NRC 2010 Assessment of Research-Doctorate Programs

The 2010 NRC Assessment

- Third in series of assessments (1982, 1995, 2010)
- Over 5,000 doctoral programs at 212 institutions in 62 fields were assessed
- Quantitative data were collected through questionnaires and from publicly available data in 2006 and 2007.
- Dimensions measured were:
- Research activity of program faculty;
- Student support and outcomes;
- Diversity

Differences from Previous NRC Assessments

- Ranges of possible ranks rather than single point estimation
- Based on weighted quantitative data rather than exclusively on reputational ratings
- Increased number of fields especially in Life Sciences

Inclusion Criteria

- Criteria for Field/Discipline:
  - at least 500 Ph.D.'s in the 5 years prior to 2004-05
  - At least 25 universities had programs in the field
- Criteria for Institution to Include Program/Sub-field:
  - at least 5 Ph.D.'s in the 5 years prior to 2005-06

UCSC's Assessed Programs

- Anthropology
- Astronomy & Astrophysics
- Ecology & Evolutionary Biology
- Molecular, Cellular, & Developmental Biology
- Chemistry
- Computer Engineering (too few programs – not ranked)
- Computer Science
- Earth Sciences
- Electrical Engineering
- Environmental Studies
- History
- History of Consciousness (emerging field – not ranked)
- International Economics
- Linguistics
- Literature
- Mathematics
- Ocean Sciences
- Physics
- Psychology
- Sociology

UCSC Programs not Included

- Biomolecular Engineering and Bioinformatics PhD
- Education PhD
- Education EDD
- Microbiology and Environmental Toxicology PhD
- Film and Digital Media PhD
- Music Composition DMA
- Music PhD
- Philosophy PhD
- Politics PhD
- Statistics and Applied Mathematics PhD
- Technology & Information Systems Management PhD
- Visual Studies PhD

Questionnaires

- Institutional

  Institution wide practices, list of doctoral programs
- Program

  Program characteristics, graduation rates, student support, doctoral faculty lists (core, new, associated), student and faculty demographics
- Faculty

  Work history, grants, ratings of program quality characteristics
- Advanced Doctoral Student (Physics, Economics)

  Research opportunites, financial support, mentoring, goals, social integration, etc.
- Program Ratings (stratified sample of faculty)

Other sources of Data

- NSF
- Faculty Publications and Citations: Institute for Scientific Information (ISI), now part of Thomson Scientific (Journal list at: http://wokinfo.com/about/mjl)
- Humanities publications: CVs analyzed for books and articles published since 1996
- Honors and Awards: 224 scholarly and honorary societies

21 Key Variables in Three Dimensional Measures

1. **Research Activity**
   - **Average publications per faculty**
   - **Average citations per publication**
   - **% of doctoral faculty holding grants**
   - **Interdisciplinarity of program (% associated faculty)**
   - **Awards per faculty**

2. **Student Support and Outcomes**
   - **Average GRE score for 2004-6**
   - **% of fully funded first year students**
   - **% of first year students with external funding**
   - **Average annual Ph.D. graduated 2002-2006**
   - **% completion within a given time period (8yrs Humanities, 6 years other)**
   - **Time to degree**
   - **Student work space**
   - **Health insurance**
   - **Student activities**
   - **% PhDs with academic positions**

3. Diversity and Academic Environment

- **% of faculty and students from underrepresented minority groups**
- **% female student and faculty**
- **% international students**

Weighting the Variables

Two approaches for weighting variables used to create ranking ranges

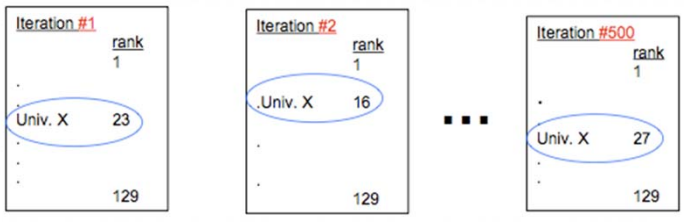
1. Survey-based (S) Weights: Program faculty were asked directly how important each of the 21 program characteristics were as an indication of quality without reference to any specific programs.
2. Regression-Based (R) Weights: A sample of faculty rated a sample of programs in their field. Ratings were related to the 21 characteristics of the rated programs using regression analysis.

Rating the Programs

- Survey (S) and regression-based (R) weights were used to calculate separate ratings.
- Each program's R rating was calculated by applying the regression coefficients generated by randomly selecting half of the faculty raters. This rating process was repeated for each program 500 times.
- Similarly, each program was rated 500 times by applying the direct survey weights using different randomly chosen sets of weights.

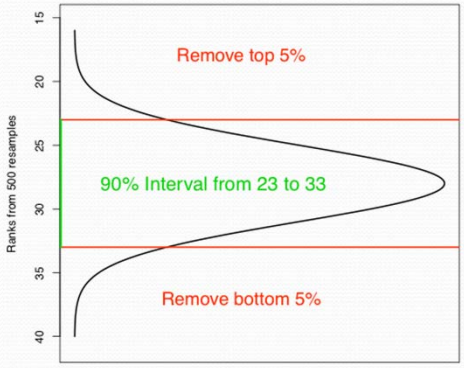
Rankings

- The 500 R and 500 S ratings were used to arrange the programs in rank order.



Ranges of Rankings

- A "range of rankings" was constructed by trimming the highest 5% and the lowest 5% of ranks each program received using each of the two weighting methods.



Illustrative Rankings for UCSC

- S and R rankings for each of UCSC's ranked programs are at http://planning.ucsc.edu/irps/2010NRC.asp.

Available on the NRC site:

- Full report, methodology guide, and complete downloadable data set at:

http://sites.nationalacademies.org/PGA/Resdoc/index.htm

Limitations of the Analysis

- Issues with the data (e.g., accuracy, time delay)
- Classification of programs
- Variability and difficulties in determining ranks
- The NRC explicitly does not endorse the use of the data for ranking.

What we can do with the data

- Programs can identify the variables making the largest contribution to the overall rating.
- Programs can compare their data to similar programs.
- Programs can determine where improvement is needed.