



Simulating a DIII National Cross Country Meet

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A brief overview on CC Races



- Race distance: 8k (5 mi)
- The sum of the places of the top 5 runners= the team score; the team with the lowest score wins
- 32 teams (and their top 7 runners) earn bids to the national meet, along with individual qualifiers
- The top 4 teams at Nationals earn podium finishes

“That’s why they run the race”

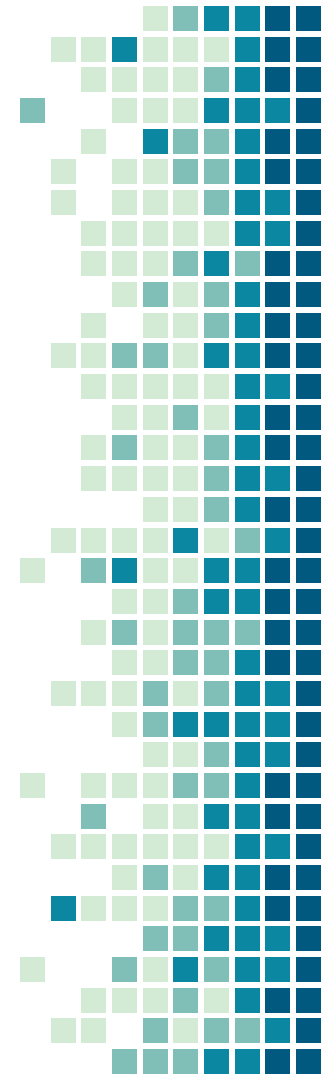
2019 Week 8 - November 19th

RANK ▲▼	TEAM & INFO ▲▼	PTS ▲▼	CHANGE ▲▼
1	 WILLIAMS New England Region (1) NESCAC (1) Pete Farwell (41st)	253 (5 fpv)	▲ 1 (LW: 2)
2	 NORTH CENTRAL (ILL.) Midwest Region (1) CCIW (1) Al Carius (54th)	251 (3 fpv)	▼ 1 (LW: 1)
3	 POMONA-PITZER West Region (1) SCIAAC (2) Jordan Carpenter (3rd)	238	▲ 2 (LW: 5)
4	 CARNEGIE MELLON Midwest Region (1) UAA (1) Tim Connelly (5th)	232	▶▶ (LW: 4)
5	 CLAREMONT-MUDD-SCRIPPS West Region (2) SCIAAC (1) John Goldhammer (36th)	226	▼ 2 (LW: 3)
6	 JOHNS HOPKINS Midwest Region (2) Centennial (1) Bobby Van Allen (20th)	216	▶▶ (LW: 6)
7	 SUNY GENESEO Atlantic Region (1) SUNYAC (1) Dan Moore (5th)	207	▲ 2 (LW: 9)
8	 UW-LA CROSSE Midwest Region (2) WIAC (1) Derek Stanley (8th)	198	▲ 5 (LW: 13)
9	 WARTBURG Central Region (1) American Rivers (1) Ryan Chapman (4th)	189	▼ 2 (LW: 7)
10	 WASHINGTON (MO.) Midwest Region (3) UAA (2) Jeff Stiles (19th)	187	▼ 2 (LW: 8)

Left: Coaches Poll
Released 4 days before
the National Meet

Finished a
disappointing 18th
at NCAA National
Meet

Finished a surprising
4th (podium) at
NCAA National Meet



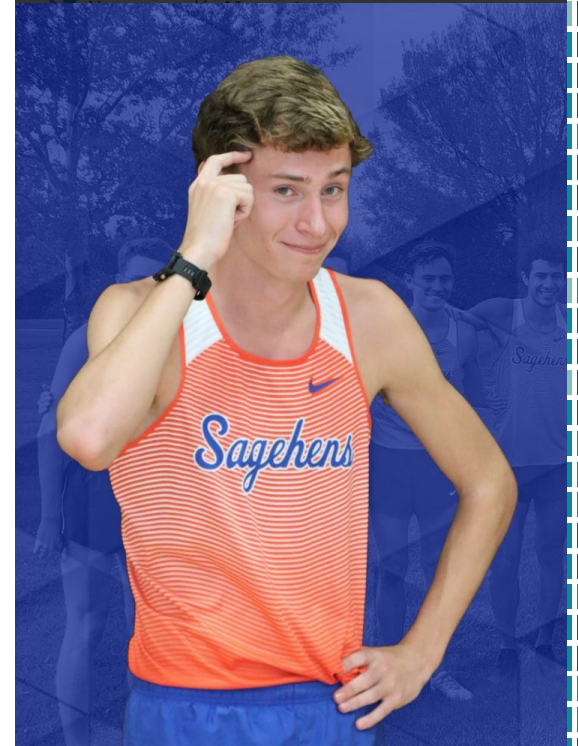
Questions and Implications

Questions

- 1) How likely were the national results given past performances?
- 2) What teams exceeded/fell short of expectations at the national meet? Which teams peak well/poorly for national meets?

Implications:

- 1) Evaluation of coaching/team performance
- 2) Useful for recruits in making college decisions



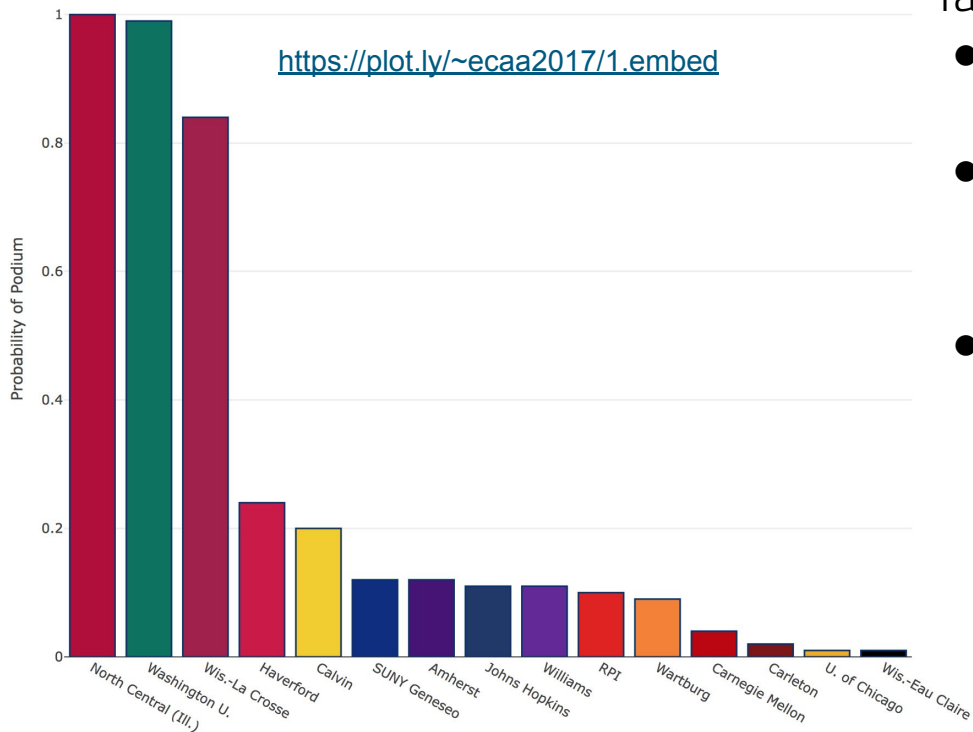
Challenges

- **Data acquisition**
 - National meet results and race results for all national qualifiers throughout the years 2018 and 2019
- Accounting for the **variability** of race performances
 - Assume an athlete's performances are normally distributed; build normal distribution for each athlete based on past performances and draw random performances
- **Adjusting** race times to account for course difficulty
 - 2019- Course adjustments courtesy of Bijan Mazaheri (former Williams runner and PhD student at Caltech)
 - 2018- $\text{adjustment} = \text{median times difference between national meet and meet in question among athletes that ran in both}$



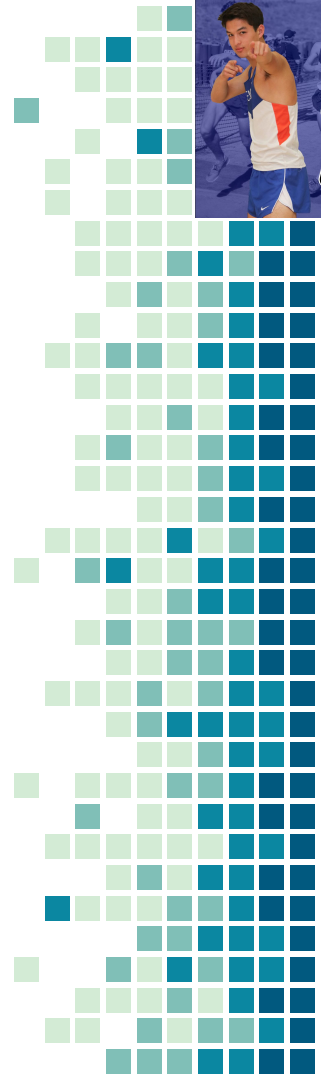
Results 2018: Success Probabilities

Results of National Meet Simulations 2018



Takeaways:

- Dominance of North Central
- Three teams head and shoulders above the rest
- A tight battle for the coveted 4th and final podium spot amongst a slew of teams

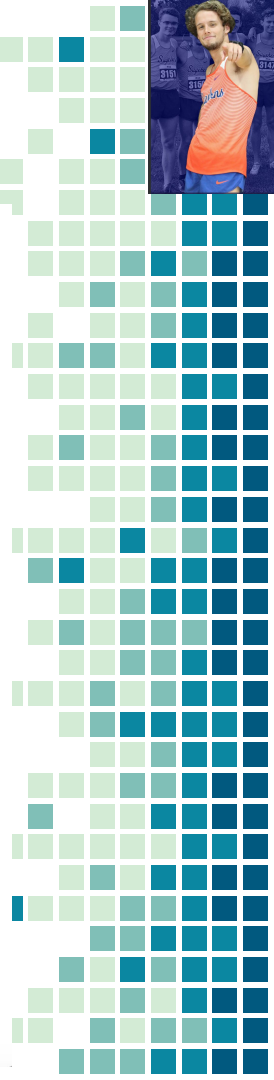
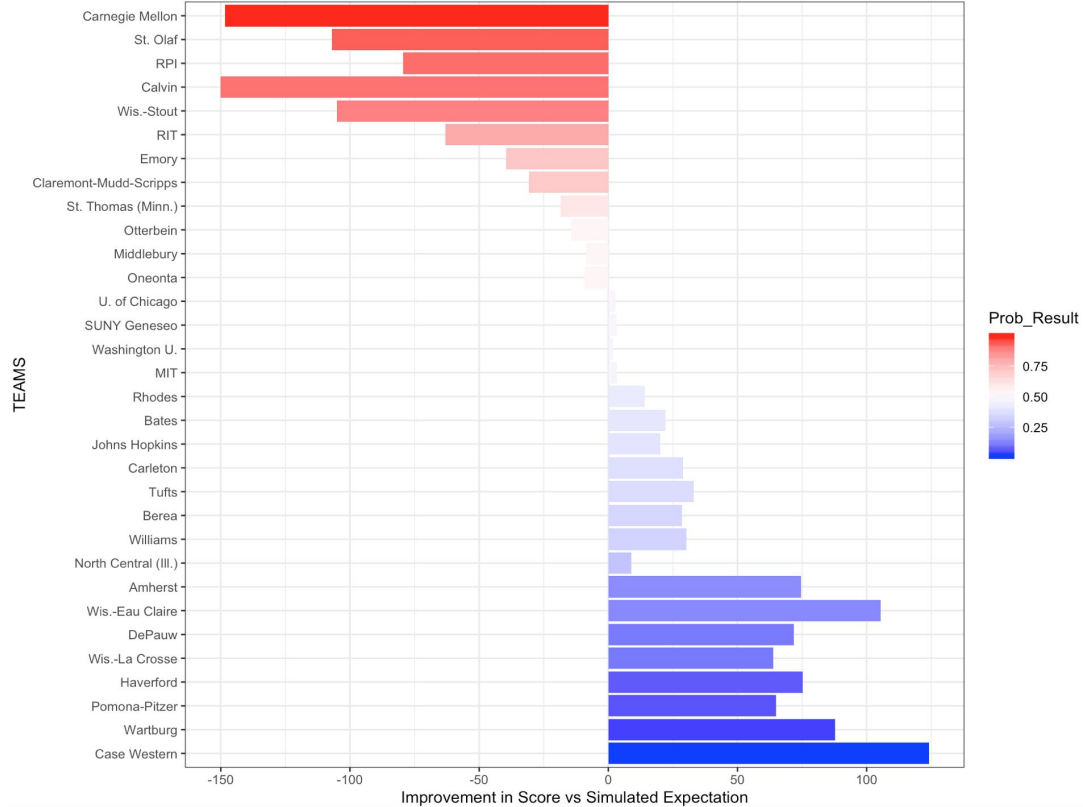


Results 2018: Over/Underperformers



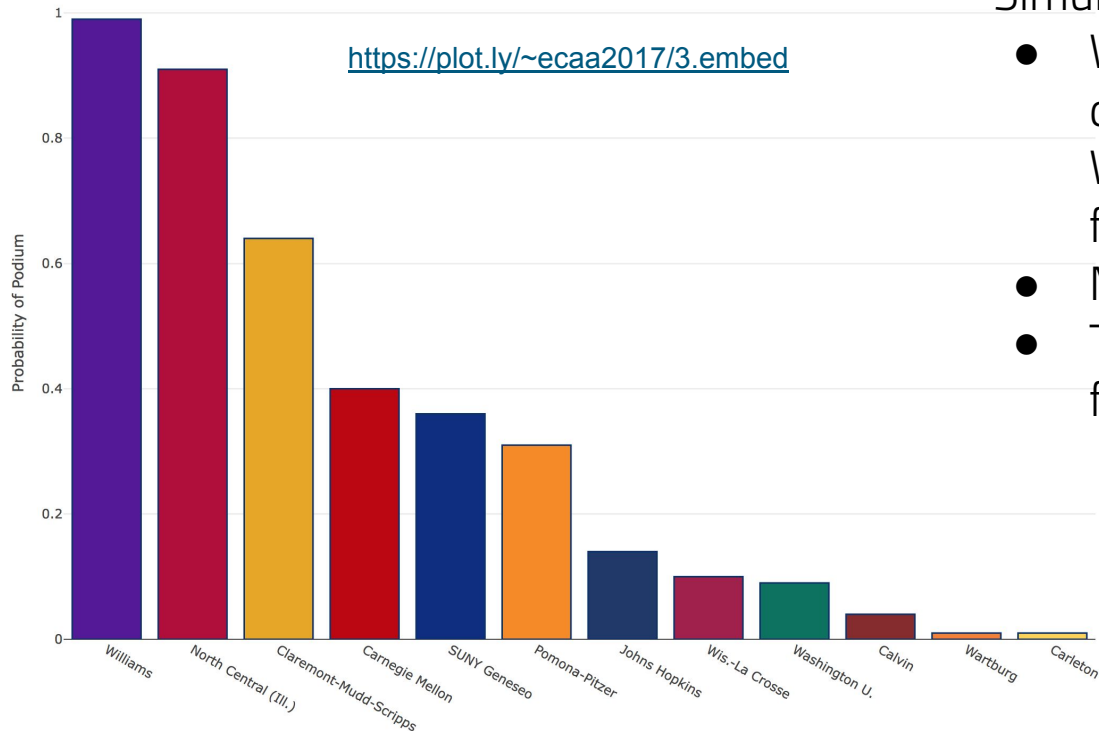
RANK ▲▼	TEAM CONFERENCE ▲▼	
1	 NORTH CENTRAL (ILL.)	43.00
2	 WASHINGTON (MO.)	110.00
3	 UW-LA CROSSE	127.00
4	 HAVERFORD	213.00
5	 WARTBURG	227.00
6	 AMHERST	253.00
7	 POMONA-PITZER	298.00
8	 WILLIAMS	300.00
9	 JOHNS HOPKINS	308.00
10	 SUNY GENESEO	329.00

Overperformers and Underperformers at the National Meet 2018



Results 2019: Success Probabilities

Results of National Meet Simulations 2019

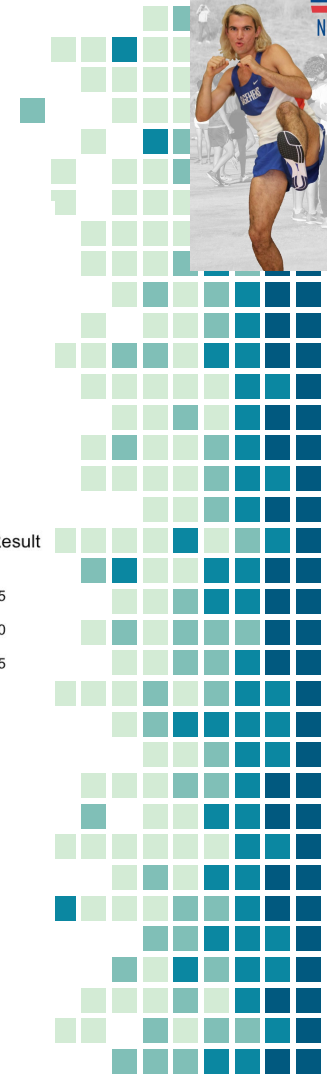
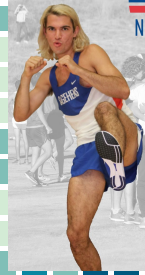


Simulation Expectations:

- Williams and NC dominant, with Williams as solid favorite for victory
- More wide-open race
- Two podium spots up for grabs

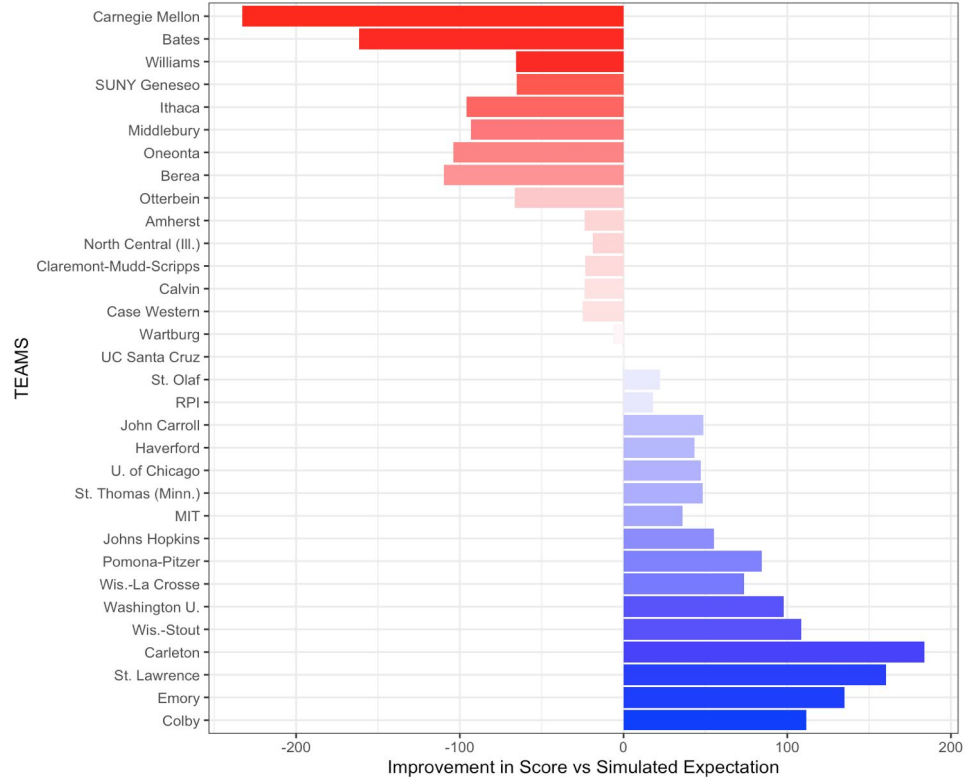


Results 2019: Over/Underperformers



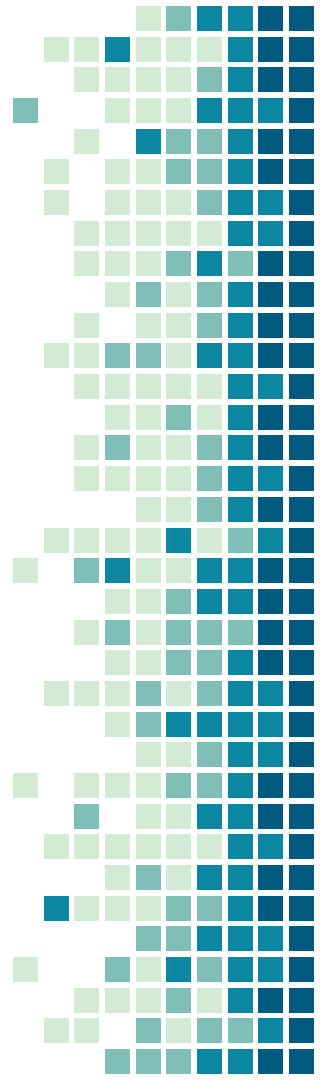
Overperformers and Underperformers at the National Meet 2019

RANK ▲▼	TEAM CONFERENCE ▲▼	
1	POMONA-PITZER	164.00
2	NORTH CENTRAL (ILL.)	182.00
3	WILLIAMS	183.00
4	WASHINGTON (MO.)	193.00
5	JOHNS HOPKINS	208.00
6	CLAREMONT-MUDD-SCRIPPS	222.00
7	UW-LA CROSSE	231.00
8	SUNY GENESEO	293.00
9	MIT	299.00
10	RPI	333.00



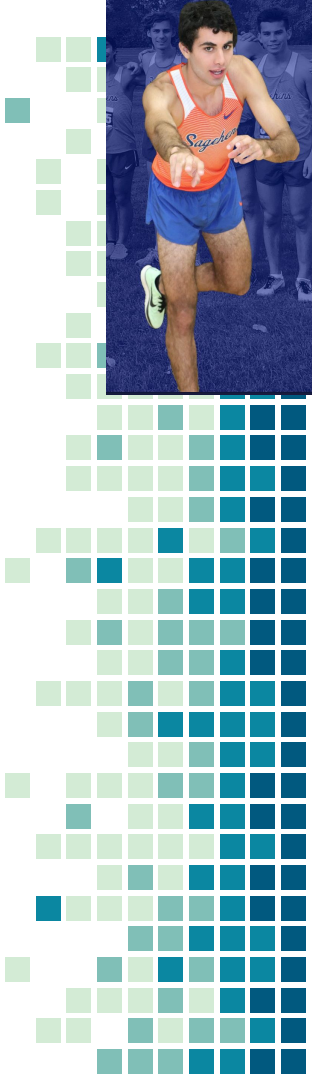
Shiny App

[Web link](#)



Conclusions

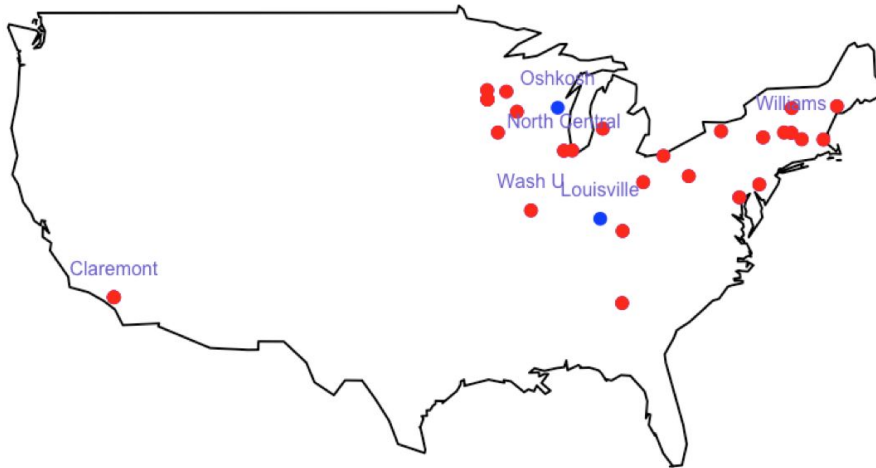
- How likely were the national results given past performances?
 - 2018- things went relatively according to script
 - 2019- unexpected results
- Which teams ran well/poorly relative to expectations?
 - Good Peakers
 - Pomona-Pitzer
 - Carleton
 - Bad Peakers
 - Carnegie-Mellon





Poss. Explanations for a Wild 2019 Meet

- Mud & Conditions
- Fatigue accrued throughout the season
- Travel



Thank you for listening!

