

Obituary – Will Steffen, the father of Earth System science

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Commentary

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This is a tribute to our dear friend and colleague Will Steffen, a remarkable human being and a visionary scientific giant. Will left us in January 2023, at an age of 75. Although he had been ill for some time, he – and we – remained optimistic until the end and his death was unexpected.

Will was the true father behind Earth System science. Early, he brought together leading scholars from diverse disciplines and backgrounds for new scientific syntheses and created Earth System science. His book from 2005 ‘*Global Change and the Earth System: A Planet under Pressure*’ (Steffen et al., 2004) is a milestone and classic in this context, a systemic view of planet Earth and the human imprint altering its dynamics.

Will’s contribution to the scientific understanding of the complex fascinating dynamics of planet Earth and the role of us humans as part of it is clearly exceptional and simply outstanding.

He initiated, inspired, and developed several paths of significant inquiry into global sustainability that have profoundly altered the way we understand the Earth System as a whole and opened our eyes for the severe challenges confronting the human civilization on our unique living planet (Hughes & Rice, 2023; Rockström, 2023; Rockström & Richardson, 2023).

Will’s work has been instrumental in clarifying the now well-established dominant role of our species in shaping the dynamics of planet Earth. In a classic paper in *Ambio*, he asked ‘are humans now overwhelming the global forces of nature’ (Steffen et al., 2007). He generated the Great Acceleration insights, showing the rapidly increasing rate of human activity since the mid-1900s and the impact upon the Earth’s biosphere and climate system (Steffen et al., 2015a, 2015b), thereby setting the stage for the establishment of the Anthropocene as a new geological epoch (Zalasiewicz et al., 2019).

Will was central in clarifying and connecting the Holocene epoch of the last 12,000 years to its critical role in providing suitable environmental conditions for the evolution of modern civilizations (Young & Steffen, 2009). The profound dependence on the environmental stability of the Holocene forms the scientific benchmark of the Planetary Boundaries framework and the safe operating space (Rockström et al., 2009), a major effort in understanding the Earth System, where Will was truly instrumental (Steffen et al., 2015b). The planetary boundaries and the Anthropocene situation now call for governance of human actions in collaboration with the planet, or planetary stewardship (Folke et al., 2021; Steffen et al., 2011).

Will played a leading role in conducting the work with another connected high profile and debated area, namely the risk of irreversible climate ‘tipping points’ (Lenton et al., 2019) that could push the world into so-called ‘hothouse conditions’, shifting the Anthropocene from a trajectory into a new state (Steffen et al., 2018). He even linked such climate tipping elements of the biosphere to financial markets and global economic actors, opening the eyes of investors to new forms of systemic risks (Galaz et al., 2018). Few could see the bigger picture as Will did, or dare to instigate the type of investigations Will did. The latter generating amazing new understandings and insights of profound significance.

Will’s work truly opened new paths of scientific inquiry and will have a lasting and deep imprint. And an imprint far beyond science. Will was an active voice, a gifted communicator, and change maker, bringing into policy, practice, and business the very best of scientific understanding of complex Earth System dynamics and its implication for sustainability and the future of civilization in the fragile Biosphere.

Will’s commitments ranged from city development to national and international climate policy, from business leaders to central banks, to name a few. Fairness, respect, and appreciation were part of his humanism. He felt wonder and curiosity for life and being alive and enjoyed being part of nature revived by climbing mountains in Australia or skating on frozen lakes in Sweden.

Will’s legacy and exceptional contributions shape the way we think and act on the world and play a fundamental and profound role in striving for transformations toward a sustainable future. Interacting with Will was, for us, hugely inspirational: we learned, discovered, and were revitalized in his company. Will’s humility, ambience, and great friendship will remain deeply in our hearts.

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