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Law, systems, and Planet Earth: Editorial

1. Introduction

When confronted with global sustainability challenges, we often take recourse to the law to govern human behaviour and achieve desired regulatory outcomes (Chapron et al., 2017). But what if law has become unfit for purpose, and therefore incapable of effectively addressing the challenges at hand? The Anthropocene, as a new geological epoch, provides a fundamentally different contextual condition alongside which our existing governance institutions, including law, must be adjusted (Dryzek, 2014; Burch et al., 2019; Sterner et al., 2019). Yet the design, purpose, and function of law, in the main, have not changed to any significant extent. Responding to this need to transform law in order to make it more fit for purpose, several scholars have been joining the effort in rethinking law for the Anthropocene (e.g., Vidas, 2011; Kim and Bosselmann, 2013; Scott, 2013; Kotzé, 2014b; Robinson, 2014; Gonzalez, 2015; Blanchard, 2016; Hey, 2016; Biber, 2017; Humby, 2017; Holley et al., 2018; Kotzé and French, 2018; Viñuales, 2018; Lim, 2019; Stephens, 2019; Burdon, 2020; Gear, 2020).

In the specific context of earth system governance, a multidisciplinary group of scholars has been leading a recent and ongoing research effort, under the banner of the Earth System Governance network's Task Force on Earth System Law, that seeks to elaborate a new legal paradigm for the Anthropocene. In their first publication that formally introduced the notion of earth system law, Kotzé and Kim (2019) employed the overarching research framework of earth system governance (Burch et al., 2019) to propose a new research agenda for the juridical dimensions of earth system governance. The notion of earth system law, defined as "an innovative legal imaginary that is rooted in the Anthropocene's planetary context and its perceived socio-ecological crisis" (Kim and Kotzé, 2021: 13), serves as the fulcrum on which this research agenda revolves. The Special Issue that we are introducing here consists of diverse attempts at imagining what earth system law could look like and how such an imaginary might be realized in the context of the Anthropocene.

A fuller determination of the precise content, purpose, meaning, and scope of earth system law remains a work in progress. While some suggest that earth system law could be a form of next generation international environmental law (Kim, 2021), or at least that it offers a framework to reimagine international environmental law for the Anthropocene (Kotzé, 2020), earth system law could potentially be much more than that. Just like earth system governance is not simply about global environmental politics (Biermann, 2021), earth system law is intended to be a more generically applicable framework that spans the entire spectrum of law that is relevant for responding to earth system transformation. The broad application of the earth system law

framework is already evident in the way in which some legal scholars are studying corporate law (Sjåfjell, 2020), human rights law (Kotzé, 2014a; Baber and Bartlett, 2020; Ensor and Hoddy, 2021), and space law (Cirkovic, 2021) at all levels of social organization, including also cities (Kotzé, 2021). The common denominator in all of these works is a perspective that embraces the earth system as an interconnected social-ecological system, and its application to legal thinking and practice (Mai and Boulot, 2021).

Similarly, earth system law research is not only concerned with law in the strict sense. Many questions that earth system law scholars seek to address do not all exclusively reside in the legal domain. The epistemic project of earth system law instead pursues research in large part through interdisciplinary and transdisciplinary conversations (Kotzé et al., 2021). Such an approach aims to enable a fertile epistemic space for interrogating whether law is still capable of responding to complex earth system governance challenges, and if it is not, to rethink law alongside an earth system perspective (Angstadt, 2021). The ultimate purpose of this research endeavour is to transform societies externally by transforming law internally. To that end, earth system law research addresses critical normative questions that are also often based on ethical considerations, and it analyses legal systems as an object of study through social sciences and humanities approaches (Kotzé and Kim, 2020).

This Special Issue is a continuation of the foregoing dialogue. It further explores analytical, normative, and transformative questions within the context of the Anthropocene's complex earth system and the continuing loss of planetary integrity.

2. Beyond ecological, planetary, and systems approaches to law

The idea of earth system law is closely linked to earth system governance scholarship, while it also builds on, and moves beyond, existing frontiers in legal research. Earth system law research, for example, draws on the *ecological* approach to law, especially the work on ecological law grounded in ecocentric ethics (Stone, 1972; Bosselmann 1995, 2008; Taylor, 1998; Garver, 2013), as well as wild law and earth jurisprudence (Cullinan, 2003; Burdon, 2011, 2014; Maloney and Burdon, 2014; Rogers and Maloney, 2017). As such, earth system law places Planet Earth (including all its living beings and biophysical processes) more centrally in the circle of law's concern (Bosselmann, 2008; Robinson, 2019). Earth system law scholarship is therefore considered as being part of the ecological law movement (Collins, 2021), which aims to advance a paradigm shift that "internalizes the natural living conditions of human existence and makes them the basis of all law" (ELGA, 2016).

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The perspective on the earth system *in toto* as a social-ecological system (Young and Steffen, 2009) has also led to a growing interest in the *planetary* approach to law, which is another important focus of earth system law research. This includes exploring the forms of law that might be effective in advancing planetary justice (Hickey and Robeyns, 2020; Ensor and Hoddy, 2021) while respecting planetary boundaries (Ebbesson, 2014; Magalhães et al., 2016; Fernández and Malwé, 2018; Biermann and Kim, 2020; French and Kotzé, 2021; Kim and Kotzé, 2021). For example, some scholars argue that Anthropocene challenges would likely require a global constitution of some sort with the purpose of preserving planetary integrity at its core (Kotzé, 2012; Kim and Bosselmann, 2013; Cardesa-Salzmann and Cocciolo, 2019), while others have begun to explore the implications of crossing irreversible planetary tipping points for earth system law (Kim, 2021).

Relatedly, the attention to governing the earth system at all scales has highlighted the need to adopt a *systems* approach to law. Earth system law therefore builds on previous work on law and complexity (Ruhl, 2008), panarchy (Ruhl, 2012), and resilience (Ebbesson and Hey, 2013; Blanchard et al., 2019; Garmestani et al., 2019; Bohman, 2021), which collectively emphasizes the need to address reductionism in law (Bosselmann, 2010) by harnessing rather than reducing legal complexity (Ruhl et al., 2017). In this context, unlike Luhmann (1993)'s systems theory of law, law is understood to be a complex adaptive system that is fully nested within larger social-ecological systems with which law co-evolves (Kim and Mackey, 2014).

Importantly, however, earth system law is intended to be more than ecological law, planetary law, or a systems approach to law, considered separately. It is the confluence of these existing lines of research that makes earth system law unique as a possible new legal paradigm and epistemic framework for the Anthropocene (Kotzé and Kim, 2019). Earth system law research, for instance, does not aim to build a single unitary legal system or ideology for the entire planet that is either strictly ecocentric or anthropocentric. The earth system law research endeavour rather embraces diversity and pluralism, as well as innovative out-of-the-box thinking that goes well beyond the strict confines of traditional legal research. Similarly, earth system law is polycentric in its institutional architecture. It is neither state-centric nor non-state-centric: States may play an important role as trustees (Bosselmann, 2015), but at the same time there is an untapped potential of non-state actors (Ayling, 2013). Earth system law in this sense offers an opportunity to the full range of diverse legal actors operating at all levels to facilitate the confluence of multiple forms of, and visions for, law in the Anthropocene (Kotzé and Kim, 2019).

3. Earth system law, or earth systems law?

Yet some commentators stress that earth system law scholarship faces the challenge of overcoming the “one-world world” paradigm, which asserts that, “regardless of variation in world-construing, all beings occupy one ‘real’ world of discrete entities” (Boulot and Sterlin, 2021: 1). The point of departure for earth system law research has so far typically been the recognition of planetary boundaries, the determination of which relies heavily on the rationalist approach to expert-based environmental problem-solving (Biermann and Kim, 2020). This is seen as a drawback because such an ontological structure results in viewing a legal system as “an independent set of norms and procedures regulating the ‘human’ use of the ‘environment’ by specifying allowable harm rather than adjudicating on mutually enhancing relations” (Boulot and Sterlin, 2021: 1; see also Law, 2015). Critics therefore caution that earth system law might share an “ontological and epistemological foundation that is similar to the environmental law systems the very failings of which [earth system law scholars] seek to overcome” (Boulot and Sterlin, 2021: 3). In other words, earth system law is yet to embrace “an understanding of how ecological systems are not only culturally co-produced, politically maintained or altered, but potentially ontologically multiple” (Boulot and Sterlin 2021: 3).

We agree that the implications of fully embracing multiple ontologies and epistemologies for law in the Anthropocene need to be further explored. The critique possibly boils down to whether one should strive for earth system law for a single unified earth system, or earth systems law for the earth's multiple systems. On the one hand, concepts like the Anthropocene and planetary boundaries should be subject to contestation at least in part for homogenizing humanity (Biermann and Lövbrand, 2019; Biermann and Kim, 2020). But on the other hand, the transformation of the earth system as a whole is an inescapable reality. Earth system law research should therefore seek to remain sensitive to the possible tensions between the pursuit of planetary integrity and the plurality of ways in which this could be achieved. Multiple understandings and experiences of the Anthropocene should not, in our view, negate the need for a planetary-scale legal system for maintaining planetary integrity and advancing planetary justice, although we recognise that this legal system should neither be grounded in, nor aim to create, a one-world world paradigm (Gupta et al., 2021).

4. Advancing the debate with this special issue

This Special Issue brings together nine contributions by 27 scholars from various disciplinary backgrounds. The contributions collectively advance the debate on earth system law by exploring the place and role of earth system law within the framework of earth system governance. Questions addressed concern the understanding of earth system law, its form and content, as well as its ontological and epistemological orientation.

The Special Issue opens with three contributions that explore the transformative power of earth system law. In the contribution by Laura Mai and Emille Boulot (2021), the authors make concrete suggestions as to how the earth system law research community could help harness the transformative potential of earth system law to facilitate positive, on-the-ground change. By identifying five challenging dimensions of earth system law – structural, normative, ontological, epistemological-conceptual, and methodological – they articulate the starting points of a theory-to-practice agenda for responding to, and engaging with, each of these challenges. They propose that this agenda could initiate and drive the processes of transformative change which earth system law purports to support.

Joshua Gellers' contribution (2021) focuses on the role that earth system law can play in accommodating non-traditional legal subjects into communities of justice in the Anthropocene. By investigating the rights of nature movement, Gellers argues that, although relevant court cases have not fully embraced the tenets of earth system law (e.g., complexity, multiple forms of influence at varying levels of governance, going beyond simple linear progression), there is support for broadening the universe of entities capable of qualifying as legal subjects that are eligible for legal rights to include both natural and artefactual non-humans.

Staying with the issue of justice in the Anthropocene, Kamila Pope et al. (2021) explore the potential of earth system law to steer legal scholarship towards alternative understandings of justice. They suggest that, through parallels drawn with ecological approaches to law and socio-ecological justice, earth system law offers innovative strategies to overcome the prevailing “mechanistic” approach to law and justice that remains rooted in environmental reductionism and deep anthropocentrism. To this end, they present the three initial axes of socio-ecological justice – the what, who, and how of justice – and assess its potential as a tool to support the shift to earth system law as a new planetary legal paradigm.

Three contributions then apply an earth system law perspective to specific legal regimes or focus areas and the multiple issues and regulatory challenges found therein. Harro van Asselt (2021) uses the analytical and normative dimensions of earth system law as a point of departure to assess the current international regulation of fossil fuel production in the light of global climate goals. By assessing the

normative potential of climate change law, human rights law, and investment law to pursue supply-side climate policy, van Asselt argues that a reconsideration of how international law can support the shift away from fossil fuel production is necessary. To that end, he explores the possible contours of an international law of “leaving it in the ground”, which brings together general principles of international law under the holistic, forward-looking, and inclusive vision of earth system law.

Hanna Ahlström et al. (2021) focus on the issue of institutional fit and governance of social-hydrological systems in the Anthropocene. They explore how earth system law can build upon existing legal principles and governance architecture to help resolve core hydrological problems – scale, intertwinements, delay, redistribution, and permanence – and in a way that adequately recognizes the evolving interconnections between the global hydrological cycle and human society. Earth system law, they suggest, can play a key role in guiding research focusing on the global hydrological cycle and the many diverse water governance regimes found around the world. It also has a role to play in advancing new ways of thinking about social-hydrological systems and their governance solutions in the Anthropocene.

Nicky van Dijk (2021) examines a major shortcoming of current human rights law, namely, its inability to maintain a safe climate for young people and future generations. Her analysis focuses on possible ways to improve the communication procedure of the international human rights treaty system. Acknowledging that the human rights framework is inherently anthropocentric and is still far away from the holistic and planetary approach of earth system law, van Dijk highlights the opportunities and limits of the communication procedure in advancing intergenerational justice, democratic legitimacy, recognition and representation, accessibility, and impact. She also underlines its potential contribution to the recognition of the inherent interconnectedness of human behaviour and the earth system.

In a critical analysis of the underpinnings of earth system law, Marie-Catherine Petersmann (2021) recognizes the novelty and innovative character of its systems-oriented ontology. But she also questions the seeming elusiveness of earth system law’s functioning, which is arguably based on an autopoietic understanding of how life-making and life-sustaining processes are enacted. Autopoiesis, she argues, presumes a “whole” that is always already unified in advance, and does not fully capture how life emerges and unfolds on Earth through processes of becoming-with others. Petersmann proposes to take instead a sympleiotic approach to earth system law, which would leave space for collective modes of being, thinking, and acting in the Anthropocene.

Louise Du Toit and Louis Kotzé (2022) argue in general terms that for international environmental law to have the capacity to respond to the socio-ecological challenges of the Anthropocene, it should embrace an earth system perspective. They propose that earth system law, which is grounded in an earth system perspective, could facilitate the legal transformations necessary to respond to such socio-ecological challenges. With reference to recent developments in the international environmental law domain, they discuss the ways in which international environmental law currently fails to align with such a perspective, and the types of considerations that international environmental law should reflect in order to be more responsive to a transforming earth system.

This Special Issue concludes with an invitation by Louis Kotzé et al. (2021) to fellow epistemic travellers to explore new frontiers in earth system law. In their contribution, the authors build on existing attempts to reimagine law and legal scholarship in a more holistic way, and they suggest a shared epistemic framework that can enable and enhance collaborative intradisciplinary and interdisciplinary research and co-learning that go hand in hand with thorough transdisciplinary stakeholder engagement. Their three-pronged discussion reveals the liberating prospects of collaboration and co-learning that would be necessary to advance earth system law and its research agenda as a new legal episteme for the Anthropocene.

5. Conclusion

The concept of earth system law as a legal imaginary for the Anthropocene is still in its infancy. Yet, in our view, the need for precise definition and drawing of exact parameters of, and within, the earth system law project is neither urgent nor perhaps even necessary, as it could possibly stifle the type of innovative legal thinking that is required to deal with the Anthropocene’s earth system governance challenges. The ongoing project of earth system law should rather be flexible and shaped by as many diverse voices, insights, and contexts as we can possibly engage with (Kotzé et al., 2021).

This Special Issue aims to contribute to what we hope will be an ongoing and exciting dialogue to reimagine law for the Anthropocene. It does so by bringing together contributions of scholars who assess and demonstrate the added value brought by earth system law in normative, analytical, and transformative terms, as well as scholars who interrogate this idea and test the limits of its application. Building on this, and going forward, we welcome others to join us in our ever-growing efforts to think about and construct a new legal paradigm for the Anthropocene.

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