World class universities and international rankings

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Ethics in Science and Environmental Politics 13: pp1 (2013)

Supplement.

Table S1. DEA results for the top 199 institutions in the SJTU ranking. HiCi = highly cited researchers, N&S = articles published in Nature and Science, PUB = articles indexed in Science Citation Index Expanded, and Social Science Citation Index.

| Rank | Unit name                      | Score | Alumni | Award | HiCi  | N&S  | PUB  |
|------|-------------------------------|-------|--------|-------|-------|------|------|
| 1    | Duke Univ                      | 100   | 18.6   | 0     | 46.1  | 42.6 | 63.4 |
| 2    | Univ Sao Paulo                 | 100   | 0      | 0     | 10.3  | 12.7 | 69   |
| 3    | Univ Leeds                     | 100   | 20.2   | 0     | 10.3  | 24   | 43.6 |
| 4    | Univ Queensland                | 100   | 14.8   | 0     | 12.6  | 22   | 54.5 |
| 5    | Tohoku Univ                    | 100   | 16.8   | 0     | 21.9  | 23.2 | 63.9 |
| 6    | Osaka Univ                     | 100   | 11.2   | 0     | 26.3  | 28.2 | 63.6 |
| 7    | Univ Arizona                   | 100   | 0      | 0     | 30.1  | 36.5 | 54.2 |
| 8    | Baylor Coll Med                | 100   | 0      | 0     | 19.3  | 30.9 | 43.4 |
| 9    | Ohio State Univ - Columbus    | 100   | 15.8   | 0     | 41.9  | 19.8 | 63   |
| 10   | Univ Geneva                    | 100   | 26.3   | 0     | 20.6  | 22.9 | 35   |
| 11   | Univ Buenos Aires              | 100   | 19.4   | 25.3  | 0     | 5.9  | 36.2 |
| 12   | Univ Vienna                    | 100   | 18.6   | 0     | 7.3   | 21.9 | 37.5 |
| 13   | Natl Taiwan Univ               | 100   | 13.7   | 0     | 7.3   | 10.3 | 57.6 |
| 14   | Univ Turin                     | 100   | 19.4   | 0     | 12.6  | 11.1 | 39.7 |
| 15   | Univ Tuebingen                 | 100   | 26.3   | 0     | 16.3  | 20.6 | 42.3 |
| 16   | Delft Univ Tech                | 100   | 13.7   | 0     | 7.3   | 23.9 | 36.1 |
| 17   | Univ Roma - La Sapienza        | 100   | 14.8   | 15.5  | 10.3  | 16.3 | 53.5 |
| 18   | Lund Univ                      | 100   | 26.3   | 0     | 25.3  | 18   | 51.7 |
| 19   | Univ Frankfurt                 | 100   | 35.9   | 8.9   | 19.3  | 14   | 39.4 |
| 20   | Seoul Natl Univ                | 100   | 0      | 0     | 7.3   | 11.5 | 63.8 |
| 21   | Pennsylvania State Univ - Univ P | 100 | 12.5   | 0     | 45.5  | 38.5 | 58.9 |
| 22   | Boston Univ                    | 100   | 13.7   | 0     | 30.1  | 27.5 | 51.5 |
| 23   | Univ Paris 06                  | 100   | 36.6   | 23.6  | 23.1  | 27.3 | 58.2 |
| 24   | Univ Michigan - Ann Arbor      | 100   | 38.4   | 0     | 60.6  | 41.7 | 78.1 |
| 25   | Moscow State Univ              | 100   | 49.1   | 34.2  | 0     | 8.3  | 53.2 |
| 26   | Johns Hopkins Univ             | 100   | 45.8   | 27.8  | 43.1  | 48.7 | 68.5 |
| 27   | Univ Nacl Autonoma Mexico      | 97.55 | 14.8   | 0     | 7.3   | 13.1 | 50.3 |
| 28   | Univ Nebraska - Lincoln        | 97.47 | 20.9   | 16.3  | 15.2  | 34.7 |
| Rank | University                          | H-index | J-index | C-index | I1-index | I2-index |
|------|------------------------------------|---------|---------|---------|----------|----------|
| 29   | McGill Univ                        | 94.82   | 25.7    | 0       | 32.6     | 22.8     |
| 30   | Univ Barcelona                     | 94.7    | 0       | 0       | 7.3      | 15.6     |
| 31   | Univ Paris 11                      | 93.96   | 33.3    | 46.2    | 14.6     | 20.4     |
| 32   | Univ Minnesota - Twin Cities       | 93.79   | 32.2    | 16.3    | 50       | 34.8     |
| 33   | Univ Milan                         | 93.63   | 20.2    | 0       | 19.3     | 14.2     |
| 34   | Univ Chicago                       | 93.5    | 67.4    | 81.9    | 50.5     | 39.5     |
| 35   | Univ Washington - Seattle          | 93.37   | 25.7    | 31.8    | 53.1     | 49.5     |
| 36   | Univ Padua                         | 93.32   | 0       | 0       | 12.6     | 18.4     |
| 37   | Michigan State Univ                | 93.23   | 11.2    | 0       | 35.7     | 22.4     |
| 38   | Univ Hawaii - Manoa                | 92.94   | 0       | 0       | 26.3     | 31       |
| 39   | Radboud Univ Nijmegen              | 92.23   | 0       | 0       | 10.3     | 20.2     |
| 40   | Texas A&M Univ - Coll Station      | 91.93   | 0       | 0       | 32.6     | 24.5     |
| 41   | Univ Sydney                        | 91.88   | 17.7    | 0       | 20.6     | 16.4     |
| 42   | Aarhus Univ                        | 91.58   | 13.7    | 18.9    | 7.3      | 24.5     |
| 43   | Univ Paris 07                      | 91      | 16.3    | 13.8    | 14.6     | 21.8     |
| 44   | Univ Amsterdam                     | 90.95   | 7.9     | 0       | 19.3     | 23.6     |
| 45   | Tokyo Univ                         | 90.87   | 32.2    | 14.1    | 43.1     | 51.9     |
| 46   | Univ Florida                       | 90.58   | 20.2    | 0       | 37.2     | 22.7     |
| 47   | Univ Goettingen                    | 90.04   | 34.5    | 20      | 14.6     | 16.5     |
| 48   | Columbia Univ                      | 89.11   | 72.4    | 65.7    | 56.5     | 52.3     |
| 49   | Univ Paris 05                      | 88.62   | 14.4    | 12      | 10.3     | 15       |
| 50   | State Univ New York - Stony Brook  | 88.53   | 0       | 0       | 17.9     | 24.6     |
| 51   | Univ Montreal                      | 88.34   | 13.7    | 0       | 14.6     | 15.6     |
| 52   | Uppsala Univ                      | 88.08   | 23.1    | 32.2    | 12.6     | 19.3     |
| 53   | Univ Alberta                       | 87.98   | 13.7    | 0       | 19.3     | 19.1     |
| 54   | Kyushu Univ                        | 87.96   | 0       | 0       | 14.6     | 17.7     |
| 55   | Univ California - Davis            | 87.62   | 0       | 0       | 46.7     | 31.7     |
| 56   | Univ Pittsburgh - Pittsburgh        | 87.14   | 22.4    | 0       | 40.6     | 23.2     |
| 57   | Univ California - Santa Cruz       | 86.45   | 0       | 0       | 27.3     | 30.3     |
| 58   | Arizona State Univ - Tempe         | 85.97   | 0       | 14.1    | 24.2     | 28.2     |
| 59   | Tech Univ Munich                   | 85.23   | 41.1    | 23.6    | 25.3     | 18.9     |
| 60   | Stockholm Univ                     | 85.03   | 26.3    | 29.6    | 16.3     | 19.2     |
| 61   | Tokyo Inst Tech                    | 84.69   | 14.8    | 0       | 21.9     | 23.9     |
| 62   | Univ Strasbourg 1                  | 84.64   | 26.3    | 22.5    | 16.3     | 16.1     |
| 63   | Natl Univ Singapore                | 84.18   | 0       | 0       | 14.6     | 13       |
| 64   | Univ Cambridge                     | 83.75   | 90.3    | 91.5    | 53.6     | 56       |
| 65   | Univ Georgia                       | 83.38   | 0       | 0       | 26.3     | 19.8     |
| 66   | Univ Koeln                         | 83.35   | 0       | 12.6    | 7.3      | 19.6     |
| 67   | Univ Bern                          | 83.21   | 14.8    | 0       | 10.3     | 19.8     |
| 68   | Hokkaido Univ                      | 82.84   | 0       | 0       | 16.3     | 16.2     |
| 69   | Ecole Normale Super Paris          | 82.7    | 53.4    | 24.5    | 12.6     | 17.2     |
| 70   | Queen Mary, Univ London            | 82.51   | 21.7    | 0       | 16.3     | 15.6     |
| 71   | Univ Tennessee - Knoxville         | 82.19   | 12.5    | 0       | 20.6     | 19.8     |
| Rank | University                                      | Score 1 | Score 2 | Score 3 | Score 4 | Score 5 |
|------|------------------------------------------------|---------|---------|---------|---------|---------|
| 72   | Case Western Reserve Univ                       | 82.16   | 36.3    | 11.5    | 21.9    | 15.2    | 42.1    |
| 73   | Dartmouth Coll                                  | 81.92   | 21.7    | 0       | 21.9    | 20.6    | 31.4    |
| 74   | Univ Texas - Austin                            | 81.61   | 19.4    | 16.7    | 46.1    | 26.7    | 54.2    |
| 75   | Massachusetts Inst Tech (MIT)                   | 81.35   | 71      | 80.6    | 65.6    | 68.7    | 61.6    |
| 76   | Univ Oxford                                    | 81.07   | 59      | 57.9    | 48.4    | 52      | 66      |
| 77   | Univ Iowa                                      | 80.74   | 0       | 0       | 34.2    | 21.8    | 49.2    |
| 78   | Harvard Univ                                   | 80.69   | 100     | 100     | 100     | 100     | 100     |
| 79   | Tel Aviv Univ                                  | 80.56   | 0       | 0       | 24.2    | 20.5    | 52.2    |
| 80   | Cardiff Univ                                   | 80.33   | 0       | 16.3    | 7.3     | 18.9    | 43.8    |
| 81   | Univ Wisconsin - Madison                       | 80.23   | 38.4    | 35.5    | 52.6    | 41.2    | 68.1    |
| 82   | Georgia Inst Tech                              | 80.21   | 14.8    | 0       | 25.3    | 23.6    | 45.6    |
| 83   | Univ California - Berkeley                     | 80.2    | 69      | 77.1    | 68.8    | 70.6    | 70      |
| 84   | Univ Munich                                    | 78.95   | 33.1    | 22.9    | 16.3    | 25.6    | 52.7    |
| 85   | Univ Grenoble 1                                | 78.93   | 0       | 15.5    | 10.3    | 17.2    | 35.8    |
| 86   | Florida State Univ                             | 78.89   | 0       | 0       | 20.6    | 20.6    | 39.7    |
| 87   | Univ California - Riverside                    | 78.85   | 14.8    | 0       | 27.3    | 25.7    | 35.9    |
| 88   | Univ Virginia                                 | 78.77   | 0       | 0       | 32.6    | 26.3    | 47.2    |
| 89   | Univ Illinois - Urbana Champaign               | 78.49   | 37.1    | 36.6    | 43.8    | 36.1    | 60.3    |
| 90   | Emory Univ                                     | 78.44   | 0       | 0       | 30.9    | 21.3    | 50.5    |
| 91   | Univ Massachusetts Med Sch                     | 78.07   | 0       | 20      | 14.6    | 25      | 28.1    |
| 92   | Univ Hamburg                                   | 76.88   | 14.8    | 0       | 17.9    | 18.8    | 39.4    |
| 93   | Univ East Anglia                               | 76.45   | 15.8    | 0       | 16.3    | 20.5    | 28      |
| 94   | Purdue Univ - West Lafayette                  | 76.36   | 16.8    | 16.7    | 30.1    | 22      | 52.8    |
| 95   | North Carolina State Univ - Rale               | 76.34   | 0       | 0       | 28.2    | 17.4    | 43.7    |
| 96   | New York Univ                                  | 76.1    | 34.1    | 24.5    | 39.9    | 34.4    | 53.4    |
| 97   | Iowa State Univ                                | 75.5    | 0       | 0       | 23.1    | 11.7    | 43.9    |
| 98   | Univ Leuven                                    | 75.45   | 0       | 0       | 21.9    | 15.6    | 50.8    |
| 99   | Univ Alabama - Birmingham                      | 74.67   | 0       | 0       | 16.3    | 16.3    | 44.6    |
| 100  | Virginia Tech                                  | 74.66   | 13.7    | 0       | 21.9    | 13      | 40.9    |
| 101  | Oregon State Univ                              | 74.43   | 13.7    | 0       | 27.3    | 24.4    | 37.2    |
| 102  | Kyoto Univ                                     | 74.23   | 35.4    | 33.4    | 38.6    | 35.8    | 70.6    |
| 103  | Univ Coll London                               | 74.08   | 31.2    | 32.2    | 38.6    | 44.3    | 65.8    |
| 104  | Univ Utrecht                                  | 74.04   | 27.4    | 20.9    | 28.2    | 28.8    | 53.3    |
| 105  | Univ Muenster                                  | 74.02   | 22.4    | 15.5    | 12.6    | 13.5    | 37.5    |
| 106  | Univ California - Los Angeles                  | 73.38   | 24.4    | 42.8    | 57.4    | 48.9    | 75.7    |
| 107  | Univ Colorado - Boulder                        | 72.65   | 14.8    | 30.8    | 39.3    | 39.4    | 45.5    |
| 108  | Univ Illinois - Chicago                        | 72.6    | 0       | 0       | 26.3    | 12.8    | 47.9    |
| 109  | Univ New South Wales                           | 72.26   | 0       | 0       | 19.3    | 11.7    | 48.5    |
| 110  | Cornell Univ                                  | 71.81   | 41.5    | 51.3    | 54.1    | 52.3    | 64.7    |
| 111  | Indiana Univ - Bloomington                    | 71.05   | 12.5    | 17.9    | 26.3    | 21.2    | 39.3    |
| 112  | Univ Colorado - Denver                         | 70.88   | 0       | 0       | 17.9    | 16.7    | 40.6    |
| 113  | Rockefeller Univ                               | 70.78   | 20.2    | 58.6    | 29.2    | 42.2    | 22.3    |
| 114  | Oregon Health & Sci Univ                      | 70.72   | 0       | 0       | 20.6    | 19.2    | 37.2    |
| #   | Institution                                      | Resources | CEI | LSCI | HSCI | GSCI |
|-----|--------------------------------------------------|-----------|-----|------|------|------|
| 115 | Hebrew Univ Jerusalem                            | 70.64     | 29.6| 20   | 24.2 | 22.9 |
| 116 | Mayo Clinic Coll Med                             | 70.62     | 0   | 0    | 25.3 | 15.2 |
| 117 | Univ Delaware                                    | 70.13     | 12.5| 0    | 20.6 | 14   |
| 118 | Univ Glasgow                                     | 69.74     | 11.2| 0    | 21.9 | 15.5 |
| 119 | Univ Utah                                        | 69.73     | 0   | 11.5 | 30.1 | 29.2 |
| 120 | Univ Connecticut - Storrs                        | 69.32     | 13.7| 0    | 16.3 | 12.3 |
| 121 | Univ Maryland - Coll Park                        | 68.93     | 23.1| 20   | 40.6 | 30.4 |
| 122 | Univ Pisa                                        | 68.87     | 16.8| 23.6 | 14.6 | 5    |
| 123 | VU Univ Amsterdam                                | 68.28     | 0   | 0    | 23.1 | 14.6 |
| 124 | Yale Univ                                        | 68.28     | 48.5| 43.6 | 57   | 55.7 |
| 125 | Univ North Carolina - Chapel Hill                | 68.25     | 11.2| 16.3 | 37.9 | 28.8 |
| 126 | Univ Freiburg                                    | 68.05     | 22.4| 20.9 | 16.3 | 19.2 |
| 127 | Univ Manchester                                  | 67.76     | 24.4| 18.9 | 28.2 | 28.3 |
| 128 | Univ Edinburgh                                   | 67.66     | 20.2| 16.7 | 26.3 | 32.3 |
| 129 | Univ Cincinnati - Cincinnati                     | 67.57     | 0   | 0    | 23.1 | 11.1 |
| 130 | Univ Southampton                                 | 67        | 0   | 0    | 19.3 | 14   |
| 131 | Univ Miami                                       | 66.96     | 0   | 0    | 24.2 | 17.8 |
| 132 | Karolinska Inst Stockholm                        | 66.48     | 27.4| 27.3 | 31.8 | 18.3 |
| 133 | Univ Wuerzburg                                   | 66.48     | 22.4| 8.9  | 24.2 | 14.4 |
| 134 | Nagoya Univ                                      | 66.46     | 0   | 14.1 | 16.3 | 20.7 |
| 135 | Univ Massachusetts - Amherst                     | 66.15     | 15.8| 0    | 33.4 | 20.4 |
| 136 | Univ Bonn                                       | 65.56     | 17.7| 20   | 14.6 | 20.2 |
| 137 | Univ Melbourne                                   | 65.51     | 13.7| 14.1 | 23.1 | 19.6 |
| 138 | Univ Mainz                                       | 65.04     | 0   | 8.2  | 17.9 | 20.4 |
| 139 | Rutgers State Univ - New Brunswick              | 64.88     | 13.7| 20   | 39.9 | 27.9 |
| 140 | Washington Univ - St. Louis                     | 64.77     | 22.4| 26   | 38.6 | 43.2 |
| 141 | Univ Rochester                                   | 64.58     | 29.6| 8.9  | 27.3 | 21.6 |
| 142 | Swiss Fed Inst Tech - Lausanne                  | 64.56     | 0   | 0    | 24.2 | 17.3 |
| 143 | Univ Liverpool                                   | 64.42     | 20.9| 15.5 | 12.6 | 19.2 |
| 144 | Univ Texas M.D. Anderson Cancer                 | 64.14     | 0   | 0    | 21.9 | 10.1 |
| 145 | Univ Durham                                      | 63.93     | 0   | 0    | 17.9 | 16.9 |
| 146 | Univ Groningen                                   | 63.62     | 0   | 20   | 17.9 | 17.2 |
| 147 | Univ Maryland - Baltimore                        | 63.23     | 0   | 0    | 21.9 | 14   |
| 148 | Univ California - San Diego                     | 63.15     | 15.8| 34   | 59.7 | 53   |
| 149 | Univ Kiel                                       | 63.08     | 13.7| 15.5 | 10.3 | 11.6 |
| 150 | Univ California - San Francisco                 | 62.96     | 0   | 36.8 | 54.1 | 51.5 |
| 151 | Univ Birmingham                                 | 62.92     | 22.4| 10.9 | 21.9 | 15.6 |
| 152 | Univ Sheffield                                  | 61.76     | 20.9| 14.1 | 21.9 | 25.5 |
| 153 | Univ Warwick                                    | 61.65     | 0   | 0    | 18.6 | 15.2 |
| 154 | Univ Copenhagen                                 | 61.53     | 27.4| 24.2 | 26.3 | 25.4 |
| 155 | Univ Southern California                        | 61.4      | 0   | 26.8 | 38.6 | 24.7 |
| 156 | Univ Pennsylvania                               | 60.87     | 31.7| 34.4 | 58.3 | 41.3 |
| 157 | Univ British Columbia                           | 60.22     | 18.6| 18.9 | 31.8 | 31.9 | 65.8 |
|   | University Name                                      | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 |
|---|-----------------------------------------------------|----|----|----|----|----|----|
| 158 | Univ Texas Health Sci Center - H                   | 60.21 | 15.5 | 17.9 | 18.7 | 31.3 |
| 159 | Imperial Coll London                                | 60.08 | 37.4 | 39.9 | 38.2 | 61.8 |
| 160 | Univ Toronto                                       | 60.06 | 19.3 | 38.6 | 37 | 79.8 |
| 161 | Univ Leicester                                      | 59.85 | 0 | 19.3 | 15.8 | 33.9 |
| 162 | Univ Texas Southwestern Med Cent                   | 59.82 | 32.8 | 31.8 | 11.3 | 35.7 |
| 163 | Univ Med & Dentistry New Jersey                    | 59.64 | 0 | 23.1 | 13.8 | 35 |
| 164 | Carnegie Mellon Univ                               | 59.59 | 32.8 | 31.8 | 11.3 | 35.7 |
| 165 | Virginia Commonwealth Univ                          | 59.42 | 14.1 | 17.9 | 7.9 | 35.9 |
| 166 | Colorado State Univ                                 | 59.39 | 0 | 0 | 27.3 | 13.9 | 38.2 |
| 167 | Univ Oslo                                           | 58.76 | 32.8 | 31.8 | 11.3 | 35.7 |
| 168 | Princeton Univ                                      | 58.51 | 80.4 | 61.9 | 40.5 | 44.8 |
| 169 | Technion Israel Inst Tech                           | 58.42 | 16.8 | 23.1 | 14.6 | 14.6 | 39.8 |
| 170 | Univ Zurich                                        | 58.18 | 26.8 | 24.7 | 27.5 | 50.2 |
| 171 | Univ Heidelberg                                     | 57.9 | 27.2 | 17.9 | 20.4 | 49.2 |
| 172 | Stanford Univ                                       | 57.71 | 78.7 | 86.6 | 68.9 | 71.6 |
| 173 | Australian Natl Univ                               | 57.63 | 12.6 | 35.7 | 30.5 | 43.4 |
| 174 | Univ Helsinki                                      | 57.22 | 17.9 | 21.9 | 20.8 | 53.8 |
| 175 | Univ Leiden                                        | 56.92 | 15.5 | 28.2 | 17.7 | 47.6 |
| 176 | Univ California - Santa Barbara                    | 56.66 | 35.3 | 41.9 | 34.9 | 43.2 |
| 177 | Tsukuba Univ                                        | 56.29 | 20 | 12.6 | 8.9 | 41.3 |
| 178 | Univ Wageningen                                    | 55.73 | 29.2 | 14.4 | 38 |
| 179 | Northwestern Univ                                  | 55.47 | 18.9 | 46.7 | 32.8 | 58.7 |
| 180 | Univ Libre Bruxelles                               | 55.14 | 18.9 | 12.6 | 14.3 | 31.6 |
| 181 | Univ Bristol                                       | 55 | 17.9 | 28.2 | 28.1 | 47.8 |
| 182 | Brown Univ                                         | 54.07 | 13.6 | 31.8 | 26.6 | 40.4 |
| 183 | Univ Basel                                         | 53.6 | 21.1 | 20.6 | 21.1 | 35.7 |
| 184 | Tech Univ Denmark                                  | 53.42 | 12.6 | 17.9 | 13.5 | 33.5 |
| 185 | Swiss Fed Inst Tech - Zurich                       | 52.78 | 36.3 | 36.1 | 38.1 | 53.6 |
| 186 | Univ California - Irvine                           | 52.34 | 29.4 | 37.2 | 27.5 | 49.3 |
| 187 | McMaster Univ                                      | 51.69 | 18.9 | 21.9 | 14.7 | 46.1 |
| 188 | Univ Ghent                                         | 51.46 | 15.5 | 16.3 | 7.7 | 52.7 |
| 189 | Rice Univ                                          | 50.82 | 21.9 | 21.9 | 19.7 | 29.5 |
| 190 | Univ Western Australia                             | 50.57 | 14.1 | 17.9 | 10.5 | 41.2 |
| 191 | Tufts Univ                                         | 49.95 | 16.7 | 23.1 | 14.4 | 39.3 |
| 192 | King's Coll London                                 | 49.3 | 23.1 | 21.9 | 15.3 | 48.7 |
| 193 | Univ Nottingham                                    | 49.19 | 20 | 24.2 | 16 | 47.9 |
| 194 | California Inst Tech                               | 49.1 | 57.4 | 66.1 | 49.7 |
| 195 | Erasmus Univ                                       | 47.92 | 20.6 | 5.8 | 31.5 |
| 196 | Univ Louvain                                       | 46.75 | 13.6 | 17.9 | 12.4 | 42.8 |
| 197 | Vanderbilt Univ                                    | 46.08 | 29.6 | 30.9 | 23.1 | 50.3 |
| 198 | George Mason Univ                                  | 40.51 | 10.3 | 5.6 | 27.1 |
| 199 | Univ Sussex                                        | 36.01 | 19.3 | 16.5 | 27.7 |