	-0.02	0.61	N/A	N/A	N/A	1.01	
Baillie Gifford (SA) - Gross	-1.06	-1.33	3.84	12.71	N/A	N/A	N/A	32.66	1.28	N/A	N/A	N/A	6.53	06/01/2015
IM ACWI Ex US Growth (SA+CF) Median	0.30	0.12	5.00	12.43	7.03	10.53	8.01	32.77	-0.32	1.31	-1.78	20.39	6.66	
Rank	82	63	61	41	N/A	N/A	N/A	51	34	N/A	N/A	N/A	52	

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	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Invesco (SA) - Net	1.82	-4.43	-0.87	8.34	N/A	N/A	N/A	24.92	0.32	N/A	N/A	N/A	2.81	06/01/2015
MSCI ACW Ex US Grth Index (USD) (Net)	-0.26	-2.54	3.08	10.59	5.32	8.21	5.83	32.01	0.12	-1.25	-2.65	15.49	4.97	
Difference	2.08	-1.89	-3.95	-2.25	N/A	N/A	N/A	-7.09	0.20	N/A	N/A	N/A	-2.16	
Invesco (SA) - Gross	1.97	-3.99	-0.27	9.03	N/A	N/A	N/A	25.70	1.01	N/A	N/A	N/A	3.48	06/01/2015
IM ACWI Ex US Growth (SA+CF) Median	0.30	0.12	5.00	12.43	7.03	10.53	8.01	32.77	-0.32	1.31	-1.78	20.39	6.66	
Rank	18	97	95	90	N/A	N/A	N/A	91	37	N/A	N/A	N/A	92	
International Equity Pool STIF - Net	0.51	1.36	1.63	0.93	N/A	N/A	N/A	0.92	0.47	N/A	N/A	N/A	0.81	04/01/2015
Short Term Custom Index	0.49	1.37	1.73	1.04	0.69	0.56	0.51	1.15	0.52	0.21	0.16	0.19	0.92	
Difference	0.02	-0.01	-0.10	-0.11	N/A	N/A	N/A	-0.23	-0.05	N/A	N/A	N/A	-0.11	
International Developed Small Cap Equity														
American Century Investment Mgmt (SA) - Net	-3.72	-0.47	7.37	12.79	N/A	N/A	N/A	43.80	-5.31	11.32	N/A	N/A	6.87	03/01/2014
MSCI ACW Ex US Sm Cap Grth Index (USD) (Net)	-2.14	-2.97	4.01	11.39	6.75	9.23	8.69	33.64	-0.28	6.50	-3.59	18.52	5.57	
Difference	-1.58	2.50	3.36	1.40	N/A	N/A	N/A	10.16	-5.03	4.82	N/A	N/A	1.30	
American Century Investment Mgmt (SA) - Gross	-3.52	0.15	8.27	13.75	N/A	N/A	N/A	44.99	-4.49	12.25	N/A	N/A	7.78	03/01/2014
IM ACWI Ex US Growth (SA+CF) Median	0.30	0.12	5.00	12.43	7.03	10.53	8.01	32.77	-0.32	1.31	-1.78	20.39	5.90	
Rank	97	50	25	26	N/A	N/A	N/A	6	80	1	N/A	N/A	17	
BlackRock ACWI Ex-US Small Cap (CF) - Net	-1.41	-4.08	2.29	11.59	6.43	N/A	N/A	31.96	4.26	2.87	-3.84	19.87	8.34	02/01/2012
MSCI ACWI Ex US Sm Cap Index IMI (USD) (Net)	-1.51	-4.41	1.86	11.24	6.14	9.05	8.73	31.65	3.91	2.60	-4.03	19.73	8.08	
Difference	0.10	0.33	0.43	0.35	0.29	N/A	N/A	0.31	0.35	0.27	0.19	0.14	0.26	
BlackRock ACWI Ex-US Small Cap (CF) - Gross	-1.38	-3.99	2.42	11.76	6.60	N/A	N/A	32.15	4.44	3.04	-3.67	20.08	8.52	02/01/2012
DFA Intl Sm Co;l (DFISX) - Net	-1.15	-3.45	1.00	11.85	7.08	10.57	8.86	30.24	5.74	5.89	-6.29	27.49	8.26	11/01/2004
MSCI Wrld Ex US Sm Cap Index (USD) (Net)	-0.85	-2.28	3.42	12.23	7.07	10.25	9.04	31.04	4.32	5.46	-5.35	25.55	7.73	
Difference	-0.30	-1.17	-2.42	-0.38	0.01	0.32	-0.18	-0.80	1.42	0.43	-0.94	1.94	0.53	
Templeton Investment Counsel (SA) - Net	-2.31	-4.38	1.05	8.94	N/A	N/A	N/A	33.07	-1.13	1.81	N/A	N/A	4.59	03/01/2014
Templeton Custom Index	-1.51	-6.22	-0.66	10.91	5.42	8.79	8.69	29.72	8.24	-1.25	-4.49	20.92	4.14	
Difference	-0.80	1.84	1.71	-1.97	N/A	N/A	N/A	3.35	-9.37	3.06	N/A	N/A	0.45	
Templeton Investment Counsel (SA) - Gross	-2.10	-3.78	1.90	9.90	N/A	N/A	N/A	34.21	-0.23	2.73	N/A	N/A	5.52	03/01/2014
IM ACWI Ex US Value (SA+CF) Median	0.82	-2.61	1.85	10.08	5.16	8.69	6.62	26.02	4.87	-3.25	-3.87	20.09	4.02	
Rank	100	78	50	53	N/A	N/A	N/A	8	89	9	N/A	N/A	20	

Net performance shown is net of all manager fees and expenses (Net-All). Gross returns are compared to median performance of similar managers. A peer group of similar managers may not exist for all funds. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences. See the Addendum for custom index specification.

Montana Board of Investments
Comparative Performance
International Equity Managers

As of September 30, 2018

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
International Emerging Equity														
BlackRock Emerging Mkts (CF) - Net	-1.13	-7.78	-0.97	12.13	3.38	N/A	N/A	37.05	10.85	-15.15	-2.49	-2.79	2.70	02/01/2012
MSCI Emg Mkts Index (USD) (Net)	-1.09	-7.68	-0.81	12.36	3.61	5.03	5.40	37.28	11.19	-14.92	-2.19	-2.60	2.94	
Difference	-0.04	-0.10	-0.16	-0.23	-0.23	N/A	N/A	-0.23	-0.34	-0.23	-0.30	-0.19	-0.24	
BlackRock Emerging Mkts (CF) - Gross	-1.10	-7.70	-0.86	12.28	3.55	N/A	N/A	37.16	11.08	-14.99	-2.30	-2.57	2.87	02/01/2012
iShares:MSCI Em Mkts (EEM) - Net	-0.95	-9.58	-3.50	N/A	N/A	N/A	N/A	36.86	N/A	N/A	N/A	N/A	12.95	01/01/2017
MSCI Emg Mkts Index (USD) (Net)	-1.09	-7.68	-0.81	12.36	3.61	5.03	5.40	37.28	11.19	-14.92	-2.19	-2.60	14.50	
Difference	0.14	-1.90	-2.69	N/A	N/A	N/A	N/A	-0.42	N/A	N/A	N/A	N/A	-1.55	
DFA Emg Mkts Sm Cap;I (DEMSX) - Net	-4.54	-12.58	-5.07	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.84	03/01/2017
MSCI Emg Mkts Sm Cap Index (USD) (Net)	-4.21	-12.30	-4.20	7.43	2.72	4.77	7.43	33.84	2.28	-6.85	1.01	1.04	4.11	
Difference	-0.33	-0.28	-0.87	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-0.27	

Gross of fees performance is not available (N/A) for the following funds: iShares:MSCI EAFE ETF (EFA), International Equity Pool STIF, DFA Intl Sm Co;I (DFISX), iShares:MSCI Em Mkts (EEM), and DFA Emg Mkts Sm Cap;I (DEMSX).

The current annual expense ratios for the iShares:MSCI EAFE ETF (EFA), International Equity Pool STIF, DFA Intl Sm Co;I (DFISX), iShares:MSCI Em Mkts (EEM), and DFA Emg Mkts Sm Cap;I (DEMSX) are 0.31%, 0.18%, 0.53%, 0.69%, and 0.73%, respectively.

Net performance shown is net of all manager fees and expenses (Net-All). Gross returns are compared to median performance of similar managers. A peer group of similar managers may not exist for all funds. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences. See the Addendum for custom index specification.

Montana Board of Investments
Comparative Performance
Fixed Income Managers

As of September 30, 2018

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Trust Funds Bond Portfolio	0.10	-1.29	-0.84	1.66	2.75	2.81	4.71	3.78	3.41	1.03	6.79	-1.43	5.76	10/01/1995
Bloomberg US Agg Bond Index	0.02	-1.60	-1.22	1.31	2.16	2.02	3.77	3.54	2.65	0.55	5.97	-2.02	5.02	
Difference	0.08	0.31	0.38	0.35	0.59	0.79	0.94	0.24	0.76	0.48	0.82	0.59	0.74	
Trust Funds Bond Portfolio	0.10	-1.29	-0.84	1.66	2.75	2.81	4.71	3.78	3.41	1.03	6.79	-1.43	5.76	10/01/1995
IM U.S. Broad Market Core FI (SA+CF) Median	0.19	-1.29	-0.74	1.82	2.58	2.64	4.58	4.06	3.10	0.82	6.17	-1.56	5.41	
Rank	65	51	56	57	34	35	41	66	43	28	26	42	11	
Reams Asset Core Plus (SA) - Net	-0.38	-1.13	-0.86	1.58	2.17	2.89	5.15	3.21	4.18	0.07	4.47	-0.85	5.15	10/01/2008
Reams Custom Index	0.02	-1.60	-1.22	1.83	2.44	2.50	4.17	3.83	3.91	0.43	5.56	-1.35	4.17	
Difference	-0.40	0.47	0.36	-0.25	-0.27	0.39	0.98	-0.62	0.27	-0.36	-1.09	0.50	0.98	
Reams Asset Core Plus (SA) - Gross	-0.33	-0.99	-0.68	1.76	2.34	3.07	5.33	3.38	4.35	0.24	4.65	-0.68	5.33	10/01/2008
IM U.S. Broad Market Core+ FI (SA+CF) Median	0.46	-1.06	-0.46	2.64	3.07	3.46	5.50	4.79	4.68	0.28	6.20	-0.49	5.50	
Rank	98	45	73	90	94	74	59	95	58	52	91	57	59	
Post High Yield Plus (SA) - Net	2.29	2.12	2.45	5.99	5.42	7.85	N/A	6.52	9.58	0.82	4.99	10.19	8.96	06/01/2009
Bloomberg US HY 2% Issuer Cap Index	2.40	2.57	3.05	8.15	5.55	7.65	9.46	7.50	17.13	-4.43	2.46	7.44	9.68	
Difference	-0.11	-0.45	-0.60	-2.16	-0.13	0.20	N/A	-0.98	-7.55	5.25	2.53	2.75	-0.72	
Post High Yield Plus (SA) - Gross	2.44	2.56	3.05	6.61	6.04	8.49	N/A	7.15	10.23	1.43	5.62	10.85	9.62	06/01/2009
IM U.S. High Yield Bonds (SA+CF) Median	2.25	2.48	3.17	7.35	5.42	7.51	8.85	7.54	14.10	-2.13	2.72	7.55	9.42	
Rank	35	47	54	78	20	9	N/A	60	85	7	2	9	42	
Post Trad'l High Yield LP (CF) - Gross	2.41	2.35	2.83	6.62	6.09	8.58	N/A	7.09	10.62	1.42	6.01	9.98	8.99	09/01/2009
IM U.S. High Yield Bonds (SA+CF) Median	2.25	2.48	3.17	7.35	5.42	7.51	8.85	7.54	14.10	-2.13	2.72	7.55	8.52	
Rank	36	58	60	77	18	8	N/A	60	81	8	2	12	25	
Neuberger Berman High Yield (SA) - Net	2.22	2.19	2.23	6.98	4.70	7.16	N/A	5.80	14.98	-4.32	1.93	7.78	7.17	01/01/2010
Bloomberg US HY 2% Issuer Cap Index	2.40	2.57	3.05	8.15	5.55	7.65	9.46	7.50	17.13	-4.43	2.46	7.44	7.60	
Difference	-0.18	-0.38	-0.82	-1.17	-0.85	-0.49	N/A	-1.70	-2.15	0.11	-0.53	0.34	-0.43	
Neuberger Berman High Yield (SA) - Gross	2.33	2.53	2.69	7.46	5.17	7.64	N/A	6.27	15.50	-3.89	2.38	8.26	7.65	01/01/2010
IM U.S. High Yield Bonds (SA+CF) Median	2.25	2.48	3.17	7.35	5.42	7.51	8.85	7.54	14.10	-2.13	2.72	7.55	7.55	
Rank	45	48	65	48	62	43	N/A	78	33	75	56	31	40	

Net performance shown is net of all manager fees and expenses (Net-All). Gross returns are compared to median performance of similar managers. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences.

Montana Board of Investments
Comparative Performance
Fixed Income Managers

As of September 30, 2018

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Oaktree U.S. High Yield (SA) - Net	2.32	1.10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.10	01/01/2018
Bloomberg US HY 2% Issuer Cap Index	2.40	2.57	3.05	8.15	5.55	7.65	9.46	7.50	17.13	-4.43	2.46	7.44	2.57	
Difference	-0.08	-1.47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-1.47	
Oaktree U.S. High Yield (SA) - Gross	2.44	1.52	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.52	01/01/2018
IM U.S. High Yield Bonds (SA+CF) Median	2.25	2.48	3.17	7.35	5.42	7.51	8.85	7.54	14.10	-2.13	2.72	7.55	2.48	
Rank	35	89	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	89	
Shenkman High Yield Fixed Income (SA) - Net	2.10	1.72	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.72	01/01/2018
Bloomberg US HY 2% Issuer Cap Index	2.40	2.57	3.05	8.15	5.55	7.65	9.46	7.50	17.13	-4.43	2.46	7.44	2.57	
Difference	-0.30	-0.85	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-0.85	
Shenkman High Yield Fixed Income (SA) - Gross	2.23	2.12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.12	01/01/2018
IM U.S. High Yield Bonds (SA+CF) Median	2.25	2.48	3.17	7.35	5.42	7.51	8.85	7.54	14.10	-2.13	2.72	7.55	2.48	
Rank	55	70	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	70	

Trust Funds Bond Portfolio and Post Trad'l High Yield LP (CF) are part of the Trust Funds Investment Pool.

Net performance shown is net of all manager fees and expenses (Net-All). Gross returns are compared to median performance of similar managers. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences.

Montana Board of Investments
 Comparative Performance
 Diversifying Strategies Managers

As of September 30, 2018

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Long U.S. Treasuries Portfolio	-3.33	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.16	03/01/2018
Bloomberg 20+ Yr Trsy Strips Index	-4.69	-8.26	-4.12	1.51	7.31	3.12	7.44	13.66	1.41	-3.74	46.38	-20.95	0.37	
Difference	1.36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-0.21	
Long U.S. Treasuries Portfolio	-3.33	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.16	03/01/2018
IM U.S. Long Duration (SA+CF) Median	-0.27	-5.27	-2.51	3.96	5.54	4.64	8.31	11.21	7.44	-3.33	18.34	-7.17	-0.21	
Rank	100	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	19	

Net performance shown is net of all manager fees and expenses (Net-All). Gross returns are compared to median performance of similar managers. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences.

Montana Board of Investments
Comparative Performance
Trust Accounts

As of September 30, 2018

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Abandoned Mine Trust	0.51	1.20	1.36	1.07	1.19	1.37	2.86	1.04	1.10	0.90	1.49	0.63	4.07	12/01/1993
Belt Water Treatment Plant Fund	0.25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.80	03/01/2018
Big Sky Economic Development Fund	0.30	-0.77	-0.32	2.20	3.23	3.38	5.14	3.97	3.98	1.82	6.77	-0.22	4.69	07/01/2005
Butte Area One Restoration	0.42	0.01	0.38	1.72	2.11	2.11	N/A	2.92	2.60	1.20	3.57	-0.08	3.01	11/01/2008
Clark Fork River Restoration	0.36	-0.11	0.27	1.69	2.28	2.32	N/A	2.85	2.72	1.37	4.26	-0.12	3.39	11/01/2008
Coal Tax Cultural Trust Fund	0.29	-0.78	-0.33	2.18	3.21	3.37	5.13	3.96	3.95	1.79	6.79	-0.23	5.96	12/01/1993
Coal Tax Park Acquisition	0.30	-0.76	-0.31	2.17	3.18	3.35	5.11	3.96	3.90	1.78	6.66	-0.25	5.93	12/01/1993
East Helena Compensation Fund	0.41	0.28	0.67	1.59	1.82	N/A	N/A	2.56	2.12	0.91	3.01	-0.13	1.52	01/01/2013
Endowment for Children	0.30	-0.77	-0.32	2.08	3.10	3.28	4.99	3.89	3.66	1.70	6.66	-0.28	4.70	08/01/2007
FWP License Account	0.46	0.77	0.98	0.92	0.80	0.89	1.43	1.11	0.84	0.61	0.59	0.42	2.97	11/01/1997
FWP Mitigation Trust Fund	0.37	0.11	0.15	0.63	0.88	1.15	2.67	1.15	0.67	0.87	1.37	0.61	3.86	12/01/1993
FWP Real Property Trust	0.30	-0.73	-0.29	2.11	3.08	3.24	4.93	3.80	3.82	1.73	6.47	-0.24	5.29	12/01/1993
Group Benefits	0.40	0.52	0.70	0.93	1.08	1.15	2.10	1.30	1.16	1.06	1.17	0.32	3.92	12/01/1993
Harold Hamm Endowment	0.31	-0.67	-0.35	N/A	N/A	N/A	N/A	1.11	N/A	N/A	N/A	N/A	0.34	07/01/2016
Montana Pole	0.34	-0.39	0.04	1.94	2.71	2.82	4.34	3.38	3.23	1.56	5.44	-0.17	5.06	09/01/1996
Montana State University	0.51	1.20	1.54	1.19	0.97	0.89	1.16	1.39	0.95	0.39	0.85	0.12	1.99	08/01/2004
Montana Tech-UM Agency Funds	0.51	1.30	1.63	1.10	0.78	0.68	0.81	1.22	0.72	0.27	0.35	0.17	1.79	03/01/2003
MT BOI - Clark Fork Site	0.32	-0.52	-0.09	2.07	2.80	2.84	N/A	3.64	3.63	1.56	5.37	-0.09	4.00	11/01/2008
MT BOI UOFM Other	0.36	0.42	0.71	1.51	1.77	1.66	2.11	2.15	2.34	1.13	2.57	-0.12	2.89	08/01/2002
MUS Group Insurance	0.45	1.21	1.45	1.16	1.27	1.15	N/A	1.09	1.33	1.26	1.30	0.17	1.15	10/01/2011
MUS Workers Compensation	0.45	0.82	1.17	N/A	N/A	N/A	N/A	1.80	N/A	N/A	N/A	N/A	0.97	04/01/2016

Performance shown is gross of fees. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences.

Montana Board of Investments
Comparative Performance
Trust Accounts

As of September 30, 2018

	QTD/ FYTD	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2017	2016	2015	2014	2013	Since Incep.	Inception Date
Older Montanans Trust	0.30	-0.75	-0.30	2.14	3.13	3.16	4.80	3.87	3.86	1.72	6.57	-0.23	4.50	08/01/2007
Permanent Coal Trust Excl Crp	0.38	0.20	0.71	2.42	3.28	3.50	4.74	3.49	3.79	2.23	6.14	0.99	5.72	12/01/1993
PERS Defined Cont Disability	3.60	4.25	8.24	7.32	N/A	N/A	N/A	14.57	3.42	N/A	N/A	N/A	7.13	09/01/2015
Potter Trust Fund	0.30	-0.73	-0.28	N/A	N/A	N/A	N/A	3.87	N/A	N/A	N/A	N/A	1.38	06/01/2016
Resource Indemnity Trust	0.28	-0.83	-0.38	2.20	3.26	3.42	5.15	4.01	4.02	1.82	6.94	-0.27	6.03	12/01/1993
Smelter Hill Up Restorative	0.42	0.61	0.89	1.34	1.57	1.53	N/A	1.85	1.79	0.92	2.49	0.01	1.95	11/01/2008
State Fund Insurance	1.12	0.73	1.59	3.29	3.57	4.11	5.39	5.05	3.50	2.21	5.00	3.11	5.53	12/01/1993
Streamside Tailings Operable Unit	0.33	-0.59	-0.15	2.05	2.99	3.11	4.58	3.69	3.58	1.69	6.22	-0.21	5.25	02/01/1999
Subsequent Injury Fund	0.52	1.39	1.71	1.06	0.69	0.61	2.42	1.11	0.61	0.22	0.11	0.13	3.12	12/01/1993
Tobacco Trust Fund	0.29	-0.80	-0.35	2.18	3.24	3.39	5.16	3.96	3.99	1.82	6.89	-0.27	5.49	01/01/2001
Treasurers	0.52	1.39	1.70	1.05	0.73	0.60	0.62	1.07	0.68	0.27	0.19	0.23	2.94	12/01/1993
Treasure State Endowment	0.29	-0.81	-0.36	2.19	3.24	3.40	5.15	4.00	3.98	1.82	6.84	-0.21	5.89	12/01/1993
Treasure State Reg. Water System	0.29	-0.81	-0.36	2.19	3.23	3.38	5.14	4.00	3.96	1.82	6.80	-0.22	5.66	06/01/2000
Trust and Legacy Account	0.28	-0.84	-0.39	2.19	3.26	3.40	5.15	4.00	4.01	1.82	6.92	-0.26	6.66	07/01/1991
UCFRB Assess/Litig Cost Rec	0.30	-0.74	-0.29	2.10	3.05	3.18	4.91	3.77	3.84	1.65	6.40	-0.24	5.59	07/01/1999
UCFRB Restoration Fund	0.31	-0.61	-0.17	2.03	2.99	3.16	4.84	3.73	3.52	1.70	6.28	-0.20	5.49	06/01/1999
Upper Blackfoot Response	0.45	0.69	1.00	1.37	1.38	1.27	N/A	1.90	1.74	0.84	1.59	0.13	1.33	09/01/2010
Weed Control Trust	0.28	-0.83	-0.38	2.20	3.26	3.40	5.16	4.01	4.02	1.82	6.94	-0.23	5.13	12/01/1993
Wildlife Habitat Trust	0.30	-0.73	-0.29	2.10	3.08	3.23	4.91	3.78	3.79	1.73	6.49	-0.24	5.30	12/01/1993
Zortman/Landusky LT H2O	0.52	1.39	1.71	1.09	1.29	1.79	4.43	1.01	1.36	0.84	1.78	-0.51	6.85	09/01/1999
Z/L Long Term H2O Trust Fund	0.52	1.39	1.72	1.15	1.34	1.57	3.72	1.08	1.39	1.15	1.76	-0.96	4.60	09/01/2005

Performance shown is gross of fees. Fiscal year ends on 06/30. Since inception performance may vary from State Street reported performance due to calculation methodology differences.

Performance Notes

- All gross and net performance data is provided by State Street Analytics (SSA). Reported gross returns for the retirement plans prior to 07/01/2002 are net of all fees.
- Gross performance for the retirement plans is calculated with fee accruals provided by Montana's Accounting department.
- Gross of fees performance is not available (N/A) for the following funds: SPDR S&P 500 ETF (SPY), Domestic Equity Pool STIF, iShares:Core S&P Md-Cp (IJH), iShares:Russ 2000 ETF (IWM), DFA Intl Sm Co;I (DFISX), iShares:MSCI EAFE ETF (EFA), International Equity Pool STIF, iShares:MSCI Em Mkts (EEM), and DFA Emg Mkts Sm Cap;I (DEMSX). The current annual expense ratios are as listed below.

Index Notes

- Retirement plan custom benchmarks are provided by State Street Bank and are calculated daily using actual allocations.
- The CAPP Custom Benchmark consists of the portfolio weighted average of the primary benchmark for each CAPP asset class.
- The Short Term Custom Benchmark consists of 100% ICE 1 Mo LIBOR Index (USD) through 4/30/2018, and 100% Federal Reserve US Treasury 1 Mo Constant Maturity Index thereafter.
- The Domestic Equity Custom Index consists of 100% S&P 1500 Comp Index through 04/30/2017 and 100% MSCI USA IM Index (USD) (Gross) thereafter.
- The International Equity Custom Index consists of 100% MSCI EAFE Index (USD) (Net) through 10/31/2006, 100% MSCI ACW Ex US Index (USD) (Net) through 06/30/2007, 92.5% MSCI ACW Ex US Index (USD) (Net) and 7.5% MSCI ACW Ex US SC IM Index (USD) (Net) through 02/28/2014, and 100% MSCI ACW Ex-US IM Index thereafter.
- The Real Estate Custom Index consists of 100% NCREIF ODCE Index (AWA) (Net) (1 Qtr Lag) through 03/31/2017 and 100% MSCI US REIT Index (USD) (Gross) thereafter.
- The Private Equity Custom Index consists of 100% S&P 1500 Comp Index+4% (1 Qtr Lag) through 03/31/2017 and 100% MSCI US Small Cap Index (USD) (Gross) thereafter.
- The Lazard Custom Index consists of 100% MSCI ACW Ex US Value Index (USD) (Net) through 6/30/2018 and 100% MSCI ACW Ex US Index (USD) (Net) thereafter.
- The Templeton Custom Index consists of 100% MSCI ACW Ex US Small Cap Value Index (USD) (Net) through 5/31/2018, and 100% MSCI ACW Ex US Small Cap Index (USD) (Net) thereafter.
- The Reams Custom Index consists of 100% Bloomberg US Unv Bond Index through 03/31/2017 and 100% Bloomberg US Agg Bond Index thereafter.

Trust Accounts Comments

- The Potter Trust Fund and the Harold Hamm Endowment were added in 06/2016.
- MUS Workers Compensation was added in 04/2016.

Manager Transition Comments

- Voya Investment Management (SA) was liquidated in 07/2018. Market value shown represents residual cash.
- iShares:Russ 2000 ETF (IWM) was funded in 04/2018.
- Jacobs Levy 130/30 Large Cap (SA) was funded in 03/2018.
- Congress Mid Cap Growth (SA) was funded in 02/2018.
- Oaktree U.S. High Yield (SA) and Shenkman High Yield Fixed Income (SA) were funded in 12/2017.
- Analytic Investors 130/30 (SA) was liquidated in 09/2017.
- BlackRock MSCI US Equity Index (CF), BlackRock MSCI US Sm Cap Equity Index (CF), and iShares:Core S&P Md-Cp (IJH) were funded in 06/2017.
- SPDR S&P 500 ETF (SPY) and iShares:MSCI EAFE ETF (EFA) were re-funded in 06/2017.
- INTECH Enhanced Plus was liquidated in 06/2017.
- Residual assets from the liquidation of AllianceBernstein Int'l Value (SA), Martin Currie (SA), Hansberger Global Investors (SA), and Aberdeen Total Return Bond Strategy (SA) were distributed in 06/2017.
- BlackRock Equity Index Fund A (CF) and BlackRock Mid Cap Equity Index A (CF) were liquidated in 05/2017.
- DFA Emg Mkts Sm Cap;I (DEMSX) was funded in 02/2017.
- SPDR S&P 500 ETF (SPY) was liquidated in 01/2017.
- iShares:MSCI Em Mkts (EEM) was funded in 12/2016.
- SPDR S&P 500 ETF (SPY) was initially funded in 09/2015, was then liquidated in 12/2015, and was re-funded in 10/2016.
- Wells Capital Management (SA), Domestic Equity Pool SPIF, and International Equity Pool SPIF were liquidated in 10/2016. Wells Capital Management (SA) residual assets from liquidation were distributed in 03/2017.
- Nicholas Investment Partners was liquidated in 07/2016. Residual assets from liquidation were distributed in 03/2017.
- Effective 07/2016, the Metropolitan West Capital Management legal entity merged into the Wells Capital Management Incorporated legal entity. The Metropolitan West Capital Mgmt (SA) has been updated to Wells Capital Management (SA) to reflect the change.
- iShares S&P SmallCap 600 Index ETF (IJR) was liquidated in 01/2016.
- Effective 05/2014, ING rebranded to Voya. The ING Investment Management (SA) has been updated to Voya Investment Management (SA) to reflect the change.

Miscellaneous Comments

- Fiscal year ends on 06/30.

Expense Ratios

• SPDR S&P 500 ETF (SPY):	0.09%
• Domestic Equity Pool STIF:	0.15%
• DFA Intl Sm Co;I (DFISX):	0.53%
• iShares:MSCI EAFE ETF (EFA):	0.31%
• International Equity Pool STIF:	0.18%
• iShares:MSCI Em Mkts (EEM):	0.69%
• DFA Emg Mkts Sm Cap;I (DEMSX):	0.73%
• iShares:Core S&P Md-Cp (IJH):	0.07%
• iShares:Russ 2000 ETF (IWM):	0.20%

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