

A GUIDE TO THE NATURE INDEX

A description of the terminology and methodology used in this supplement, and a guide to the functionality available free online at natureindex.com.

The Nature Index is a database of author affiliations and institutional relationships. The index tracks contributions to articles published in a group of highly selective science journals, chosen by an independent group of active researchers.

The Nature Index provides absolute counts of publication productivity at the institutional and national level and, as such, is one indicator of global high-quality research output.

Data in the Nature Index are updated monthly, with the most recent 12 months of data made available under a Creative Commons licence at natureindex.com.

The database is compiled by Nature Publishing Group (NPG) in collaboration with Digital Science.

The list of journals tracked by the Nature Index is under review, and from 2016 will be extended to include the clinical sciences.

NATURE INDEX METRICS

There are three measures provided by the Nature Index to track affiliation data. The simplest is the **article count (AC)**. A country or institution is given an AC of 1 for each article that has at least one author from that country or institution. This is the case whether an article has one or a hundred authors, and it means that the same article can contribute to the AC of multiple countries or institutions.

To get a better sense of a country or institution's contribution to an article, and to remove the possibility of counting articles more than once, the Nature Index uses the **fractional count (FC)**, which takes into account the relative contribution of each author to an article. The total FC available per paper is 1, which is shared between all authors under the assumption that each contributed equally. For instance, a paper with 10 authors means that each author receives an FC of 0.1. For authors who have joint affiliations, the individual FC is then split equally between each affiliation.

The third measure used is the **weighted fractional count (WFC)**, which applies a weighting to the FC to adjust for the over-representation of papers in astronomy and astrophysics. The four journals in these disciplines publish about 50% of all papers in international journals in this field — approximately five times the equivalent percentage for other fields. Therefore, although the data for astronomy and astrophysics are compiled in the same way as for all other disciplines, articles from these

natureindex.com users can search for specific institutions or countries and generate their own reports, ordered by article count (AC), fractional count (FC) or weighted fractional count (WFC).

Each query will return a profile page that lists the country or institution's recent research outputs, from which it is possible to drill down for more information. For example, articles can be displayed by journal, and then by article title. As in the supplement, research outputs are organized by subject area. The profile page also lists the institution or country's top collaborators, as well as its relationship with other research organizations.

journals are assigned one-fifth the weight of other articles (i.e., the FC is multiplied by 0.2 to derive the WFC).

The total FC or WFC for an institution is calculated by summing the FC or WFC for individual authors.

The process is similar for countries, although complicated by the fact that some institutions have overseas labs that will be counted towards their host country totals. What's more, there is great variability in the way authors present their affiliations. Every effort is made to count affiliations consistently, with a background of reasonable assumptions.

For more information on how the affiliation information is processed and counted, please see the FAQ section at natureindex.com.

NATUREINDEX.COM

A global indicator of high-quality research

The screenshot shows the Nature Index website interface. At the top, there is a navigation bar with links for Home, Institution outputs, Country outputs, Customer support, and FAQ. Below this, there is a search bar and a breadcrumb trail: Home / Institution outputs / Institution name. The main content area is titled "Institution name" and "Country". There are three tabs: Research (selected), Collaboration, and Relationships. Below the tabs, there is a date range selector: "1 January 2014 - 31 December 2014". To the right of this, there is a table with three columns: AC, FC, and WFC. The values are: AC: 1221, FC: 598.04, WFC: 558.30. Below this table, there is a section titled "Outputs by subject" with a donut chart and a table. The table lists subjects: Chemistry, Earth & Environmental Sciences, Life Sciences, and Physical Sciences, with their respective AC, FC, and WFC values. A note states: "Note: Articles may be assigned to more than one subject area." At the bottom, there is a link: "Return to institution outputs".

AC	FC	WFC
1221	598.04	558.30

Subject	AC	FC	WFC
Chemistry	276	179.1	179.11
Earth & Environmental Sciences	95	42.73	42.73
Life Sciences	439	231.50	231.50
Physical Sciences	652	284.48	244.74

THE SUPPLEMENT

Nature Index 2015 China is based on data from the Nature Index, covering articles published during three consecutive years between 1 January 2012 and 31 December 2014.

Most analyses within the supplement use WFC as the primary metric, as it provides a more even basis for comparison across multiple disciplines, and in determining the relative contribution of each city or institution. Some sections and graphics also refer to collaboration score. This is a relatively new metric that is derived by adding the FC for all the bilateral relationships for that institution or country. If institution A has relationships with two others, B and C, then the collaboration score is the sum of FC for A + B and A + C. ■