



Data and Information on Graduate Education in the U.S.

Revitalizing Graduate STEM Education for the 21st Century
Board on Higher Education and Workforce
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A View of the Future of Graduate Education in the U.S.

- Lots of policy focus on graduate education
- No new observations or recommendations, but the system has changed

1970s

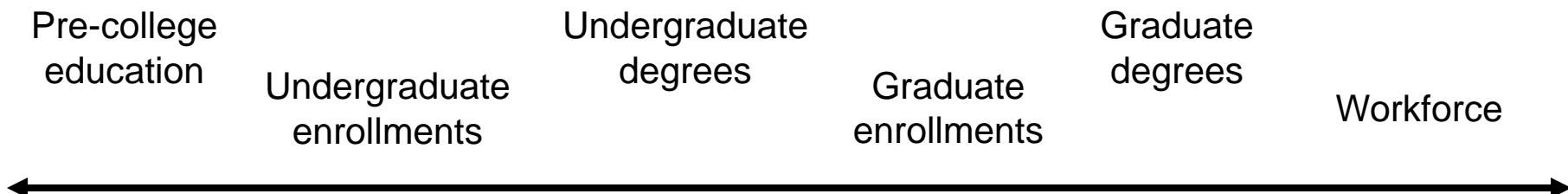
- Disciplinary focus, work as an individual
- U.S. a world leader in higher education and attracting talent
- Students predominantly white and majority male
- Predominantly U.S. citizen students and postdocs
- Public and private non-profit campus-based degree programs
- Mobility is limited (across disciplines, sectors, economies)

2000s

- Greater interdisciplinary and team focus
- Growth in higher education abroad and increasing competition from other nations
- Greater racial/ethnic diversity and higher proportion of female students
- Increase in foreign students and foreign postdocs
- Growth of for-profit institutions and online programs
- Students move across fields, countries and institutions



Human Resources Data Continuum



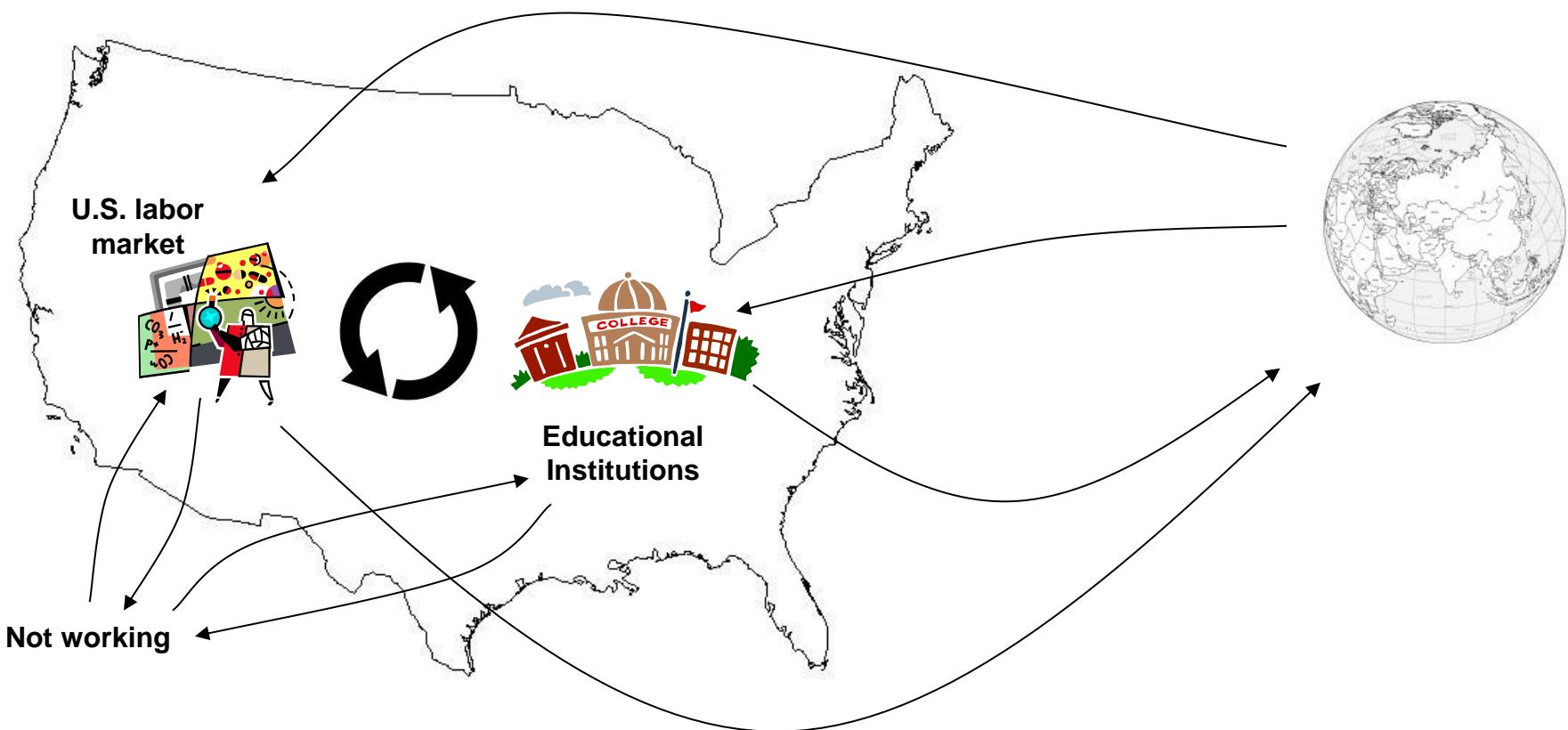
At each stage in this continuum, we are trying to understand:

- **How many people are in this stage?**
- **What are their demographic characteristics?**
- **What are the short-term and long-term trends at that stage?**
- **How does performance at one stage relate to other stages?**

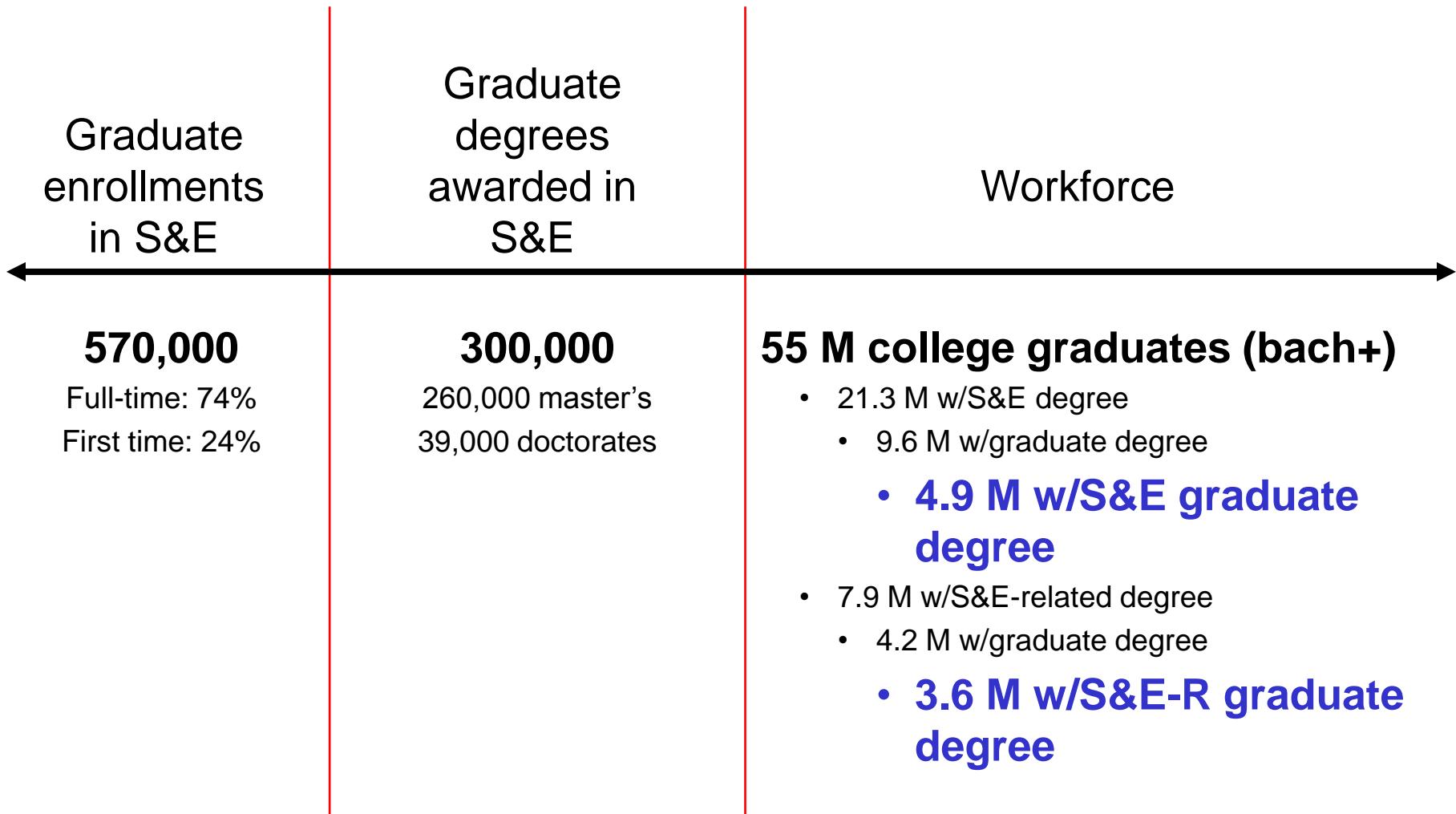


Flows and Pathways

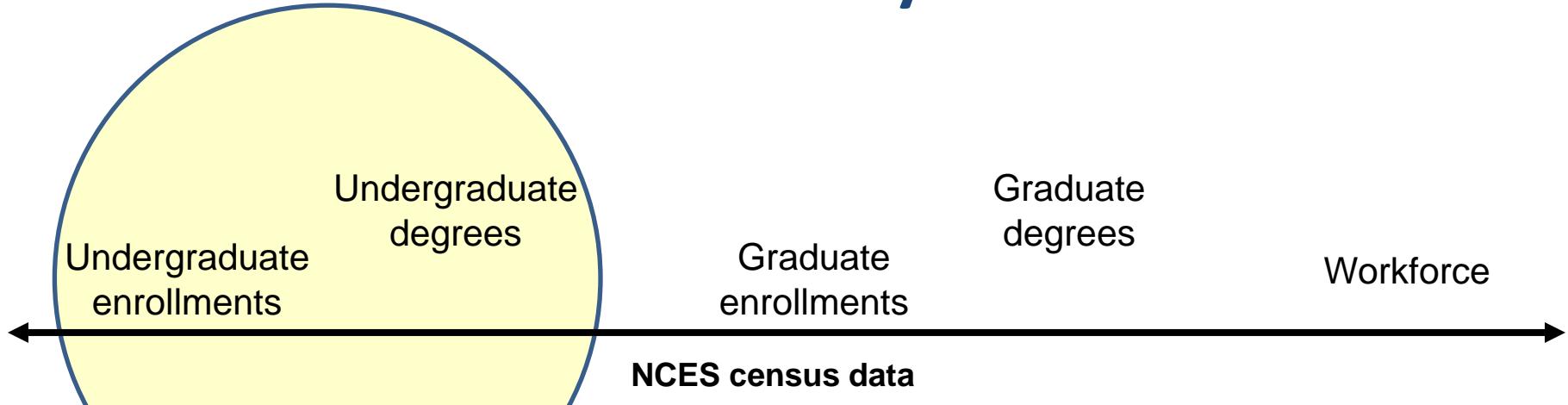
There is no distinct pipeline that individuals follow – education and career movement is better described as flows and pathways.



Scope of U.S. S&E Graduate Education: 2015



Flows and Pathways Vs. Data



NCES census data

- Annual
- Student characteristics
- School characteristics
- Degrees by detailed discipline

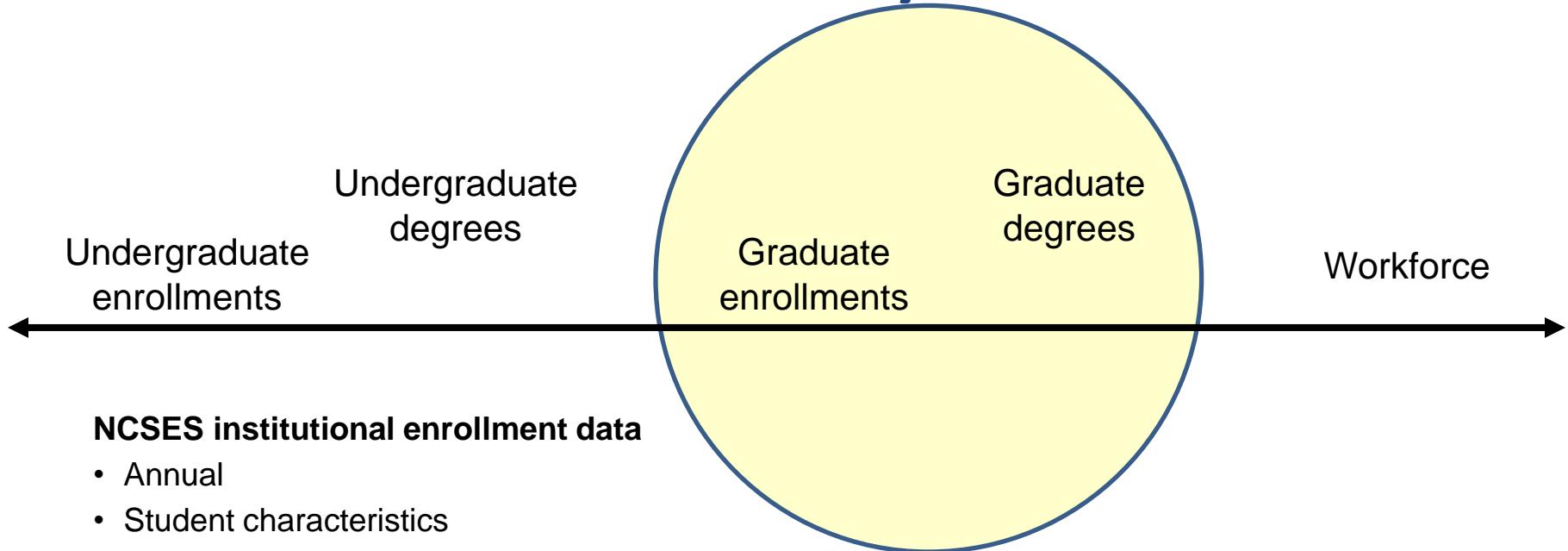
NCES sample data on students

- Longitudinal
- Students as they matriculate, graduate and move on
- Little detail on discipline, but can aggregate to S&E as a group

Professional society data (not always representative)

- Discipline-based
- Departmental characteristics
- Student characteristics
- Financial statistics

Flows and Pathways Vs. Data



NCSES institutional enrollment data

- Annual
- Student characteristics
- Enrollments by detailed discipline
- Not disaggregated by degree level

NCSES doctoral degree data

- Annual
- Detailed characteristics of doctoral graduates
- Graduate funding profile

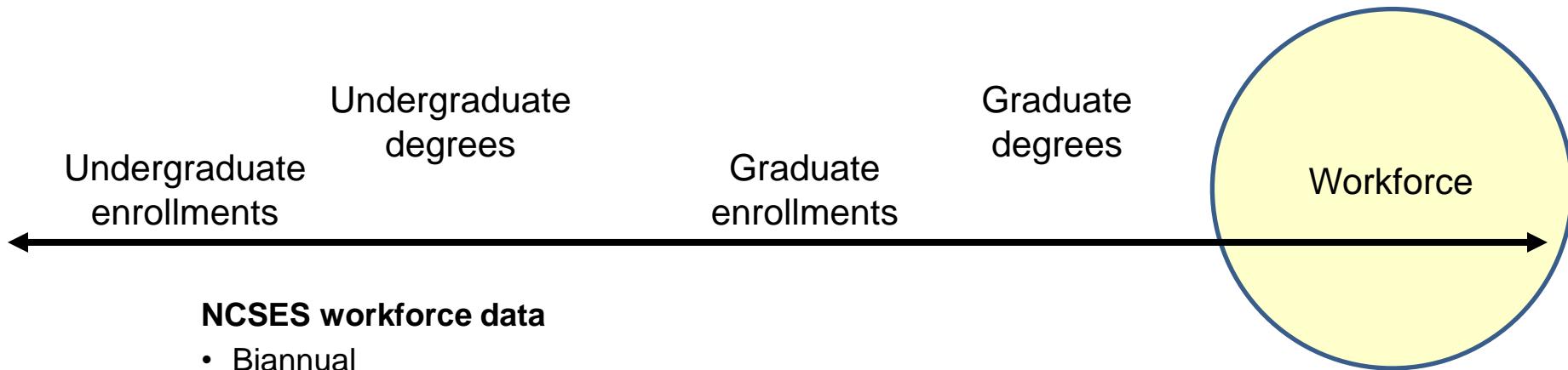
NCES census data

- Master's degrees by detailed discipline

Professional society data

- Annual
- Department-level

Flows and Pathways Vs. Data



NCSES workforce data

- Biannual
- Educational, employment and demographic characteristics
- Aggregate data on postdocs from academic and FFRDC employers

Census Bureau workforce data

- Annual
- S&E degree holders as a part of the entire workforce

NCES workforce data

- Some longitudinal data on S&E graduate students extends here

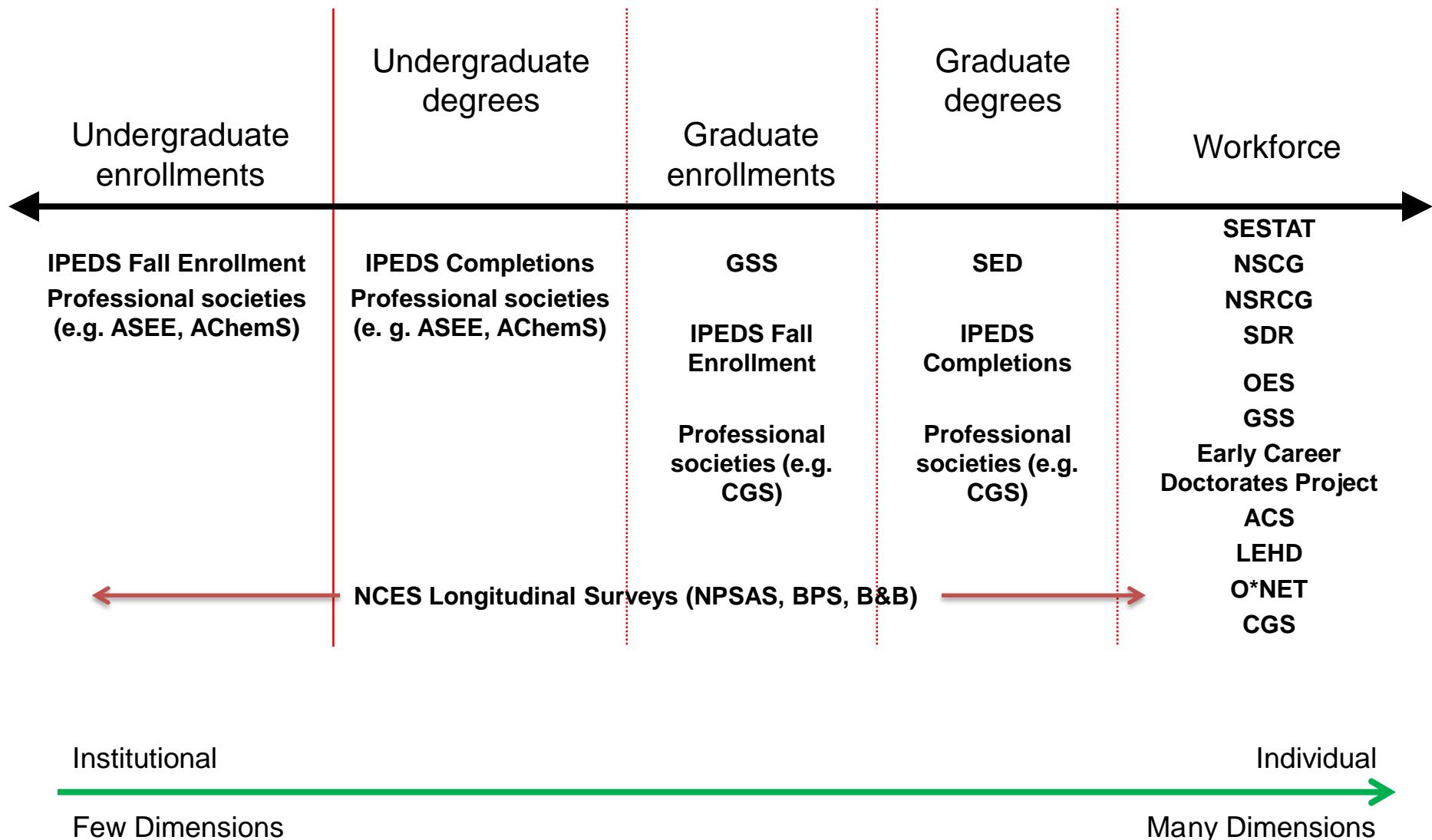
Professional society data

- Discipline-based
- Type of graduate
- Individual characteristics

Other large-scale collections

- Private and federal program data

Scope of Human Resources Data



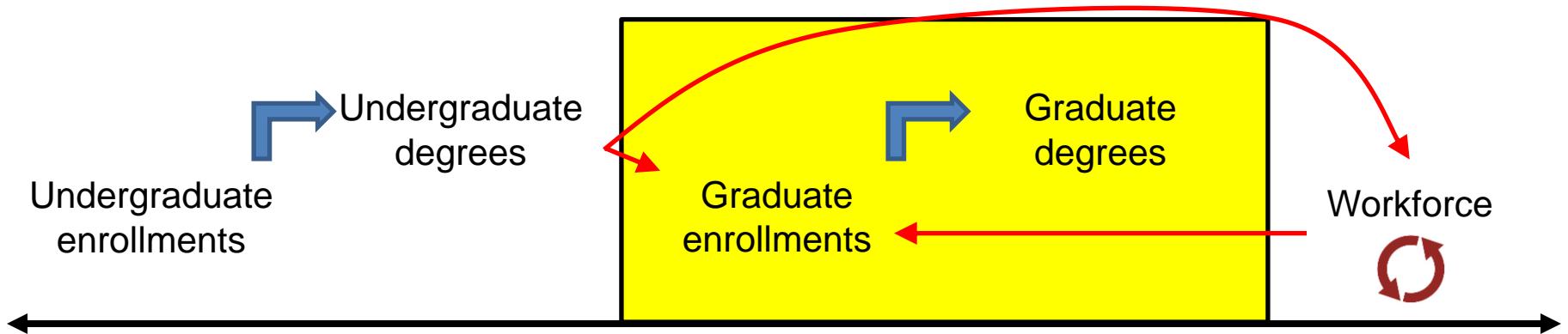
Other Resources

- Administrative Records and Big Data
- Institutional Data, Exit Interviews, Follow-up Surveys
- Program Participation Data
- Program Evaluation Data
- Social Media Data

LINKING ACROSS DATASETS



Data and Information Needs



→ **Transitions – Attrition (levels, contextual factors)**

→ **Transitions – Graduate school vs. Workforce entry**

↻ **Transitions – Job changes and movement, adequate academic preparation, reskilling, life-long learning**

Matriculation – Programs, interventions, investments



Issues for Consideration

1. Synthesize existing research

2. Frameworks and models

An example: science of learning, career preparation, program improvement

3. Lots of existing data – can we make better use of what is available?

- The S&T education and workforce research community is well-developed and has increasingly better access to data and tools – they may be able to assist
- What kinds of information do policymakers and educators need on a regular basis? Is this different than the questions that researchers are developing?

4. Is new or different data required?

- Qualitative vs. quantitative information
- Would information at a non-national scale be helpful? Who is best position to collect that data?
- Is there extant data that we are not using, or that could be but is not accessible?
- Gaps in data regarding the actual graduate school experience – how to bridge that gap?



Issues for Consideration

5. Some compelling themes

- Degrees vs. Skills/competencies
- Degree-based education versus other types of training/education
- Teaching methods and knowledge acquisition



Different Consumers Need Different Information

