A decade of Earth science

Great Earth science has been published over the ten years since the launch of *Nature Geoscience*. The field has also become more interdisciplinary and accountable, as well as more central to society and sustainability.

Change is the motor of the world. We at *Nature Geoscience* have accompanied the exciting journey of the Earth and planetary sciences for ten years now. Over this time, we have watched over the publication of many impressive and unexpected insights. In celebration of the journal's tenth anniversary, we have commissioned a series of retrospective News and Views articles that look back at interesting developments of the past ten years or so, and their impacts on their discipline since publication.

We can only shine a few spotlights, and have chosen to highlight six topics in particular where we feel that progress has been significant: the influence (or not) of tectonics on the composition of the atmosphere (page 9); the role of environmental characteristics in determining the elemental composition of marine plankton (page 15); the formation of the Earth–Moon system (page 16); the causes behind the period of slow warming at the beginning of the twenty-first-century (page 12); the interactive feedbacks between hydrothermal vents, microbial life and ocean chemistry (page 10); and the regional and global evolution of Earth's climate over the past 2,000 years (page 18). And for a more personal touch, we have added two shorter pieces into the mix that describe papers that have inspired two of us editors in our own scientific journey (pages 14 and 20).

In terms of personal views on the past decade of geoscience, we are looking forward to hearing more from our readers, in particular those at an early stage in their career (students or postdocs with no more than five years of post-PhD research experience): we are inviting early career geoscientists to write to us with the story of the paper(s) that most inspired them or changed the direction of their research interests. The best tales will be published in the News and Views section of *Nature Geoscience* over the course of 2018 (see http://go.nature.com/2BpTGMX for more details of the competition).

The past decade has brought change along with new science. We have witnessed the disciplines within the Earth and planetary sciences moving closer together. For example, the interdependence of past climate and tectonics — connected through the modulation of atmospheric composition by the deep carbon cycle — has received much interest lately (*Nat. Geosci.* **10**, 877; 2017); environmental scientists and economic geologists are working together and reaching out to the social sciences to get a grasp of how to source the metals and minerals needed to secure food, water and energy while maintaining a liveable environment in the twenty-first century (*Nat. Geosci.* **9**, 729; 2016); palaeoclimate has become an integral part of climate change science; and volcanologists and climate scientists work together, sometimes with historians, to understand past, present and future climate change.

The Earth and planetary sciences have converged, too, both in methods and outlook. This development is exemplified by two Comments in this issue: on page 2 Hand and German argue that deep-ocean research has much to learn from space exploration in terms of designing sophisticated but lean robotic systems for in situ analysis, and that our understanding of Earth's oceans and those in the outer Solar System can cross-fertilize. McGouldrick on page 4 notes the need for deeper comparative insights into the diversity of planetary atmospheres in our neck of the Solar System if we ever want to make sense of exoplanets.

In addition, tensions between science and society have become sharper, as has public scrutiny of scientific findings. Back in 2009, the Climategate scandal shook the science community, when the hacked e-mails of a few climate scientists were fervently discussed in public, including allegations of misconduct (*Nat. Geosci.* **3**, 509; 2010). A few years later seismologists were accused and found guilty of manslaughter in the L'Aquila trial for their failure to warn the population of imminent earthquake risk (*Nat. Geosci.* **6**, 77; 2013). Not least in light of these cases, the geoscience community is making a concerted effort at better accountability, by documenting data, computer code and methods, and at better communication with the public sphere.

There is much more to be discovered about Earth and the other worlds in the Universe. As we do so, it is of utmost importance to keep open the dialogue with society at large, both on fundamental research and on how to save our planet. If we can make that dialogue work as a true two-way interaction, the next ten years will be an even more exciting time to be working in the Earth and planetary sciences. ❐

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