

# THE DYNAMIC EVOLUTION OF INTERNATIONAL ENVIRONMENTAL LAW

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*This article will explore selected innovations within multilateral environmental agreements that have contributed to the dynamic evolution of international environmental law within the context of the traditional rules relating to treaties, international institutions and state responsibility. It will argue that whilst these innovations undoubtedly push and develop the boundaries of these areas of law, they do not represent a significant departure from the traditional principle of consent that underpins international law more generally. But should they? The period of modern international environmental law (from 1972 to date), which from a lawyer's perspective might be described as dynamic and innovative, has simultaneously witnessed significant and persistent environmental change and degradation across the biosphere, atmosphere and hydrosphere. The question for 21st century environmental lawyers is whether international environmental law is fit for the Anthropocene and whether there is sufficient scope for future dynamic evolution within the constraints and structures of the existing international legal system.*

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## **I INTRODUCTION**

As a relatively modern field of international law, international environmental law has, over its 40-year history, deliberately developed processes, institutions and substantive measures designed to specifically respond to global environmental threats such as climate change and the Sixth Extinction. It is the interest of the international community as a collective, in the environment and, consequently, in the implementation of environmental obligations, that requires a refinement of, if not a departure from, the traditional consent-based approach to international law. This modified approach has been demonstrated by the sometimes innovative response of multilateral environmental agreements (MEAs) to issues such as reservations, treaty amendment, compliance and dispute settlement.

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Moreover, in an effort to engage the maximum number of states – and, to a lesser extent, other actors – within a regime, MEAs have also developed flexible and differential obligations, blurring the traditional distinction between hard and soft law. Treaties have become "regimes" and regimes increasingly play a substantive role in the creation, implementation and enforcement of environmental law. Regimes interact with one another in what is described as a "regime complex" or "polycentric" system, and this interaction poses challenging questions about the relationship between treaty law and international institutional law, as well as the evolving nature of international law more generally.

This article will explore selected innovations within MEAs that have contributed to the dynamic evolution of international environmental law within the context of the traditional rules relating to treaties, international institutions and state responsibility. It will argue that whilst these innovations undoubtedly push and develop the boundaries of these areas of law, they do not represent a significant departure from the traditional principle of consent that underpins international law more generally. But should they? The period of modern international environmental law (from 1972 to date), which from a lawyer's perspective might be described as dynamic and innovative, has simultaneously witnessed significant and persistent environmental change and degradation across the biosphere, atmosphere and hydrosphere. We have already exceeded safe operating limits or planetary boundaries in respect of three of the nine areas of concern<sup>1</sup> and the extent to which humankind has become an ecological force in its own right has led some scientists to herald a new geological epoch: the Anthropocene.<sup>2</sup> The question for 21st century environmental lawyers is whether international environmental law is fit for the Anthropocene and whether there is sufficient scope for future dynamic evolution within the constraints and structures of the existing international legal system.

## ***II APPLYING TRADITIONAL PRINCIPLES OF INTERNATIONAL LAW TO ENVIRONMENTAL PROBLEMS***

The origin of an evolutionary development of international environmental law is that environmental obligations are largely (although not exclusively) law-making as opposed to contractual or synallagmatic. Environmental treaty obligations are not reciprocal in the traditional sense of being owed to individual or even a group of parties, but instead are owed to all parties or

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1 These are climate change, biosphere integrity and biochemical flows. See Johan Rockström and others "A Safe Operating Space for Humanity" (2009) 461 *Nature* 472; and Will Steffen, Katherine Richardson and Johan Rockström "Planetary Boundaries: Guiding Human Development on a Changing Planet" (2015) 347 *Science* 736.

2 Will Steffan, Paul J Crutzen and John R McNeil "The Anthropocene: Are Humans Now Overwhelming the Great Forces of Nature?" (2007) 36 *Ambio* 614; and Will Steffan and others "The Anthropocene: Conceptual and Historical Perspectives" (2011) 369 *PTRSA* 8.

even to the international community as a whole.<sup>3</sup> This creates challenges for traditional rules relating to treaties and state responsibility, which are largely based on the notion of reciprocal obligations. The concept of reciprocity for example, underpins the default rules relating to treaty reservations under arts 19–23 of the 1969 Vienna Convention on the Law of Treaties (VCLT)<sup>4</sup> as well as the principles relating to material breach.<sup>5</sup> Similarly, a direct relationship between states relating to injury or impact normally needs to be established for the application of the rules relating to state responsibility.<sup>6</sup> The relative absence of reciprocity underpinning obligations relating to the protection of the environment is not exclusive to international environmental law<sup>7</sup> but it is undoubtedly a defining feature of the discipline.

The response of international law generally to what Simma has described as a move "from bilateralism to community interest in international law"<sup>8</sup> lies in the creation of erga omnes obligations.<sup>9</sup> It is the notion of community interest, "over and above any interests of the contracting parties individually"<sup>10</sup> that lies at the core of erga omnes obligations, and that community or collective interest is explicitly acknowledged in most if not all MEAs. But how does an erga omnes norm differ from a non-erga omnes norm in practical terms? The VCLT itself provides little, if any, recognition

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- 3 This is a general rather than a universal proposition. Some MEAs provide for "reciprocal" as well as "legislative" obligations. For example, the extent to which developing countries are required to comply with their obligations under the 1992 United Nations Framework Convention on Climate Change is explicitly dependent upon the effective implementation of developed countries' obligations under the Convention in respect of financial resources and technology transfer: United Nations Framework Convention on Climate Change 1771 UNTS 107 (opened for signature 9 May 1992, entered into force 21 March 1994) [UNFCCC], art 4(7). See also Protocol to the United Nations Framework Convention on Climate Change 2303 UNTS 162 (opened for signature 11 December 1997, entered into force 16 February 2005) art 11 [Kyoto Protocol]; and Stockholm Convention on Persistent Organic Pollutants 2256 UNTS 119 (opened for signature 22 May 2001, entered into force 17 May 2004), art 13(4).
- 4 Vienna Convention on the Law of Treaties 8 ILM 679 (opened for signature 23 May 1969, entered into force 27 January 1980) [VCLT].
- 5 Article 60.
- 6 *Draft articles on Responsibility of States for Internationally Wrongful Acts* UN Doc A/56/10 (12 December 2001), art 42.
- 7 This is also a feature of human rights law, for example.
- 8 B Simma "From Bilateralism to Community Interest in International Law" (1994) 250 Hague Recueil 221 at 238.
- 9 *Barcelona Traction, Light and Power Company Ltd (Belgium v Spain) (Second Phase)* [1970] ICJ Rep 3 at 32.
- 10 J Pauwelyn "A Typology of Multilateral Treaty Obligations: Are WTO Obligations Bilateral or Collective in Nature?" (2003) 14 EJIL 907 at 908. See also Simma, above n 8, at 298–299.

of erga omnes agreements. The Convention's recognition of a community or collective interest in a treaty is largely confined to developing principles to preserve that treaty – such as from the impacts of unduly wide reservations<sup>11</sup> or the unilateral termination of or withdrawal from a treaty in response to a non-material breach<sup>12</sup> – rather than acknowledging the potential of that treaty to impact on the rights and obligations of non-party states or the international community more generally. The VCLT largely dismisses the possibility that treaties may have legal consequences for non-party states without their express or implied consent,<sup>13</sup> and the international community as a collective or indeed its individual members is not apparently able to hold states to account for those obligations outside the recognised rules of state responsibility or the rules relating to breach of treaties.<sup>14</sup>

Within the context of the MEA however, a low number of agreements do require parties to ensure that *all* states act consistently with the treaty,<sup>15</sup> or that non-parties provide comparable documentation or meet equivalent standards when trading or otherwise interacting with treaty parties.<sup>16</sup> Although in practical terms states may, as a consequence, effectively comply with treaties to which they are not a party, this is not a technical departure from the traditional third party rules as set out under the VCLT. The treaty obligation in question applies to treaty parties as opposed to non-parties, and rules relating to breach and state responsibility can be applied only to parties. The same qualification applies to those treaties that restrict or even ban trade with non-parties (such as the 1987 Montreal Protocol on the Ozone Layer and the 1989 Basel Convention on the Control of Transboundary Movements of

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11 VCLT, above n 4, art 19(3).

12 Article 60.

13 Articles 34–36.

14 See *Barcelona Traction, Light and Power Company Ltd*, above n 9, at 47; and *East Timor (Portugal v Australia)* [1995] ICJ Rep 90 at 102. Article 48 of the 2001 Draft Articles, above n 6, provides for the invocation of responsibility by a non-injured state in respect of erga omnes obligations but the rights of non-injured states to intervene are limited to their ability to claim that the wrongful conduct cease and a demand for reparation on behalf of the injured state or "of the beneficiaries of the obligation breached".

15 See for example Antarctic Treaty 5778 UNTS 402 (opened for signature 1 December 1959, entered into force 23 June 1961) art 10.

16 See for example Convention on International Trade in Endangered Species 993 UNTS 243 (opened for signature 3 March 1973, entered into force 1 July 1975) [CITES], arts 2(4), 3(1), 4(1), 5(1) and 10; Cartagena Protocol on Biosafety to the 1992 Convention on Biological Diversity (opened for signature 29 January 2000, entered into force 11 September 2003), art 24; Stockholm Convention on Persistent Organic Pollutants 2256 UNTS 119 (opened for signature 22 May 2001, entered into force 17 May 2004), art 3(2)(b)(iii); and Minamata Convention on Mercury 55(3) ILM 582 (signed 10 October 2013, entered into force 16 August 2017), art 3(6)(b).

Hazardous Waste).<sup>17</sup> The ban is formally imposed on (and thus can be enforced against) parties, notwithstanding its practical impact on non-parties.

More significantly for the purposes of the development of treaty law, MEAs have substantively developed and applied the concept of *erga omnes inter partes*. For example, most non-compliance mechanisms (NCPs) as developed by MEAs<sup>18</sup> provide for proceedings to be initiated by any state (and in some cases other participants such as treaty bodies or even non-governmental organisations (NGOs)) without that state having to prove that they have been injured or are otherwise especially affected by the breach. Even outside of non-compliance mechanisms, practice permitting parties to hold states to account for breaches of environmental treaties without having to establish injury or special impact is developing. For example, Australia in the *Whaling Case* successfully alleged that Japan was in breach of its obligations under Article VIII of the 1946 International Convention on the Regulation of Whaling<sup>19</sup> without establishing that its own interests were affected above any other state party.<sup>20</sup>

### **III DYNAMIC EVOLUTION OF INTERNATIONAL ENVIRONMENTAL LAW WITHIN MEAS**

As noted above, MEAs have been particularly dynamic in the development of treaty law in order to respond to the community or *erga omnes* interest in environmental obligations. As such, MEAs have focused on maximising the universal law-making impact of treaties as well as providing for innovative means to adapt, develop and enforce those obligations. Superficially they appear to impact the notion of consent, which is fundamental to international law, but in reality consent is largely preserved even if only at the point of ratification. These developments therefore arguably represent an adaptation of, rather than a departure from, traditional treaty law.

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17 Protocol on Substances that Deplete the Ozone Layer 26 ILM 1541 (opened for signature 16 September 1987, entered into force 1 January 1989) [Montreal Protocol], art 4; and Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel) 28 ILM 657 (1989) (opened for signature 22 March 1989, in force 5 May 1992), Decision III/I (1995) (not yet in force).

18 See further in Part III(C) below.

19 International Convention on the Regulation of Whaling 161 UNTS 72 (opened for signature 2 December 1946, entered into force 10 November 1948) [ICRW].

20 *Whaling in the Antarctic (Australia v Japan: New Zealand intervening) (Judgment)* [2014] ICJ Rep 226. In fact, Australia deliberately avoided arguing that its interests were in any way affected in order to avoid engaging in any discussion as to the status of the area under contention as Australian waters pursuant to its contested claim in the Antarctic.

## ***A Reservations***

One of the most important features of MEAs has been the move towards a general prohibition of unilateral reservations to the treaty's principal provisions.<sup>21</sup> Most modern MEAs prohibit reservations to the principal instrument in order to preserve the integrity of the commitments undertaken, reflecting the community interest in the objects and purposes of the treaty.<sup>22</sup> This is in direct contrast to the approach of human rights treaties for example, which can also be characterised as embodying a community interest. The trend within international environmental law is so ubiquitous that it might be argued that it constitutes an emerging customary norm within the field. This notwithstanding, it must be acknowledged that whilst reservations are typically prohibited in respect of the body of the treaty they are commonly permitted in respect of obligations relating to individual species, substances or measures listed in the appendices or annexes of MEAs.<sup>23</sup> More generally, even where reservations are prohibited states may nevertheless unilaterally limit the extent to which they implement a commitment where qualified or differential language is used to frame the obligation in question.<sup>24</sup>

## ***B Developing Dynamic Treaties Through Amendment, Interpretation and Decision-Making***

In an area where rapid developments in science and, to a lesser extent, ethics and values significantly impact legal and policy approaches to environmental problems, the ability to respond flexibly to those developments is crucial to the success of any MEA. The primary rule, as set out in the VCLT is that "[a] treaty may be amended by agreement between the parties".<sup>25</sup> This basic principle underpins the rules relating to the amendment of MEAs but important developments have

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21 On reservations more generally, see A Pellet "Article 19 (1969)" in Olivier Corten and Pierre Klein (eds) *The Vienna Conventions on the Law of Treaties: A Commentary* (Oxford University Press, Oxford, 2011) vol 2 405; C Walter "Article 19" in Oliver Dörr and Kirsten Schmalenbach (eds) *Vienna Convention on the Law of Treaties: A Commentary* (Springer, Berlin, 2012) 239; ET Swaine "Treaty Reservations" in Duncan B Hollis (ed) *The Oxford Guide to Treaties* (Oxford University Press, Oxford, 2012) 277; and International Law Commission "Text of the Draft Guidelines constituting the Guide to Practice on Reservations to Treaties, as provisionally adopted by the International Law Commission" (2011) <<http://legal.un.org>>.

22 A prohibition on reservations is not peculiar to environmental treaties. One of the earliest instruments to provide for such a prohibition is the United Nations Convention on the Law of the Sea 1833 UNTS 3 (opened for signature 10 December 1982, entered into force 16 November 1994) [UNCLOS].

23 See for example CITES, above n 16, art 23.

24 See for example UNFCCC, above n 3, art 3(1) requiring parties to "protect the climate system for the benefit of present and future generations of humankind, *on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities*" (emphasis added). Of course a "unilateral" interpretation of a treaty may be challenged by other parties and subject to international adjudication.

25 VCLT, above n 4, art 39.

occurred in relation to the appendices or annexes of those instruments not least in the utilisation of the Conference of the Parties (COPs) as the primary institution for the consideration and adoption of amendments. A significant feature of many MEAs is the tacit amendment procedure, whereby amendments will automatically enter into force for all parties unless parties expressly notify the depository otherwise. The tacit amendment procedure typically applies to amendments of appendices and annexes to treaties rather than to the treaty itself, although the 2013 Minamata Convention on Mercury<sup>26</sup> unusually permits a *new* annex to be adopted by means of tacit amendment.<sup>27</sup> Tacit and analogous amendment procedures serve a valuable function in facilitating the rapid updating of MEAs and maximising the likely acceptance of those amendments as states are forced to opt out rather than to opt in. However, in almost all MEAs state consent and the principle of sovereignty is preserved as states may ultimately opt out and refuse to be bound by an amendment if they so choose. This procedure therefore simply provides an example of the "any other means if so agreed" as envisaged in Article 11 of the VCLT. A greater challenge to the traditional rules on amendment is posed by the 1987 Montreal Protocol, which permits adjustments to its technical annexes agreed to in the absence of consensus on the basis of a two-third majority (including "double" majorities of developed and developing countries) to take effect for *all* parties with no further ability to opt out.<sup>28</sup> This process is, however, thus far unique among MEAs.

Without formally amending a treaty, institutions such as COPs may nevertheless adopt decisions – binding and non-binding – often on a majority basis, which in practical terms significantly affect the scope or the implementation of obligations under the treaty. For example, in 1986, the Convention on International Trade in Endangered Species (CITES)<sup>29</sup> COP adopted a resolution creating a quota system permitting limited trade in Appendix I species, such as the leopard, subject to specified conditions.<sup>30</sup> The practical effect of this resolution was an informal amendment of CITES or, at a minimum, the adoption of a very particular interpretation of the obligation laid down in Article III of the Convention. Under the 1997 Kyoto Protocol<sup>31</sup> the COP adopted, in 2001, the Marrakesh Accords,

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26 Minamata Convention on Mercury, above n 16.

27 Article 27(3).

28 Montreal Protocol, above n 17, art 4(9).

29 CITES, above n 16.

30 M Fitzmaurice "Expression of Consent to be Bound by a Treaty as Developed in Certain Environmental Treaties" in J Klabbers and R Lefeber (eds) *Essays on the Law of Treaties: A Collection of Essays in Honour of Bert Verdiag* (Martinus Nijhoff, The Hague, 1998) 59 at 75. See, now, *Management of Nationally Established Quotas* Resolution Conf 14.7 (Rev CoP15).

31 Kyoto Protocol, above n 3.

which established wide-ranging and detailed rules relating to its implementation.<sup>32</sup> More significantly, the 1992 United Nations Framework Convention on Climate Change (UNFCCC)<sup>33</sup> COP adopted the Copenhagen Accord in 2009,<sup>34</sup> which, whilst soft in character, was described prior to 2015 as "the most influential document that has emerged from the climate negotiations in the recent past",<sup>35</sup> and which established the two degrees Celsius target that was ultimately incorporated into the 2015 Paris Agreement.<sup>36</sup> More generally, all non-compliance procedures adopted under MEAs to date have been established by means of a COP or MOP decision although in all cases the original mandate for such a procedure can be found within the relevant treaty text.<sup>37</sup> Nevertheless, the procedures developed to address compliance under these regimes create, in many cases, significant new rights under international law for non-state actors to initiate proceedings and impose complex requirements on potentially *all* parties to support those states unable to comply. Perhaps the most ambitious COP decision affecting the rights of treaty parties was the attempt, in 1994, to ban the transboundary movement of waste from OECD to non-OECD countries under the Basel Convention by means of a decision only.<sup>38</sup> Concerns expressed by the parties over whether the COP could unilaterally alter parties' obligations under the Treaty<sup>39</sup> led the COP one year later to adopt the ban as an amendment to the Treaty.<sup>40</sup> Notably, that amendment has yet to enter into force. The extent to which MEA treaty bodies have the capacity to adopt decisions which impact on the treaty obligations

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32 Decisions 2–14/CP.7 UN doc FCCC/CP/2001/13/Add.1 (21 January 2002).

33 UNFCCC, above n 3.

34 Decision 2/CP.15 UN Doc FCCC/CP/2009/11/Add.1 (30 March 2010).

35 D French and L Rajamani "Climate Change and International Environmental Law: Musings on a Journey to Somewhere" (2013) 25 JEL 437 at 446.

36 Paris Agreement under the United Nations Framework Convention on Climate Change 55 ILM 743 (opened for signature 22 April 2016, entered into force 4 November 2016).

37 Until 23 October 2017 there was no treaty basis for the NCP established under the Espoo Convention on Environmental Impact Assessment in a Transboundary Context 1989 UNTS 309 (opened for signature 25 February 1991, entered into force 10 September 1997) notwithstanding the adoption of an NCP procedure in 2004 (see Decision III/2 *Review of Compliance* (2004); Decision IV/2 *Operating Rules of the Implementation Committee* (as amended by Decision V/4 *Review of Compliance* (2011)). An amendment to the Convention was adopted in 2004 to remedy this omission and insert a new article into the Convention (art 14*bis*) (Decision III/7 *Second Amendment to the Espoo Convention* (2004)) and this amendment finally entered into force on 23 October 2017.

38 Decision II/12 (1994).

39 RR Churchill and G Ulfstein "Autonomous Institutional Arrangements in Multilateral Environmental Agreements: A Little-Noticed Phenomenon in International Law" (2000) 94 AJIL 623 at 639.

40 Decision III/1 (1995) *Amendment to the Basel Convention*.



of states is principally a matter for international institutional law rather than treaty law per se.<sup>41</sup> However, it is evident that some MEAs have deliberately developed these institutional procedures to "overcome the cumbersome treaty-making process"<sup>42</sup> in order to respond to environmental challenges.<sup>43</sup>

### ***C Material Breach and Non-Compliance with MEAs***

The rules relating to material breach as set out in Article 60 of the VCLT<sup>44</sup> provide a rare example of where the Convention makes a limited distinction between law-making and contractual treaties.<sup>45</sup> Taken as a whole, the provision seeks to balance the rights of the collective in supporting the stability of the agreement with the right of an injured party to obtain appropriate remedy and redress in the event of breach. The principle of negative reciprocity, which underpins Article 60 of the VCLT,<sup>46</sup> is most clearly demonstrated in its requirement that a party can only unilaterally<sup>47</sup> suspend a multilateral treaty as against the party in breach where they have been especially affected by the breach<sup>48</sup> or where the breach radically changes the position of every party with respect to the further performance of their obligations under the treaty.<sup>49</sup> In short, the party wishing to suspend an agreement against a party

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41 G Ulfstein "Treaty Bodies and Regimes" in Duncan B Hollis (ed) *The Oxford Guide to Treaties* (Oxford University Press, Oxford, 2012) 428 at 428.

42 At 435.

43 The nature of the resolution or decision and the level of support will be important factors in determining the extent to which treaties can be developed through this mechanism. For example, the International Court of Justice concluded that resolutions adopted by only a majority of states within the International Whaling Commission could not be used to interpret art 8 of the 1946 ICRW, above n 19, nor as subsequent practice establishing an agreement of the parties within the meaning of art 31(a)–(b) of the VCLT, above n 4: *Whaling in the Antarctic*, above n 20, at [46] and [83].

44 See generally T Giegerich "Article 60" in Oliver Dörr and Kirsten Schmalenbach (eds) *Vienna Convention on the Law of Treaties: A Commentary* (Springer, Berlin, 2012) 1021; MM Gomaa *Suspension or Termination of Treaties on Grounds of Breach* (Kluwer Law International, The Hague, 1996); B Simma and CJ Tams "Article 60 (1969)" in Olivier Corten and Pierre Klein (eds) *The Vienna Conventions on the Law of Treaties: A Commentary* (Oxford University Press, Oxford, 2011) vol 2 1351; and B Simma and CJ Tams "Reacting against Treaty Breaches" in Duncan B Hollis (ed) *The Oxford Guide to Treaties* (Oxford University Press, Oxford, 2012) 576.

45 Simma and Tams, above n 44, at 1353.

46 Giegerich, above n 44, at 1022.

47 States parties to an agreement may choose to suspend or terminate a treaty against a party in breach or in its entirety by unanimous agreement: VCLT, above n 4, art 60(2)(a).

48 Article 60(2)(b).

49 Article 60(2)(c).

in breach must have a "particular interest" in the performance of the obligation in question, "which goes beyond that of the other parties to the treaty."<sup>50</sup> This requirement, combined with the high-threshold definition of material breach,<sup>51</sup> would seem to render the application of Article 60 of the VCLT largely irrelevant to the typical MEA where obligations are generally erga omnes partes rather than clearly reciprocal in nature.<sup>52</sup> During the negotiations of the VCLT Sir Gerald Fitzmaurice advocated that states should not be permitted to unilaterally suspend multilateral treaties in response to breach.<sup>53</sup> Although his argument was rejected in general terms, a specific exception was provided for in Article 60(5) of the VCLT, which denies the right to suspend or terminate humanitarian treaties in the event of breach.<sup>54</sup>

Responding to the inadequacy of Article 60 of the VCLT in respect of community-focused environmental obligations, more than twenty MEAs have developed or are in the process of developing internal procedures to deal with parties in breach or, as it is now commonly termed, in non-compliance with the treaty.<sup>55</sup> Typically, an MEA non-compliance procedure (NCP) is managed by a designated institution established by the treaty, and any party in non-compliance may be referred to that institution by other parties, by itself or,<sup>56</sup> increasingly, by a treaty institution such as the

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50 Simma and Tams, above n 44, at 1365.

51 Article 60(3) of the VCLT, above n 4, defines a material breach as a repudiation of the treaty not sanctioned by that treaty or a violation of a provision essential to the accomplishment to the object or purpose of that treaty.

52 The VCLT, above n 4, is silent on the consequences of a non-material breach and the extent to which an uninjured party may challenge a party in breach.

53 Giegerich, above n 44, at 1036. For a discussion of the pre-Vienna position on the right to respond to a breach of a treaty, see S Rosenne *Breach of Treaty* (Grotius Publications, Cambridge, 1985) at 3–44.

54 IM Sinclair *The Vienna Convention on the Law of Treaties* (Manchester University Press, Manchester, 1983) at 190.

55 See generally Antonio Cardesa-Salzmann "Constitutionalising Secondary Rules in Global Environmental Regimes: Non-Compliance Procedures and the Enforcement of Multilateral Environmental Agreements" (2012) 24 JEL 103; J Klabbers "Compliance Procedures" in Daniel Bodansky, Jutta Brunée and Ellen Hey (eds) *The Oxford Handbook of International Environmental Law* (Oxford University Press, Oxford, 2007) 995; Karen N Scott "Non-compliance Procedures and Dispute Resolution Mechanisms under international Environmental Agreements" in D French, M Saul and ND White (eds) *International Law and Dispute Settlement: New Problems and Techniques* (Hart Publishing, Oxford, 2010) 225; and T Treves and others (eds) *Non-Compliance Procedures and Mechanisms and the Effectiveness of International Environmental Agreements* (TMC Asser Press, The Hague, 2009).

56 The first MEA to permit self-referral in non-compliance proceedings was the 1987 Montreal Protocol, above n 17, and this mode of initiating proceedings was used relatively extensively in the 1990s. See DG Victor "The Operation and Effectiveness of the Montreal Protocol's Non Compliance Procedure" in DG Victor, K

secretariat or meeting of the parties.<sup>57</sup> In a minority of cases proceedings can even be initiated by an appropriately qualified NGO or an individual.<sup>58</sup> This multilateral as opposed to reciprocal response to breach, which is further enhanced by the increasing levels of public participation within non-compliance proceedings,<sup>59</sup> has been developed by MEAs operating in the areas of climate change, ozone depletion, wildlife protection, biodiversity conservation, pollution prevention and control and fisheries management among others.<sup>60</sup> Moreover, in contrast to the coercive approach which characterises the traditional response to a breach of treaty as developed by the law of treaties and the rules relating to countermeasures, non-compliance proceedings generally adopt a more facilitative approach, and measures adopted by compliance bodies are often designed to assist rather than to punish a state in non-compliance with their treaty obligations.<sup>61</sup> The preference for facilitation rather than coercion has recently been expressed by the parties to the 2015 Paris Agreement in Article 15, which establishes that the new NCP shall, in contrast to the Kyoto NCP, be "facilitative in nature and function in a manner that is transparent, non-adversarial and non-punitive".

The relationship between NCPs and the more traditional rules relating to breach of treaty, dispute resolution and countermeasures is not clear.<sup>62</sup> On one hand, it might be argued that NCPs constitute specialised rules of application to breach within MEAs and, consequently, must be applied instead of

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Raustiala and EB Skolnkiuff (eds) *The Implementation and Effectiveness of International Environmental Commitments: Theory and Practice* (MIT Press, Cambridge (Mass), 1998) 137.

- 57 Almost 20 MEAs provide for the institutional initiation of NCPs and in practice, the overwhelming majority of proceedings have been initiated by institutions to date. See Scott, above n 55, at Appendix II.
- 58 For example, non-compliance proceedings can be initiated by individuals or appropriately qualified NGOs under the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters 2161 UNTS 447 (opened for signature 25 June 1998, entered into force 30 October 2001); and the Bern Convention on the Conservation of European Wildlife and Natural Habitats ETS 104 (opened for signature 19 September 1979, entered into force 1 June 1982).
- 59 Scott, above n 55, at 249–251.
- 60 For a comprehensive list of the MEAs that have developed or are in the process of developing non-compliance procedures, see Scott, above n 55, at Appendix I.
- 61 Scott, above n 55, at 244–247. The emphasis on facilitating compliance as opposed to penalising non-compliance supports a more general managerial approach to addressing implementation of and compliance with MEAs. See further A Chayes and A Handler Chayes *The New Sovereignty: Compliance with Regulatory Agreements* (Harvard University Press, Cambridge (Mass), 1995). It should be noted penal measures are by no means irrelevant and that a number of non-compliance procedures adopt a combined facilitative and coercive approach towards compliance. The NCP established under the 1997 Kyoto Protocol, above n 3, for example comprises both a Facilitative and an Enforcement Branch.
- 62 See M Fitzmaurice "Non-Compliance Procedures and the Law of Treaties" in T Treves and others (eds) *Non-Compliance Procedures and Mechanisms and the Effectiveness of International Environmental Agreements* (TMC Asser Press, The Hague, 2009) 453.

the default rules relating to breach and countermeasures.<sup>63</sup> On the other hand, it can be argued that a compliance measure which is neither binding nor established pursuant to a binding regime cannot be applied instead of the traditional rules of dispute resolution and responding to breach. Moreover, NCPs are generally not comprehensive, and their scope may be limited to dealing with the consequences of designated treaty provisions. Typically, obligations associated with technical and financial support are excluded from the non-compliance process.<sup>64</sup> In principle therefore, non-compliance procedures arguably supplement and support the traditional rules relating to treaties, countermeasures and dispute resolution rather than replacing them. In practice however, NCPs are in effect replacing traditional rules owing to their ability to respond more sensitively to the erga omnes and non-reciprocal nature of environmental obligations.<sup>65</sup>

### ***D Blurring the Distinction between Soft and Hard Law***

The distinction between so-called "soft" and "hard" law in the field of international environmental law is increasingly and indeed *deliberately* blurred. The corpus of the discipline comprises many commitments that are not obviously binding but which are exceedingly influential: the 2010 Aichi Biodiversity Targets<sup>66</sup> and 2009 Copenhagen Accord<sup>67</sup> and the 2015 Sustainable Development Goals<sup>68</sup> provide obvious examples. One conservation agreement, the 1979 Migratory Species Convention, has deliberately developed non-binding<sup>69</sup> but normative regimes in respect of 19 species,<sup>70</sup> which are intended to operate in a manner of a typical treaty albeit on a voluntary basis in order to maximise participation.

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63 VCLT, above n 4, art 60(4); and Draft Articles on Responsibility of States for Internationally Wrongful Acts, above n 6, art 55.

64 Scott, above n 55, at 239–241.

65 Where of course there is no NCP or where a party to a dispute is not also a party to the NCP states may well resort to traditional dispute settlement mechanisms. See for example *Whaling in the Antarctic*, above n 20, at 226; *Pulp Mills on the River Uruguay (Argentina v Uruguay) (Judgment)* [2010] ICJ Rep 14; and *The South China Sea Arbitration (The Philippines v China) (Award)* PCA 2013-19, 12 July 2016.

66 Decision X/2 (2010) *Strategic Plan for Biodiversity Targets 2011 – 2020, including Aichi Biodiversity Targets*.

67 Decision 2/CP.15, above n 34.

68 *Transforming our world: the 2030 Agenda for Sustainable Development* GA Res 70/1 (2015).

69 On the binding (or otherwise) nature of memoranda of understanding, see A Aust "Alternatives to Treaty-Making: MOUs as Political Commitments" in Duncan B Hollis (ed) *The Oxford Guide to Treaties* (Oxford University Press, Oxford, 2012) 46; and J Klabbbers *The Concept of Treaty in International Law* (The Hague: Kluwer Law International, 1996).

70 See Convention on the Conservation of Migratory Species of Wild Animals "Species" <www.cms.int>.

Within treaties, which are themselves binding, high level commitments or statements of principle are sometimes described as "soft".<sup>71</sup> Moreover, in this field more than any other treaties may provide for differential obligations relating to the scope, nature and timing of the obligations within a treaty.<sup>72</sup> Typically referred to as common but differentiated responsibilities (and respective capabilities) (CBDRRC), the first treaty to incorporate CBDRRC in a structured way was the 1987 Montreal Protocol, and this flexible and innovative approach to the creation of treaty obligations is integral to the success of the ozone regime.<sup>73</sup> The principle underpins the climate regime<sup>74</sup> and is enshrined in the 1997 Kyoto Protocol, which applies emissions commitments only to Annex I states.<sup>75</sup> To the extent that MEAs permit the exercise of state discretion in determining the level of commitment or action on the basis of capacity (sometimes referred to as contextual differentiation) then those commitments may also be described as "soft" or, at the very least, demonstrating modern "variations" of "hard law".<sup>76</sup>

Arguably this blurring of hard and soft law has been taken to a whole new level in the 2015 Paris Agreement, which uniquely (thus far) permits states to unilaterally determine their level of commitment in respect of reducing greenhouse gas emissions and/or enhancing sinks in light of the overall target of restricting temperature rise to no more than two degrees Celsius.<sup>77</sup> Whilst the Paris Agreement itself is clearly legally binding (in contrast to, for example, the 2009 Copenhagen Accord) there is uncertainty as to whether the nationally determined contributions (NDCs) are themselves legally binding with some commentators arguing that they are legally binding<sup>78</sup> and others suggesting that the NDCs themselves are not but the various administrative obligations associated with them

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71 A Boyle "Soft Law in International Law-making" in M Evans (ed) *International Law* (3rd ed, Oxford University Press, Oxford, 2010) 122 at 130–132.

72 See P Cullet *Differential Treatment in International Environmental Law* (Ashgate, Burlington, 2003); and D French "Developing States and International Environmental Law: The Importance of Differentiated Responsibilities" (2000) 49 ICLQ 35.

73 Marco Gonzalez, Kristen N Taddonio and Nancy J Sherman "The Montreal Protocol: How Today's Successes Offer a Pathway to the Future" (2005) 5 J Environ Stud Sci 122 at 125.

74 See UNFCCC, above n 3, arts 3–4.

75 Kyoto Protocol, above n 3, art 4.

76 Gabrielle Spilker and Vally Koubi "The Effects of Treaty Legality and Domestic Institutional Hurdles on Environmental Treaty Ratification" (2016) 16 IEA 223.

77 Paris Agreement, above n 36, art 4.

78 Daniel Bodansky "The Legal Character of the Paris Agreement" (2016) 25 RECIEL 142 at 146.

(such as reporting) are.<sup>79</sup> One scholar has gone so far as to describe the Paris Agreement as "an exemplar of new lawmaking".<sup>80</sup>

#### ***IV BUILDING REGIMES UNDER TREATY LAW***

Liberated from international relations scholarship the term "regime" is used in international law to describe a particularly dynamic and innovative approach to law-making adopted by most MEAs. This approach typically comprises: a framework or over-arching convention setting out guiding principles, general obligations and establishing institutions; protocols or annexes developing the substance of the regime; and formal decisions and resolutions adopted by the conference or meeting of the parties intended to guide, inform or develop its implementation.<sup>81</sup> Typically the MEA establishes institutions such as a decision-making body (COP or MOP), a secretariat, technical bodies, a financial mechanism, and, increasingly, a compliance body.<sup>82</sup> Examples of regimes (in contrast to treaties) include the 1979 Convention on Long-Range Transboundary Air Pollution and its eight protocols,<sup>83</sup> the 1979 Convention on Migratory Species and its seven Agreements,<sup>84</sup> 19 Memoranda of Understanding and four special species initiatives, and the 1992 UNFCCC and its 1997 Kyoto Protocol and 2015 Paris Agreement. In creating their own "institutional apparatuses",<sup>85</sup> often described as "autonomous institutional arrangements",<sup>86</sup> MEAs create and in doing so "become

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79 See Guri Bang, Jon Hovi and Tora Skodvin "The Paris Agreement: Short-Term and Long-Term Effectiveness" (2016) 4 *Politics and Governance* 209; and Christina Voigt "The Compliance and Implementation Mechanism of the Paris Agreement" (2016) 25 *RECIEL* 161.

80 Lavanya Rajamani "The 2015 Paris Agreement: Interplay Between Hard, Soft and Non-Obligations" (2016) 28 *JEL* 337 at 358.

81 See generally T Gehring "Treaty-Making and Treaty Evolution" in Daniel Bodansky, Jutta Brunée and Ellen Hey (eds) *The Oxford Handbook of International Environmental Law* (Oxford University Press, Oxford, 2007) 467; and PC Szasz "International Norm-Making" in E Brown-Weiss (ed) *Environmental Change and International Law* (United Nations University Press, Tokyo, 1992) 41.

82 See generally G Ulfstein "Treaty Bodies" in Daniel Bodansky, Jutta Brunée and Ellen Hey (eds) *The Oxford Handbook of International Environmental Law* (Oxford University Press, Oxford, 2007) 877; and G Ulfstein "International Framework for Environmental Decisionmaking" in Malgosia Fitzmaurice, David M Ong and Panos Merkouris (eds) *Research Handbook on International Environmental Law* (Edward Elgar Publishing, Cheltenham, 2010) 26.

83 Convention on Long-Range Transboundary Air Pollution 18 ILM 1442 (opened for signature on 30 November 1979, entered into force 16 March 1983).

84 Convention on the Conservation of Migratory Species of Wild Animals 19 ILM 15 (opened for signature on 23 June 1979, entered into force 1 November 1983).

85 Gehring, above n 81, at 473.

86 Churchill and Ulfstein, above n 39.

themselves machineries for the making and development of international environmental law".<sup>87</sup> In this sense MEAs might be described as "quasi-constitutional" treaties.<sup>88</sup> Nevertheless, while the locus of decision-making, where decisions can be adopted by consensus, has formally shifted from states to an institution – the COP – states are not bound by decisions in the absence of their consent even under simplified or expedited treaty amendment procedures, with the one exception of adjustments to the Montreal Protocol, as noted above.<sup>89</sup> Of arguably greater significance is the function performed by these institutions in developing the interpretation and implementation of treaties by virtue of decision-making and their role in responding to non-compliance, as described above.

## V LINKING AND LEVERAGING REGIMES

The term "fragmentation" describes "the emergence of specialised and (relatively) autonomous rules or rule complexes, legal institutions and spheres of legal practice",<sup>90</sup> and is typically used to emphasise the isolation and disconnect between regimes and institutions as well as treaty congestion.<sup>91</sup> Whilst of relevance to international law generally, the term has particular resonance in the area of international environmental law where the contrast between autonomous and, to an extent, isolated treaty regimes, with the integrated ecological ecosystems they are designed to manage, is particularly stark. It is thus unsurprising that one of the most important dynamic evolutionary developments within this field has been the development of institutional connections or linkages between MEAs, designed to unleash "hidden synergies between regimes".<sup>92</sup> Between MEAs:<sup>93</sup>

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87 Gehring, above n 81, at 474.

88 C Brölmann "Specialised Rules of Treaty Interpretation: International Organisations" in Duncan B Hollis (ed) *The Oxford Guide to Treaties* (Oxford University Press, Oxford, 2012) 507 at 509.

89 See G Handl "International 'Lawmaking' by Conferences of the Parties and Other Politically Mandated Bodies" in Rüdiger Wolfrum and Volker Röben (eds) *Developments of International Law in Treaty Making* (Springer, Berlin, 2005) 127.

90 International Law Commission *Fragmentation of International Law: Difficulties Arising from the Diversification and Expansion of International Law* UN Doc A/CN.4/L.682 (13 April 2006) at 11(8) [*Fragmentation of International Law*].

91 Treaty congestion refers to the multiplication of overlapping treaties. See Edith Brown Weiss "International Environmental Law: Contemporary Issues and the Emergence of a New World Order" (1993) 81 *Georgetown U LJ* 675 at 697.

92 Oren Perez "Multiple Regimes, Issue Linkage and International Cooperation: Exploring the Role of the WTO" (2005) 26 *UPJIEL* 735 at 735.

93 Karen N Scott "International Environmental Governance: Managing Fragmentation through Institutional Connection" (2011) 12 *MJIL* 177 at 184.

... linkage and institutional interaction operate on a number of levels and may arise as a mere consequence of ecological, sociological or functional interdependence or as a result of a deliberate governance strategy.

Both inadvertent and deliberate linkages can be identified between MEAs, but deliberate coordination, in relation to information sharing, the development of joint initiatives and, rarely, the pooling of resources exemplify linkage as described by international relations scholars. For example, the 1992 Biodiversity Convention<sup>94</sup> has entered into formal relationships with 18 other MEAs,<sup>95</sup> as well as over 140 memoranda of understanding with other bodies including scientific institutions, universities and botanical gardens.<sup>96</sup> It has developed active programmes of coordination with the so-called biodiversity cluster.<sup>97</sup> The most extensive example of formal institutional cooperation has been developed by the Basel, Stockholm<sup>98</sup> and Rotterdam<sup>99</sup> Conventions – the so-called chemicals cluster – which have held a series of joint meetings at which joint (synergies) decisions have been adopted to develop joint work programmes and develop administrative synergies between the three conventions including the appointment of an Executive Secretary of all three Conventions.<sup>100</sup>

These connections and linkages between regimes have given rise to new descriptions of environmental governance, which is sometimes described as polycentric<sup>101</sup> or underpinned by

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94 Convention on Biological Diversity 31 ILM 822 (opened for signature 5 June 1992, entered into force 29 December 1993).

95 Scott, above n 93, at 192.

96 At 192.

97 See Richard Caddell "Inter-Treaty Cooperation, Biodiversity Conservation and the Trade in Endangered Species" (2013) 22 RECIEL 264; Richard Cadell "The Integration of Multilateral Environmental Agreements: Lessons from the Biodiversity-Related Conventions" (2011) 22 YIEL 37; and José Octavio Valázquez Gomar "Environmental Policy Integration among Multilateral Environmental Agreements: The Case of Biodiversity" (2016) 16 IEA 525.

98 Convention on Persistent Organic Pollutants 40 ILM 532 (opened for signature 22 May 2001, entered into force 17 May 2004).

99 Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade 38 ILM 1 (opened for signature 11 September 1998, entered into force 24 February 2004).

100 An overview of and links to the synergies decisions can be found at "History of the Synergies Process" Synergies among the Basel, Rotterdam and Stockholm conventions <[www.brsmeas.org](http://www.brsmeas.org)>.

101 Victor Galaz and others "Polycentric Systems and Interacting Planetary Boundaries – Emerging Governance of Climate Change-Ocean Acidification-Marine Biodiversity" (2012) 81 Ecological Economics 21.



network structure<sup>102</sup> or, drawing on comparisons with ecosystems, a "complex adaptive system."<sup>103</sup> The most widely used description of this new form of environmental governance is "regime complex" defined as a system "of functionally overlapping institutions that continuously affect each other's operations."<sup>104</sup> Regime complexes can be found across the field of international environmental law and, as a concept, has been explored in the context of climate change<sup>105</sup> and biodiversity<sup>106</sup> – and indeed the relationship between climate change and biodiversity<sup>107</sup> – and is no longer confined to MEA structures but also encompasses private authorities.<sup>108</sup> A recent example of regime complex in action is the adoption of the 2016 Kigali Amendment to the 1987 Montreal Protocol on the Ozone Layer to phase out hydrofluorcarbons (HFCs), a powerful greenhouse gas, a measure predicted to prevent approximately 0.5 degrees of warming by 2100 thus contributing to efforts to address climate change.<sup>109</sup>

These forms of arrangements between MEAs – whether deliberate or inadvertent – raise important legal questions associated with the status and capacity of MEA institutions to enter into such arrangements, the status of the agreements themselves and the impact of those agreements on the obligations of states, particularly where membership of the agreements cooperating is not coincidental. In short, the regime and the regime complex create both opportunities and challenges for traditional consent-based international law.

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102 Rakhyun E Kim "The Emergent Network Structure of the Multilateral Environmental Agreement System" (2013) 23 GEC 980 at 981.

103 Rakhyun E Kim and Brendan Mackey "International Environmental Law as a Complex Adaptive System" (2014) 14 IEA 5.

104 Thomas Gehring and Benjamin Faude "The Dynamics of Regime Complexes: Microfoundations and Systemic Effects" (2013) 19 Global Governance 119 at 120.

105 See Harro van Asselt and Stefan Bößner "The Shape of Things to Come: Global Climate Governance after Paris" (2016) 10(1) CCLR 46; and Kenneth W Abbott "The Transnational Regime Complex for Climate Change" (2012) 30 Environment and Planning 571.

106 José Octavio Valázquez Gomar, Lindsay C Stringer and Jouni Paavola "Regime Complexes and National Policy Coherence: Experiences in the Biodiversity Cluster" (2014) 20 Global Governance 119.

107 Amado S Tolentino "The Ramsar, Biodiversity and Climate Change Conventions – Inter-Convention Synergies" (2015) 45 EPL 209; and Harro van Asselt "Managing the Fragmentation of International Environmental Law: Forests at the Intersection of the Climate and Biodiversity Regimes" (2012) 44 NYUJILP 1206.

108 Jessica F Green and Graeme Auld "Unbundling the Regime Complex: The Effects of Private Authority" (2017) 6 TEL 259.

109 Decision XXVIII/1 (2016) *Further Amendment of the Montreal Protocol*. See also Keith Ripley and Cleo Verkuijl "'Ozone Family' Delivers Landmark Deal for the Climate" (2016) 46 EPL 371.

## VI CONCLUDING REMARKS

International environmental law has developed undeniably dynamic and innovative responses to the fundamental environmental challenges facing the world and the inevitable community interest in both the challenges and the responses. These responses have largely taken place within the parameters of the traditional rules relating to treaties, institutions and state responsibility although the boundaries of international law are undoubtedly stretched from time to time. Today international environmental law can be described as "a complex network of norms and institutions"<sup>110</sup> that includes "modes of regulation that are often transnational, informal and voluntary in character".<sup>111</sup> Flexibility is built into regimes through treaty architecture, which typically comprises separate instruments dividing the general from the technical, and maintained by expedited processes for amendment and an expansive approach to decision-making. Participation is maximised – possibly at the cost of effectiveness – through introducing variable commitments, which lie along the spectrum between hard and soft law. The community interest is recognised through a general prohibition on reservations and the creation of innovative compliance mechanisms that do not depend on the interests of individual states. And MEAs are continuously innovating. Responding to activities that are subject to significant scientific uncertainty the notion of "experimentalist governance" has recently developed, comprising: the creation of provisional framework goals and metrics, a decentralised approach to implementation, requirements relating to regular reporting, peer review, and periodic reevaluation of goals and decision-making practices.<sup>112</sup> Experimentalist governance has been used to describe the emerging regime for geoengineering as developed under the 1996 London Protocol<sup>113</sup> to the 1972 London Convention<sup>114</sup> but its essential characteristics appear just as applicable to the 2015 Paris Agreement.

But is this enough and can international environmental law continue to evolve dynamically within the constraints of international law, which ultimately is based on 20th century – if not 19th century – notions of state sovereignty? Jackson and Bührs argue that there is a difference between regime

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110 Rakhyun E Kim "The Emergent Network Structure of the Multilateral Environmental Agreement System" (2013) 23 GEC 980 at 988.

111 Philipp Pattberg and Oscar Widerberg "Theorising Global Environmental Governance: Key Findings and Future Questions" (2015) 43 *Millennium: Journal of International Studies* 684 at 685.

112 Chiara Armeni "Global Experimentalist Governance: International Law and Climate Change Technologies" (2015) 65 *ICLQ* 875 at 875–888.

113 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 36 *ILM* 1 (opened for signature 7 November 1996, entered into force 24 March 2006).

114 Armeni, above n 112, at 875–888.

effectiveness and ecological effectiveness and achieving the former does not guarantee the latter<sup>115</sup> – a conclusion seemingly unchallengeable when considered against the state of the global environment in 2018. Kim and Bosselman criticise initiatives that merely seek to address normative fragmentation<sup>116</sup> and argue instead for legal interpretation that builds "systemic relationships between rules by envisaging them as part of the shared purpose",<sup>117</sup> underpinned by the principle of ecological integrity which operates as a form of "grundnorm".<sup>118</sup> Or is international law as a system incapable of meaningful environmental protection? Natarajan and Khoday conclude that "our disciplinary creeds ties us in overt and subtle ways to particular relationships with the natural environment" that "systematically reinforce ecological harm".<sup>119</sup> This conclusion, although underpinned by justifiable criticism of the relationship between humankind and nature, is excessively bleak and overlooks developments in environmental policy and ethics that have occurred in the last 50 years. Its truth, however, lies in the acknowledgment that there are limits to dynamic evolution of international environmental law under the current system, and future effectiveness of environmental law will likely be dependent upon a significant shift in ethical and political thinking around ecological protection in the Anthropocene rather than mere development of legal processes and principles in the Holocene.

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115 Wendy Jackson and Ton Bührs "International Environmental Regimes: Understanding Institutional and Ecological Effectiveness" (2015) 18 *JIWLP* 63.

116 Rakhyun E Kim and Klaus Bosselmann "International Environmental Law in the Anthropocene: Towards a Purposive System of Multilateral Environmental Agreements" (2013) 2 *TEL* 285 at 296–297.

117 At 303.

118 At 386.

119 Usha Natarajan and Kishan Khoday "Locating Nature: Making and Unmaking International Law" (2014) 27 *LJIL* 573 at 592 and 573. They argue that concepts such as sovereignty, development, economic and human rights are unsuited to "perceiving or observing ecological limits": at 574–575.

