

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 and fractional 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 regularly, with the most recent 12 months made available under a Creative Commons licence at natureindex.com. The database is compiled by Springer Nature. The list of journals tracked by the Nature Index will be extended in 2018.

NATURE INDEX METRICS

There are several 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 regardless of the number of authors an article has, and it means that the same article can contribute to the AC of multiple countries or institutions.

To get a sense of a country's or institution's contribution to an article, and to ensure they are not counted more than once, the Nature Index uses the fractional count (FC), which takes into account the share of authorship on each article.

The total FC available per paper is 1, which is shared among 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.

Another 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. Four journals tracked by the index in these disciplines publish approximately five times the number of papers relative to other disciplines. Therefore, although the data for astronomy and astrophysics are compiled in the same way as for other disciplines, articles from these journals are assigned one-fifth the weight of other articles (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

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 outputs, from which it is possible to drill down for more information. Articles can be displayed by journal, and then by article. Research outputs are organized by subject area. The pages list the institution or country's top collaborators, as well as its relationship with other organizations. Registering allows users to track an institutions' performance over time, create their own indexes and export table data.

countries, although complicated by the fact that some institutions have overseas labs that will be counted towards host country totals. The fourth metric is bilateral collaboration score (CS). A bilateral collaboration can be between any two institutions or countries co-authoring at least one paper in the journals tracked by the Nature Index. CS is derived by summing the FCs from papers with authors from both institutions. If institution A has co-authored a paper with another institution, then the collaboration score between A and B is the sum of the FC for A+B.

Every effort is made to count affiliations consistently, with a background of reasonable assumptions. For more on how the affiliation information is processed, visit 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 'Home', 'Institution outputs', 'Country outputs', 'Customer support', and 'FAQ'. Below this is a breadcrumb trail: 'Home / Institution outputs / Institution name'. The main content area has a search bar for 'Institution name' and 'Country'. There are three tabs: 'Research' (selected), 'Collaboration', and 'Relationships'. A date range selector shows '1 January 2017 - 31 December 2017'. A table summarizes the metrics:

	AC	FC	WFC
Region: Global	1221	598.04	558.30
Subject/journal group: All			

Below the table is a donut chart titled 'Outputs by subject' showing the distribution of outputs across four subject areas: Chemistry (red), Earth & Environmental Sciences (green), Life Sciences (yellow), and Physical Sciences (blue). A note states: 'Note: Articles may be assigned to more than one subject area.' Below the chart is a table showing the breakdown by subject:

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

At the bottom left of the interface, there is a link: '< Return to institution outputs'.

THE SUPPLEMENT

Nature Index 2018 Japan is based on data from natureindex.com, covering articles published during six years from 1 January 2012 to 31 December 2017. The tables rank Japan's top 100 institutions by normalized WFC, an indicator of an institution's high-quality research output as a proportion of total output in the natural sciences. This is derived by dividing an institution's cumulative WFC in the Nature Index 2012–2017 by its total number of natural science articles in Scopus 2012–2017. Also listed are the institution's total number of articles in the Nature Index and the percentage of its total articles in Scopus that are in natural sciences. Separate tables rank institutions in academic, corporate and other sectors, as well as in specific subject areas. ■