Allocations and Usage

NERSC Users Group Annual Meeting 2019

July 19, 2019
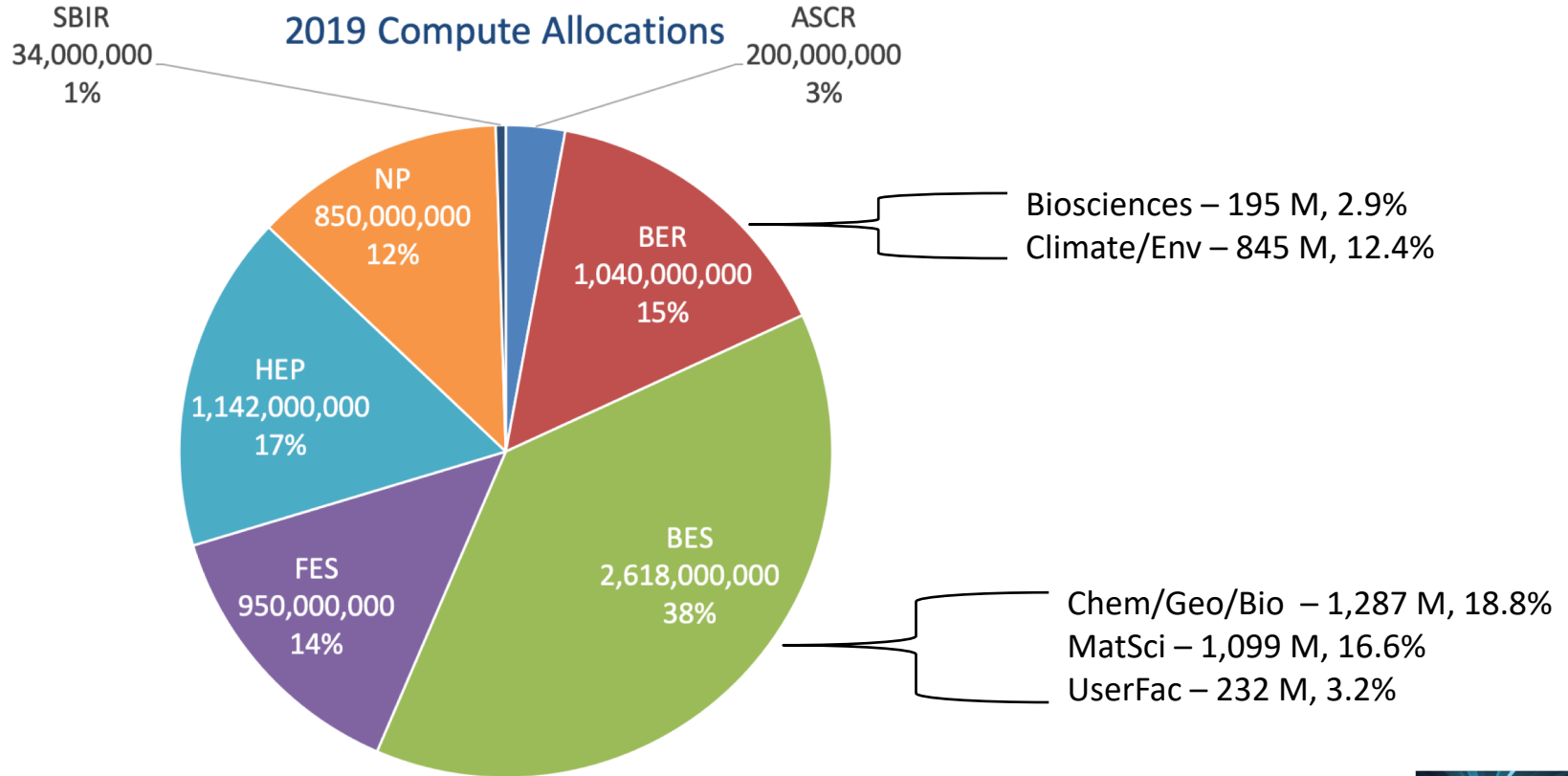
Richard Gerber

NERSC Senior Science Advisor
High Performance Computing Department Head

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NERSC Allocations

Year	DOE Mission	ALCC	Directors Reserve	Other	Total
2014	2,400	300	300		3,000
2015	2,400	300	300		3,000
2016	2,400	300	300		3,000
2017	4,800	600	600	62	6,062
2018	6,834	850	850	750	9,250
2019	6,834	650	650	0	8,134
2020	6,834	350	200	0	7,384

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Office Allocations

2019 Compute Allocations

SBIR 34,000,000 1%

ASCR 200,000,000 3%

NP 850,000,000 12%

HEP 1,142,000,000 17%

BER 1,040,000,000 15%

FES 950,000,000 14%

BES 2,618,000,000 38%

Biosciences – 195 M, 2.9%
Climate/Env – 845 M, 12.4%

Chem/Geo/Bio – 1,287 M, 18.8%
MatSci – 1,099 M, 16.6%
UserFac – 232 M, 3.2%

NERSC Charging and Usage

Charged vs. Used

- NERSC Hours **Used** is nodes-hours used time *Machine Factor*
- NERSC Hours **Charged** is Used with discounts applied

Discounts used to affect user behavior

1. High utilization to maximize science and meet commitments to DOE
2. Encourage use of unique capabilities
3. Prepare community for next-generation and exascale systems
4. Accommodate special needs

Discounts

- Premium: 200% regular charge, high priority (4)
- Low on KNL: 50% regular charge, low priority (1,3)
- Flex on KNL: 25% regular charge, gives scheduler flexibility (1)
- Large job: 60% regular charge, enhanced priority (2)
- Overburn (scavenger): no charge once allocation is exhausted; backfill only, lowest priority
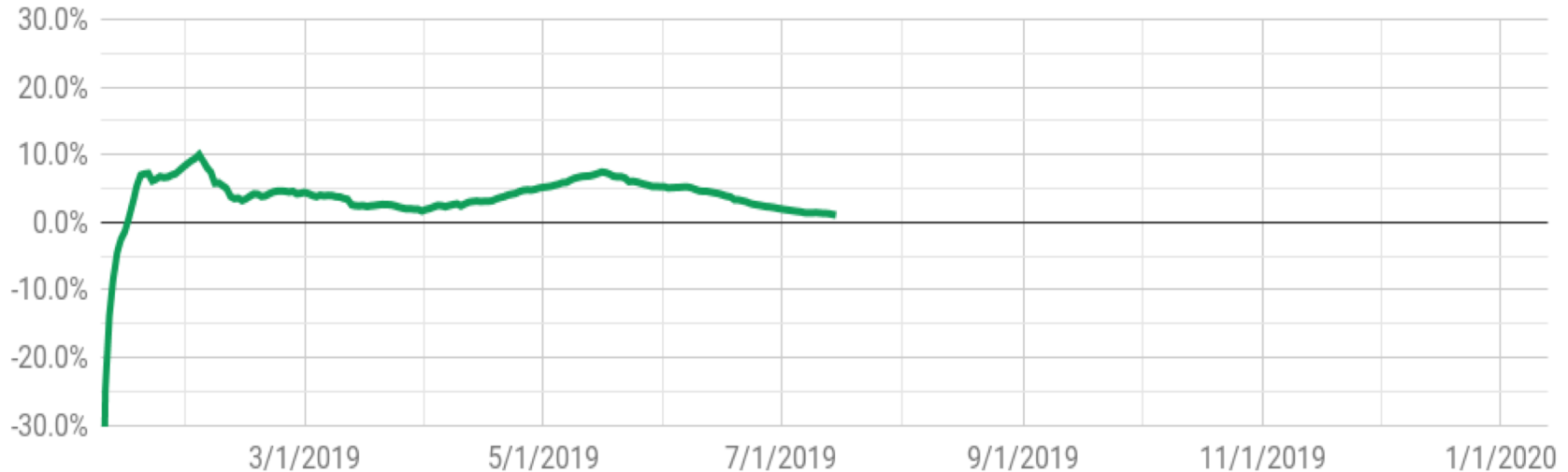
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Hours Used Relative to Target Pace
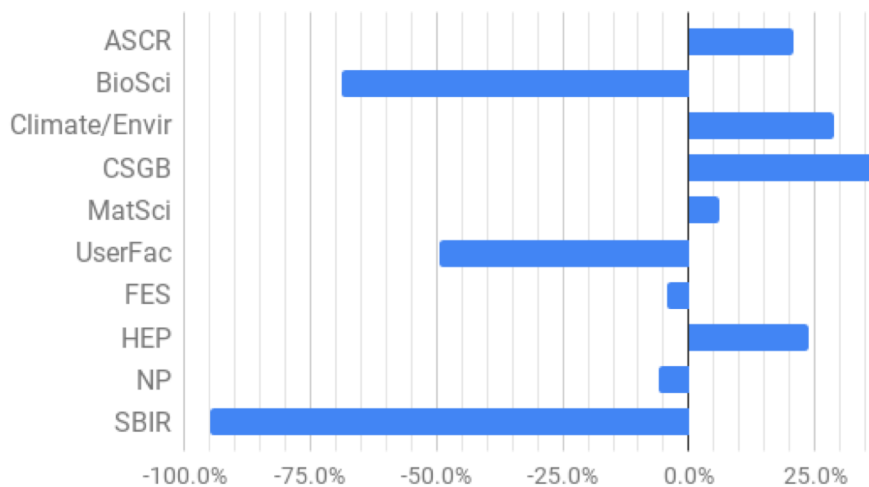
NERSC is delivering a lot of hours to science.
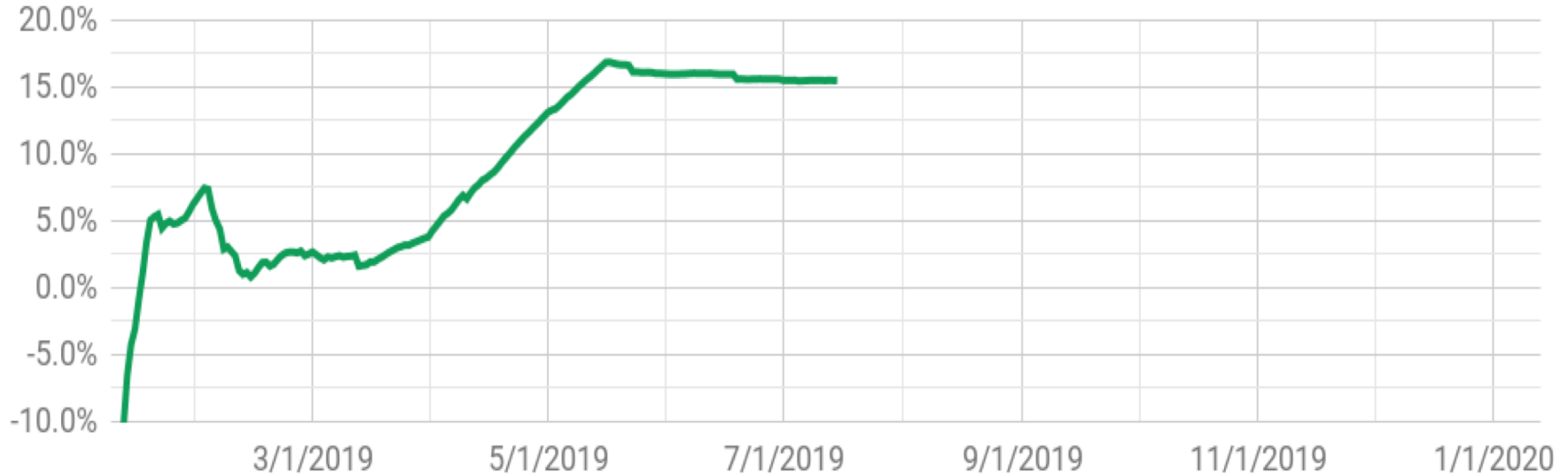
Hours Charged Relative to Target Pace

- Charging is right on pace
- This is good: need enough remaining allocation to keep machine busy, but not so much that regular QOS wait times are long at end of year
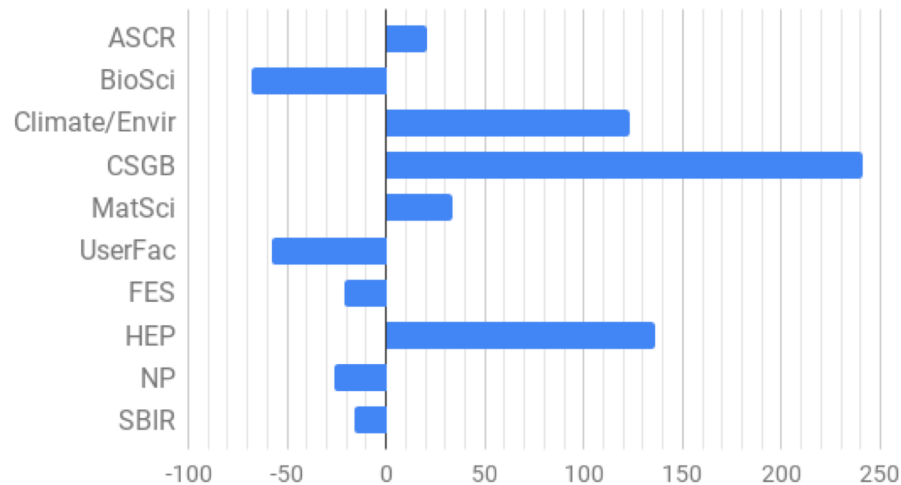
NERSC Office / Program Spend Rate

Some offices/programs are overspending and some are underspending

Spend Rate as of 7/15/19

Spend Rate as of 7/15/19 (M NERSC Hours)

Summary

- NERSC is ahead of target for hours delivered to science
- Different communities are using time at different paces
- We will continue to tweak queues and charge factors to
  - Increase utilization
  - Minimize queue wait times
- If you have been using one architecture or another, we'll work with you to try to find a run strategy that maximizes your throughput and is cost effective
  - e.g., DUNE