

# Having an impact

As the journal's first impact factor is released, it is time to reflect on journal metrics and how *Nature Climate Change* has been making its mark.

How time flies. The first issue of *Nature Climate Change* appeared in April 2011, and the journal — a monthly publication — is now well into its third volume. By the time this issue goes to press, we should have received our first impact factor from Thomson Reuters<sup>1</sup>. The impact factor is one of the most recognized metrics and is a measure of a journal's influence. It is calculated on two years' worth of citation data. The impact factor released in 2013 is for 2012; it is calculated on citation counts in 2012 of papers published in 2010–2011, divided by the number of 'citable items' published in that period. Citable items — typically considered to be research papers and review articles — may not include all of the journal content that has been cited, Commentary and Policy Watch pieces would be excluded, for example.

The importance of impact factors is much debated, with a feeling that too heavy an emphasis is placed on this single number. A small number of very highly cited papers can strongly influence the final number, and the citation is not rated on being positive or negative, so a highly criticized paper may inflate the value.

Further criticisms of the impact factor include the timeframe — it only looks at the first two years of citations for any given paper, so the longer-term impact of work is not measured; and coverage — citations in books, conferences, reports, policy documents, working papers and the media — is not taken into account. Different dynamics, including publishing timelines and formats, across research disciplines result in different citation rates, meaning that comparison across fields is not possible. The social sciences are not well represented by impact factors; a study has shown that they often have artificially low numbers and are better ranked by other metrics<sup>2</sup>. Thomson Reuters recognises this and there is a Social Science Citation Index, covering over 4,000 journals and 50 disciplines in the social sciences, for better comparison in these fields<sup>3</sup>.

Another tool for measuring journal performance is the h5-index used by Google Scholar, which provides greater coverage of citations including books, conference and working papers<sup>4,5</sup>. One advantage of the h5-index is that it is based

on five years' worth of data, rather than just two, which should make it more reliable; on the other hand a new journal would have to wait this period of time before receiving its first h5-index ranking.

**The impact factor is one of the most recognized metrics and is a measure of a journal's influence.**

All metrics have shortcomings, are still used as they provide a value for something that is difficult to define. Regardless, *Nature Climate Change* papers have attracted attention across the scientific and broader community in ways that might not be captured by a single number.

*Nature Climate Change* publishes across the climate change disciplines and it is pleasing that papers from all fields are being recognized in the scientific community. Our most cited paper is about coral reefs and ocean acidification<sup>6</sup>, with another marine ecology paper — 'Coral and mollusc resistance to ocean acidification adversely affected by warming'<sup>7</sup> — also being well cited. A top social science paper is 'The role of social and decision sciences in communicating uncertain climate risks'<sup>8</sup>. The physical sciences are also represented, for example 'Global radiative forcing from contrail cirrus'<sup>9</sup> and a paper on the historical interdecadal modulation of El Niño Southern Oscillation<sup>10</sup>. Citation counts vary between the ISI Web of Science and Google Scholar due to the different coverage. As is to be expected, papers from our first year, 2011 to early 2012, dominate as they have had longer to accumulate citations.

The *Nature Climate Change* papers that have received the most press coverage are not necessarily those that are the most cited. Papers that have been reported in the media come from many sections of the journal and are varied in subject area. Examples include a paper on the impacts of wind farms on land surface temperature<sup>11</sup>, a Perspective on shrinking body size as an ecological response to climate change<sup>12</sup> and a paper on a hotspot of sea-level rise<sup>13</sup>. Other top stories picked up by the media include a very

highly cited Correspondence on the rapid growth in carbon dioxide emissions after the global financial crisis of 2008–2009<sup>14</sup>, and more recently a paper on intensification of turbulence affecting air travel over the Atlantic, which received worldwide interest<sup>15</sup>. Many more *Nature Climate Change* papers have featured in the press, as well as in digital and social media.

The impact of published research on policy and working papers is harder to gauge, however feedback from authors and reviewers indicates that papers from the journal are being referenced outside academia. We expect several papers from the journal to feature in the upcoming Intergovernmental Panel on Climate Change Assessment Report Five, with 'The Physical Science Basis' expected in September of this year, followed by 'Impacts, Adaptation and Vulnerability' and 'Mitigation of Climate Change' early next year and the Synthesis Report in October 2014. Another report, the US National Climate Assessment — currently in draft form but closed for comments<sup>16</sup> — references several *Nature Climate Change* papers.

*Nature Climate Change* is establishing itself as a resource of climate change information for scientists and the broader community. Although measuring the success of a publication is a complex process, the impact factor represents a key indicator of influence. The release of our first impact factor is therefore an exciting milestone for the journal. □

## References

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