ITDASHBOARD.gov MENU

Back to Investment Detail

Business Case

Table of Contents

Section A: Investment Summary Information

Investment Name

NOAA/OCIO/ NOAA R&D High Performance Computing System (HPCS)

Unique Investment Identifier

006-000380400

Investment Description

High performance computing resources are used for weather and climate research in the development and use of sophisticated numerical models to predict and understand atmospheric and oceanic phenomena.

Agency

Department of Commerce

Point of Contact

Andre Mendes - CIO

email 202-482-4797

Investment Type

Major IT Investments

Bureau

National Oceanic and Atmospheric Administration

Mission Support

Not Applicable

Shared Service Category

Not Applicable

Shared Service Identifier

Not Applicable

Date Investment First Submitted

09/20/2021

Date of Last Investment Detail Update

05/31/2022

Section B: Investment Detail

1. Briefly describe the investment's return on investment, including benefits internal and external to the government and outcomes achieved or planned.

   The estimated return on NOAA R&D HPCS was estimated to be approximately $23.5 billion for the FY 2009 to FY 2017 Life Cycle based on the economic analyses of the benefits of weather and climate research described in the following documents: Benefit/Cost Analysis for Geophysical Fluid Dynamics Laboratory Climate Change Computing Initiative, NOAA, June 2002; and Benefit Analysis for NOAA High Performance Computing System Research Applications, Stratus, December 4, 2003. In addition, the investment demonstrated an average Benefits-to-Cost Ratio of 47:1. These returns, while capturing only a small number of benefits that were estimated and quantified, demonstrate the significant value that HPC-enabled weather and climate forecasting contributes to society. This tremendous benefits-to-cost ratio will continue to increase as computational capability is added. Further studies funded by DOE Grant estimate minimum ROI of 7.7:1 for Government overall - U.S. Department of Energy Office of Science, Office of Advanced Scientific Computing Research, and the National Nuclear Security Administration, under award number DE-SC0008540.

Section C: Investment and Contracts

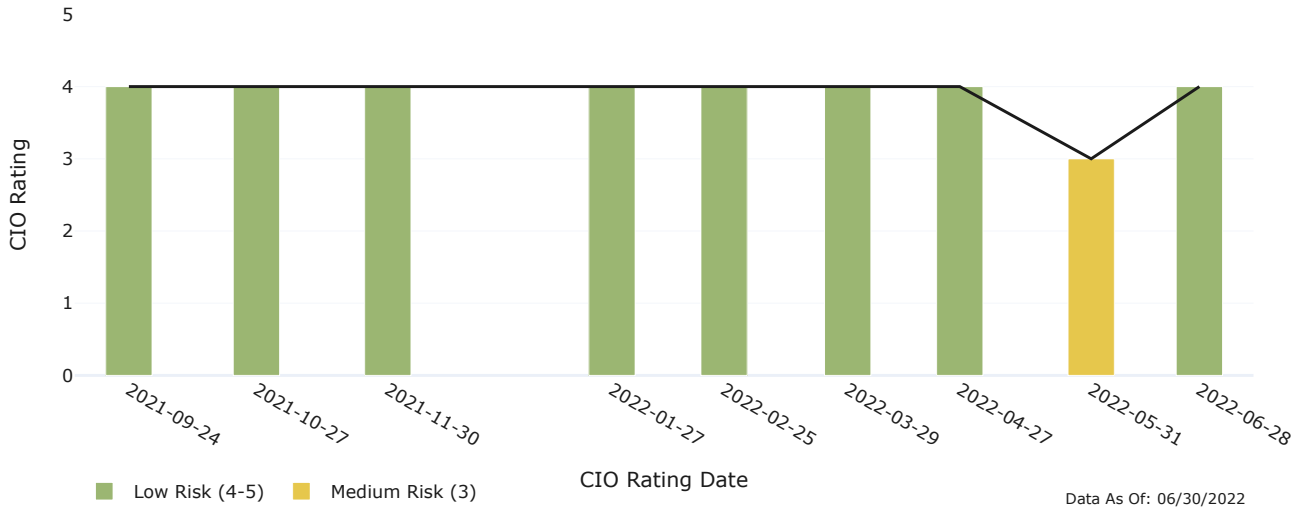
Public URLs

- **https://www.noaa.gov/organization/information-technology/high-performance-computing-communications**

Contracts

- **NOAAOCIOCLIMATE2016**
- **DG133010CQ0014**
- **ST133018CQ0073**

Section D: Historic CIO Rating



CIO Rating	Date	Comments
4	Jun 28, 2022	HPCS is a constellation of super computers used by NOAA to perform research and development to improve climate and weather models that is meeting the mission requirements in performance. The HPCS investment is in Operational and Maintenance mode and constituently meets and exceeds performance metrics. Accomplishments: System availability 99.5%; Data availability 100%; Compute hours made available 196,001,193. Progressing with some risk and issues including a Human Capital risk that is being addressed and partially mitigated.

CIO Rating	Date	Comments
3	May 31, 2022	HPCS is a constellation of super computers used by NOAA to perform research and development to improve climate and weather models that is meeting the mission requirements in performance. The HPCS investment is in Operational and Maintenance mode and constituently meets and exceeds performance metrics. Accomplishments: System availability 99.53%; Data availability 100%; Compute hours made available 196,427,7124. Progressing with some risk and issues.
4	Apr 27, 2022	HPCS is a constellation of super computers used by NOAA to perform research and development to improve climate and weather models that is meeting the mission requirements in performance. The HPCS investment is in Operational and Maintenance mode and constituently meets and exceeds performance metrics. Accomplishments: System availability 99.63%; Data availability 100%; Compute hours made available 195,476,748. Progressing with some risk and issues.
4	Mar 29, 2022	HPCS is a constellation of super computers used by NOAA to perform research and development to improve climate and weather models that is meeting the mission requirements in performance. The HPCS investment is in Operational and Maintenance mode and constituently meets and exceeds performance metrics. Accomplishments: System availability: 99.58%, Data availability: 99.94%, Compute hours made available: 196,495,054. Progressing as expected with some risk.
4	Feb 25, 2022	HPCS is a constellation of super computers used by NOAA to perform research and development to improve climate and weather models that is meeting the mission requirements in performance. The HPCS investment is in Operational and Maintenance mode and constituently meets and exceeds performance metrics. Accomplishments: System availability: 99.43, Data availability: 100%, Compute hours made available: 193,623,064. Progressing as expected with some risk.
4	Jan 27, 2022	HPCS is a constellation of super computers used by NOAA to perform research and development to improve climate and weather models that is meeting the mission requirements in performance. Accomplishments: System availability: 99.5% (12/2021), Data availability: 100% (12/2021), Compute hours made available: 196,935,139 (12/2021). Progressing as expected with some risk.
4	Nov 30, 2021	HPCS is a constellation of super computers used by NOAA to perform research and development to improve climate and weather models that is meeting the mission requirements in performance. Accomplishments: System availability: 99.74% (10/2021), Data availability: 100% (10/2021), Compute hours made available: 195,844,721 (10/2021). Progressing as expected with minimum risk.
4	Oct 27, 2021	HPC is a constellation of super computers used by NOAA to perform research and development to improve climate and weather models that is meeting the mission requirements in performance. Accomplishments: System availability 99.21% (9/2021) Data availability 99.89% (9/2021; Compute hours made available 191,028,850 (9/2021). Human Capital is high risk but is being addressed and is partially mitigated.
4	Sep 24, 2021	HPC is a constellation of super computers used by NOAA to perform research and development to improve climate and weather models that is meeting the mission requirements in performance. Accomplishments: System availability 98.96% (8/2021); Data availability 99.92% (8/2021); Compute hours made available 192,694,702 (8/2021). Human Capital is high risk but is being addressed and is partially mitigated.

Data Last Updated On: 06/30/2022

Section E: Investment Spending

Table 1: Distribution by Spending Type

Spending Type	PY 2021	CY 2022	BY 2023
DME Costs	0	0	0
O&M Costs	63.1	198.1	93.1
Total	63.1	198.1	93.1

Table 2: Distribution by Cost Pools

Cost Pools

Cost Pools	PY 2021	CY 2022	BY 2023
Internal Labor	4.665	4.665	4.665
External Labor	4.259	4.259	4.259
Outside Services	24.315	22.861	22.861
Hardware	19.01	114.01	49.01
Software	1.96	11.96	1.96
Facilities & Power	3.58	33.53	3.53
Telecom	5.311	6.815	6.815
Other	0	0	0
Internal Services	0	0	0
Totals	63.1	198.1	93.1

Cost in millions (M)

Table 3: Distribution by IT Towers

IT Tower	PY 2021	CY 2022	BY 2023
Security & Compliance	1.975	1.975	1.975
IT Management	3.41	3.41	3.41
Network	4.636	6.09	6.09
Data	0	0	0
Compute	51.776	135.322	75.322
Storage	0.415	10.415	5.415
End User	0	0	0
Output	0	0	0
Application	0.504	10.504	0.504
Delivery	0	0	0
Platform	0	0	0
Data Center	0.384	30.384	0.384
Totals	63.1	198.1	93.1

IT Towers

Cost in millions (M)

Data Last Updated On: 05/31/2022

Section F: Project and Activities Detail

Table 1: Project Details

Project Name	Project UID	Status	Project Life Cycle Cost ($M)	Cost Variance (%)	Start Date	End Date	Schedule Variance (%)	Schedule Variance (Days)
FY21 R&D HPCS O&M	3804M16002	Complete	63.1	-0.23	2020-10-01	2021-09-30	0	0
FY22 R&D HPCS O&M	3804M16002	In Progress	63.1	-6.6	2021-10-01	2022-09-30	0	0

Low Medium High

Table 2: Activity Details

Unique Project ID	Activity Name	Activity Description	Planned Start Date	Projected Start Date	Actual Start Date	Planned Completion Date	Projected Completion Date	Actual Completion Date	Planned Total Cost ($M)	Projected Total Cost ($M)	Actual Total Cost ($M)
3804M16002	FY21 Contract HPC Support Service	FY21 Contract HPC Support Service	2020-10-01	2020-10-01	2020-10-01	2021-09-30	2021-09-30	2021-09-30	19.06	19.064	19.13
3804M16002	FY21 Research HPC - Oak Ridge DOE	FY21 Research HPC - Oak Ridge DOE	2020-10-01	2020-10-01	2020-10-01	2021-09-30	2021-09-30	2021-09-30	19.8	19.8	21.8
3804M16002	FY21 R&D HPCS Facilities	FY21 R&D HPCS Facilities	2020-10-01	2020-10-01	2020-10-01	2021-09-30	2021-09-30	2021-09-30	4.7	4.701	4.7
3804M16002	FY21 R&D HPCS Software Engineering	FY21 R&D HPCS Software Engineering	2020-10-01	2020-10-01	2020-10-01	2021-09-30	2021-09-30	2021-09-30	2.97	2.969	2.97

Unique Project ID	Activity Name	Activity Description	Planned Start Date	Projected Start Date	Actual Start Date	Planned Completion Date	Projected Completion Date	Actual Completion Date	Planned Total Cost ($M)	Projected Total Cost ($M)	Actual Total Cost ($M)
3804M16002	FY21 Wide Area Network NWAVE	FY21 Wide Area Network NWAVE	2020-10-01	2020-10-01	2020-10-01	2021-09-30	2021-09-30	2021-09-30	3.45	3.45	3.45
3804M16002	FY21 Contract Support Service Q1Q2	FY21 Contract Support Service Q1Q2	2020-10-01	2020-10-01	2020-10-01	2021-03-31	2021-03-31	2021-03-31	1.04	1.036	1.24
3804M16002	FY21 Contract Support Service Q3Q4	FY21 Contract Support Service Q3Q4	2021-04-01	2021-04-01	2021-04-01	2021-09-30	2021-09-30	2021-09-30	18.03	18.028	17.9
3804M16002	FY21 Research HPC Oak Ridge Q1Q2	FY21 Research HPC Oak Ridge Q1Q2	2020-10-01	2020-10-01	2020-10-01	2021-03-31	2021-03-31	2021-03-31	0	1.0E-5	0
3804M16002	FY21 R&D HPCS Facilities Q1Q2	FY21 R&D HPCS Facilities Q1Q2	2020-10-01	2020-10-01	2020-10-01	2021-03-31	2021-03-31	2021-03-31	2.11	2.105	2.11
3804M16002	FY21 R&D HPCS SENA Q1Q2	FY21 R&D HPCS SENA Q1Q2	2020-10-01	2020-10-01	2020-10-01	2021-03-31	2021-03-31	2021-03-31	2.35	2.35	2.35
3804M16002	FY21 R&D HPCS SENA Q3Q4	FY21 R&D HPCS SENA Q3Q4	2021-04-01	2021-04-01	2021-04-01	2021-09-30	2021-09-30	2021-09-30	0.62	0.619	0.62
3804M16002	FY21 NWAVE Q1Q2	FY21 Wide Area Network NWAVE Q1Q2	2020-10-01	2020-10-01	2020-10-01	2021-03-31	2021-03-31	2021-03-31	2.94	2.943	2.94
3804M16002	FY21 NWAVE Q3Q4	FY21 Wide Area Network NWAVE Q3Q4	2021-04-01	2021-04-01	2021-04-01	2021-09-30	2021-09-30	2021-09-30	0.51	0.507	0.51
3804M16002	FY21 Research HPC Oak Ridge Q3Q4	FY21 Research HPC Oak Ridge Q3Q4	2021-04-01	2021-04-01	2021-04-01	2021-09-30	2021-09-30	2021-09-30	19.8	19.79999	21.8
3804M16002	FY21 R&D HPCS Facilities Q3Q4	FY21 R&D HPCS Facilities Q3Q4	2021-04-01	2021-04-01	2021-04-01	2021-09-30	2021-09-30	2021-09-30	2.6	2.596	2.6
3804M16002	FY22 R&D HPC Facilities	FY22 R&D HPC Facilities	2021-10-01	2021-10-01	2021-10-01	2022-09-30	2022-09-30		4.7	4.701059	4.26
3804M16002	FY22 Contract HPC Support Service	FY22 Contract HPC Support Service	2021-10-01	2021-10-01	2021-10-01	2022-09-30	2022-09-30		19.13	19.132	3.38
3804M16002	FY22 Contract Support Q3/Q4	FY22 Contract Support Q3/Q4	2022-04-01	2022-04-01	2022-04-01	2022-09-30	2022-09-30		17.9	17.896	0
3804M16002	FY22 Research HPC Oak Ridge DOE	FY22 Research HPC Oak Ridge DOE IAA	2021-10-01	2021-10-01	2021-10-01	2022-09-30	2022-09-30		19.8	19.79901	0

Unique Project ID	Activity Name	Activity Description	Planned Start Date	Projected Start Date	Actual Start Date	Planned Completion Date	Projected Completion Date	Actual Completion Date	Planned Total Cost ($M)	Projected Total Cost ($M)	Actual Total Cost ($M)
3804M16002	FY22 Research HPC Oak Ridge Q1Q2	FY22 Research HPC Oak Ridge Q1Q2	2021-10-01	2021-10-01	2021-10-01	2022-03-31	2022-03-31	2022-03-31	0	1.0E-5	0
3804M16002	FY22 Wide Area Network NWAVE	FY22 Wide Area Network NWAVE	2021-10-01	2021-10-01	2021-10-01	2022-09-30	2022-09-30		3.45	3.45	3.45
3804M16002	FY22 NWAVE Q1Q2	FY22 NWAVE Q1Q2	2021-10-01	2021-10-01	2021-10-01	2022-03-31	2022-03-31	2022-03-31	2.94	2.943	2.94
3804M16002	SENA Q3Q4	SENA Q3Q4	2022-04-01	2022-04-01	2022-04-01	2022-09-30	2022-09-30		0.62	2.4	0.26
3804M16002	FY22 R&D HPC Software Engineering	FY22 R&D HPC Software Engineering	2021-10-01	2021-10-01	2021-10-01	2022-09-30	2022-09-30		2.97	4.75	0.96
3804M16002	FY22 Contract Support Q1/Q2	FY22 Contract Support Q1/Q2	2021-10-01	2021-10-01	2021-10-01	2022-03-31	2022-03-31	2022-03-31	1.24	1.236	3.38
3804M16002	FY22 Research HPC Oak Ridge Q3Q4	FY22 Research HPC Oak Ridge Q3Q4	2022-04-01	2022-04-01	2022-04-01	2022-09-30	2022-09-30		19.8	19.799	0
3804M16002	FY22 R&D HPC Facilities Q3Q4	FY22 R&D HPC Facilities Q3Q4	2022-04-01	2022-04-01	2022-04-01	2022-09-30	2022-09-30		2.6	2.596059	1.14
3804M16002	FY22 R&D HPC Facilities Q1Q2	FY22 R&D HPC Facilities Q1Q2	2021-10-01	2021-10-01	2021-10-01	2022-03-31	2022-03-31	2022-03-31	2.11	2.105	3.11
3804M16002	FY22 NWAVE Q3Q4	FY22 NWAVE Q3Q4	2022-04-01	2022-04-01	2022-04-01	2022-09-30	2022-09-30		0.51	0.507	0.51
3804M16002	SENA Q1Q2	SENA Q1Q2	2021-10-01	2021-10-01	2021-10-01	2022-03-31	2022-03-31	2022-03-31	2.35	2.35	0.7

Table 3: Project Related Details

FY21 R&D HPCS O&M

1. Are information technology investments adequately implementing incremental development methodology? (Y/N)
2. What is the frequency of incremental development iterations? (ex. 1 month, 3 months, 6 months, 12 months or greater)
3. Please describe the iterative development methodology being employed. (500 characters or less)

FY22 R&D HPCS O&M

1. Are information technology investments adequately implementing incremental development methodology? (Y/N)
2. What is the frequency of incremental development iterations? (ex. 1 month, 3 months, 6 months, 12 months or greater)

3. Please describe the iterative development methodology being employed. (500 characters or less)

Return to top