Mathematica

Tracking Data System for the REU Program

NSF EEC Grantees Conference
October 22, 2019

Cecilia Speroni • Clemencia Cosentino

Courtesy of REU Site in Innovative Engineering using Renewable Resources at the University of Alabama

Congress imposed a reporting requirement

- The America COMPETES Reauthorization Act requires that students in the REU program "be tracked, for employment and continued matriculation in STEM fields, through receipt of the undergraduate degree and for at least three years thereafter"
- NSF commissioned:
  - A feasibility study, conducted by the Science and Technology Policy Institute (STPI)
  - Pilot testing of approaches to comply with congressional requirements (and that can be used to benefit the program—namely, program officers, program grantees, and student participants)

The REU Data System

Data system designed with 3 goals in mind

Monitoring implementation

Providing information that program officers need to monitor adherence to program guidelines and make programmatic revisions

Providing monitoring information needed by NSF leadership and Congress

Evaluating impacts

Assessing whether the program has an impact on target outcomes

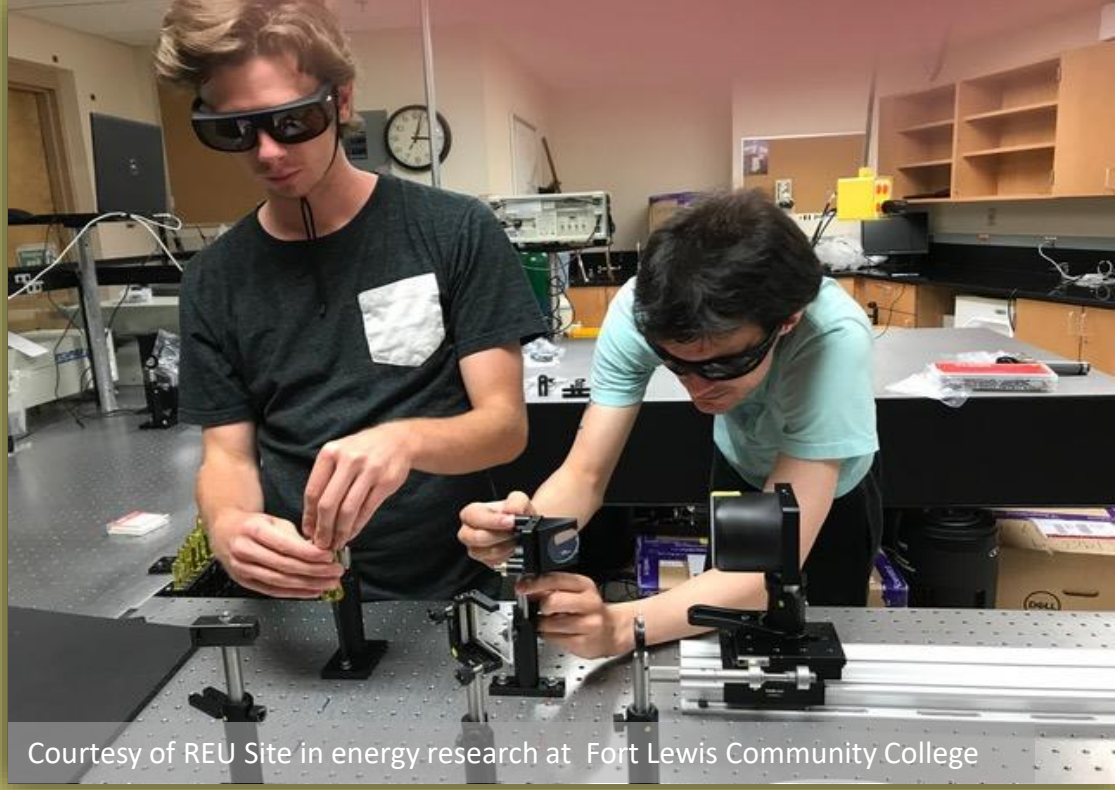
Determining how the program has an impact on given outcomes

Contributing to the knowledge base

Supporting studies that contribute to filling gaps in the literature

Roadmap

- Share selected findings from the retrospective analysis of extant NSF data on former REU participants
- Describe the REU Data System and pilot
- Breakout activity
- Coming up next



Courtesy of REU Site in energy research at Fort Lewis Community College

NSF current monitoring system

Research.gov

NSF collects limited demographic information

- Gender
- Race
- Ethnicity
- Disability
- College standing and institution (provided by PIs)

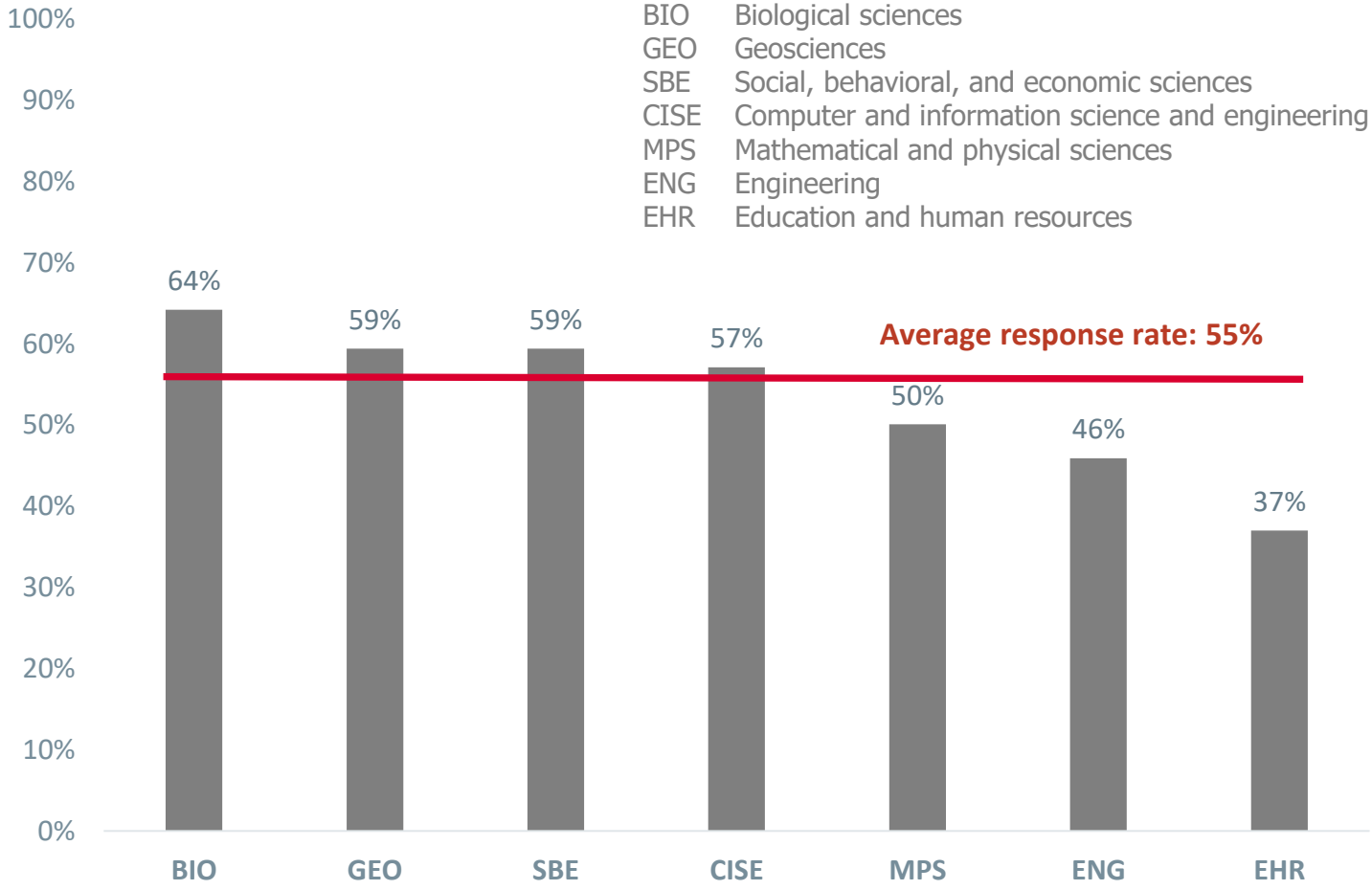
Percentage of REU participants responding to NSF's demographic survey

Go to **menti.com**

Enter code **432917**

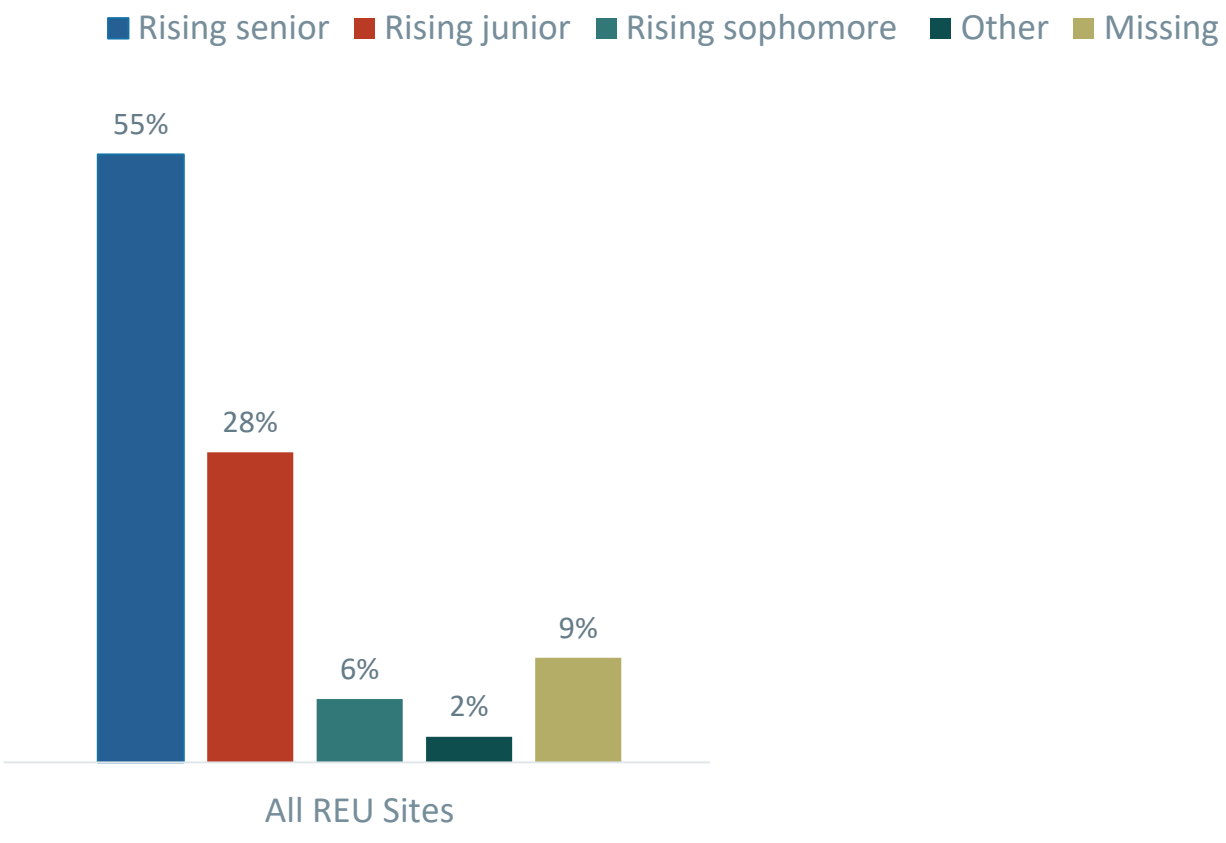
Enter your best estimate

Percentage of REU participants responding to NSF's demographic survey



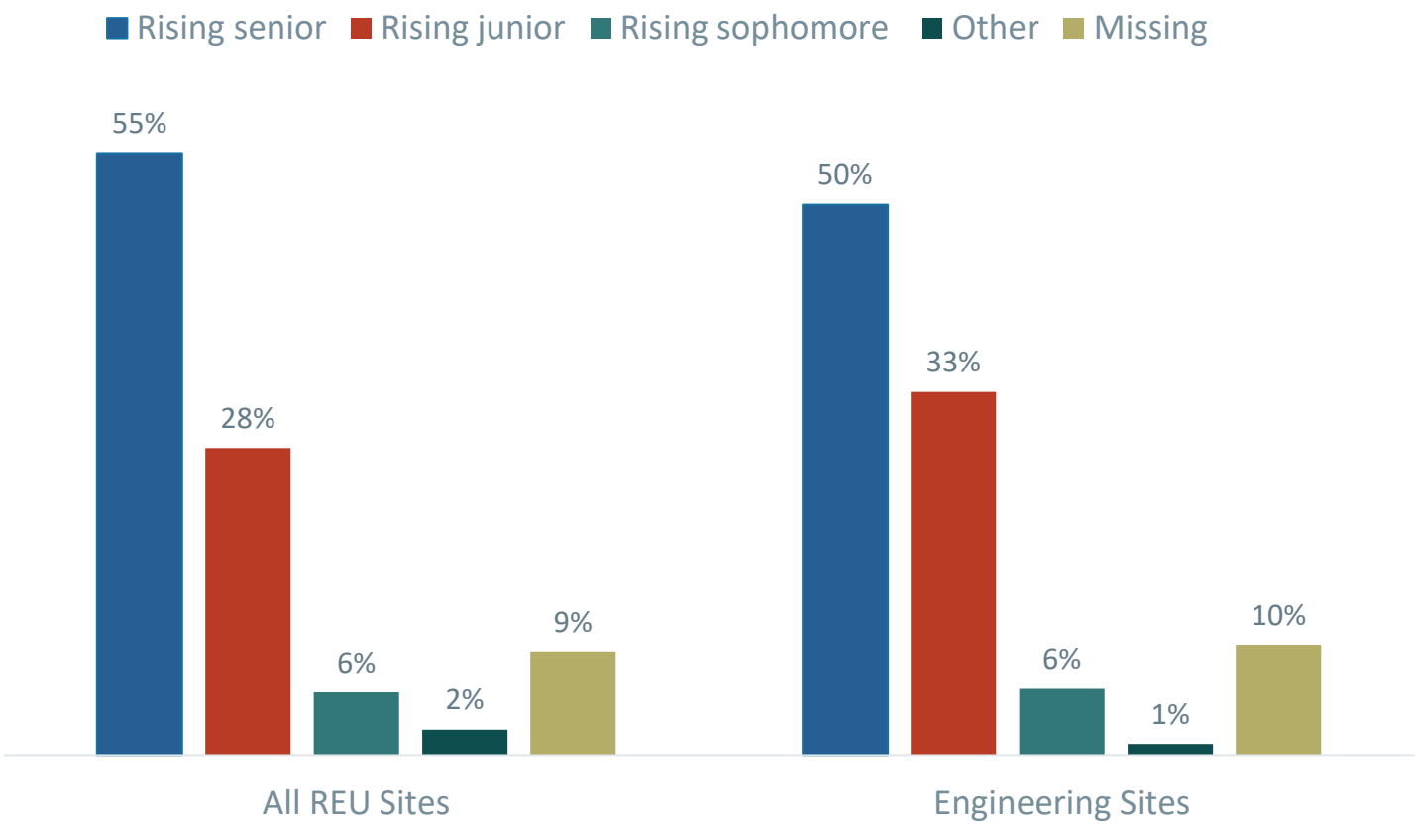
Source: REU Sites 2013 cohort (N = 4,850). Note: Response rates range from 33% (GEO-Polar Programs) to 64% (BIO).

Most REU Site participants are upper-level college students (1)



Source: REU Sites 2013 cohort (N = 4,850).

Most REU Site participants are upper-level college students (2)



Source: REU Sites 2013 cohort (N = 4,850).

Across Sites, slightly over half of REU participants are women, and a small share report having a disability

	All REU Sites	Engineering Sites
Gender		
Female	**52%**	**46%**
Male	46%	54%
Missing	2%	.4%
Disability		
No	95%	97%
Yes	**2%**	**2%**
Missing	3%	1%
Number of respondents	**2,663**	**271**

Source: Research.gov.
Notes: Estimates based on 55% surveys completed for the 2013 cohort (2014 estimates are very similar).

Most participants are White; a quarter are Hispanic or Black

	All REU Sites	Engineering Sites
Race/ethnicity		
White, non-Hispanic	56%	59%
Hispanic	**15%**	**16%**
Black, non-Hispanic	**10%**	**11%**
Asian	8%	9%
American Indian/Alaska Native	1%	.7%
Native Hawaiian/Pacific Islander	.2%	0%
Multiple races	6%	4%
Missing	3%	.7%
Number of respondents	**2,663**	**271**

Source: Research.gov.
Notes: Estimates based on 55% surveys completed for the 2013 cohort (2014 estimates are very similar).

REU minority representation in perspective

NSF's goal: To develop "a STEM workforce that reflects the diversity of the nation"

	REU participants (ENG)	College students enrolled in STEM degrees	College population of 20-24 year olds	General population
Race/ethnicity				
Hispanic	15.4% (16%)	15.4%	21.9%	18.1%
Black	10.3% (11%)	10.9%	14.5%	13.4%
American Indians/Alaskan Native	1.1% (1%)	1.0%	0.9%	1.3%
Native Hawaiians/Pacific Islanders	0.2% (0.2%)	0.4%	0.2%	0.2%
Mixed Race	5.6% (6%)	3.6%	2.9%	2.7%
Source	**NSF data (2013)**	**BPS (2012/2014)**	**Census (2017)**	**Census (2017)**

Integrating Research in Sustainable Energy and the Environment across Disciplines (IR-SEED) at Texas A&M University-Kingsville

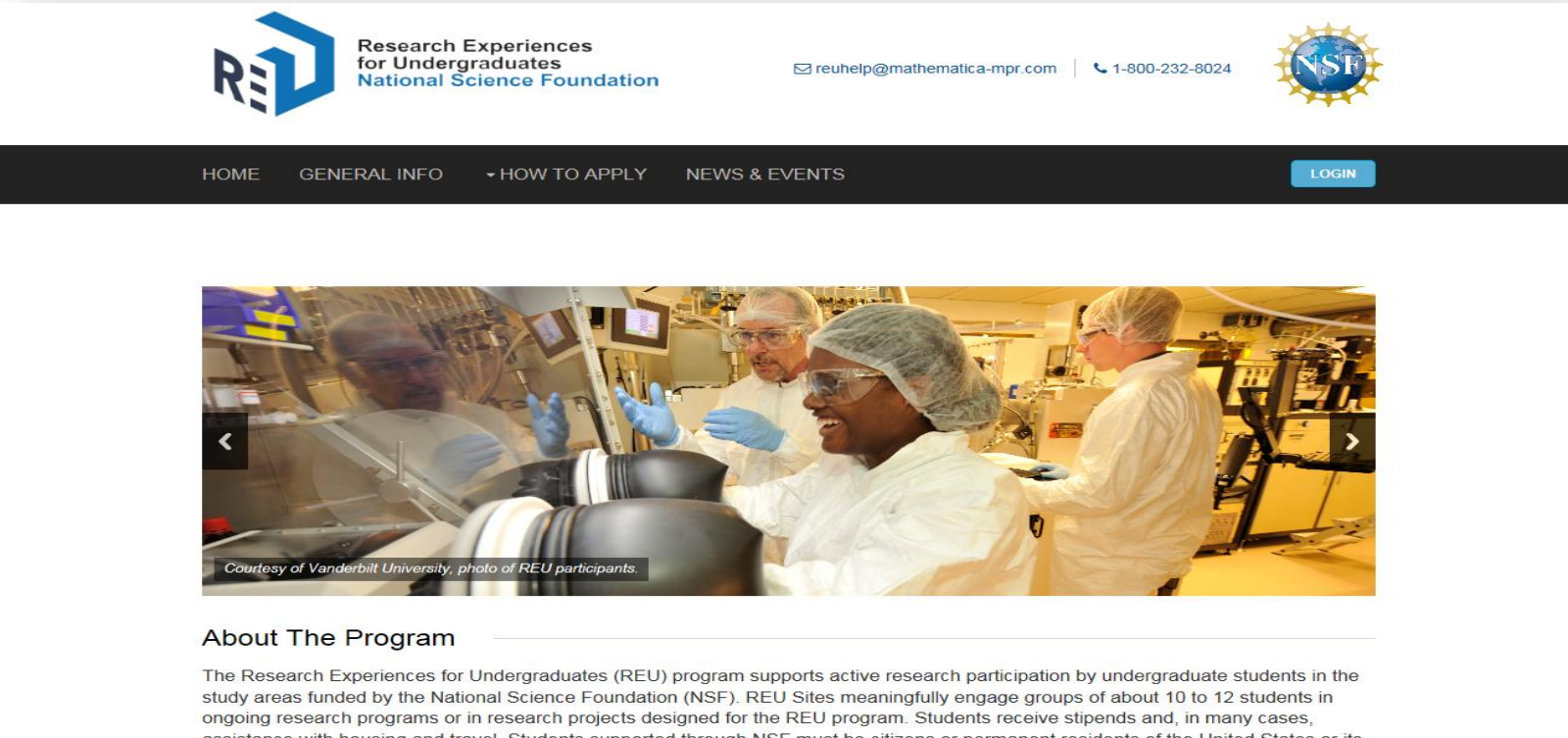
REU Pilot Data System

www.nsfreu.org

REU Data System

Testing two approaches to collecting baseline data:

- **Registration** (Biological Sciences and Earth Sciences)
- **Common application** (Engineering and Mathematical Sciences)



Key differences between the two approaches

REGISTRATION	COMMON APPLICATION
Fewer data	More data
Contact information Demographic characteristics Socio-economic status Current enrollment Expected graduation date Consent	Contact information Demographic characteristics Socio-economic status Current enrollment Expected graduation date Consent --- Prior REU participation Academic background Application materials • Resume • Personal statement • Unofficial transcript • Customized questions • Customized requests
Applicants are reported by the PI	Applicants are recorded automatically

Pilot statistics

Users

Nearly **15,000 users** (14,741 student accounts and 175 PIs and admin users)

About **6,600 applications** submitted through the system to Engineering and Math pilot Sites

58 REU Sites participated in the pilot

Common application (39 Sites)

27 Sites in Engineering

12 Sites in Mathematics

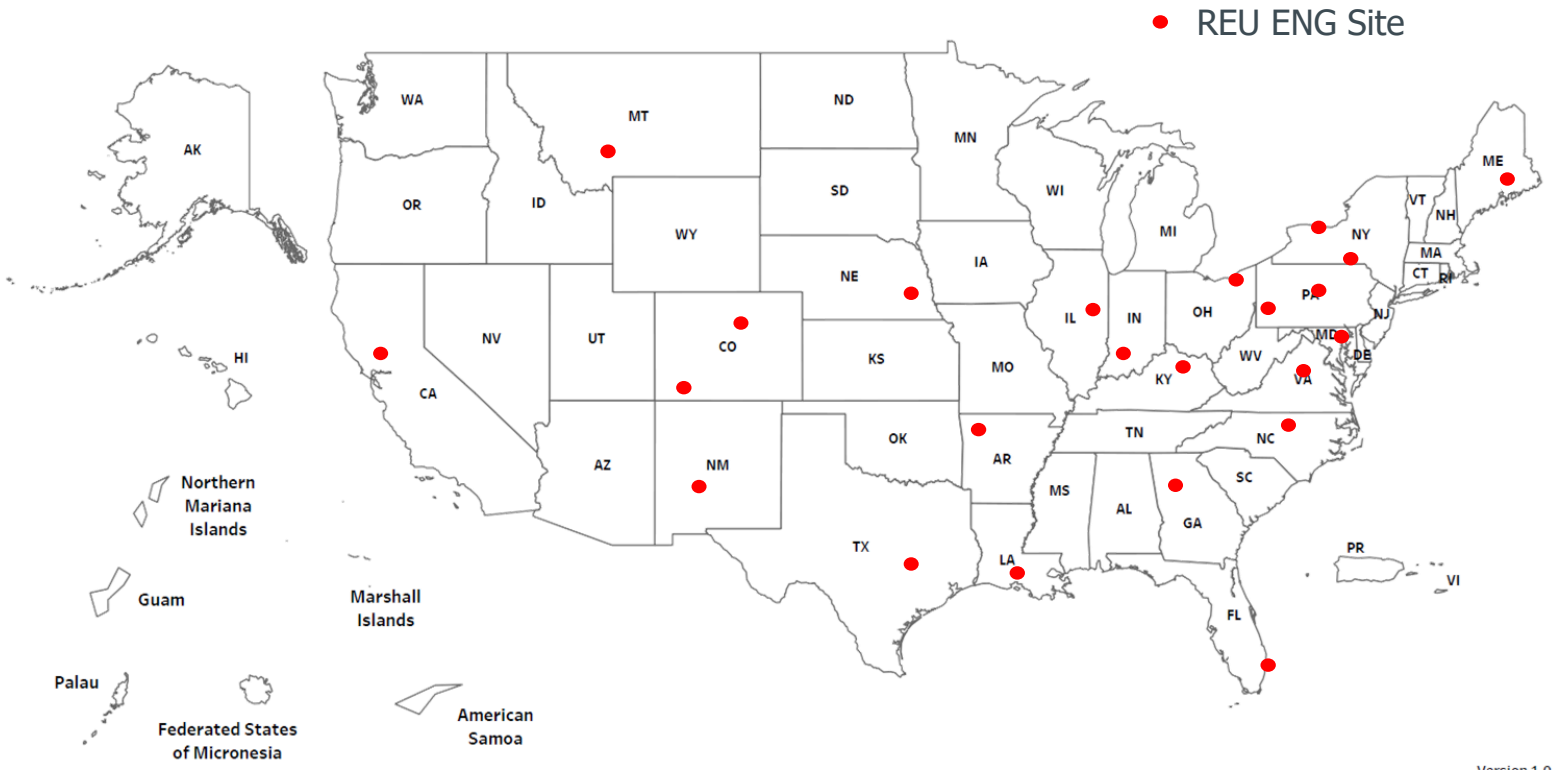
Registration (19 Sites)

14 Sites in Biology

5 Sites in Earth Sciences

Source: REU System Data as of 10/1/19

Engineering Sites in the pilot



Some statistics from Engineering Sites in the pilot

Applicants

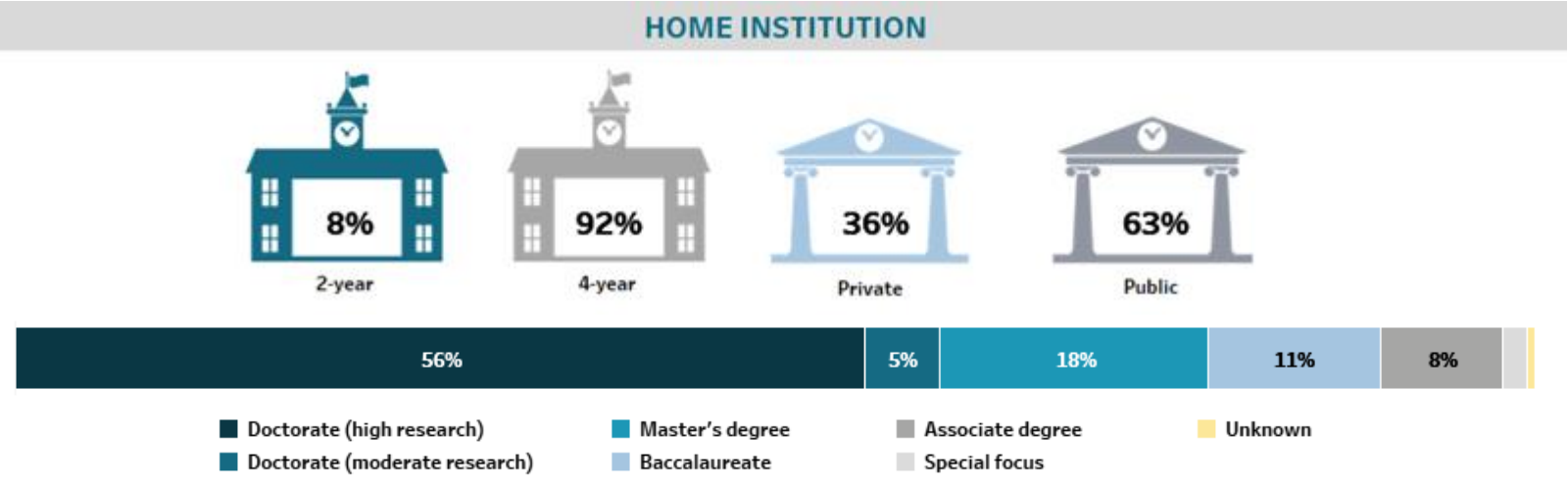
1,639 unique applicants to 27 REU Sites

Applicant submitted an average of 2.8 applications

Participants

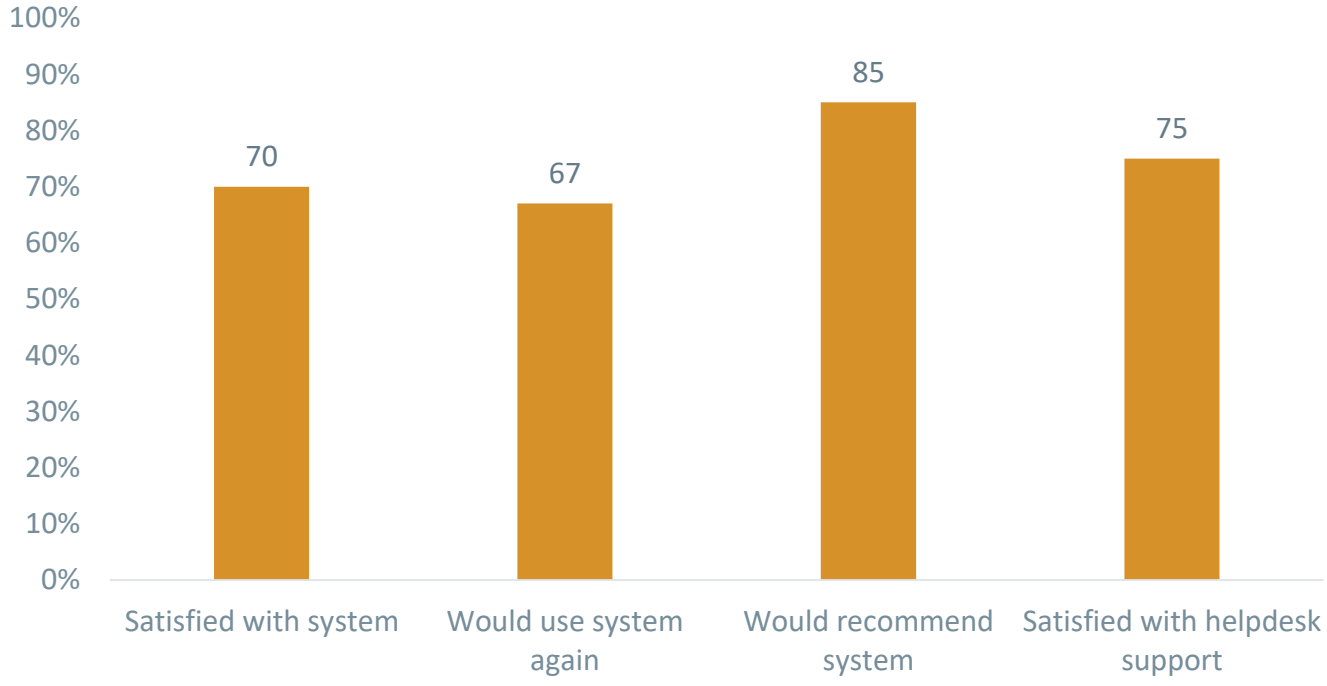
186 participants

40% of Participants are ethnic or racial underrepresented minorities



Source: REU System Data as of 10/1/19

Most principal investigators in the common application were satisfied with the system



Source: Principal investigator REU pilot satisfaction survey, July 2019. (N=27 survey respondents in common application pilot)

Notes: Bars indicate the percentage who reported being "very" or "somewhat satisfied"; "very likely" or "likely" to recommend the system; and would use the system again if it were offered "as is".

About half of PIs believed that the common application increased the number of applications they received

44% believed pilot led to an increase in the number of applications

48% believed the pilot did not impact the number of applications

0% believed the pilot led to a decrease in the number of applications

8% not applicable (new REU Site) or left question missing

Source: Principal investigator REU pilot satisfaction survey, July 2019. (N=27 survey respondents in common application pilot)

Ongoing: REU Participant exit survey

- The survey was programmed and deployed through the REU system, and administered with weekly reminders among non-respondents
- Sent to all participants reported in the REU system (a total of 354 participants across 36 Sites)
- **Response rate of 68%** (as of October 15th)

Survey closes today!

Breakout Activities

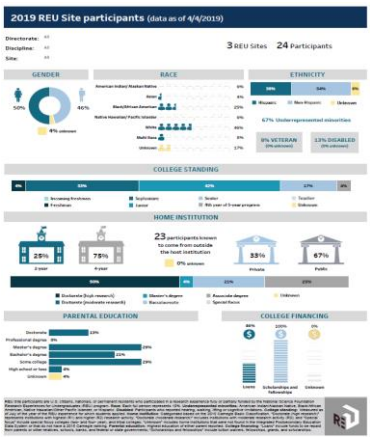
Data Reports – Please weigh in!

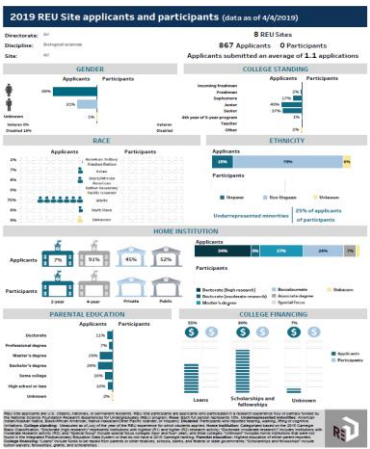
- Join a table to form no more than 4 groups
- Select one person in your group to take notes
- Spend 10 minutes discussing these questions

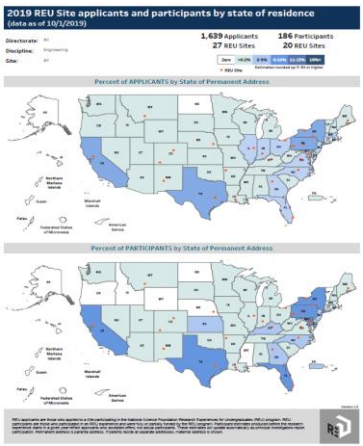
  Question 1: Is there any aspect of recruitment and selection that is not well captured in the infographics and could be included based on data from the common application?

  Question 2: Are there any data points in the dashboards you would have specified differently?

- Note taker for each group shares conclusions in 2 minutes







Coming up…

Fall 2019

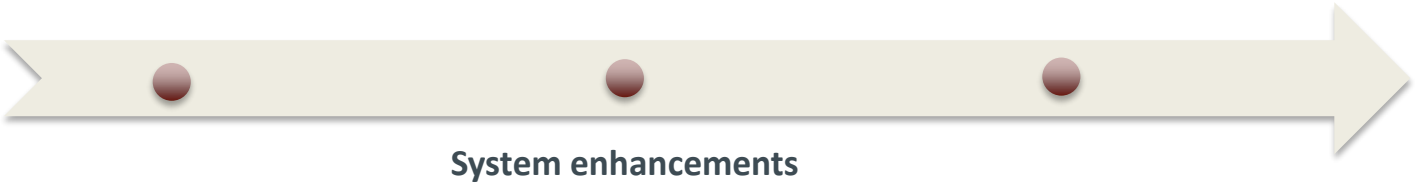
System maintained for 2020 application cycle

- Only common application
- Offered to 2019 pilot Sites

Fall 2020

(Expected) Second pilot for 2021 application cycle

- Both registration and common application
- Larger pilot (all REU disciplines invited)



System enhancements

Don’t forget to rate the session using the EEC Conference app!

Thank you

www.nsfreu.org

Please, send us a high-quality picture of your students for updates to the REU website!

Clemencia Cosentino, PI/PD ccosentino@mathematica-mpr.com

Cecilia Speroni, Deputy PD csperoni@mathematica-mpr.com

Engineering REU participants 6 years ago and today

Some evidence of increased racial/ethnic diversity in the REU program in Engineering*

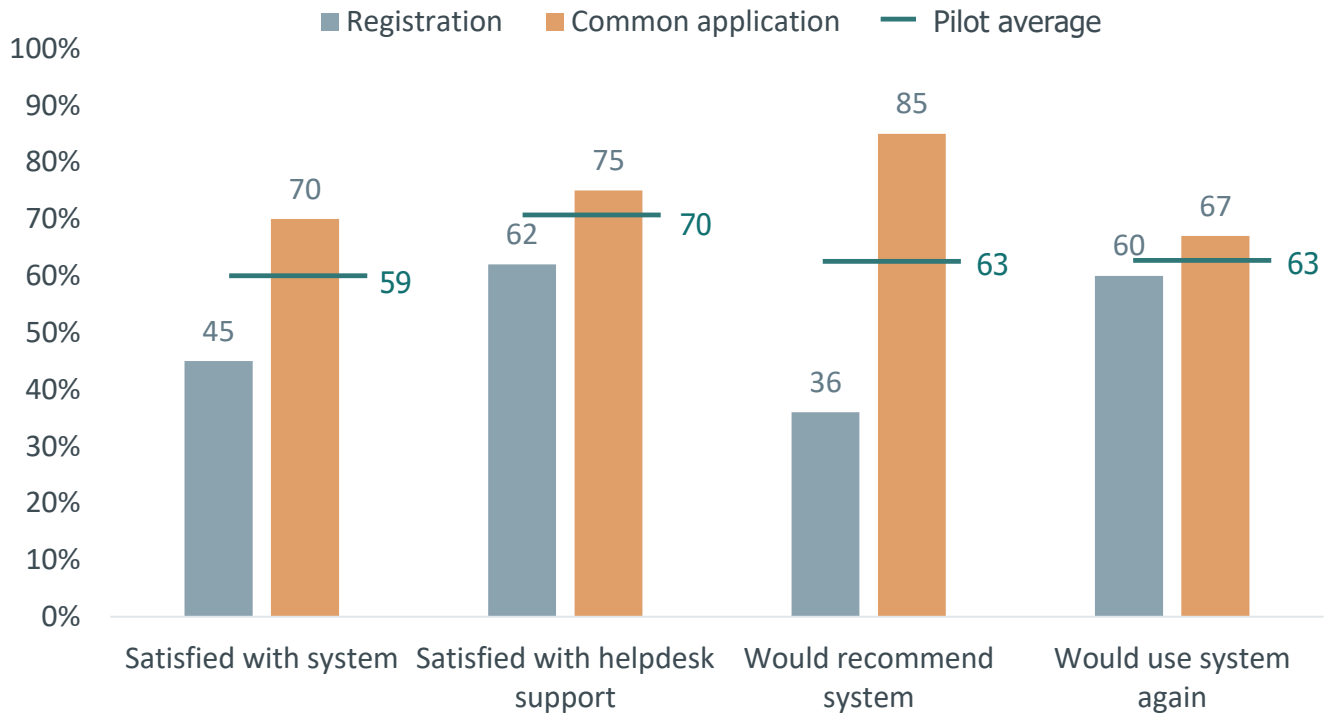
	2013 (Research.gov) ENG	2019 (REU data system) ENG
Race		
American Indian/Alaskan Native	2%	2%
Asian	9%	6%
Black or African-American	11%	15%
Native Hawaiian/Pacific Islander	0%	1%
White	71%	59%
Multiple races	4%	7%
Missing	3%	10%
Ethnicity		
Hispanic	16%	21%
Not Hispanic	84%	75%
Missing	.7%	4%
	271	**186**

*Warning: in both years, data available only on a sample of participants (2013: those who answered the research.gov demographic survey; 2019: participants in Sites participating in the REU data system pilot

Source: REU System Data as of 10/1/19

Most principal investigators were satisfied with the system

PIs in the common application pilot were more satisfied than those in the registration pilot



Source: Principal investigator REU pilot satisfaction survey, July 2019. (N=27 survey respondents in common application pilot; N=22 in registration)

Notes: Bars indicate the percentage who reported being "very" or "somewhat satisfied"; "very likely" or "likely" to recommend the system; and would use the system again if it were offered "as is".

About half of PIs believed the pilot had an impact on the number of applications

Common Application

44% believed pilot led to an increase in the number of applications

48% believed the pilot did not impact the number of applications

0% believed the pilot led to a decrease in the number of applications

8% not applicable (new REU Site) or left question missing

Registration

0% believed pilot led to an increase in the number of applications

40% believed the pilot did not impact the number of applications

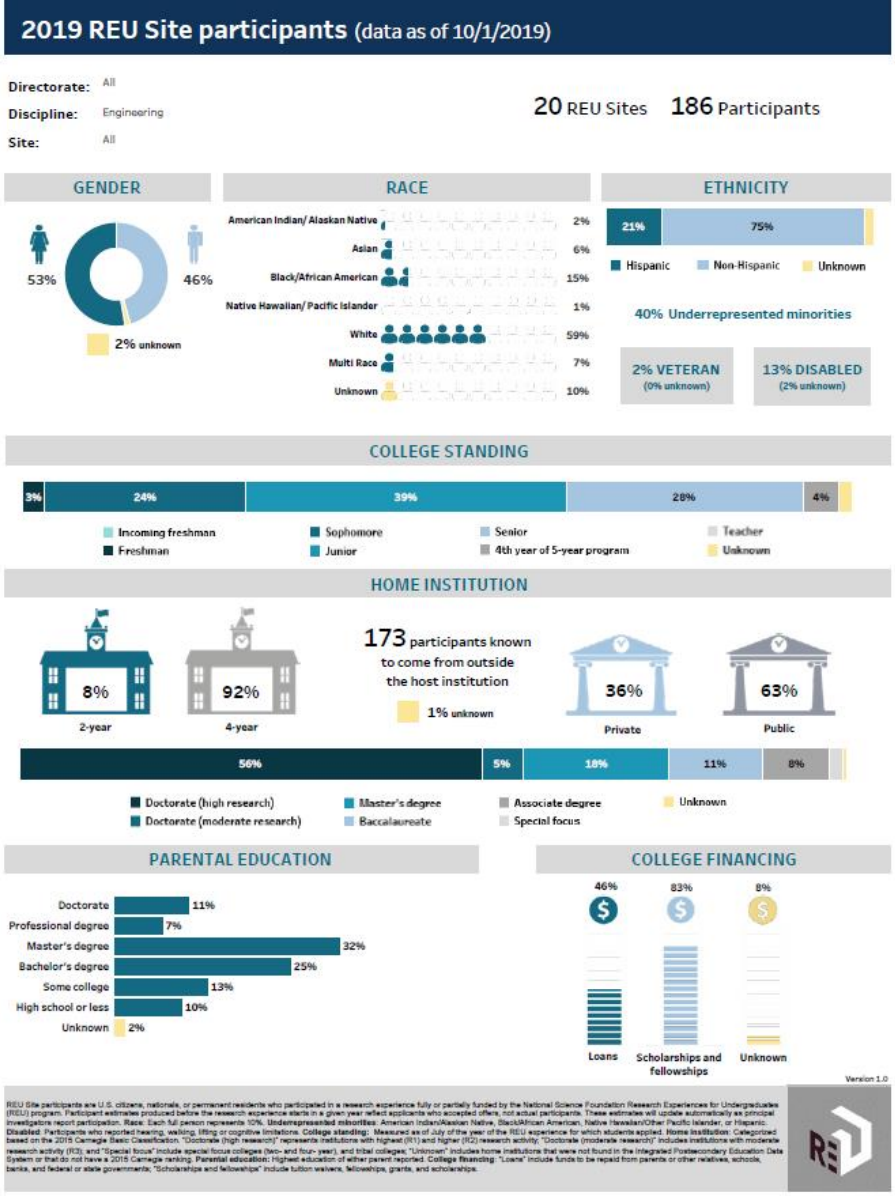
45% believed the pilot led to a decrease in the number of applications

14% not applicable (new REU Site) or left question missing

Source: Principal investigator REU pilot satisfaction survey, July 2019. (N=27 survey respondents in common application pilot; N=22 in the registration)

Data Reports

Participants in Engineering



Data Reports

Applicants and Participants in Engineering