



Redesigning the Survey of Graduate Students and Postdoctorates in Science and Engineering (GSS)

Kelly Kang, National Science Foundation (NSF)

Patricia Green, RTI International (RTI)

Peter Einaudi, RTI International (RTI)

Council of Graduate Schools Annual Meeting

December 8, 2016

National Science Foundation

National Center for Science and Engineering Statistics



Session Overview

- GSS Background
- Major Changes Planned in GSS
- Increase GSS Data Uses and Utility
- Discussion and Feedback



GSS Background

- Conducted annually since 1972
- Sponsored by NSF and the National Institutes of Health (Department of Energy in some years)
- Census of all U.S. academic institutions that grant graduate degrees in science, engineering, and health (SEH) fields

Current GSS Data Collection

Part 1: School coordinators at each institution

- Verify and update eligible units (departments, programs, research centers, or health care facilities)

Part 2: School coordinators report total counts on:

- Fall graduate enrollments by SEH field, enrollment status, demographics, and financial support
- Postdocs in SEH by field, demographics, financial support, and doctoral degree type
- Other doctorate-level nonfaculty researchers (NFRs) in SEH by field, doctoral degree type, and sex



Major Changes Planned in GSS

- Separate data on master's and doctoral students to make data much more useful
- Use Classification of Instructional Program (CIP) codes rather than GSS codes
- Move toward file transfer to upload data rather than manual data entry into GSS Web instrument



Separate Data on Master's & Doctorates

For all GSS-eligible science, engineering, and health fields, collect data on:

- All master's degree students (both research and professional degrees)
- All research doctorate students

Using CIP Codes for Field Taxonomy

- CIP codes are used for the Integrated Postsecondary Education Data System (IPEDS) thus available in the institutions student databases
- Using CIP codes allow for more flexibility in data comparisons with other data sources
- Continue using GSS codes for data reporting on postdocs and non-faculty doctoral researchers (NFRs)

Use File Transfer to Upload Data

- Separate reporting of master's and doctorate student data will increase institutions' response burden
- Burden can be reduced by creating data file from student databases and transferring onto GSS Web instrument
- Three data file transfer options for institutions:
 1. Upload de-identified individual-level data
 2. Upload unit-level data using an Excel macro that aggregates individual-level data
 3. Upload unit-level data as in prior cycles

Increasing GSS Data Uses and Utility

- Separate data on master's and doctoral degree students help graduate schools to benchmark their data against peers and national estimates
- Demonstration of current GSS data to show separate reporting of master's and doctorate student data yielding more useful information



Table 1. 12 Largest U.S. Land-Grant Institutions in Science, Engineering and Health by Graduate Enrollment – Status and Percent in Broad Field: 2014

Public Land-Grant Institutions	Number			Percent		
	Total	PT	FT	Science	Engineering	Health
Texas A&M U	7,612	1,320	6,292	54.3	41.7	4.0
U Florida	7,317	1,881	5,436	45.4	34.3	20.3
U Illinois at Urbana-Champaign	6,459	428	6,031	56.6	39.2	4.2
Purdue U	6,425	1,923	4,502	42.1	51.8	6.0
U Wisconsin-Madison	6,137	656	5,481	65.3	26.8	7.9
North Carolina State U	6,019	1,315	4,704	55.6	43.3	1.1
U Maryland, College Park	5,613	1,070	4,543	57.7	35.8	6.6
U Minnesota	5,253	445	4,808	64.2	25.3	10.5
Ohio State U	5,233	391	4,842	58.9	26.7	14.3
U California, Berkeley	5,172	0	5,172	63.2	28.7	8.2
Pennsylvania State U	4,695	4,62	4,233	63.1	34.3	2.7
Virginia Polytechnic Institute	4,589	1,182	3,407	53.2	43.1	3.6
Institutional average	5,877	923	4,954	56.6	35.9	7.4

FT = full time; PT = part time.

SOURCE: Survey of Graduate Students and Postdoctorates in Science and Engineering, 2014.

Table 2. 12 Largest U.S. Engineering Institutions, by Total Graduate Enrollment, Percent Female, and Percent Foreign: 2014

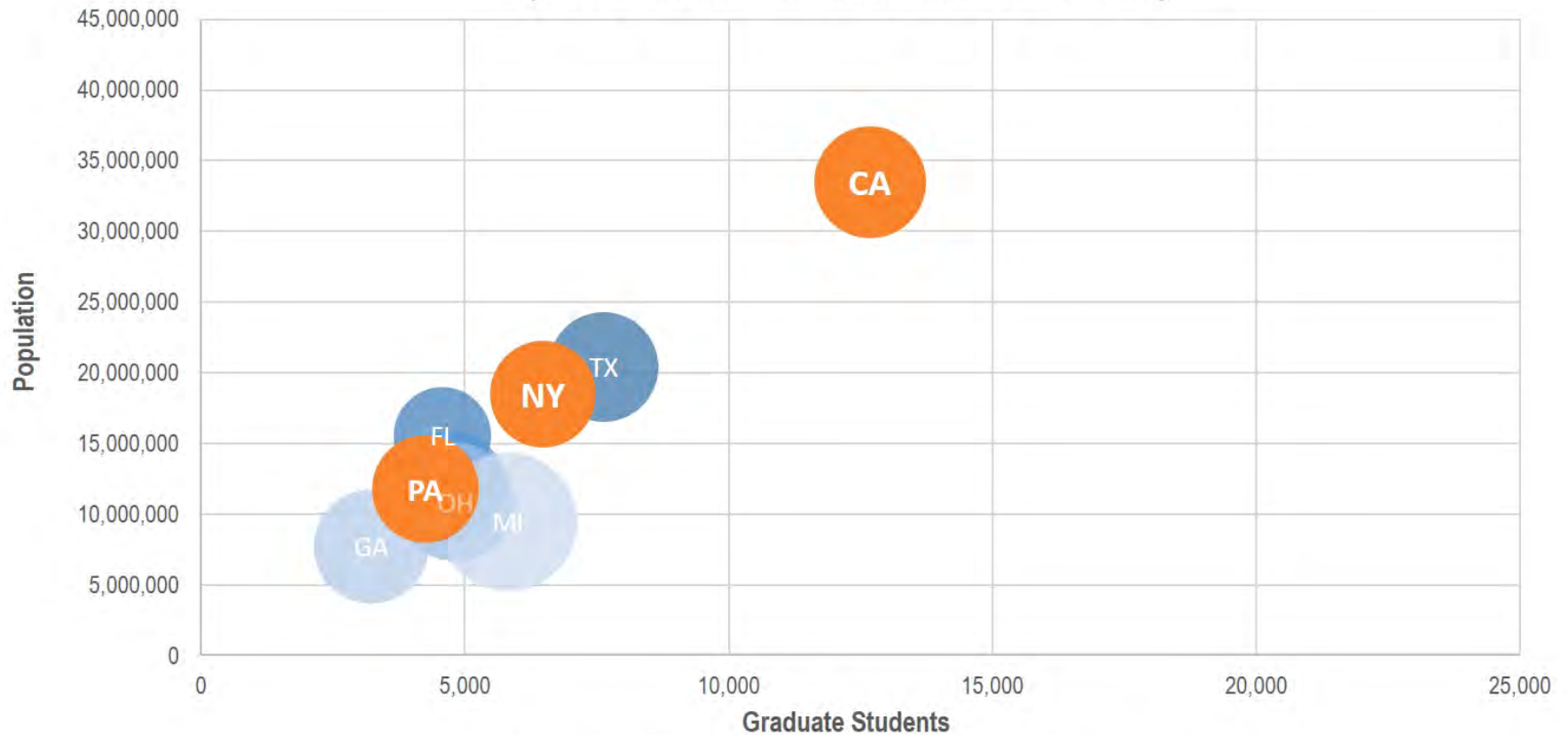
Institutions	Number		Percent	
	Total		Female	Foreign
Georgia Institute of Technology	3,900		21.2	50.1
U Southern California	3,613		27.4	68.1
Purdue U	3,476		22.5	55.9
Stanford U	3,270		28.4	44.6
Texas A&M U	3,172		23.4	64.4
U Michigan	2,943		23.1	52.2
Arizona State U	2,870		23.1	67.0
Massachusetts Institute of Technology	2,700		28.7	45.2
North Carolina State U	2,608		25.1	50.1
U Illinois at Urbana-Champaign	2,529		22.7	62.6
U Florida	2,512		25.2	53.6
Northeastern U	2,264		28.9	80.7
Institutional average	2,988		25.0	57.9

Comparisons Over Time

- The GSS can be used to compare change over time
- The following examples look at the relationship between state population and graduate science and engineering enrollment between 2000 and 2014
- Comparisons are done for separately for larger and smaller states
 - Cut-point = 10 million residents
- Bubble size shows the ratio of graduate students per 10,000 residents

2000

State Population and Engineering Graduate Students (States with 10 Million or More Residents)

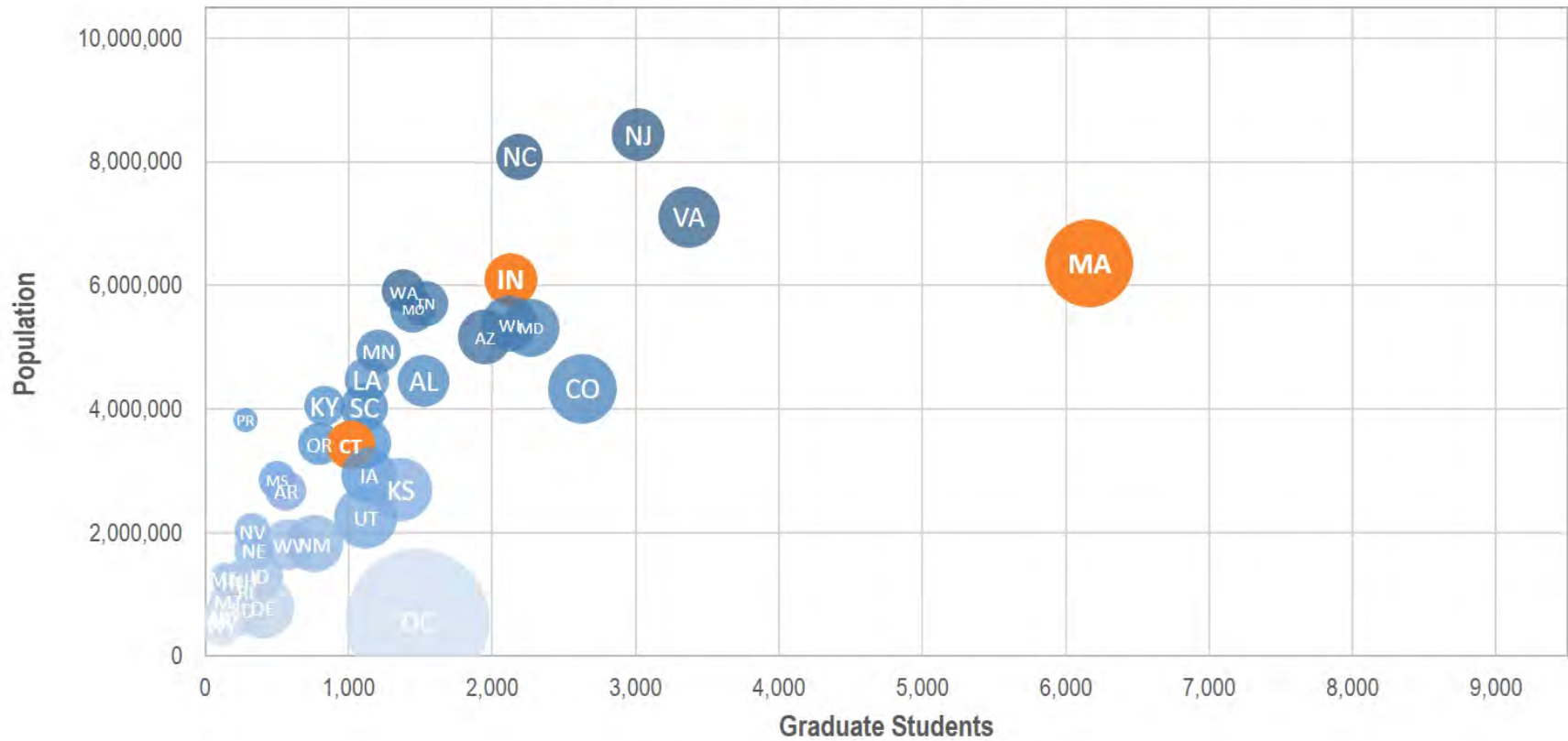


Bubble Size = Ratio of Graduate Students to State Population (per 10,000)

SOURCES: Survey of Graduate Students and Postdoctorates in Science and Engineering (NSF) and Annual Estimates of the Resident Population (Census)

2000

State Population and Engineering Graduate Students (States with Less than 10 Million Residents)

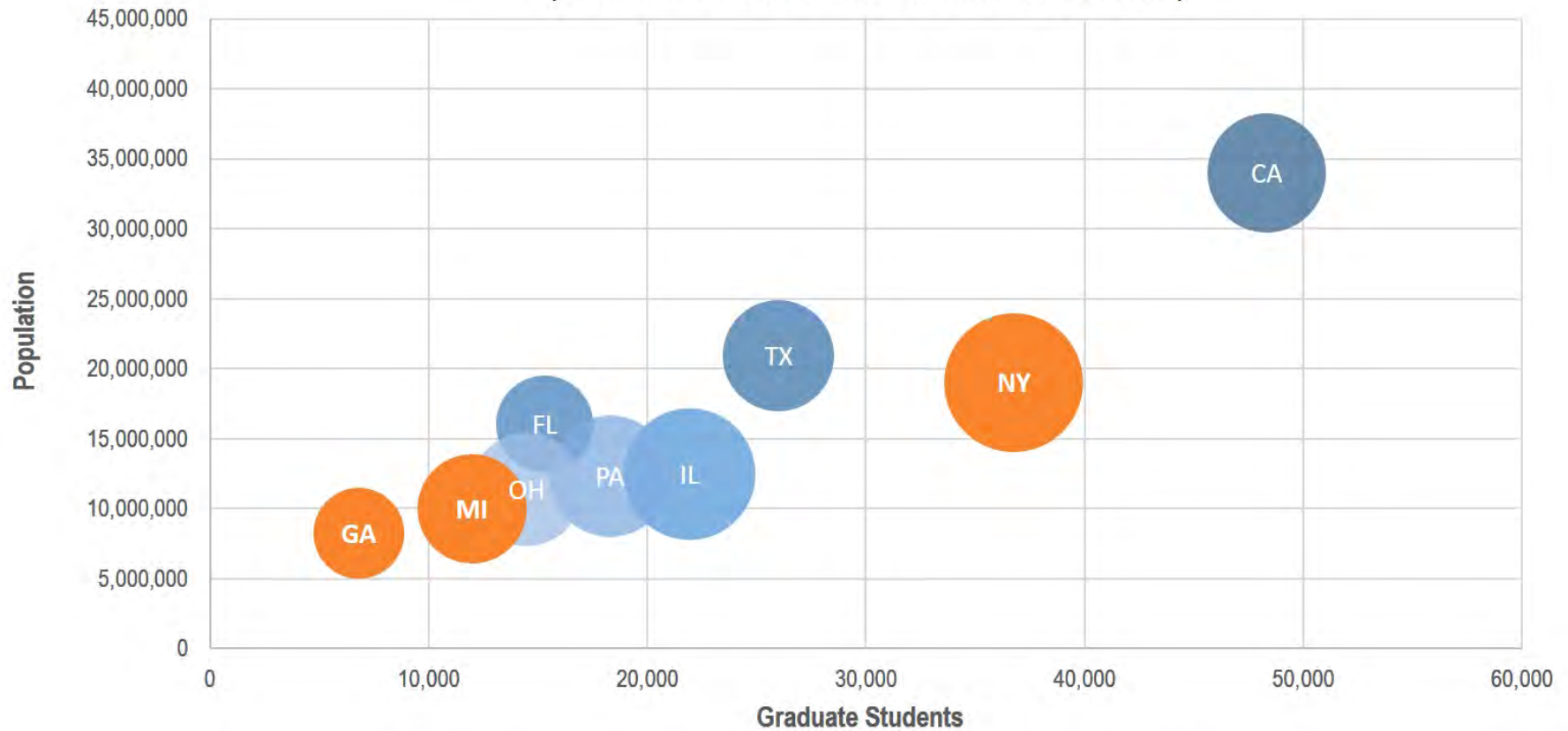


Bubble Size = Ratio of Graduate Students to State Population (per 10,000)

SOURCES: Survey of Graduate Students and Postdoctorates in Science and Engineering (NSF) and Annual Estimates of the Resident Population (Census)

2000

State Population and Science Graduate Students (States with 10 Million or More Residents)



Bubble Size = Ratio of Graduate Students to State Population (per 10,000)

SOURCES: Survey of Graduate Students and Postdoctorates in Science and Engineering (NSF) and Annual Estimates of the Resident Population (Census)

Financial Support Data

Currently available for graduate students

Primary source of financial support

- Federal – DoD, NIH, HHS, NSF, USDA, DOE, Other
- Non-federal – Institutional/State/Local Government,
Other U.S. Source, Non-U.S. Source
- Self – Student's Own Resources

Primary mechanism of financial support

Fellowships, Traineeship, Research Assistantships,
Teaching Assistantships, Other

Financial Support Data

- Possible changes to sources of financial support data are being considered because it is difficult for many schools to report
- Consideration of collecting financial support data only for doctoral students
- Next slides show the types of data currently collected



Table 3. Primary Source of Support for Full-time Graduate Students in Biological Sciences at 12 Washington DC-Area Institutions: 2014

Institutions	Full-Time Graduate Students	Primary Source of Support (%)			
		Federal	Institutional	Other	Self
Johns Hopkins U	1,024	48.9	28.2	11.2	11.6
Georgetown U	543	2.2	11.0	9.0	77.7
Virginia Polytechnic Institute and State U	303	22.8	61.7	9.9	5.6
U Maryland, College Park	302	20.2	63.2	0.0	16.6
Virginia Commonwealth U	282	20.9	52.5	6.4	20.2
U Virginia	239	40.6	52.7	6.7	0.0
George Mason U	216	14.4	46.8	1.9	37.0
Y Maryland Baltimore	169	44.4	39.6	2.4	13.6
George Washington U	141	66.0	19.9	11.3	2.8
Howard U	110	3.6	50.9	16.4	29.1
U Maryland, Baltimore County	103	47.6	33.0	1.0	18.4
Eastern Virginia Medical School	43	7.0	11.6	2.3	79.1
Institutional average	290	28.2	39.3	6.5	26.0

Source: NSF/NCSES, Survey of Graduate Students and Postdoctorates in Science and Engineering

Table 4. Primary Mechanism of Support for Full-time Graduate Students in Biological Sciences at 12 Washington DC-Area Institutions: 2014

Institutions	Full-Time Graduate Students	Primary Mechanism of support (%)				
		Fellowship	Traineeship	RA	TA	Other
Johns Hopkins U	1,024	13.4	25.9	31.4	4.5	24.8
Georgetown U	543	1.3	1.5	5.3	1.1	90.8
Virginia Polytechnic Institute and State U	303	1.3	0.0	58.1	32.3	8.3
U Maryland, College Park	302	7.0	0.0	20.2	56.3	16.6
Virginia Commonwealth U	282	2.1	13.5	31.9	5.7	46.8
U Virginia	239	11.7	17.2	59.8	10.9	0.4
George Mason U	216	3.7	0.0	18.5	35.6	42.1
U Maryland Baltimore	169	2.4	5.9	56.8	0.0	34.9
George Washington U	141	14.9	67.4	9.2	5.7	2.8
Howard U	110	9.1	0.9	6.4	36.4	47.3
U Maryland, Baltimore County	103	7.8	34.0	8.7	29.1	20.4
Eastern Virginia Medical School	43	2.3	0.0	0.0	0.0	97.7
Institutional average	239	5.5	14.4	25.4	17.9	36.8

Financial Support Data Needs

- What information about students financial support is most useful for your institution?
- Is collecting financial support data for master's students as important given additional burden?
- Would less details on primary support source (3 sources - federal, nonfederal, self-support) and primary support mechanism (3 types- RA, TA, other) for the master's students useful?
- Is “primary” source or mechanism of financial support for students meaningful?



Discussion

Current Redesign Efforts

- Pilot survey being conducted with a sample of 80 institutions in 2016 GSS cycle
- Methodological study this winter and next spring to examine financial support reporting
- Provide training (e.g., webinars) and targeted technical assistance to help institution coordinators with changes
- Some institutions may need to identify analytic or programming support for coordinator who do not have access the student databases



Conclusion

- Support of the graduate school deans are important for successful implementation of the changes
- Collecting more useful graduate education data benefits all data users
- Plan to provide institution profiles for each GSS institutions based on new data when available



GSS Contact information

Please send your feedback to:

Kelly Kang kkang@nsf.gov

Patricia Green pgreen@rti.org

Peter Einaudi peinaudi@rti.org