

**CLIMATE CHANGE, FRAGMENTATION, AND THE
CHALLENGES OF GLOBAL ENVIRONMENTAL LAW:
ELEMENTS OF A POST-COPENHAGEN ASSEMBLAGE**

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ABSTRACT

The 2009 United Nations climate conference in Copenhagen has been widely viewed as a failure—a referendum in the eyes of many on the top-down, comprehensive approach to climate governance embodied in the Kyoto Protocol and carried forward in efforts to negotiate a successor regime. Despite a modest agreement on future work toward a new agreement, the most recent climate meeting in Cancún Mexico reinforces this view, underscoring the conclusion that Copenhagen represents an important inflection point for international climate policy. Although much of the post-Copenhagen commentary has correctly identified various problems, even fatal flaws, with the process, very little has been particularly helpful in marking out a constructive way forward. This Article takes some steps in that direction, offering a partial re-conceptualization of the nature and possibilities of global climate governance in the post-Copenhagen era. It starts from the premise that any realistic approach to climate governance must begin with the facts of globalization, legal

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pluralism, and fragmentation rather than the view that climate change is a particular kind of global problem that can only be solved through a top-down, supra-national regime aimed at managing the Earth system. As argued here, this “Earth systems governance” approach to the climate change problem, which derives from radically enhanced scientific and technical ways of understanding global environmental change and a particularly narrow view of collective action, has become deeply embedded as a basic objective of climate policy. The resulting logic of global environmental managerialism, however, is very much at odds with the plural, fragmented nature of the international legal and political order – a fact well illustrated by the limited results coming out of the recent climate meetings in Copenhagen and Cancún as well as the near total disarray that marks the current climate policy discourse in the United States and other major emitting countries. In contrast, an alternative, post-Copenhagen approach to the problem of climate governance that starts with the facts of globalization and its implications for law and legal order trains attention to new and different, and much messier, ways of coordinating efforts across jurisdictions and building enabling environments for collective action. This Article maps several key elements of post-Copenhagen climate governance through an analysis of efforts to bring reduced emissions from deforestation and forest degradation (“REDD”) into climate policy. Although deforestation, nearly all of which occurs in the tropics, accounts for some fifteen percent of global carbon dioxide emissions, it has only recently become a major focus of climate policy, emerging as one of the few areas of consensus in the international climate negotiations. As a new paradigm for land use that implicates multiple legal and institutional orders at multiple levels, the REDD experience illustrates both the opportunities and the challenges of constructing climate governance through the complex articulation between distinctively global projects and particular national and sub-national institutions. Approaching climate governance from this perspective provides a basis for some more general claims regarding the possibilities of global environmental law in the context of a plural, fragmented international legal order.

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1. INTRODUCTION

This Article starts from the premise that climate change is not simply another environmental problem, but rather “a key site in the global transformation of world order.”¹ By now, of course, the scale, scope, and potential severity of global climate change have been well documented. Expected impacts such as sea-level rise,² melting ice sheets,³ receding glaciers,⁴ altered precipitation

¹ Clark A. Miller & Paul N. Edwards, *Introduction: The Globalization of Climate Science and Climate Politics*, in *CHANGING THE ATMOSPHERE: EXPERT KNOWLEDGE AND ENVIRONMENTAL GOVERNANCE* 3 (Clark A. Miller & Paul N. Edwards eds., 2001).

² See Gerald A. Meehl et al., *Global Climate Projections*, in *CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS, CONTRIBUTION OF WORKING GROUP I TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE* 747, 820–22 (Solomon et al. eds., 2007) (reviewing projections regarding sea-level rise).

³ See Peter Lemke et al., *Observations: Changes in Snow, Ice and Frozen Ground*, in *CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS, CONTRIBUTION OF WORKING GROUP I TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE*, *supra* note 2, at 337, 361–69 (reviewing evidence regarding ice sheet mass loss in Greenland and Antarctica); Meehl et al., *supra* note 2, at 816–20 (reviewing projections regarding ice sheet loss in the twenty-first century).

patterns,⁵ increased frequency and intensity of hurricanes,⁶ drought,⁷ new and amplified disease vectors,⁸ ocean acidification,⁹ species loss,¹⁰ and all manner of social and economic consequences¹¹ have been discussed extensively in the relevant literatures. So too the unique governance challenges presented by the problem of climate change—the long atmospheric residence times of greenhouse gases and the essentially “irreversible” warming effects of such gases,¹² the inertia of a global energy

⁴ See Lemke et al., *supra* note 3, at 356–60 (reviewing evidence regarding glacier and ice cap loss); Meehl et al., *supra* note 2, at 814–16 (reviewing projections regarding glacier and ice cap loss).

⁵ See Meehl et al., *supra* note 2, at 768–70, 782, 784 (discussing climate model projections of precipitation extremes).

⁶ See *id.* at 786, 788–89 (discussing climate model projections of tropical cyclones and extra-tropical storms).

⁷ See *id.* at 768–70, 782 (discussing climate model projections of increased risk of drought in certain areas).

⁸ See Ulisses Confalonieri et al., *Human Health*, in CLIMATE CHANGE 2007: IMPACTS, ADAPTATION AND VULNERABILITY, CONTRIBUTION OF WORKING GROUP II TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 391, 407–12 (Parry et al. eds., 2007) (reviewing “projections of climate-change-related health impacts”).

⁹ See Meehl et al., *supra* note 2, at 793 (discussing ocean acidification resulting from increasing atmospheric concentrations of carbon dioxide).

¹⁰ See Andreas Fischlin et al., *Ecosystems, Their Properties, Goods and Services*, in CLIMATE CHANGE 2007: IMPACTS, ADAPTATION AND VULNERABILITY, CONTRIBUTION OF WORKING GROUP II TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 8, at 211, 239–45 (discussing projections regarding biodiversity impacts of climate change).

¹¹ See Tom Wilbanks et al., *Industry, Settlement and Society*, in CLIMATE CHANGE 2007: IMPACTS, ADAPTATION AND VULNERABILITY, CONTRIBUTION OF WORKING GROUP II TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 8, at 357, 364–77 (reviewing wide range of projected social and environmental impacts of climate change).

¹² See David Archer & Victor Brovkin, *The Millennial Atmospheric Lifetime of Anthropogenic CO₂*, 90 CLIMATIC CHANGE 283, 294 (2008) (“[T]he substantial fraction of projected CO₂ emissions will stay in the atmosphere for millennia, and a part of fossil fuel CO₂ will remain in the atmosphere for many thousands of years.”). Susan Solomon and her co-authors elaborate on the “irreversible” effects of carbon dioxide emissions:

It is not generally appreciated that the atmospheric temperature increases caused by rising carbon dioxide concentrations are not expected to decrease significantly even if carbon emissions were to completely cease. Future carbon dioxide emissions in the 21st century will hence lead to adverse climate changes on both short and long time scales that would be essentially irreversible [where irreversible is defined here as a time scale exceeding the end of the millennium in the year 3000

system marked by trillions of dollars in fixed capital with very long turnover times,¹³ deeply entrenched patterns of land use,¹⁴ the generation-scale time lags separating the costs of mitigation from any benefits,¹⁵ the uncertainties with respect to responses and feedbacks of dynamic systems,¹⁶ the radically uneven and unequal challenges associated with adaptation needs and capabilities¹⁷—a “super wicked problem” if ever there was one.¹⁸ Indeed, when viewed as a mitigation challenge, any serious attempt to solve the

Susan Solomon et al., *Irreversible Climate Change Due to Carbon Dioxide Emissions*, 106 PROC. NAT'L ACAD. SCI. 1704, 1704 (2009) (internal references omitted); see also NAT'L RESEARCH COUNCIL OF THE NAT'L ACAD. OF SCI., CLIMATE STABILIZATION TARGETS: EMISSIONS, CONCENTRATIONS, AND IMPACTS OVER DECADES TO MILLENNIA 6 (2010) (“[C]ertain levels of warming associated with carbon dioxide emission could lock the Earth and many future generations of humans into very large impacts . . .”).

¹³ See John P. Holdren, *The Energy Innovation Imperative: Addressing Oil Dependence, Climate Change, and Other 21st Century Energy Challenges*, 1 INNOVATIONS TECH. GOVERNANCE, GLOBALIZATION 3, 6 (2006) (“The replacement cost of today’s global energy-supply system . . . is in the range of \$12 trillion, and this immense capital investment turns over with a characteristic time of 30–40 years, the average operating lifetime of the facilities involved.”).

¹⁴ See Gert Jan Nabuurs et al., *Forestry*, in CLIMATE CHANGE 2007: MITIGATION, CONTRIBUTION OF WORKING GROUP III TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 541, 546–47 (Metz et al. eds., 2007) (discussing forest sector emissions and removals); Pete Smith et al., *Agriculture*, in CLIMATE CHANGE 2007: MITIGATION, CONTRIBUTION OF WORKING GROUP III TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* at 497, 503–05 (discussing regional and global trends in emissions from agricultural practices).

¹⁵ See THE WORLD BANK, WORLD DEVELOPMENT REPORT 2010: DEVELOPMENT AND CLIMATE CHANGE 49 (2010) (noting that “the costs of mitigation policies are borne immediately, and the possibly large benefits of such policies (avoided damages) are enjoyed far in the future”).

¹⁶ See Kenneth L. Denman et al., *Couplings Between Changes in the Climate System and Biogeochemistry*, in CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS, CONTRIBUTION OF WORKING GROUP I TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 2, at 499, 526–33 (discussing terrestrial and ocean carbon cycle processes and feedbacks to climate).

¹⁷ See W. Neil Adger et al., *Assessment of Adaptation Practices, Options, Constraints and Capacity*, in CLIMATE CHANGE 2007: IMPACTS, ADAPTATION AND VULNERABILITY, CONTRIBUTION OF WORKING GROUP II TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 8, at 717, 733–37 (discussing “limits and barriers to adaptation”); Kirstin Dow et al., *Exploring the Social Justice Implications of Adaptation and Vulnerability*, in FAIRNESS IN ADAPTATION TO CLIMATE CHANGE 79, 79–96 (W. Neil Adger et al. eds., 2006) (outlining asymmetries in worldwide adaptive capacities).

¹⁸ See generally Richard J. Lazarus, *Super Wicked Problems and Climate Change: Restraining the Present to Liberate the Future*, 94 CORNELL L. REV. 1153 (2009) (discussing the “super-wicked” nature of the climate change problem).

climate change problem entails nothing short of a full-scale reorganization of the fossil energy system that currently provides more than 80% of world energy¹⁹ and fundamental changes in global land-use patterns.²⁰ Viewed as an adaptation challenge (and it is clear that such a view must proceed in tandem with mitigation), climate change goes to the very core of structural vulnerabilities in the world system, the resilience and adaptive capacity of social and ecological systems, the obligations of the rich to the poor, the prospect of seemingly permanent states of emergency. More recent proposals entertaining the possibility of planetary-scale geoengineering to manage the Earth's radiation balance and the global carbon cycle entail a degree of intentional human intervention in the Earth system that would be truly unprecedented.²¹

The rapidly growing body of legal scholarship on climate change addresses many of these issues, focusing on questions of instrument choice, institutional design, federalism, the rights and obligations of various actors, the challenges of adaptation, and the implications for administrative law (to name a few).²² Not

¹⁹ See BRITISH PETROLEUM, BP STATISTICAL REVIEW OF WORLD ENERGY 41 (2010) (reporting world energy consumption by fuel, with fossil fuels accounting for approximately 88% of total world energy consumption).

²⁰ See Terry Barker et al., *Technical Summary*, in CLIMATE CHANGE 2007: MITIGATION, CONTRIBUTION OF WORKING GROUP III TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 14, at 25, 29 (identifying sectoral contributions to GHG emissions with forestry (17.4%) and agriculture (13.5%) accounting for more than 30% of the total).

²¹ See generally THE ROYAL SOC'Y, GEOENGINEERING THE CLIMATE: SCIENCE, GOVERNANCE, AND UNCERTAINTY (2009) (discussing geoengineering techniques and related governance issues); David G. Victor et al., *The Geoengineering Option: A Last Resort Against Global Warming?*, 88 FOREIGN AFF. 64, 64-72 (2009) (evaluating geoengineering proposals).

²² See generally Alejandro E. Camacho, *Adapting Governance to Climate Change: Managing Uncertainty Through a Learning Infrastructure*, 59 EMORY L.J. 1 (2009) (discussing the challenge of uncertainty regarding the effects of climate change for natural resource governance); Ann E. Carlson, *Iterative Federalism and Climate Change*, 103 NW. U. L. REV. 1097 (2009) (exploring interplay between state and federal responses to climate change); Robin Kundis Craig, "Stationarity is Dead" – *Long Live Transformation: Five Principles for Climate Change Adaptation Law*, 34 HARV. ENV'T'L L. REV. 9 (2010) (proposing a "principled flexibility" approach to climate change in order to adapt to changing environmental conditions); Daniel A. Farber, *Climate Change, Federalism, and the Constitution*, 50 ARIZ. L. REV. 879 (2008) (discussing the relationship between federal and state responses to climate change); Eric A. Posner & Cass R. Sunstein, *Climate Change Justice*, 96 GEO L.J. 1565 (2008) (positing that the United States' role in reducing greenhouse gas emissions should be independent from notions of corrective or distributive justice); Jedediah

surprisingly, and with good reason, much of the existing literature has approached the problem in the context of traditional understandings of environmental law, often with a domestic focus, but usually with a recognition that such understandings do not suffice in terms of the response options that are needed to comprehend, much less govern, such a daunting set of challenges. Everyone, it seems, recognizes the mismatch between the scale of the problem and existing legal and governance capabilities, manifest in the notable absence of any global law-making body or world environmental authority capable of stepping in to steer the world community toward a solution.²³ Likewise, the fragmented nature of the various institutions and regulatory authorities that would need to be engaged in any comprehensive approach to global climate change, not to mention the deep political divisions between nations, is readily apparent to even the most casual observer. The radically incomplete effort by the parties to the international climate regime to forge a comprehensive legal instrument for the post-2012 period bears witness to these difficulties.²⁴ So too does the difficulty of enacting domestic

Purdy, *The Politics of Nature: Climate Change, Environmental Law, and Democracy*, 119 YALE L.J. 1122 (2010) (contextualizing approaches to climate change within a discussion of American environmental and political history); J.B. Ruhl & James Salzman, *Climate Change, Dead Zones, and Massive Problems in the Administrative State: A Guide for Whittling Away*, 98 CAL. L. REV. 59, 65 (2010) (investigating challenges facing administrative agencies charged with responding to complex environmental problems such as climate change); Amy Sinden, *Allocating the Costs of the Climate Crisis: Efficiency Versus Justice*, 85 WASH. L. REV. 293 (2010) (evaluating alternative proposals to assign responsibility for reducing greenhouse gases and advocating on behalf of a per-capita approach); Katherine A. Trisolini, *All Hands on Deck: Local Governments and the Potential for Bidirectional Climate Change Regulation*, 62 STAN. L. REV. 669 (2010) (arguing that local governments have an important role to play in responding to climate change); Jonathan B. Weiner, *Radiative Forcing: Climate Policy to Break the Logjam in Environmental Law*, 17 N.Y.U. ENVTL. L.J. 210 (2008) (discussing political logjam facing climate legislation in the U.S.).

²³ See, e.g., Lazarus, *supra* note 18, at 1160–61 (“Climate Change is ultimately a global problem. But there is an absence of any global lawmaking institution with a jurisdictional reach and legal authority that match the scope of the problem.”).

²⁴ See U.N. Framework Convention on Climate Change [UNFCCC], Rep. of the Conf. of the Parties on its 15th Sess., Dec. 7–19, 2009, *Copenhagen Accord*, Decision 2/CP.15, U.N. Doc. FCCC/CP/2009/11/Add.1 (Mar. 30, 2010) [hereinafter *Copenhagen Accord*]; William D. Nordhaus, *Economic Aspects of Global Warming in a Post-Copenhagen Environment*, 107 PROC. NAT’L ACAD. SCI. 11721 (2010) (concluding that the actions contemplated by the Copenhagen Accord, even if carried out in full, would not be sufficient to meet prudent stabilization

climate change legislation in the United States and other major emitting countries.²⁵

In sum, there is on the one hand clear recognition that the incredibly complex, multidimensional problem of climate change demands a comprehensive global solution; while on the other hand it is all too apparent that the existing international legal and political order is not up to the task. The “perils of global legalism” – to use Eric Posner’s phrase – serves as an apt description of both the limited efficacy of international law and the problems that ensue from an exaggerated faith in the ability of the current international legal system to solve this massive collective action problem.²⁶ The recent Copenhagen Accord, and now the Cancún Agreement, provide unambiguous confirmation that the existing United Nations process is limited, at best, and unlikely to be a major driver of climate governance in the coming years.²⁷ Once all the rage, Multilateral Environmental Agreements now seem to be limping along as hollow reminders of a more optimistic time when coherent global environmental governance seemed within reach.²⁸ Where, then, does this leave us? Where do we go after Copenhagen?

targets). The recently completed Cancún Agreement, which narrowly averted a complete breakdown of the U.N. climate process, represents a very modest step to enshrine and elaborate on some of the pledges embodied in the Copenhagen Accord and keeps the process alive for at least another year. See UNFCCC, Outcome of the Work of the Ad Hoc Working Group on Long-Term Cooperative Action under the Convention, Nov. 29–Dec. 10, 2010, Cancún Draft Decision -/CP.16, Advanced Unedited Version (Dec. 11, 2010) [hereinafter *Cancún Agreement*].

²⁵ The difficulties of enacting domestic climate legislation in the United States and other countries have been very apparent in recent months. See, e.g., Carl Hulse & David M. Herszenhorn, *Democrats Call Off Climate Bill Effort*, N.Y. TIMES, July 22, 2010, at A14, available at <http://www.nytimes.com/2010/07/23/us/politics/23cong.html> (“The effort to advance a major climate change bill through the Senate this summer collapsed”); *Australia Shelves Key Emissions Trading Scheme*, BBC NEWS (Apr. 27, 2010), <http://news.bbc.co.uk/2/hi/8645767.stm> (“The Australian government has put plans for a flagship emissions scheme on hold until 2013 at the earliest.”).

²⁶ See ERIC A. POSNER, *THE PERILS OF GLOBAL LEGALISM* 7–8 (2009) (discussing difficulties of solving global collective action problems such as climate change in the absence of world government, and criticizing “global legalism” as a naïve faith in the ability of “law without government” to solve such problems).

²⁷ See *Copenhagen Accord*, *supra* note 24; *Cancún Agreement*, *supra* note 24.

²⁸ This is not to say that Multilateral Environmental Agreements are somehow unimportant or wholly without success. Witness the effectiveness of the Montreal Protocol in stemming the destruction of the stratospheric ozone

This Article offers some provisional answers to these questions, proposing a partial re-conceptualization of the nature and possibilities of climate governance in the post-Copenhagen era. The argument proceeds in three steps. First, our extraordinary ability to see and understand global environmental problems such as climate change has facilitated an unrealistic view that the path to solving such problems must lead to global institutions capable of governing the Earth system in a comprehensive manner. Put another way, our unprecedented ability to see environmental problems as global problems has instilled an unrealistic penchant for *globalism* in environmental law and governance.²⁹ When combined with the seemingly ubiquitous logic of technocratic managerialism that drives dominant approaches to contemporary environmental regulation,³⁰ this way of seeing has underwritten a series of attempts within the field of international environmental law and diplomacy to construct top-down, supra-national architectures that are deeply at odds with the contemporary international legal and political order.³¹

Second, if we look at how globalization is actually proceeding and what scholars of globalization outside of the environmental field are telling us; that is, if we accept as fact the fragmented, plural nature of the international legal and political order, we must look to new and different (and much messier) architectures for coordinating efforts across different jurisdictions.³² In doing so, we

layer. See JAMES GUSTAVE SPETH, *RED SKY AT MORNING: AMERICA AND THE CRISIS OF THE GLOBAL ENVIRONMENT* 95–96 (2004) (reviewing the performance of major international environmental agreements).

²⁹ See Clark A. Miller, *Democratization, International Knowledge Institutions, and Global Governance*, 20 *GOVERNANCE* 325, 339 (2007) (describing globalism as “the explicit framing of policy issues as being capable of identification, analysis, and management on scales no smaller than the planet as a whole”); see also Elinor Ostrom, *A Polycentric Approach for Coping with Climate Change* 3–4 (World Bank Policy Research, Working Paper No. 5095, 2009) (arguing against waiting for a single global solution to the climate change problem).

³⁰ See generally DOUGLAS A. KYSAR, *REGULATING FROM NOWHERE: ENVIRONMENTAL LAW AND THE SEARCH FOR OBJECTIVITY* (2010) (critiquing the role of technocratic knowledge practices such as risk-assessment and cost-benefit analysis as dominant ways of thinking in contemporary environmental law).

³¹ The Kyoto Protocol is perhaps the most obvious example. Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 10, 1997, 2303 U.N.T.S. 148 [hereinafter *Kyoto Protocol*]; see discussion *infra* Section 1.

³² According to Paul Berman,

[a]s a descriptive matter, pluralists argue that legal fragmentation and the contest among plural sources of norms are not realities that a

need to move away from the simplified notion of the state as a unitary actor with its international analogue of consent-based treaty regimes; away from “a policy instrument theory of state capacity”³³ with its international analogues of instrument choice and regime architectures toward a more nuanced appreciation for the ways in which global projects are made, inserted into, and reworked through a complex mix of national and sub-national institutions.

All of which makes the task of trying to understand the current conjuncture exceedingly difficult, ensuring that any effort to reconceptualize climate governance in the post-Copenhagen period is necessarily provisional. That said, and this is the third step in the argument, it is clear that we need a fresh vocabulary, an expanded set of concepts, alternative ways of framing the challenges, but more importantly, new ways of understanding the conditions of possibility for climate governance that build upon past efforts without sliding back into the worn grooves of prior thinking. To be sure, a number of commentators have bemoaned the problems inherent in the way that international environmental law has heretofore approached climate change and have suggested alternative approaches to the problem—trade; technology;

hierarchically situated actor can choose to permit or reject; pluralism is simply a fact because multiple communities assert norms that have impacts Accordingly, instead of bemoaning either the fragmentation of law or the messiness of jurisdictional overlaps, we should accept them as necessary consequences of the fact that communities can be neither homogenized into a single universal collective nor hermetically sealed off from one another. More normatively, we can go further and consider the possibility that this jurisdictional messiness may, in the end, provide important systemic benefits by fostering dialogue among multiple constituencies, authorities, levels of government, and nonstate communities.

Paul Schiff Berman, *The New Legal Pluralism: Defining the Field*, 5 ANN. REV. L. & SOC. SCI. 225, 238 (2009). *But see* David Kennedy, *One, Two, Three, Many Legal Orders: Legal Pluralism and the Cosmopolitan Dream*, 31 N.Y.U. REV. L. & SOC. CHANGE 641, 641 (2007) (“Legal pluralism is not a fact about the world. It is a professional experience: the experience that things don’t add up, that coherence fails, that incommensurability must be acknowledged.”). Whether fact or experience—and it is not clear why the experience of legal pluralism is not itself a fact about the world—the proliferation of legal and normative orders is something that lawyers and legal scholars must confront in any serious engagement with globalization.

³³ SASKIA SASSEN, *TERRITORY, AUTHORITY, RIGHTS: FROM MEDIEVAL TO GLOBAL ASSEMBLAGES* 227 (2006).

development; security; etc.³⁴—all of which have their respective merits, lending further support to the observation that this is a problem that cuts across many domains and one that deeply implicates, and thus cannot escape, the basic facts of pluralism and fragmentation.

But any re-conceptualization true to its charge needs at least to attempt a rethinking of basic concepts and approaches. Accordingly, instead of starting with the usual suspects of actors, interests, and institutions; principles and norms; levels of governance; instruments and implementation—all basic concepts deployed by leading analytical perspectives on international environmental law³⁵ and all very important in their own right in understanding the landscape of climate governance—the re-conceptualization advanced here (partial as it is) begins with the view that climate governance, in its emerging manifestations, operates through a constellation of global forms or projects that have a distinctive capacity for de-contextualization and mobility (think, for example, of specific policy instruments such as cap-and-trade, new forms of property such as emissions allowances and offset credits, certain principles and norms, standards regimes for greenhouse gas (“GHG”) reporting and accounting, or widely accepted social and environmental safeguards) that are being

³⁴ See, e.g., Scott Barrett, *A Multitrack Climate Treaty System*, in ARCHITECTURES FOR AGREEMENT: ADDRESSING GLOBAL CLIMATE CHANGE IN THE POST-KYOTO WORLD 237 (Joseph E. Aldy & Robert N. Stavins eds., 2007) (proposing a new “architecture” for climate policy that begins with the objective of sustainable development); David G. Victor, *Fragmented Carbon Markets and Reluctant Nations*, in ARCHITECTURES FOR AGREEMENT: ADDRESSING GLOBAL CLIMATE CHANGE IN THE POST-KYOTO WORLD 150–51 (Joseph E. Aldy & Robert N. Stavins eds., 2007) (“Conceptualizing the climate change issue as one of economic cooperation might help to mobilize attention to better precedents.”); Jon Barnett, *Security and Climate Change*, 13 GLOBAL ENVTL. CHANGE 7 (2003) (exploring climate change as a security issue).

³⁵ See, e.g., DANIEL BODANSKY, *THE ART AND CRAFT OF INTERNATIONAL ENVIRONMENTAL LAW* 108–35 (2010) (describing key actors and their interests and roles in international environmental law); PHILIPPE SANDS, *PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW* (2nd ed., 2003) (discussing key principles and norms of various substantive areas of international environmental law); Jeffrey L. Dunhoff, *Levels of Environmental Governance*, in THE OXFORD HANDBOOK OF INTERNATIONAL ENVIRONMENTAL LAW 86 (Daniel Bodansky et al. eds., 2007) (discussing “allocation of authority over environmental issues among different levels of governance”); Richard B. Stewart, *Instrument Choice*, in THE OXFORD HANDBOOK OF INTERNATIONAL ENVIRONMENTAL LAW 148 (Daniel Bodansky et al. eds., 2007) (examining various environmental regulatory instruments and their role in international environmental law).

assimilated and worked out in particular national and sub-national circumstances.³⁶ Put more abstractly, this Article contends that in order to understand the nature and possibilities of climate governance in the Post-Copenhagen context, we need to look at how certain forms and techniques of globalization—instruments, ideologies, calculative rationalities, expert systems, networks, legalisms of various kinds—are materialized through the “thick environments” of national and sub-national institutions and what this entails for efforts to coordinate efforts across various jurisdictions.³⁷ The metaphor that best captures this is not that of a “download” from higher levels of governance to lower, or that of a “transplant” from one legal system to another (though both are important), but rather that of an “assemblage” of various global forms and projects on the one hand and their instantiations in the partial, situated, contingent settings of national and sub-national institutions on the other.³⁸

³⁶ This characterization borrows from the notion of “global forms” advanced by Stephen Collier and Aihwa Ong:

Global phenomena . . . have a distinctive capacity for decontextualization and recontextualization, abstractability and movement, across diverse social and cultural situations and spheres of life. Global forms are able to assimilate themselves to new environments, to code heterogeneous contexts and objects in terms that are amenable to control and valuation.

Stephen J. Collier & Aihwa Ong, *Global Assemblages, Anthropological Problems, in GLOBAL ASSEMBLAGES: TECHNOLOGY, POLITICS, AND ETHICS AS ANTHROPOLOGICAL PROBLEMS* 11 (Aihwa Ong & Stephen J. Collier eds., 2005).

³⁷ See SASSEN, *supra* note 33, at 227 (advocating for research on the ways that “global systems insert themselves in national domains where they were once nonexistent. The outcome of this negotiation between standardizing global systems and the thick environments of the national can easily be packaged as national even though its actual content pertains to new global systems.”). This conceptualization bears some similarity to Sally Engle Merry’s research on the “vernacularization” of international human rights ideas or norms in particular, local circumstances. See Sally Engle Merry, *Transnational Human Rights and Local Activism: Mapping the Middle*, 108 AM. ANTHROPOLOGIST 38, 44–49 (2006) (“Vernacularization falls along a continuum depending on how extensively local cultural forms and practices are incorporated into imported institutions.”).

³⁸ Although the concept of assemblage has a rich theoretical provenance, it is used here primarily as a descriptive term that provides an alternative to an exclusive focus on levels or scales of governance in order to highlight the emergent, contingent combinations of people, practices, technologies, and rationalities in particular domains. See SASSEN, *supra* note 33, at 5 n.1 (2006) (discussing theoretical understandings of the concept of assemblage, while arguing for a simple, descriptive use of the term that captures different combinations of territory, authority, and rights in the context of her inquiry into globalization). Aihwa Ong describes the “space of analysis” that is captured by the concept of global assemblage as one that “bypasses structural analysis, scalar

From a normative standpoint, such a perspective departs from, but need not be inconsistent with, the dominant approach to climate governance, with its progression from global atmospheric stabilization targets to emissions pathways, national commitments, policy instruments, and implementation. Godspeed if that approach can be made to work, and this Article certainly does not advocate the abandonment of ongoing efforts to negotiate an effective post-2012 climate treaty. But in the meantime and in light of the considerable difficulties confronting the U.N. process (not to mention the U.S. Congress), it is critical to recognize and build upon the great deal of ongoing climate governance activities happening in many diverse places around the world and at multiple levels (including the U.N. process). All of which is messy, incoherent, highly politicized, and wrapped into larger strategic concerns. But this is where we are, and rather than wait for some transformative moment in the international negotiations or, even more ambitious, some new ecological awakening, it would seem prudent to explore novel ways to build on what is actually happening without retreating into localism and without abdicating to a crude realism that simply accepts the contemporary geopolitical order. Triage perhaps, but a triage that does not have to be fatalistic in the face of daily reminders that the prospects of hitting stabilization targets are slipping away.

Analytically, such an approach directs attention away from a focus on climate governance as a singular enterprise toward a more empirically grounded exploration of how particular states and state capacities are being mobilized to support and facilitate different global projects directed at various aspects of the climate change problem; the manner in which laws, customs and normative orders of various kinds in various places are being

progressionism and predetermined outcomes commonly deployed by political economy." Aihwa Ong, *Neoliberalism as a Mobile Technology*, 32 *TRANS. INST. BRIT. GEOGRAPHERS* 3, 5 (2007). Elaborating further on the concept, Collier & Ong note that

[a]n assemblage is the product of multiple determinations that are not reducible to a single logic. The temporality of an assemblage is emergent. It does not always involve new forms, but forms that are shifting, in formation, or at stake. As a composite concept, the term "global assemblage" suggests inherent tensions: global implies broadly encompassing, seamless, and mobile; assemblage implies heterogeneous, contingent, unstable, partial, and situated.

Collier & Ong, *supra* note 36, at 12.

pushed and pulled into such efforts; the infrastructural conditions and knowledge practices that allow global projects to take shape and circulate; the possibilities for advancing stakeholder participation and accountability in the absence of traditional democratic institutions; and the implications of new value forms for property, territory, and control over resources. One important goal of such an inquiry is to provide additional analytical content to the notion of an emerging “global environmental law” by exploring how states, markets, laws, and other institutions come to cohere within nested, polycentric forms of governance.³⁹ Another is to suggest some elements of an agenda for further research that is sensitive to the partial, uneven, and contingent natures of climate governance in the post-Copenhagen era.

These arguments are elaborated through an analysis of efforts to bring reduced emissions from deforestation and forest degradation (“REDD”) into climate policy.⁴⁰ Deforestation, nearly all of which occurs in the tropics, accounts for some 15% of global anthropogenic CO₂ emissions—more than the global transportation sector and roughly comparable to 2005 CO₂ emissions from the United States or China.⁴¹ And yet, despite this

³⁹ See generally Tseming Yang & Robert V. Percival, *The Emergence of Global Environmental Law*, 36 *ECOLOGY L.Q.* 615 (2009) (discussing concept of global environmental law); see also *infra* Section 2.

⁴⁰ See *infra* Section 3; William Boyd, *Ways of Seeing in Environmental Law: How Deforestation Became an Object of Climate Governance*, 37 *ECOLOGY L.Q.* 843, 872–77 (2010) (providing background on REDD).

⁴¹ See G.R. van der Werf et al., *CO₂ Emissions from Forest Loss*, 2 *NATURE GEOSCIENCE* 737, 738 (2009) (estimating contribution of emissions from deforestation, forest degradation, and destruction of peatlands at about 15% of total anthropogenic CO₂ emissions). Earlier estimates for the 1990s put emissions from deforestation at some 20% of anthropogenic greenhouse gas emissions. See Raymond E. Gullison et al., *Tropical Forests and Climate Policy*, 316 *SCI.* 985, 985 (2007) (noting that “[t]ropical deforestation released ~1.5 billion metric tons of carbon to the atmosphere annually throughout the 1990s, accounting for almost 20% of anthropogenic greenhouse gas emissions”); Nabuurs et al., *supra* note 14, at 543 (reporting that emissions from deforestation in the 1990s were 5.8 billion metric tons (5.8 Gigatonnes or Gt) of CO₂ per year, which is approximately 1.6 Gt of carbon per year); see also Corinne Le Quéré et al., *Trends in the Sources and Sinks of Carbon Dioxide*, 2 *NATURE GEOSCIENCE* 831, 832 (2009) (“The relative contribution of LUC [Land Use Change] CO₂ emissions to total anthropogenic CO₂ emissions decreased from 20% in 1990–2000 to 12% in 2008, owing to increasing fossil fuel emissions and below-average deforestation emissions in 2008.”). For a comparison of emissions from deforestation with those from the transportation sector, see Hans-Holger Rogner et al., *Introduction to CLIMATE CHANGE 2007: MITIGATION. CONTRIBUTION OF WORKING GROUP III TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE* 99, 105 fig.1.3b,

substantial contribution to the climate change problem, emissions from tropical deforestation were expressly excluded from the Kyoto Protocol's first commitment period (2008-2012),⁴² creating an immense gap in international climate policy. Since the mid-2000s, however, there has been a clear shift in favor of including deforestation in climate policy at multiple levels.⁴³ Widely viewed as one of the few bright spots in the recent international climate negotiations, REDD represents an effort to mobilize the protection of tropical forests in various countries as part of a coordinated scheme aimed at valorizing the carbon embodied in standing tropical forests and translating this into compliance-grade emissions reductions that can be recognized in various pay-for-performance schemes. As such, REDD is an enormously ambitious and challenging endeavor (nothing short of a new paradigm for tropical land use) that is fraught with difficulty and that could easily fall apart. It also represents what is likely the last best chance to save tropical forests at scale.

Building on a previous article that explored the scientific, technical, and legal practices involved in making deforestation an object of climate governance,⁴⁴ this Article uses the REDD case to illustrate how an incipient global project is being inserted into and worked out through particular national and sub-national efforts to govern forests and land use, measure and monetize carbon, and link rural actors and local communities into a new development model that is tied to emerging GHG compliance systems. As a nascent form of climate governance, REDD puts considerable pressure on traditional legal conceptions of tropical forests as sovereign national resources, and has potentially far-reaching implications for existing structures of forest governance and land

which shows agricultural emissions at 13.5%, forestry emissions at 17.4%, energy supply emissions at 25.9%, and transportation emissions at 13.1% of global GHG emissions in 2004). CO₂ emissions in the United States for 2005 were 5.8 Gt/year. Chinese emissions for the same year were 5.1 GtCO₂/yr. See INT'L ENERGY AGENCY, WORLD ENERGY OUTLOOK 2007: CHINA AND INDIA INSIGHTS 199 (2007) (comparing the emissions of China and India with other regions of the world).

⁴² See U.N. Framework Convention on Climate Change [UNFCCC], Rep. on its 7th Sess., Oct. 29-Nov. 10, 2001, *Decision 11/CP.7: Land Use, Land-Use Change, and Forestry*, U.N. Doc. FCCC/CP/2001/13/Add.1, 60 (Jan. 21, 2002) (excluding avoided deforestation activities from the Clean Development Mechanism); see also Boyd, *supra* note 40, at 869-71 (discussing reasons why tropical deforestation was excluded from the Kyoto Protocol).

⁴³ See discussion *infra* Section 3.2.

⁴⁴ See Boyd, *supra* note 40.

use. In keeping with the approach advanced in this Article, REDD can thus be seen as a global project that is taking shape in faraway places—an emergent assemblage, a mash up, a trading zone where decisions taken in international climate negotiations, the design of GHG compliance systems, high-tech forest monitoring capabilities, and the heady prospects of international carbon finance mix with the contingent and uneven realities of national administrative capacities and laws, state and local practices of forest governance, and a multitude of stakeholders and forest-dependent peoples.

One of the lessons that emerges from the case study is that if REDD is ever going to work—that is, if REDD is ever going to succeed in building durable and equitable practices of sustainable forest governance capable of protecting standing tropical forests over very long time periods across different jurisdictions—it will only happen if the resulting assemblage builds upon the vernacular institutions and informal processes that are necessary to sustain any attempt at forging a new formal order of land use.⁴⁵ Conversely, if REDD is pursued in a strictly top-down manner that ignores, or even seeks to erase, the rights, interests, and customary practices of local forest-dependent communities, it will surely fail like so many other past schemes to improve the human condition.⁴⁶ The result of such failure, of course, would almost certainly mean a continuation of business-as-usual, which will inevitably lead to the ongoing destruction of the world's remaining tropical forests as global pressures on land use intensify. Given the considerable momentum currently behind REDD and the lack of any viable alternatives to protect tropical forests at scale, it is critical, therefore, to make a run at getting it right. Doing so, this Article contends, requires understanding not only how this particular form of climate governance is being assembled in various circumstances, but also the key elements of an enabling

⁴⁵ See JAMES C. SCOTT, *SEEING LIKE A STATE: HOW CERTAIN SCHEMES TO IMPROVE THE HUMAN CONDITION HAVE FAILED* 310 (1998) (“Formal order, to be more explicit, is always and to some considerable degree parasitic on informal processes, which the formal scheme does not recognize, without which it could not exist, and which it alone cannot create or maintain.”).

⁴⁶ See *id.* (describing various failed schemes to improve the human condition); see also TANIA MURRAY LI, *THE WILL TO IMPROVE: GOVERNMENTALITY, DEVELOPMENT, AND THE PRACTICE OF POLITICS* 4–6 (2007) (describing experiences with various “improvement schemes” in Indonesia and analyzing such schemes as a distinct governmental rationality).

environment for how it might work, and a sober assessment of what is gained and what is lost in the process.

The Article proceeds as follows: the next Section traces the manner in which new ways of seeing associated with the emerging program of Earth systems science during the post-World War II period have facilitated a view of the Earth system as a unitary governable domain, with important implications for how environmental law thinks about global environmental problems such as climate change. Section 2 then applies some of the insights from research on law and globalization to the project of global environmental law, with specific attention to the role of the state and the implications of pluralism and fragmentation for efforts to develop effective forms of climate governance. Section 3 explores in detail the case of REDD as an emerging form of climate governance, illustrating how REDD has come to be constituted as a global project of potentially immense reach, the manner in which it is taking shape in faraway places all over the world, the resulting changes in forest law and governance, and the ways in which new forms of value, driven by emerging GHG compliance systems, are reshaping the relationship of the state to the forest and to local communities and forest-dependent people. The Article concludes with some general claims regarding the nature and possibilities of post-Copenhagen climate governance.

2. CLIMATE CHANGE AND THE PROJECT OF EARTH SYSTEMS GOVERNANCE

Contemporary understandings of global climate change derive from decades of scientific, technical, and institutional investments in new, comprehensive ways of seeing the Earth as an integrated system and an ability to monitor and assess ecological disruptions that are increasingly global in scale.⁴⁷ This distinctive set of knowledge practices—a new epistemology of global environmental change—has profoundly influenced basic understandings of and approaches to environmental governance.⁴⁸

⁴⁷ See generally PAUL N. EDWARDS, *A VAST MACHINE: COMPUTER MODELS, CLIMATE DATA, AND THE POLITICS OF GLOBAL WARMING* (2010) (tracing the history of how the global climate system became a coherent object of knowledge).

⁴⁸ See William C. Clark et al., *Acid Rain, Ozone Depletion and Climate Change: An Historical Overview*, in THE SOCIAL LEARNING GROUP, *LEARNING TO MANAGE GLOBAL ENVIRONMENTAL RISKS: A COMPARATIVE HISTORY OF SOCIAL RESPONSES TO CLIMATE CHANGE, OZONE DEPLETION, AND ACID RAIN* 22-27 (2001) (discussing the

Indeed, the idea that the Earth system can be approached as an object of governance has come to operate as a powerful background norm for much of international environmental law and, specifically, climate change law and policy. As such, it has important, though often unrecognized, implications for how we think about the prospects for global environmental governance. This Section explores these unrecognized implications, arguing that the dominant approach to climate governance embodied in the Kyoto Protocol and in much of the ongoing discussion regarding a post-2012 climate treaty suffers from an unrealistic embrace of global, *dirigiste* solutions that has blinded international climate policy to the possibilities of varied solutions that come with partial, nested forms of climate governance.

2.1. *Ways of Seeing and the Climate Problem*

The idea that human societies are capable of acting as agents of environmental change on a *global* scale has existed since at least the late nineteenth century,⁴⁹ but it is only within the last century and, more fundamentally, in the last several decades, that we have developed systematic ways of seeing and understanding the myriad and growing human impacts on the global environment.⁵⁰ While the full history of this new way of seeing has yet to be written, many of the key developments that underwrote it are relatively easy to recognize. Early conceptual foundations were

historical development of Earth systems science and understandings of human impacts on the global environment).

⁴⁹ See GEORGE P. MARSH, *MAN AND NATURE*, at iii (David Lowenthal ed., 1965) (1864) (“The object of the present volume is: to indicate the character and, approximately, the extent of the changes produced by human action in the physical conditions of the globe we inhabit”); see also CLARENCE GLACKEN, *TRACES ON THE RHODIAN SHORE* 704 (1967) (concluding that recognition of the “philosophic importance” of “man as a modifier of nature” did not happen until later in the nineteenth century); Mike Hulme et al., *Unstable Climates: Exploring the Statistical and Social Constructions of ‘Normal’ Climate*, 40 *GEOFORUM* 197, 198 (2009) (discussing the role of standardized instruments, formal statistical rules, and particular knowledge practices of meteorologists and climatologists in the nineteenth century that “turned the idea of climate into something that could be measured and quantified”).

⁵⁰ See Paul N. Edwards, *The World in a Machine: Origins and Impacts of Early Computerized Global Systems Models*, in *SYSTEMS, EXPERTS AND COMPUTERS: THE SYSTEMS APPROACH IN MANAGEMENT AND ENGINEERING, WORLD WAR II AND AFTER* 221 (Agatha C. Hughes & Thomas P. Hughes eds., 2000) (noting that “grounded empirical knowledge of geophysical features and processes remained in a rudimentary state until the Second World War”).

laid in the 1920s by Russian geochemist Wassily Vernadsky who, drawing on previous work by Theodore Suess and others, articulated the modern concept of the “biosphere” as an organizing principle for the Earth sciences, and pointed to the growing planetary-scale impacts of human societies.⁵¹

The experience of the Second World War gave new meaning to these insights. The conduct of the war, its sheer impact on the environment, and the use of nuclear weapons fostered a profound appreciation for the capacity of human beings to fundamentally alter and even destroy the conditions for life on the planet. At the same time, as part of the war effort and in response to rising Cold War tensions, the 1950s witnessed the beginning of major government support for the development of tools and infrastructures to systematically assess various aspects of the Earth’s bio-geophysical systems.⁵²

By the second half of the 1950s, the general conception of the Earth as an integrated system had begun to take shape and drive specific research agendas. Increasingly formal approaches to “systems thinking,” which soon came to dominate fields as diverse as operations research and ecology, matched with growing computational capabilities, provided the foundations for modern Earth systems science.⁵³ This was perhaps most apparent in work

⁵¹ See generally W. I. VERNADSKY, *THE BIOSPHERE* (1926) (articulating the modern concept of the biosphere); W. I. Vernadsky, *The Biosphere and the Noösphere*, 33 *AMER. SCIENTIST* 1, 9 (1945) (identifying “man” as a “large-scale geological force”).

⁵² On the Cold War as a major impetus for the study of Earth systems, see Ronald E. Doel, *Constituting the Postwar Earth Sciences: The Military’s Influence on the Environmental Sciences in the USA After 1945*, 33 *SOC. STUD. SCI.* 635 (2003). See also EDWARDS, *supra* note 47, at 224–27 (discussing development of global data infrastructures for weather and climate research in the context of the Cold War); David M. Hart & David G. Victor, *Scientific Elites and the Making of US Policy for Climate Change Research, 1957–74*, 23 *SOC. STUD. SCI.* 643 (1993) (discussing emergence of climate research in the United States during the Cold War period).

⁵³ See generally Peter J. Taylor, *Technocratic Optimism, H.T. Odum, and the Partial Transformation of Ecological Metaphor after World War II*, 21 *J. HIST. BIOLOGY* 213 (1988) (tracing the rise of systems thinking in ecology in the post WWII period). Thomas and Agatha Hughes have elaborated on the more general spread of systems thinking:

[a]fter World War II, a systems approach to solving complex problems and managing complex systems came into vogue among engineers, scientists, and managers The approach spawned new academic fields, new ‘sciences of management,’ and new modes of engineering practice. It effloresced into a number of forms, including operations research, systems engineering, systems analysis, and system dynamics.

on bio-geochemical cycles and, specifically, research on the global carbon cycle, which highlighted the large and growing anthropogenic influence on the atmosphere.⁵⁴ Roger Revelle, the famous oceanographer and one of the first scientists to raise concerns about climate change, summed up the basic view in 1957:

human beings are now carrying out a large scale geophysical experiment of a kind that could not have happened in the past nor be reproduced in the future. Within a few centuries we are returning to the atmosphere and oceans the concentrated organic carbon stored in sedimentary rocks over hundreds of millions of years.⁵⁵

The next year, Charles David Keeling, a colleague of Revelle's at the Scripps Institute, began measuring CO₂ concentrations in the atmosphere at Mauna Loa Hawaii, providing the data for one of the most important artifacts of climate science—the famous Keeling curve showing continuous increases in atmospheric CO₂ concentrations—and a powerful illustration of the growing human influence on the climate system.⁵⁶

Thomas P. Hughes and Agatha C. Hughes, *Introduction to SYSTEMS, EXPERTS, AND COMPUTERS: THE SYSTEMS APPROACH IN MANAGEMENT AND ENGINEERING, WORLD WAR II AND AFTER 1* (Thomas P. Hughes & Agatha C. Hughes eds., 2000).

⁵⁴ See Robert W. Kates, B.L. Turner II & William C. Clark, *The Great Transformation*, in *THE EARTH AS TRANSFORMED BY HUMAN ACTION: GLOBAL AND REGIONAL CHANGES IN THE BIOSPHERE OVER THE PAST 300 YEARS 1* (Turner et al. eds., 1990) ("Whereas humankind once acted primarily upon the visible 'faces' or 'states' of the earth such as forest cover, we are now also altering the fundamental flows of chemicals and energy that sustain life on the only inhabited planet we know.").

⁵⁵ Roger Revelle & Hans E. Suess, *Carbon Dioxide Exchange Between Atmosphere and Ocean and the Question of an Increase of Atmospheric CO₂ During the Past Decades*, 9 *TELLUS* 18, 19 (1957). Since Revelle's article, the "large-scale" or "grand" experiment trope has been repeated often by environmental scientists and others. Jane Lubchenco, for example, has asserted that

[t]he conclusions . . . are inescapable: during the last few decades, humans have emerged as a new force of nature. We are modifying physical, chemical, and biological systems in new ways, at faster rates, and over larger spatial scales than ever recorded on Earth. Humans have unwittingly embarked on a grand experiment with our planet. The outcome of this experiment is unknown, but has profound implications for all life on Earth.

Jane Lubchenco, *Entering the Century of the Environment: A New Social Contract for Science*, 279 *SCI.* 491, 492 (1998).

⁵⁶ See Charles D. Keeling et al., *Atmospheric Carbon Dioxide Variations at Mauna Loa Observatory, Hawaii*, 28 *TELLUS* 538, 550 (1976) ("[T]he observed long term

During this period, policymakers and scientists from various disciplines also initiated some of the first international collaborations to assess global environmental change. In 1955, for example, a major international symposium at Princeton University brought together scholars from the natural and social sciences to take stock of the many ways that human societies were changing the face of the planet.⁵⁷ The resulting volume documented, in qualitative terms, numerous examples of historical and contemporary global environmental change, with considerable angst regarding the future.⁵⁸ Two years later, sixty-seven nations launched the International Geophysical Year (“IGY”) of 1957-58—the first major multi-national effort to develop a comprehensive understanding of the Earth as a dynamic integrated system.⁵⁹ Among other things, the IGY witnessed the launching of the first Earth-observing satellites and consolidated a global network for

trend of rising CO₂ appears clearly to be in response to increasing amounts of industrial CO₂ in the air on a global scale.”).

⁵⁷ See MAN’S ROLE IN CHANGING THE FACE OF THE EARTH (William L. Thomas et al eds., 1956) (presenting results of the multi-disciplinary Princeton symposium on past and present human impacts on the Earth).

⁵⁸ See *id.* Lewis Mumford, one of the conference organizers, summarized the implications of this new “planetary” understanding (and responsibility): “[f]or the first time man may, as a conscious, interrelated comprehensive group, take possession of the whole planet. For the last century, not merely have we been able to think of the world as a whole, in time and space, but we have been able throughout manifold inventions to act in the same fashion. Yet both our thinking and our acting have been crude, not to say primitive, because we have not yet created the sort of self, freed from nationalistic and ideological obsessions, capable of acting within this global theatre.” Lewis Mumford, *Prospect*, in MAN’S ROLE IN CHANGING THE FACE OF THE EARTH, *supra* note 57, at 1151.

⁵⁹ See William C. Clark et al., *Acid Rain, Ozone Depletion, and Climate Change: An Historical Overview*, in 1 LEARNING TO MANAGE GLOBAL ENVIRONMENTAL RISKS: A FUNCTIONAL ANALYSIS OF SOCIAL RESPONSES TO CLIMATE CHANGE, OZONE DEPLETION, AND ACID RAIN 22-23 (Social Learning Group eds., 2001) (describing the 1957-58 IGY as “one of the first coordinated, multinational efforts to study the earth as a dynamic system,” resulting in “a revolution in our understanding of the earth as a dynamic, integrated system”); see also EDWARDS, *supra* note 47, at 204 (discussing the “overarching purpose for the [IGY] venture: to study Earth as a ‘single physical system’”); Robert G. Fleagle, *From the International Geophysical Year to Global Change*, 30 REV. OF GEOPHYSICS 305, 305-06 (1992) (tracing the history of global change research and noting the importance of the IGY of 1957 to 1958 as one of the first coordinated efforts to study the Earth as a dynamic system); Sheila Jasanoff, *Heaven and Earth: The Politics of Environmental Images*, in EARTHLY POLITICS: LOCAL AND GLOBAL IN ENVIRONMENTAL GOVERNANCE 44-45 (Sheila Jasanoff & Marybeth Martello eds., 2004) (noting the importance of the 1957-58 IGY in laying the foundation for Earth systems science and in producing a new kind of legibility capable of generating “facts on a planetary scale”).

meteorological observations.⁶⁰ Together, these efforts provided some of the first global data sets to support early general circulation models (“GCMs”) of the climate system.⁶¹

These early climate models,⁶² although quite crude by today’s standards, represented some of the world’s most sophisticated scientific and technical work (second only, perhaps, to the nuclear weapons programs) seeking to apply digital technology and numerical simulation techniques to understanding complex dynamic systems.⁶³ With leadership from John von Neumann, a pioneer in the field of numerical weather prediction, Jule Charney, and others, early modeling efforts were soon institutionalized in various centers in the United States and Europe, all with access to massive computing power.⁶⁴ As climate models grew in sophistication, driven in large part by relentless advances in computational capabilities, demands for data increased substantially, and modelers worked to “couple” existing climate models with models of the oceans, the cryosphere, the biosphere,

⁶⁰ See EDWARDS, *supra* note 47, at 207 (“The IGY marked a dramatic transition. As a concept, with its single-physical-system framework, its emphasis on three-dimensional observing systems, and its satellite data initiative, the IGY’s global meteorology represented the cutting edge of science.”).

⁶¹ See EDWARDS, *supra* note 50, at 234 (“The IGY efforts thus represent the first global data networks for constant, consistent, structured observation on a scale and grid to match the emerging atmospheric models.”).

⁶² See EDWARDS, *supra* note 47, at 139–86, 337–55 (discussing historical development of GCMs and their implications for knowledge about the climate system).

⁶³ See *id.* at 111–15 (discussing application of simulation techniques to weather prediction). As Edwards goes on to note,

[s]imulation modeling opened up a way out of this quandary [the inability to do controlled experiments on the Earth system]. Only through simulation can you systematically and repeatedly test variations in the ‘forcings’ (the variables that control the climate system). Even more important, only through modeling can you create a control—a simulated Earth with pre-industrial levels of greenhouse gases, or without the chloroflourocarbons that erode the ozone layer, or without aerosols from fossil fuel and agricultural waste combustion—against which to analyze what is happening on the real Earth.

Id. at 140. On the development of simulation techniques, see Peter J. Galison, *Computer Simulations and the Trading Zone*, in *THE DISUNITY OF SCIENCE: BOUNDARIES, CONTEXT, AND POWER* 118 (Peter Galison & David J. Stump eds., 1996); see also Eric Winsberg, *Sanctioning Models: The Epistemology of Simulation*, 12 *SCI. IN CONTEXT* 275, 276 (1999) (describing simulation as “a form of calculation,” but with its own unique epistemology).

⁶⁴ See EDWARDS, *supra* note 47, at 153–67 (discussing the first generation of GCMs and the modeling groups that created them).

and human activities—eventually seeking to simulate the entire Earth system, “replicating the world in a machine.”⁶⁵ Taken as a whole, the development of climate models and their supporting infrastructures constituted an exercise in what Paul Edwards calls “infrastructural globalism”—a long-term project directed at building and elaborating “socio-technical systems that produce knowledge about the whole world.”⁶⁶ Through these practices, the climate system, together with the larger Earth system, became new objects of knowledge and governance.⁶⁷

At the same time that the climate research community was building new, increasingly sophisticated machines and ever more expansive data networks to understand the Earth’s climate, research during the 1950s on the cycling of radionuclides in the environment as a result of nuclear testing paved the way for improved understandings of global circulation patterns in the atmosphere.⁶⁸ Tracking global fallout allowed meteorologists to “trace the movement of air around the planet far more precisely,” while fallout monitoring programs provided the first opportunity to sample carbon dioxide concentrations in the stratosphere.⁶⁹ This research “proved momentous for studies of anthropogenic climate change,” producing “some of the first three-dimensional studies of global atmospheric chemistry and circulation.”⁷⁰

⁶⁵ *Id.* at 139.

⁶⁶ *Id.* at 25.

⁶⁷ See, e.g., Naomi Oreskes, *Why Believe a Computer? Models, Measures, and Meaning in the Natural World*, in *THE EARTH AROUND US: MAINTAINING A LIVABLE PLANET* 70 (Jill S. Schneiderman ed., 2000) (discussing how modeling practices in the sciences create new objects of knowledge). In his recent book on climate change science, Paul Edwards takes this on directly:

[h]ow did “the world” become a *system*? What made it possible to see local forces as elements of a planetary order, and the planetary order as directly relevant to the tiny scale of ordinary, individual human lives? How did the complex concepts and tools of global thinking become the common sense of an entire Western generation? How has systems thinking shaped, and been shaped by, the world-scale infrastructures that have emerged to support knowledge, communication, and commerce?

EDWARDS, *supra* note 47, at 3.

⁶⁸ See EDWARDS, *supra* note 47, at 207–15 (discussing contribution of fallout studies to understandings of climate change).

⁶⁹ *Id.* at 209.

⁷⁰ *Id.* at 208–09.

Fallout studies also provided the foundation for improved understandings of the fate and transport of organochlorines and other synthetic chemicals in the environment.⁷¹ Based on earlier studies of strontium 90 and other radionuclides, pioneering work starting in the 1960s detected DDT, PCBs and other persistent, bioaccumulative compounds throughout the environment—from marine mammals in the Arctic to the breast milk of tribal women in remote areas of Papua New Guinea—powerfully illustrating the ever-widening reach of industrial chemicals and serving as a major source of motivation for the early environmental movement.⁷²

Enhanced understandings of the global circulation of radionuclides and other toxic substances were matched by a massive expansion of satellite-based Earth observation during the post-World War II period.⁷³ Driven in part by Cold War rivalries,

⁷¹ See George M. Woodwell, *Radioactivity and Fallout: The Model Pollution*, 19 *BIOSCIENCE* 884, 884 (1969) (“Biologically active materials released into the biosphere travel in patterns that are surprisingly well known. A major contribution of atomic energy has been definition of those patterns, using as tracers the radioactivity in fallout from bomb tests.”); George M. Woodwell, *Toxic Substances and Ecological Cycles*, 216 *SCI. AM.*, Mar. 1967, at 24 (discussing contributions of fallout studies to understanding “global, long-term ecological processes that concentrate toxic substances” in the environment). Similarly, John Wargo notes that

[t]he U.S. nuclear weapons program unintentionally produced the very first paradigm for understanding global environmental problems such as climate change, ozone depletion, and mercury contamination in marine food chains. . . . The pattern of discovery that radionuclides persist, move through the atmosphere, follow complex ecological pathways that lead to human exposures, and produce life-threatening health effects became a model for later efforts to understand and manage pollution and hazardous chemicals.

JOHN WARGO, *GREEN INTELLIGENCE: CREATING ENVIRONMENTS THAT PROTECT HUMAN HEALTH*, at xvii (2009).

⁷² See generally H.L. Harrison et al., *Systems Studies of DDT Transport*, 170 *SCI.* 503 (1970) (discussing development and application of systems models for understanding long-term impacts of DDT in ecosystems); S. Jensen et al., *DDT and PCB in Marine Animals from Swedish Waters*, 224 *NATURE* 247 (1969) (discussing early discoveries of DDT and PCBs in marine mammals); David B. Peakall & Jeffrey L. Lincer, *Polychlorinated Biphenyls: Another Long-Life Widespread Chemical in the Environment*, 20 *BIOSCIENCE* 958 (1970) (documenting presence of PCBs in various environmental media and animal tissues); George M. Woodwell et al., *DDT in the Biosphere: Where Does it Go?*, 174 *SCI.* 1101, 1106 (1971) (describing how global modeling supports assessment of the hazards of DDT in the biosphere).

⁷³ See NAT'L RESEARCH COUNCIL, *EARTH OBSERVATIONS FROM SPACE: THE FIRST 50 YEARS OF SCIENTIFIC ACHIEVEMENTS* (2008) [hereinafter *EARTH OBSERVATIONS FROM SPACE*] (reviewing growth of satellite-based Earth observation since the 1950s).

new satellite-based remote sensing capabilities created new “facts on a planetary scale” by allowing particular environmental problems to be comprehended and approached in ways (and at scales) that were previously unattainable.⁷⁴ Atmospheric conditions could now be measured throughout the vertical column of the atmosphere, greatly enhancing the existing ground-based observation system. Such advances allowed stratospheric ozone depletion, for example, to be understood and framed as a problem of global scope.⁷⁵ After some considerable work in transforming the flood of new data into usable formats, satellite-based observations also provided much needed data for ongoing climate modeling efforts.⁷⁶ At the same time, remote sensing enabled the first truly synoptic view of global land cover change, allowing for major advances in understandings of the scale and scope of deforestation and the role of land use in the global carbon cycle.⁷⁷

⁷⁴ See, e.g., *id.* at 1 (discussing the launch of Sputnik in 1957 as a transformative moment for Earth systems science); HAROLD A. MOONEY, *THE GLOBALIZATION OF ECOLOGICAL THOUGHT* 49 (1998) (characterizing remote sensing as “[o]ne of the foremost technological advances in recent decades” in terms of the “amount and quality of information on Earth System processes, at frequent intervals, and at many scales of resolution”); Jasanoff, *supra* note 59, at 45 (discussing efforts of IGY and the Earth sciences to produce “facts on a planetary scale”). To date, only a few environmental law scholars have focused on the role of remote sensing in environmental governance. See, e.g., Daniel C. Esty, *Environmental Protection in the Information Age*, 79 N.Y.U. L. REV. 115, 156–57 (2004) (discussing the role of remote sensing in environmental monitoring); Kenneth J. Markowitz, *Legal Challenges and Market Rewards to the Use and Acceptance of Remote Sensing and Digital Information as Evidence*, 12 DUKE ENVTL. L. & POL’Y F. 219, 219–20 (2002) (“Satellite remote sensing and digital systems, including geographic information systems (GIS), provide powerful tools for visualizing and solving complex legal and environmental problems.”).

⁷⁵ See *EARTH OBSERVATIONS FROM SPACE*, *supra* note 73, at 38–39 (noting the “rudimentary view” of stratospheric ozone distribution provided by ground-based instruments in the “pre-satellite era” compared to the “revolutionized” understanding of atmospheric dynamics, and stratospheric ozone in particular, made possible by satellite instruments); STEPHEN O. ANDERSEN & K. MADHAVA SARMA, *PROTECTING THE OZONE LAYER: THE UNITED NATIONS HISTORY* 5–19 (2002) (discussing advances in Earth systems science and satellite observations that allowed the destruction of the stratospheric ozone layer to be approached as a global environmental problem); SETH CAGIN & PHILIP DRAY, *BETWEEN EARTH AND SKY: HOW CFCs CHANGED OUR WORLD AND ENDANGERED THE OZONE LAYER* 262–76 (1993) (discussing history and importance of satellite-based observations for understanding stratospheric ozone depletion).

⁷⁶ See EDWARDS, *supra* note 47, at 274 (discussing challenges involved in assimilating satellite-based observations into usable global data sets for climate modeling efforts).

Simply put, space-based observations “revolutionized” understandings of the global environment, creating a platform that, along with emerging climate models, allowed the Earth to be viewed as an integrated system.⁷⁸

It is easy to take all of this for granted today; to forget the qualitatively different forms of knowledge entailed by these developments when compared to previous understandings of transboundary environmental problems. Based on exponential increases in computing power, climate models today can achieve resolutions that are orders of magnitude greater than those of early models from the 1960s⁷⁹ – allowing us to see the past, present, and future of the climate system as a single ontological whole. Likewise, remote sensing capabilities now provide real-time data

⁷⁷ See, e.g., EARTH OBSERVATIONS FROM SPACE, *supra* note 73, at 84 (“The advent of satellite data has revolutionized our ability to characterize global land cover and monitor land-use patterns. Satellite sensors offer a synoptic view of Earth, as well as the objectivity associated with a consistent measurement and methodology for mapping the entire planet.”); Boyd, *supra* note 40 at 884–91 (summarizing key developments in remote sensing of land cover change); Ruth DeFries, *Terrestrial Vegetation in the Coupled Human-Earth System: Contributions of Remote Sensing*, 33 ANN. REV. ENV'T & RESOURCES 369, 383 (2008) (“The synoptic view from remote sensing has transformed the perceived role of terrestrial vegetation in the [Earth] system.”).

⁷⁸ See, e.g., WILL STEFFEN ET AL., GLOBAL CHANGE AND THE EARTH SYSTEM: A PLANET UNDER PRESSURE 271 (2004) (“Observation of the Earth from space has revolutionised human perspectives and understanding of the planet . . .”). James McCarthy makes a similar point:

[o]ver the past three decades, a broad array of Earth-orbiting satellite sensors and systems have evolved from proof of concept to operational missions and have totally transformed research approaches in many branches of the atmospheric, oceanic, and ecological sciences. . . . Satellite sensors and systems now provide observational capabilities across the Earth sciences with entirely new dimensions. Today we have geographic continuity in data that was unimaginable a generation ago.

James J. McCarthy, *Reflections on: Our Planet and Its Life, Origins, and Futures*, 326 SCI. 1646, 1650 (2009).

⁷⁹ See Daniel A. Farber, *Modeling Climate Change and its Impacts: Law, Policy, and Science*, 86 TEX. L. REV. 1655, 1698 (2008) (providing a general overview of climate models and noting the importance of understanding the uncertainties and limits associated with climate models); Hervé Le Treut et al., *Historical Overview of Climate Change Science*, in CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS, CONTRIBUTION OF WORKING GROUP I TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 2, at 112–18 (providing an overview of the development of climate modeling and the increased complexity and resolution made possible by advances in computational capacity); see also Leo J. Donner & William G. Large, *Climate Modeling*, 33 ANN. REV. ENV'T & RESOURCES 1 (2008) (reviewing current state of climate modeling).

on global atmospheric conditions and land-cover change across the entire globe, while new “active” remote sensing applications allow for three-dimensional biomass mapping across the Earth’s ecosystems.⁸⁰ At the micro level, instruments can now detect chemicals in the environment and human tissues at the parts per quadrillion level.⁸¹

Living in an age of global environmental assessment, we have grown accustomed to a rapidly expanding knowledge base regarding the environmental health of the planet.⁸² From the IPCC reports on climate change⁸³ to the Millennium Ecosystem Assessment,⁸⁴ these large-scale assessments have allowed us to recognize new facts about the global environment, providing a powerful impetus for framing particular global problems—biodiversity loss, stratospheric ozone depletion, climate change, deforestation, persistent organic pollutants—that has in turn underwritten a push for new global forms of environmental

⁸⁰ See, e.g., Gregory P. Asner et al., *High-Resolution Forest Carbon Stocks and Emissions in the Amazon*, 107 PROC. NAT’L ACAD. SCI. 16738, 16738 (2010) (reporting on use of high-resolution mapping of carbon stocks and emissions in the Amazon region); Gregory P. Asner, *Tropical Forest Carbon Assessment: Integrating Satellite and Airborne Mapping Approaches*, 4 ENVTL. RES. LETTERS 1, 2–8 (2009) (discussing opportunities to combine satellite-based remote sensing with new airborne techniques for measuring carbon densities to develop high-resolution carbon maps); Boyd, *supra* note 40, at 879 (discussing application of remote sensing technologies to forest carbon mapping).

⁸¹ See, e.g., Ken Sexton et al., *Human Biomonitoring of Environmental Chemicals*, 92 AM. SCI. 38, 40 (2004) (“Specialists can now detect extremely low levels—parts-per-billion, parts-per-trillion, even parts-per-quadrillion—of multiple markers using a relatively small sample, say, 10 milliliters or less.”).

⁸² See William C. Clark et al., *Evaluating the Influence of Global Environmental Assessments*, in GLOBAL ENVIRONMENTAL ASSESSMENTS: INFORMATION AND INFLUENCE 1, 2–6 (Ronald B. Mitchell et al. eds., 2006) (discussing growth and influence of large-scale “global environmental assessments” over the last several decades as important components of international environmental governance).

⁸³ See, e.g., INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, FOURTH ASSESSMENT REPORT: CLIMATE CHANGE 2007 (2007).

⁸⁴ UNITED NATIONS MILLENNIUM ECOSYSTEM ASSESSMENT BOARD, ECOSYSTEMS AND HUMAN WELL-BEING: CURRENT STATE AND TRENDS, VOLUME 1, THE MILLENNIUM ECOSYSTEM ASSESSMENT REPORT SERIES (2005); UNITED NATIONS MILLENNIUM ECOSYSTEM ASSESSMENT BOARD, ECOSYSTEMS AND HUMAN WELL-BEING: SCENARIOS, VOLUME 2, THE MILLENNIUM ECOSYSTEM REPORT SERIES (2005); UNITED NATIONS MILLENNIUM ECOSYSTEM ASSESSMENT BOARD, ECOSYSTEMS AND HUMAN WELL-BEING: POLICY RESPONSES, VOLUME 3, THE MILLENNIUM ECOSYSTEM REPORT SERIES (2005).

governance.⁸⁵ By structuring our basic understandings of such problems and by providing new institutional frameworks for international collaboration, these new ways of seeing have profoundly shaped our views regarding the possibilities for response.

2.2. *The Project of Earth Systems Governance*

Understanding the Earth as a single integrated system combined with the recognition that human beings are altering biogeophysical systems on a planetary scale has fostered a deep commitment to particular forms of global environmental governance over the past several decades. This distinctive approach—what some are now referring to as “Earth systems governance”⁸⁶—is not entirely novel, of course. In its basic orientation, it shares a great deal with the high-modernist, technocratic visions that have animated state projects of various kinds throughout the last century,⁸⁷ and can be seen as a logical extension of the early 20th century progressive program for natural resources management with its strong endorsement of rationalization, efficiency, and expertise.⁸⁸

⁸⁵ See Clark et al., *supra* note 59, at 22–26 (describing the evolution of knowledge of the Earth system during the twentieth century and related efforts to “manage” global environmental problems).

⁸⁶ Earth system governance has been defined

as the interrelated and increasingly integrated system of formal and informal rules, rule-making systems, and actor-networks at all levels of human society (from local to global) that are set up to steer societies towards preventing, mitigating, and adapting to global and local environmental change and, in particular, earth system transformation, within the normative context of sustainable development.

FRANK BIERMANN ET AL., *EARTH SYSTEM GOVERNANCE: PEOPLE, PLACES AND THE PLANET: SCIENCE AND IMPLEMENTATION PLAN OF THE EARTH SYSTEM GOVERNANCE PROJECT 4* (2009). Though its lineage is much older, the concept has gained currency in the contemporary period through the work of the multi-disciplinary human dimensions of global change research community. See, e.g., Frank Biermann et al., *Navigating the Anthropocene: The Earth System Governance Strategy Paper*, 2 CURRENT OPINION IN ENVTL. SUSTAINABILITY 202, 203 (2010) (describing new Earth System Governance Project of the International Human Dimensions Program on Global Environmental Change).

⁸⁷ See SCOTT, *supra* note 45 (discussing various “high-modernist” state schemes to refashion and make “legible” various aspects of society and environment).

⁸⁸ See generally SAMUEL P. HAYS, *CONSERVATION AND THE GOSPEL OF EFFICIENCY: THE PROGRESSIVE CONSERVATION MOVEMENT, 1890–1920* (1959) (chronicling the

What is new about this late twentieth and early twenty-first century approach to problems of Earth systems disruption, however, is the imperative of globalism that inheres in the basic framing, the notion that human and biogeophysical systems are tightly coupled, the recognition that human activity is pushing the Earth system outside of its “natural” operating state, and the resulting conviction that global environmental problems are best resolved through supra-national regimes.⁸⁹ “Managing Planet Earth,” as the title of *Scientific American* put it in 1989, leads almost naturally to a commitment to new international institutions capable of mitigating transboundary environmental harms and protecting the global commons.⁹⁰

Without question, the most successful application of this approach has been the Montreal Protocol regime to protect the stratospheric ozone layer.⁹¹ Based on conceptual advances in atmospheric chemistry and the deployment of satellite-based observations, which “revolutionized” the understanding of ozone dynamics in the upper atmosphere,⁹² the stratospheric ozone layer emerged as an object of worldwide concern in the late 1970s. By

dominant role of experts and the quest for rationalization and efficiency during the progressive conservation era).

⁸⁹ See David John Frank, *Science, Nature, and the Globalization of the Environment, 1870–1990*, 76 SOC. FORCES 409, 411 (1997) (asserting that a substantial increase in international environmental treaties “was catalyzed in part by a conceptual reconstitution of the entity ‘nature’. . . [as] a natural system with planet-wide interdependencies”).

⁹⁰ According to William Clark,

[i]t is as a global species that we are transforming the planet. It is only as a global species—pooling our knowledge, coordinating our actions and sharing what the planet has to offer—that we may have any prospect for managing the planet’s transformation along pathways of sustainable development. Self-conscious, intelligent management of the earth is one of the great challenges facing humanity as it approaches the 21st century.

William C. Clark, *Managing Planet Earth*, 261 SCI. AM., Sept. 1989, at 47; see also Peter M. Vitousek et al., *Human Domination of Earth’s Ecosystems*, 277 SCI. 494, 499 (1997) (“[H]umanity’s dominance of Earth means that we cannot escape responsibility for managing the planet. . . . Maintaining populations, species, and ecosystems in the face of those changes, and maintaining the flow of goods and services they provide humanity, will require active management for the foreseeable future.”).

⁹¹ Montreal Protocol on Substances that Deplete the Ozone Layer, 26 I.L.M. 1541 (1987) [hereinafter Montreal Protocol].

⁹² See EARTH OBSERVATIONS FROM SPACE, *supra* note 73, at 38–39 (discussing role of satellite-based observations in revolutionizing understanding of stratospheric ozone dynamics).

the early 1990s, the international community had fashioned a comprehensive legal instrument that allocated responsibility for the problem among key countries and proved flexible enough to accelerate the phase-out of ozone-depleting substances after evidence emerged that there was a gaping seasonal hole in the ozone layer over Antarctica—illustrating the power of Earth systems science in facilitating international environmental lawmaking.⁹³ The Montreal Protocol has thus been widely and rightly praised as the first successful instance of international cooperation aimed at managing a truly global environmental problem.

Building on the Montreal Protocol experience, both the United Nations Framework Convention on Climate Change (“UNFCCC”) and the Kyoto Protocol sought to carry forward the agenda of Earth systems governance, embracing the overarching goal of managing anthropogenic influences on the Earth’s climate system in a comprehensive fashion.⁹⁴ Thus, the key objective of the UNFCCC—“stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system”⁹⁵—combined with the Kyoto Protocol’s multi-gas,⁹⁶ multi-sector regime⁹⁷ directed at all major sources, sinks, and reservoirs of greenhouse gases⁹⁸ bears witness to a fundamental commitment to global environmental managerialism. The Bali Action Plan, the Copenhagen Accord, and the Cancún Agreement all seek to carry this forward, embracing the ultimate objective of reducing global

⁹³ See RICHARD ELLIOT BENEDICK, *OZONE DIPLOMACY: NEW DIRECTIONS IN SAFEGUARDING THE PLANET* 108–17, 163–217 (1998) (discussing new urgency associated with advances in the assessment of ozone depletion, with specific attention to the Antarctic ozone “hole,” and chronicling the response by the Parties to the Montreal Protocol to strengthen the instrument and accelerate the phase-out of ozone depleting substances); ANDERSON & SARMA, *supra* note 75, at 13–19 (discussing discovery and measurement of the Antarctic ozone “hole”).

⁹⁴ United Nations Framework Convention on Climate Change, June 12, 1992, 1771 U.N.T.S. 107 [hereinafter UNFCCC]; Kyoto Protocol, *supra* note 31.

⁹⁵ UNFCCC, *supra* note 94, art. 2.

⁹⁶ See Kyoto Protocol, *supra* note 31, art. 3.1, annex A (“The Parties included in Annex I shall, individually or jointly, ensure that their aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A do not exceed their assigned amounts . . .”).

⁹⁷ See *id.* annex A (identifying sectors that will be subject to emissions reductions requirements for Annex I Parties).

⁹⁸ *Id.* arts. 2–3.

emissions in order to achieve stabilization targets and calling for a comprehensive, multi-sector approach to the problem.⁹⁹

Of course, other powerful crosscutting norms and principles have shaped, and continue to shape, the international climate regime (such as it is). Principles of equity and common but differentiated responsibilities,¹⁰⁰ national sovereignty,¹⁰¹ polluter pays,¹⁰² sustainable development,¹⁰³ and precaution¹⁰⁴ are all present in the Framework Convention, the Kyoto Protocol, and the various efforts directed at a new post-2012 instrument. Like all consent-based international agreements, the climate regime reflects the push and pull of various state actors and interests. But underneath all of these, this Article contends, lies a particular way of understanding the climate problem that carries with it a natural affinity for globalist solutions.

⁹⁹ See UNFCCC, Rep. of the Conference of the Parties, Thirteenth Session, Dec. 3-15, 2007, *Decision 1/CP.13: Bali Action Plan*, ¶ 1(a), U.N. Doc. FCCC/CP/2007/6/Add.1 (Mar. 14, 2008) [hereinafter *Bali Action Plan*] (establishing an action plan to develop a new legal instrument that would incorporate “[a] shared vision for long-term cooperative action, including a long-term global goal for emission reductions, to achieve the ultimate objective of the Convention, in accordance with the provisions and principles of the Convention, in particular the principle of common but differentiated responsibilities and respective capabilities, and taking into account social and economic conditions and other relevant factors”); *Copenhagen Accord*, *supra* note 24 (endorsing the need for continued international action to combat climate change); *Cancún Agreement*, *supra* note 24, para. 1 (affirming “that climate change is one of the greatest challenges of our time and that all Parties share a vision for long-term cooperative action in order to achieve the objective of the Convention, under its Article 2”).

¹⁰⁰ See UNFCCC, *supra* note 94, pmb., para. 6, arts. 3.1, 4.1 (acknowledging that participation in the response to climate change should be on the basis of equity and common but differentiated responsibilities); Kyoto Protocol, *supra* note 31, art. 10 (reaffirming principle of “common but differentiated responsibilities” for determining commitments under the Protocol).

¹⁰¹ See UNFCCC, *supra* note 94, pmb., paras. 8-9 (reaffirming principle of state sovereignty).

¹⁰² See *id.* pmb., para. 3 (noting that the developed countries are responsible for the largest share of historical and contemporary emissions of greenhouse gases); Kyoto Protocol, *supra* note 31, arts. 3, 10 (establishing new commitments for Annex I Parties while nothing that the Protocol does not introduce any new commitments for non-Annex I parties).

¹⁰³ See *id.* art. 3.4 (“Parties have a right to, and should, promote sustainable development.”); Kyoto Protocol, *supra* note 31 art 2.1, (discussing objective of promoting sustainable development).

¹⁰⁴ See UNFCCC, *supra* note 94, art. 3.3 (“The Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects.”).

None of which is intended to question the tremendous value that stems from our ability to see and understand environmental problems on a planetary scale. The point of this Article is not to suggest that such understandings are problematic on their own terms. Rather, the point is to recognize and explore the difficulties that arise when such understandings are applied uncritically as a template or roadmap for governance. As the Brundtland Report pointed out more than two decades ago: "The Earth is one but the world is not."¹⁰⁵ Between these two phrases lies much of the dilemma that has haunted modern international environmental law since its inception.

But it is a dilemma that has escaped sustained engagement precisely because it is anathema to the very premise (and promise) of international environmental law: that the world can somehow be brought together in the face of global environmental threats to act as one through consent-based treaty regimes among state actors.¹⁰⁶ The achievements of the Montreal Protocol reinforced this conviction, deflecting attention away from the fact that the relatively simple and unique circumstances that underwrote the Montreal Protocol's success provide limited lessons for the far more challenging task of negotiating an effective international instrument to deal with global climate change. More important, this conviction fails to acknowledge basic questions of political

¹⁰⁵ WORLD COMM'N ON ENV'T AND DEV., OUR COMMON FUTURE 27 (1987). The Brundtland Report echoed, in many ways, earlier work on global environmental disruption.

In short, the two worlds of man—the biosphere of his inheritance, the technosphere of his creation—are out of balance, indeed potentially in deep conflict. And man is in the middle. This is the hinge of history at which we stand, the door of the future opening on to a crisis more sudden, more global, more inescapable, and more bewildering than any ever encountered by the human species and one which will take decisive shape within the life span of children who are already born.

BARBARA WARD & RENÉ DUBOS, ONLY ONE EARTH: THE CARE AND MAINTENANCE OF A SMALL PLANET 12 (1972)

¹⁰⁶ The Stockholm Declaration from the 1972 U.N. Conference on the Human Environment made the point explicit: "A growing class of environmental problems, because they are regional or global in extent or because they affect the common international realm, will require extensive co-operation among nations and action by international organizations in the common interest." United Nations Conference on the Human Environment, Stockholm, Swed., June 5-16, 1972, *Declaration of the United Nations Conference on the Human Environment*, ch. 1, para. 7, June 16, 1972, U.N. Doc. A/CONF.48/14/Rev.1 [hereinafter *Stockholm Declaration*].

economy that are marginalized by the overall approach—questions about fairness and distribution, questions about politics and participation, questions about responsibility and underlying drivers of environmental disruption—all of which have been reposed, to a large extent, as technical (often legal) matters for state parties and the international bureaucrats who serve them.¹⁰⁷

This process of turning questions of politics and political economy into technical issues reflects a basic orientation in international law and other expert discourses.¹⁰⁸ The project of

¹⁰⁷ The more recent turn to “sustainable development,” made popular by the Brundtland Report and codified in the Rio Declaration, reinforces this managerial ethos. See WORLD COMM’N ON ENV’T AND DEV., *supra* note 105, at 49–65 (discussing strategic imperatives of the effort to operationalize sustainable development); United Nations Conference on Environment and Development, Rio de Janeiro, Braz., June 3–14, 1992, *Rio Declaration on Environment and Development*, U.N. Doc. A/CONF.151/26/Rev.1 (Vol. I), Annex I (Aug. 12, 1992) (promoting sustainable development and related principles as overarching objectives of international environmental law).

¹⁰⁸ See *infra* Section 2.3. In the context of international law, Martti Koskenneimi makes the point directly:

The great achievement of Lauterpacht and his generation was to create space for progressive law outside the vocabularies of nationhood. That achievement came at a cost. Thinking about international law in apolitical and technical terms opened the door for expert rule and managerialism, not in competition with politics as in the domestic realm, but as a *substitute* for it. What we now see is an international realm where law is everywhere—the law of this or that regime—but no politics at all; no parties with projects to rule, no division of powers, and no aspiration of self-government beyond the aspiration of statehood—aspirations identified precisely as what we should escape from. Managerialism was the dark side of the inter-war project of imagining international law in technical terms.

Martti Koskenneimi, *The Fate of Public International Law: Between Technique and Politics*, 70 MOD. L. REV. 1, 29 (2007). There is a rich social science literature exploring how questions of development and state projects of “improvement” are built upon similar processes of rendering questions of politics and political economy as technical issues reserved for experts. See, e.g., JAMES FERGUSON, *THE ANTI-POLITICS MACHINE: “DEVELOPMENT,” DEPOLITICIZATION, AND BUREACRATIC POWER IN LESOTHO* 256 (1994) (showing how the international “development apparatus” operates as “the principal means through which the question of poverty is de-politicized in the world today”); LI, *supra* note 46, at 7 (“Questions that are rendered technical are simultaneously rendered nonpolitical.”); TIMOTHY MITCHELL, *RULE OF EXPERTS: EGYPT, TECHNO-POLITICS, MODERNITY* 15 (2002) (discussing the pervasive role of technical expertise in articulating programs of national development and economic growth during the twentieth century); NIKOLAS ROSE, *POWERS OF FREEDOM: REFRAMING POLITICAL THOUGHT* 205 (1999) (“When . . . numbers are used as ‘automatic pilots’ in decision making they transform the thing being measured—segregation, hunger, poverty—into its statistical indicator and displace political disputes into technical disputes about

Earth systems governance takes this to a new level. Given the sheer intellectual and institutional complexity of the task, it is a project reserved by default for experts—a nascent example, perhaps, of what Michel Foucault called “governmentality”—a particular style of government built upon specific knowledge practices that have made the Earth system into a thinkable, governable domain.¹⁰⁹

As such, it can be viewed as a manifestation of the utopian impulse of modern international law—a noble project aimed at corralling and civilizing wayward nation states toward the collective resolution of seemingly intractable problems that clearly exceed the capacities of any single government.¹¹⁰ Noble as it is, however, at least two nagging concerns need to be confronted. First, there are strong anti-democratic undercurrents apparent in much of the expert discourse over global environmental problems—reflecting a tendency, one might argue, toward a permanent state of exception.¹¹¹ Garrett Hardin, whose famous

methods.”); SCOTT, *supra* note 45, at 4–5 (describing modern “statecraft” as resting on projects aimed at simplification and legibility).

¹⁰⁹ See Michel Foucault, *Governmentality*, in THE FOUCAULT EFFECT: STUDIES IN GOVERNMENTALITY 87, 102 (Graham Burchell et al. eds., 1991) (deploying the notion of “governmentality” to capture an approach to government that first emerged in the 18th century, “which has as its target population, as its principal form of knowledge political economy, and as its essential technical means apparatuses of security”); see also Eva Lövbrand et al., *Earth System Governmentality: Reflections on Science in the Anthropocene*, 19 GLOBAL ENVTL. CHANGE 7 (2009) (analyzing Earth systems governance as an example of governmentality); Nikolas Rose et al., *Governmentality*, 2 ANN. REV. L. & SOC. SCI. 83 (2006) (surveying the development of Foucault’s ideas on governmentality and recent work in a variety of fields making use of the concept).

¹¹⁰ Cf. MARTTI KOSKENNIEMI, FROM APOLOGY TO UTOPIA: THE STRUCTURE OF INTERNATIONAL LEGAL ARGUMENT (2005) (discussing utopian impulses embedded within the structure of certain strands of international legal argument); MARTTI KOSKENNIEMI, THE GENTLE CIVILIZER OF NATIONS: THE RISE AND FALL OF INTERNATIONAL LAW 1870–1960 (2002) (tracing the liberal, “civilizing” impulse of modern international law from its formative late 19th century roots through its mid-twentieth century decline).

¹¹¹ See GIORGIO AGAMBEN, HOMO SACER: SOVEREIGN POWER AND BARE LIFE 6–12 (1998) (discussing the centrality of “bare life” to sovereign power and modern trend toward permanent state of exception). The general point was made in compelling fashion by a Brazilian participant at one of the public hearings held by the Brundtland Commission in its preparations for OUR COMMON FUTURE:

You talk very little about life, you talk too much about survival. It is very important to remember that when the possibilities for life are over, the possibilities for survival start. And there are peoples here in Brazil,

1968 article *The Tragedy of the Commons*¹¹² arguably serves as the *locus classicus* for global environmental concern, asserted shortly after that article that in the absence of “world government that is sovereign in reproductive matters,” humankind is headed for certain ruin in the form of global ecological crisis.¹¹³ Echoing the strong neo-Malthusian claims of the day,¹¹⁴ Hardin’s views acknowledge the strong possibility (even necessity) of a biopolitical project of exception. More recently, James Lovelock, progenitor of the famous Gaia hypothesis—a sort of new age packaging of the Earth system concept—stated emphatically that the nature of our current ecological crisis “may require . . . the suspension of democratic government for the duration of the survival emergency.”¹¹⁵ One does not have to look far to find other examples.¹¹⁶ And while these may be extreme positions—mere

especially in the Amazon region, who still live, and these peoples that still live don’t want to reach down to the level of survival.

WORLD COMM’N ON ENV’T AND DEV., *supra* note 105, at 40. Shelia Jasanoff sees in the observation of this nameless Brazilian

an eloquent critique of modern biopolitics . . . Policy-makers concerned with survival, this speaker from Brazil seems to say, will not be bothered by the fates of living individuals in real communities. This is why, from the standpoint of those ‘who still *live*,’ it is a sort of demotion, a ‘reaching down,’ to become a cipher in a calculus concerned only with the nameless, faceless challenge of planetary survival.

Shelia Jasanoff, *A New Climate for Society*, 27 THEORY, CULTURE & SOC’Y 233, 239 (2010).

¹¹² Garrett Hardin, *The Tragedy of the Commons*, 162 SCI. 1243 (1968).

¹¹³ Garrett Hardin, *Living on a Lifeboat*, 24 BIOSCIENCE 561, 568 (1974). Elinor Ostrom, among others, has criticized Hardin’s presumption that centralized authority is necessary to avoid tragedies of the commons, and her research has demonstrated in multiple cases the adaptive governance strategies of common property regimes. See ELINOR OSTROM, GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION 9 (1990) (“The presumption that an external Leviathan is necessary to avoid tragedies of the commons leads to recommendations that central governments control most natural resource systems.”); *id.* at 216 (“The models that social scientists tend to use for analyzing CPR [common property resource] problems have the perverse effect of supporting increased centralization of political authority.”).

¹¹⁴ See, e.g., PAUL R. EHRLICH, THE POPULATION BOMB (1971) (discussing the dangers of uncontrolled population growth).

¹¹⁵ See JAMES LOVELOCK, THE VANISHING FACE OF GAIA: A FINAL WARNING 61 (2009) (asserting that “orderly survival . . . may require, as in war, the suspension of democratic government for the duration of the survival emergency”).

¹¹⁶ See, e.g., ROBERT L. HEILBRONER, AN INQUIRY INTO THE HUMAN PROSPECT 106 (1980) (“For the majority of capitalist nations, however, I do not see how one can

anecdotes that do not reflect widely held views—they highlight the importance of examining carefully the implications of a seemingly permanent environmental crisis couched in terms of a project aimed at managing planet Earth for anyone concerned with the task of building structures and institutions capable of responding to such a crisis in a manner that remains accountable and open to meaningful participation.

The second concern, while less conspiratorial in nature, is ultimately much more fundamental: it's not working! As Gus Speth, a major participant in the making of both U.S. and international environmental law, writes:

[t]hus far, the climate convention is not protecting climate, the biodiversity convention is not protecting biodiversity, the desertification convention is not preventing desertification, and even the older and stronger Convention on the Law of the Sea is not protecting fisheries. Nor are they poised to do so in the immediate future. The same can be said for the extensive international discussions on world forests, which never have reached the point of a convention. International environmental law has had its successes These successes have tended to be narrow in focus or regional in scope. No blanket condemnation of international environmental law is appropriate. But the bottom line is that on the big issues the trends of deterioration continue. With few exceptions, our instrument of choice, international environmental law, is not yet changing them, and the hour is late.¹¹⁷

Speth's lament on the failures of international environmental law fingers a number of culprits, but one of the more important is the notion that framing a particular problem in a certain way—as one of desertification or biodiversity or climate change—has, when combined with the preferences of international law for the

avoid the conclusion that the required transformation will be likely to exceed the capabilities of representative democracy.”); WILLIAM OPHULS & A. STEPHEN BOYAN JR., *ECOLOGY AND THE POLITICS OF SCARCITY REVISITED: THE UNRAVELING OF THE AMERICAN DREAM* 215 (1992) (“[T]he steady-state society will not only be ostensibly more authoritarian and less democratic than the industrial societies of today . . . , but it may also be more oligarchic as well”); see also ANNA BRAMWELL, *ECOLOGY IN THE 20TH CENTURY: A HISTORY* (1989) (discussing the complex politics of ecological movements in the 20th century).

¹¹⁷ SPETH, *supra* note 28, at 96.

Convention-Protocol model, translated into efforts to build legal regimes around these problems in a manner that tends to address symptoms and surface issues rather than deeper, underlying causes of environmental disruption.¹¹⁸ The result has been weak, ineffectual treaties, and, in Speth's view, a lot of time wasted failing to prepare for action.¹¹⁹ To be sure, there has always been a certain poverty of imagination when it comes to alternatives and it may well turn out that, in the "final analysis" as they say, this is the best we can do.¹²⁰ For his part, Speth articulates several complementary alternatives, from radical reform of existing international environmental institutions and lawmaking to an enthusiastic embrace of what he calls "green JAZZ."¹²¹ Old governance and new, it seems, both have a role to play in trying to move environmental law forward in the face of a world that is exceedingly complicated and messy.

2.3. *Implications for Environmental Law*

The "touchstone" of environmental law, according to Richard Lazarus, is "ecological injury caused by human activity."¹²² "Broadly stated," says Lazarus, "environmental law regulates human activity in order to limit ecological impacts that threaten public health and biodiversity."¹²³ It regulates, or seeks to regulate, in other words, the process of "ecological transformation"—an effort that "includes regulating the *extent* of transformation, its geographic *location*, and, at least as important, its *pace*."¹²⁴ Ecological injuries thus have distinctive spatial and temporal scales, and, as virtually everyone knows, these "spatial

¹¹⁸ See, e.g., *id.* at 102 (concluding that treaty-protocol model of international environmental law fails to address the underlying nature of the problem at issue).

¹¹⁹ See *id.* (identifying problems of international environmental law as stemming in part from too many conventions trying to address too many environmental issues that in turn "gives rise to coordination problems, limits on participation . . . and various inefficiencies").

¹²⁰ See *id.* at 101 (noting the "failure of imagination" regarding alternatives to the dominant "treaty-protocol" approach of international environmental law).

¹²¹ See *id.* at 173 (describing the JAZZ approach as one in which "people and businesses create a world full of unscripted, voluntary initiatives that are decentralized and improvisational").

¹²² RICHARD J. LAZARUS, *THE MAKING OF ENVIRONMENTAL LAW* 1 (2004).

¹²³ *Id.*

¹²⁴ *Id.* at 8.

and temporal scales . . . have increased from the local and regional to the global.”¹²⁵

All of which maps neatly onto the standard history of U.S. environmental law. In the beginning, there were limited common law actions, primarily nuisance cases, dealing with seemingly discrete problems of industrial pollution. As common law judges sought to balance the needs of a rapidly industrializing society with the social costs of pollution, the limits of the common law became apparent, giving way to local and state regulation, sometimes with federal financial assistance, aimed at solving increasingly regional pollution problems. This, too, soon proved inadequate in the face of the intensification and growing spatial extent of ecological disruption, providing the basis for the federalization of pollution control embodied in statutes such as the Clean Air Act and the Clean Water Act and built upon a model of cooperative federalism and an ever-expanding administrative state. Finally, we end with the inevitable recognition that many of our most pressing and intractable environmental problems are global in scope and thus demand supra-national forms of governance.¹²⁶

There is nothing incorrect in the way that the standard history recounts the basic facts. Like any good functionalist understanding of law, it describes well enough what happened. But there is something incomplete in how the story ends that stems from a tendency to naturalize the issue of scale. In other words, the standard narrative of environmental law—that ever larger problems require moving to higher levels of governance—contains within it a certain teleology that derives in large part from our ways of understanding environmental problems, our assumptions about scale, and what Elinor Ostrom identifies as an uncritical acceptance of the conventional theory of collective action.¹²⁷

¹²⁵ *Id.* at 9. As Lazarus continues, “[w]e have traveled far beyond merely scratching the surface of the planet’s ecosystem. Today we are ‘altering the fundamental flows of chemicals and energy that sustain life,’ and ‘no ecosystem on earth’s surface is free of pervasive human influence.’” *Id.*

¹²⁶ See, e.g., ROBERT V. PERCIVAL ET AL., ENVIRONMENTAL REGULATION: LAW, SCIENCE AND POLICY 61–84 (6th ed. 2009) (discussing the evolution from common law to federal environmental laws in the context of air and water pollution).

¹²⁷ As Ostrom notes,

[t]he applicability of the conventional theory [of collective action] is considered so obvious by many scholars that few questions have been raised about whether this is the best theoretical foundation for making

Recognizing that virtually every major environmental problem has turned out to be more expansive than first understood, with “spillover effects” and “commons problems” providing the dominant framings for the extra-jurisdictional reach of various problems, leads naturally under the standard account to the conclusion that environmental regulation and governance can (or at least should) “scale up” in response to such problems such that the appropriate level of governance is “matched” to the scale of the problem.¹²⁸ As Professor Lazarus puts it when talking about global environmental change: “the nature of the ecological problems to be addressed compels the construction of an international institutional framework for lawmaking and implementation . . .”¹²⁹

real progress toward substantially reducing greenhouse gas emissions and taking other actions to reduce the threat of massive harm brought about by climate change.

Ostrom, *supra* note 29, at 9. Ostrom goes on to point out the general lack of empirical support for the conventional theory in a variety of contexts and argues for a more contextual approach to collective action related to climate change that recognizes the value of “polycentric” approaches to solving complex social dilemmas and the pathologies embedded in the view that the nature of the climate problem requires a “global solution.” *Id.* at 4–13; *see also* Hari M. Osofsky, *Is Climate Change “International”? Litigation’s Diagonal Regulatory Role*, 49 VA. J. INT’L L. 585 (2009) (discussing issues of scale in climate governance).

¹²⁸ *See* Henry N. Butler & Jonathan R. Macey, *Externalities and the Matching Principle: The Case for Reallocating Environmental Regulatory Authority*, 14 YALE L. & POL’Y REV. 23, 25 (1996) (“The Matching Principle suggests that, in general, the size of the geographic area affected by a specific pollution source should determine the appropriate governmental level for responding to the pollution.”). Jeffrey Dunhoff remarks similarly that

much of the rational choice-influenced literature attempts to ‘match’ the scope or level of regulatory authority with the scope or level of the underlying environmental problem. Hence, the focus is primarily on the ‘vertical’ dimensions of governance, and the central inquiry is whether environmental problems are best addressed through more centralized (say, international or national) or less centralized (say, national or provincial) governance mechanisms.

Dunhoff, *supra* note 35, at 90.

¹²⁹ LAZARUS, *supra* note 122, at 235; *see also* Daniel C. Esty, *Revitalizing Environmental Federalism*, 95 MICH L. REV. 570, 593, 626–27 (1996) (“The presence of a transboundary harm demands some form of overarching governmental action across the scope of the harm.”). *But see* Thomas W. Merrill, *Golden Rules for Transboundary Pollution*, 46 DUKE L.J. 931, 932 (1997) (“When one examines existing environmental regimes more closely, however, a paradox emerges. Notwithstanding the broad general trend toward centralized regulatory authority in environmental law, and the widespread invocation of transboundary pollution as a justification for this trend, little meaningful regulation of transboundary pollution actually exists.”).

Taken to its logical conclusion, such a view leads to a preference for more hard law and more government at increasingly higher levels, manifest most prominently in calls for the creation of a new world environment organization that possesses the tools and the authority to deal with problems that are global in scale.¹³⁰ The project of Earth systems governance and the related effort to establish a comprehensive international regime to combat global climate change represent the apotheosis of this approach.

But does anyone really expect to see a new world environment organization with teeth anytime soon? Short of that, does anyone really expect a new, post-Kyoto climate treaty that will include all major emitters *and* impose a common regulatory architecture that could dictate, much less enforce, national level commitments and actions? If anything, the Copenhagen conference brought home in no uncertain terms what many had already come to accept—that a top-down, Kyoto-type architecture for dealing with global climate change is simply out of reach for the foreseeable future.¹³¹ Even under the best circumstances, a ripening of the Copenhagen Accord and the recently adopted Cancún Agreement into a new legal instrument will still be built upon a plural, pledge-and-review architecture that translates, at best, into a series of loosely linked compliance systems supported by robust international monitoring, reporting, and verification (“MRV”). Moreover, even if the UNFCCC parties are somehow able in the near future to negotiate a comprehensive new treaty that could garner near universal membership, it is obvious that much of the hard work

¹³⁰ See, e.g., A WORLD ENVIRONMENT ORGANIZATION: SOLUTION OR THREAT FOR EFFECTIVE INTERNATIONAL ENVIRONMENTAL GOVERNANCE? (Frank Biermann & Steffen Bauer eds., 2005) (presenting scholarly arguments for and against the creation of a world environment organization); Steve Charnovitz, *A World Environment Organization*, 27 COLUM. J. ENVTL. L. 323 (2002) (arguing for the creation of a world environment organization). Solving global environmental problems, in this view, is often conceived as an enterprise that requires international institutions that can somehow replicate the basic lawmaking and enforcement capabilities that exist at the national level. See, e.g., LAZARUS, *supra* note 122, at 235–36 (concluding that “once the institutional frameworks [are] in place, the increasingly compelling nature of the scientific facts regarding the need for coordinated global action (as witnessed in recent years with the amassed evidence of global climate change) would likely provide the needed impetus for lawmaking and law enforcement to occur”).

¹³¹ There is some historical irony in the fact that the pledge-and-review, schedule-based approach embodied in the Copenhagen Accord echoes earlier proposals by Japan and other countries prior to Kyoto and looks similar to the major emitters process that President George W. Bush initiated.

involved in making such a treaty work will happen at national and sub-national levels. Any way you cut it, climate governance goes deep and will involve multiple legal and normative orders across many different jurisdictions.¹³² All of which underscores the difficult but pressing task of rethinking the conditions of possibility for climate governance in the post-Copenhagen world.

3. GLOBALIZATION AND THE FACT OF FRAGMENTATION

If one accepts the argument thus far (even if only for the sake of argument), efforts to understand and inform climate governance should start from the view that authority is fragmented, plural, and increasingly difficult to harness toward collective global projects. Such an approach differs from traditional ways of thinking about environmental law, which often look first to the nature and scale of the problem and then to the appropriate level of governance and the policy instruments that will achieve optimal fit.¹³³ While this may work fine in terms of prescriptions for ideal design, it does not provide a sound basis for understanding the challenges and opportunities facing environmental governance going forward. Beginning instead with the implications of fragmentation and pluralism for efforts to ground collective action provides a more realistic point of departure for thinking about the prospects for climate governance and the possibilities of global environmental law. This Section explores these issues, building on insights developed by scholars working on the implications of globalization for law and governance, with particular attention to

¹³² Viewed from this perspective, climate governance obviously implicates multi-scalar, diagonal forms of regulation identified by Hari Osofsky and others. See Osofsky, *supra* note 127 (analyzing the multiscale aspects of responses to climate change). Of course, the basic notion of cooperative federalism (and now iterative federalism) speaks directly to the importance of engaging multiple “levels” of governance in the effort to deal with environmental problems. See, e.g., Carlson, *supra* note 22, at 1101 (discussing the dynamic nature of iterative federalism within the environmental context). Several legal scholars have recently emphasized the importance of sub-national actors in plural approaches to climate governance. See, e.g., Judith Resnik et al., *Ratifying Kyoto at the Local Level: Sovereignism, Federalism, and Translocal Organizations of Government Actors (TOGAs)*, 50 ARIZ. L. REV. 709, 726–58 (2008) (discussing the role of “translocalism” in climate governance); Richard B. Stewart, *States and Cities as Actors in Global Climate Regulation: Unitary vs. Plural Architectures*, 50 ARIZ. L. REV. 681 (2008) (arguing in favor of a plural model of climate regulation that allows for multiple regulatory systems); Trisolini, *supra* note 22 (concluding that local governments are important actors in multi-level approach to climate governance).

¹³³ See discussion *supra* Section 1.

the role of the state and market institutions in fashioning effective forms of climate governance in the context of a plural, fragmented legal order.

3.1. *Globalization and Environmental Law*

Much ink (perhaps too much) has been spilled in an effort to demarcate and define “globalization.” This Article will not attempt to summarize this vast, unwieldy literature¹³⁴ other than to echo what others have said before—that, depending on how one defines it, globalization is not a new phenomenon when viewed in historical perspective;¹³⁵ that globalization, though not defined as such, is something that classical social theorists such as Marx and Weber clearly recognized;¹³⁶ that the global has occupied a very prominent place on the agenda of contemporary social science since the mid-1990s;¹³⁷ that the intensification of international flows

¹³⁴ See, e.g., DAVID HELD ET AL., *GLOBAL TRANSFORMATIONS: POLITICS, ECONOMICS, AND CULTURE* (1999) (providing an overview of various strains of globalization studies).

¹³⁵ See, e.g., 3 FERNAND BRAUDEL, *CIVILIZATION AND CAPITALISM 15TH-18TH CENTURY: THE PERSPECTIVE OF THE WORLD* (Siân Reynolds trans., 1984) (emphasizing the importance of a long-term, global perspective on economic history); E.J. HOBBSAWM, *THE AGE OF CAPITAL: 1848-1875*, at 48-68 (1975) (discussing how “the tightening net of the international economy drew even the geographically very remote areas into direct and not merely literary relations with the rest of the world”); IMMANUEL WALLERSTEIN, *THE MODERN WORLD-SYSTEM: CAPITALIST AGRICULTURE AND THE ORIGINS OF THE EUROPEAN WORLD ECONOMY IN THE SIXTEENTH CENTURY* (1974) (linking the rise of capitalism in Europe to the exploitation of the global periphery); see also DAVID SINGH GREWAL, *NETWORK POWER: THE SOCIAL DYNAMIC OF GLOBALIZATION* 18 (2008) (arguing that “[i]t is a rather parochial conceit of contemporary commentators . . . that globalization is something unique to our time”); A. G. Hopkins, *The History of Globalization – and the Globalization of History?*, in *GLOBALIZATION IN WORLD HISTORY* 12 (A.G. Hopkins ed., 2002) (situating contemporary understanding of globalization in historical context).

¹³⁶ See, e.g., KARL MARX AND FREDERICK ENGELS, *THE COMMUNIST MANIFESTO* 39 (Verso ed., 1998) (1848) (“The need of a constantly expanding market for its products chases the bourgeoisie over the whole surface of the globe. It must nestle everywhere, settle everywhere, establish connections everywhere.”); KARL MARX, *GRUNDRISSE: FOUNDATIONS OF THE CRITIQUE OF POLITICAL ECONOMY* 408 (Martin Nicolaus trans., Random House, Inc. 1973) (1858) (“The tendency to create the *world market* is directly given in the concept of capital itself.”); MAX WEBER, *Science as a Vocation*, in *FROM MAX WEBER: ESSAYS IN SOCIOLOGY* 129, 155 (H. H. Gerth & C. Wright Mills, eds., trans., Galaxy Book 1958) (1946) (“The fate of our times is characterized by rationalization and intellectualization and, above all, by the ‘disenchantment of the world.’”).

¹³⁷ See, e.g., *GLOBALIZATION THEORY: APPROACHES AND CONTROVERSIES* (David Held & Anthony McGrew eds., 2007) (presenting various contemporary

of people, goods, capital, technologies, and information does not spell the end of the nation state;¹³⁸ and that lawyers and legal scholars have spent a good deal of time (and spilled a good deal of their own ink) facilitating various aspects of globalization and seeking to understand its implications for law and legal order.¹³⁹

What is clear is that whether viewed in political-economic, institutional, or cultural terms, globalization challenges the traditional division of environmental law into distinct domestic and international spheres—a challenge that environmental law scholarship has recently begun to take up and one that calls for more sustained engagement with the various literatures seeking to make sense of globalization and its implications for law. To that effect, while there is a long tradition of scholarship in international law (public and private) seeking to come to terms with various aspects of globalization and the international legal order, legal scholars and social scientists of various persuasions have recently begun to explore the varied and variable relationships between globalization and law in more direct and ambitious ways. Reflecting the dynamic nature of the field and the ongoing struggle to develop a coherent understanding of globalization and its implications for law (what Sabrina Cassese refers to as a “global

approaches to globalization); ANTHONY GIDDENS, *THE CONSEQUENCES OF MODERNITY* (1990) (identifying globalization as a constitutive feature of the modern world).

¹³⁸ See, e.g., SASSEN, *supra* note 33 (discussing nation-state as a key institution in facilitating globalization).

¹³⁹ As David Kennedy notes

[e]conomic globalization means legal globalization; every crate travels with a packet of rights and privileges, every transfer relies on a network of institutions and rules. The internationalization of politics means the legalization of politics. Every agent of the state, of the city, of the region, acts and interacts on the basis of delegated powers, through the instruments of decision and rule and judgment. Indeed, globalization has *fragmented* both economic and political power, but it has not *delegalized* it.

David Kennedy, *The Mystery of Global Governance*, 34 OHIO N.U. L. REV. 827, 848 (2008). The extensive literature on law and colonialism offers another perspective on the manner in which law has acted as handmaiden to particular processes of globalization. See, e.g., Sally Engle Merry, *Law and Colonialism*, 25 LAW & SOC'Y REV. 889, 917–18 (1991) (discussing multiple ways in which European law contributed to colonialism and capitalist expansion).

legal grammar"¹⁴⁰), these efforts have embraced various labels and pursued different points of entry into the subject.

Thus, at the most general level, a number of scholars have sought to understand and theorize "the globalization of law" or, in more truncated terms, the emergence of "global law" in multiple substantive domains, public and private.¹⁴¹ A key premise of this literature is that the world of national legal orders is giving way to a more globalized society—manifest in the growth of transnational economic activity, the rise of a distinctly global politics, and the increased density of international regulatory regimes—that is calling forth and made possible by a proliferation of global rules, norms, and institutions.¹⁴² Somewhat more specific in approach, Harold Koh and others have advanced the concept of "transnational law and transnational legal process," looking at the ways in which specific norms (human rights norms in Koh's case) get articulated—often by so-called norm entrepreneurs—and then "downloaded, uploaded or transplanted" into various legal systems.¹⁴³ More recently, a growing literature has coalesced

¹⁴⁰ See Sabino Cassese, *The Globalization of Law*, 37 N.Y.U. J. INT'L L. & POL. 973, 987 (2005) ("It is hard to analyze the vertical and horizontal concatenation of national, supranational, and global law because we still do not know the (incomplete, despite being quite developed) global legal 'grammar' . . ."). *But see* David Kennedy, *One, Two, Three, Many Legal Orders: Legal Pluralism and the Cosmopolitan Dream*, 31 N.Y.U. REV. L. & SOC. CHANGE 641, 654 (2007) (criticizing efforts to fashion a unified legal vocabulary as a response to the pluralism of the international legal order).

¹⁴¹ See, e.g., Paul Schiff Berman, *From International Law to Law and Globalization*, 43 COLUM. J. TRANSNAT'L L. 485, 490 (2005) (arguing for an expansive approach to "law and globalization" that recognizes the varied and complex ways that legal norms are constructed and disseminated "in an era when the prerogatives of territorially delimited nation-states, while not completely unimportant, have become less salient than they once were"); Cassese, *supra* note 140, at 973 (discussing different types of legal globalization and their attendant enabling rules); Terence C. Halliday & Pavel Osinsky, *Globalization of Law*, 32 ANN. REV. SOC. 447, 447-48 (2006) (contrasting the "ubiquity of law in the empirical reality of globalization" with the "equivocal status" of law in studies of globalization and outlining key elements for a theory of globalization and law); Robert Howse, *The End of the Globalization Debate: A Review Essay*, 121 HARV. L. REV. 1528, 1550, 1554 (2008) (book review) (highlighting the importance of moving beyond debates over the merits of globalization per se to a focus on the "terms and conditions of global law" and "how the distinctive features of global legal processes . . . structure and constrain a global politics"); Martin Shapiro, *The Globalization of Law*, 1 IND. J. GLOBAL LEGAL STUD. 37 (1993) (emphasizing the limited, partial, and uneven globalization of public and private law).

¹⁴² See sources cited *supra* note 141.

¹⁴³ See, e.g., Harold Hongju Koh, *Transnational Legal Process*, 75 NEB. L. REV. 181, 183-84 (1996) ("Transnational legal process describes the theory and practice

around the concept of “global administrative law,” with particular attention to how principles of administrative law might be used to resolve problems of accountability and “good governance” in the development of supra-national regulatory regimes.¹⁴⁴ Other scholars have focused less on evolving rules and norms than on emerging architectures and forms, attending, for example, to the structures that link different jurisdictions and regulatory systems—“diagonal,” “intersystemic,” and even “dialectical” regulation¹⁴⁵—

of how public and private actors—nation-states, international organizations, multinational enterprises, non-governmental organizations, and private individuals—interact in a variety of public and private, domestic and international fora to make, interpret, enforce, and ultimately, internalize rules of transnational law.”); Harold Hongju Koh, *Why Transnational Law Matters*, 24 PENN ST. INT’L L. REV. 745, 753 (2006) (arguing that “[t]ransnational law represents a kind of hybrid between domestic and international law that can be downloaded, uploaded, or transplanted from one national system to another.”).

¹⁴⁴ See, e.g., Sabino Cassese, *Administrative Law Without the State? The Challenge of Global Regulation*, 37 N.Y.U. J. INT’L L. & POL. 663, 694 (2005) (noting the importance of ensuring “respect for the rule of law, the principle of participation, and the duty to give reasoned decision” as the scale and scope of global regulation increase); Daniel C. Esty, *Good Governance at the Supranational Scale: Globalizing Administrative Law*, 115 YALE L.J. 1490 (2006) (arguing for adoption of administrative law principles in context of global policymaking to enhance legitimacy and good governance); Benedict Kingsbury et al., *The Emergence of Global Administrative Law*, 68 LAW & CONTEMP. PROBS. 15, 17 (2005) (defining “global administrative law as comprising the mechanisms, principles, practices, and supporting social understandings that promote or otherwise affect the accountability of global administrative bodies, in particular by ensuring that they meet adequate standards of transparency, participation, reasoned decision, and legality, and by providing effective review of the rules and decisions they make”); Nico Krisch & Benedict Kingsbury, *Introduction: Global Governance and Global Administrative Law in the International Legal Order*, 17 EUR. J. INT’L L. 1, 1 (2006) (observing that “much of global governance can be understood as regulation and administration, and that we are witnessing the emergence of a ‘global administrative space’: a space in which the strict dichotomy between domestic and international has largely broken down, in which administrative functions are performed in often complex interplays between officials and institutions on different levels, and in which regulation may be highly effective despite its predominantly non-binding forms”).

¹⁴⁵ See Robert B. Ahdieh, *Dialectical Regulation*, 38 CONN. L. REV. 863, 868 (2006) (describing “dialectical regulation” as a strong form of intersystemic regulatory engagement marked by jurisdictional overlap and regulatory dependence as compared, for example, to “dialogic” regulatory interaction marked by information sharing and voluntary interactions); Paul Schiff Berman, *Dialectical Regulation, Territoriality, and Pluralism*, 38 CONN. L. REV. 929, 930–32 (2006) (characterizing “dialectical regulation” as a possible model “for understanding the new plural order of multiple and interlocking governance structures” that goes “beyond the relatively rigid legal doctrines of jurisdiction, choice of law, and judgment recognition”). Berman goes on to argue that Ahdieh’s model of dialectical regulation needs to be broadened beyond

as well as the proliferation of networked forms of transnational governance that wield considerable influence in particular fields.¹⁴⁶ And, of course, there is an extensive literature seeking to bring insights from constitutional law and constitutionalism into the study of the international legal order.¹⁴⁷

Although each of these different approaches carries with it a distinctive mix of positive and normative concerns, all of them bear witness to a broader effort to bring the study of law and regulation into a more direct confrontation with a globalizing world where hard distinctions between an international and a domestic legal order, and between a public and private sphere, are increasingly tenuous and where coordination between and among different “scales” or “systems” of governance is where much of the action occurs.¹⁴⁸ Lurking behind each of these perspectives, moreover,

governmental actors to include the “wide variety of non-state normative communities” that are “empowered” as “regulatory actors . . . in a world defined by the simultaneous *erosion* of and *persistence* of territoriality as a relevant framework for understanding legal authority.” *Id.* at 931-32. See also Osofsky, *supra* note 127 (describing climate change governance as a multi-scalar process of diagonal regulation).

¹⁴⁶ See, e.g., Kanishkia Jayasuriya, *Globalization, Law, and the Transformation of Sovereignty: The Emergence of Global Regulatory Governance*, 6 IND. J. GLOBAL LEGAL STUD. 425, 446-47 (1999) (discussing the fragmentation of state sovereignty and the emergence of regulatory networks as a form of “network governance”); ANNE-MARIE SLAUGHTER, A NEW WORLD ORDER 31-32 (2004) (discussing the “disaggregation” of the unitary state into its functional, specialized units and the emergence of transgovernmental networks of regulators (and courts and legislators) as key features of global governance); Anne-Marie Slaughter & David Zaring, *Networking Goes International: An Update*, 2 ANN. REV. LAW SOC. SCI. 211, 218 (2006) (“Networks comport with deep-seated intuitions about how globalization really works Regulatory networks parallel and comport with the disaggregated but powerful way that globalization has actually happened.”).

¹⁴⁷ See, e.g., Alec Stone Sweet, *Constitutionalism, Legal Pluralism, and International Regimes*, 16 IND. J. GLOBAL LEGAL STUD. 621, 621-22 (2009) (defending a “constitutionalist” approach to the international legal order). David Kennedy takes issue with the “constitutionalist” approach:

Do we know enough about the structure of global arrangements, whether legal or political, economic, cultural, to be confident that what we know domestically as ‘constitutionalism’ is a good idea for the globe? What if the distances are so great, the forces so chaotic, the differences in situation so profound that the constitution ratifies what ought rather to be transformed?

Kennedy, *supra* note 139, at 847-48.

¹⁴⁸ See, e.g., GREWAL, *supra* note 135, at 20-22 (discussing the role of standards in facilitating social coordination in a globalizing world); Robert B. Ahdieh, *Foreign Affairs, International Law, and the New Federalism: Lessons from Coordination*, 73 MO. L. REV. 1185, 1223-25 (2008) (identifying coordination as “the central

lies a recognition that the international legal order, such as it is, is decidedly pluralistic and increasingly fragmented. Put another way, there is a recognition among all of these approaches, grudging as it may be in some instances, that the various processes that we might group under the term globalization are taking place within a dense, multi-layered, overlapping set of normative orders and that this is not, save perhaps according to the ardent constitutionalists, going away.¹⁴⁹

At the same time that the literature on law and globalization recognizes, at least implicitly, the prevalence of pluralism and fragmentation in the contemporary context (a topic that will be returned to below), much of this scholarship also points to the relative importance of environmental regulation as a key site where law and globalization meet.¹⁵⁰ And yet, despite such observations and despite the obvious affinity between our intuitions about globalization and the transboundary nature of many environmental problems (not to mention the proliferation of multilateral environmental agreements over the last several decades¹⁵¹), we still have limited analytical equipment and lack a well-developed research agenda for explaining how globalization is interacting with environmental law across different jurisdictions and problem domains.

Seeking to fill some of these gaps, Professors Tseming Yang and Robert Percival have recently advanced the concept of “global environmental law” as part of an effort to define a research agenda

dynamic of institutional engagement across jurisdictional lines in a regime of intersystemic governance”); Cassese, *supra* note 144, at 677 (“The most recurrent functions in global regulatory systems are coordination, the promotion of cooperation, harmonization, and standardization.”).

¹⁴⁹ *But see* Sweet, *supra* note 147, at 623 (arguing that the perceived dichotomy between constitutionalism and pluralism in international law is false).

¹⁵⁰ *See, e.g.,* Ahdieh, *supra* note 145, at 906 (“[C]ross-border environmental regulation may offer the best examples of intersystemic regulation” that is truly “multi-level”); Shapiro, *supra* note 141, at 51 (“Perhaps globalization is clearest and most dramatic in environmental law.”).

¹⁵¹ *See* ADIL NAJAM ET AL., GLOBAL ENVIRONMENTAL GOVERNANCE: A REFORM AGENDA 30 (2006) (discussing the proliferation of MEAs). More than 500 multilateral environmental agreements (“MEAs”) are registered with the United Nations. *Id.* And even though a significant number of these are institutionally linked and/or regional in nature, it is clear that international environmental law suffers from what some commentators refer to as “treaty congestion.” When one recognizes that many of these instruments have spawned their own independent secretariats and subsidiary bodies of various types, the fragmentation of international environmental law becomes apparent.

that is more sensitive to the realities of globalization and its implications for environmental law.¹⁵² Borrowing from transnational legal process and other literatures on globalization and law, these authors characterize global environmental law as a field of inquiry that goes beyond previous efforts to chart the adoption and transplantation of national legal principles by other nations and international regimes to focus on “an emerging set of independent and convergent legal principles” at multiple levels.¹⁵³ In their view, global environmental law embraces the idea that “international environmental regimes are not stand-alone systems” but “integral parts of a larger system that also includes national regulatory systems.”¹⁵⁴ Such an approach, moreover, emphasizes “problem-based approaches to regulation as opposed to jurisdiction-based regulation,” and seeks to broaden the focus of international environmental law “from negotiation and formulation of limited legal commitments by each party to greater attention to the design of institutional structures.”¹⁵⁵ Global environmental law, therefore, seeks to move beyond the traditional focus of international environmental law on the possibilities and limits of consent-based regimes among state actors and abstract arguments regarding instrument choice¹⁵⁶ toward a more empirically grounded focus on institutional design and problem solving that crosses multiple jurisdictional scales and attends to multiple actors coordinating through a variety of organizational forms.¹⁵⁷ Key examples include global regulation of consumer

¹⁵² See Yang & Percival, *supra* note 39, at 616–17 (describing global environmental law as “a field of law that is international, national, and transnational in character all at once” and that is emerging via pathways of “transplantation, convergence, integration, and harmonization”).

¹⁵³ *Id.* at 626.

¹⁵⁴ *Id.* at 655.

¹⁵⁵ *Id.* at 655–56; see also Ahdieh, *supra* note 148, at 1245 (pointing to “the need for heightened attention to questions of institutional design in the interaction of sub-national, national, and international authorities”).

¹⁵⁶ See, e.g., Jonathan B. Weiner, *Global Environmental Regulation: Instrument Choice in Legal Context*, 108 YALE L.J. 677, 681–83 (1999) (developing a model to test “optimal” instrument choice for global environmental regulation under alternative legal frameworks). But see David M. Driesen, *Choosing Environmental Instruments in a Transnational Context*, 27 ECOLOGY L.Q. 1, 51–52 (2000) (arguing for a “transnational legal process” approach to global environmental instrument choice that attends to national legal and political context).

¹⁵⁷ This resonates with the view of “modular environmental regulation” espoused by Jody Freeman and Dan Farber. See Jody Freeman & Daniel A. Farber, *Modular Environmental Regulation*, 54 DUKE L.J. 795 (2005) (discussing

products and chemicals, the spread of environmental impact assessments, and nested forms of climate governance.¹⁵⁸

In its overall orientation, global environmental law thus shares a great deal with the broader, more established literature on global environmental governance and its recent new governance variants, which seek to understand the changing nature of environmental regulation in the face of a bewildering complexity of state and non-state actors interacting at multiple levels in ways that no longer fit with traditional understandings of the Westphalian state system.¹⁵⁹ A key theme in much of this literature, not surprisingly, has been the changing nature of sovereignty in the face of global environmental problems and the inability of the international regime concept to capture the manner in which such problems are being addressed.¹⁶⁰ Some scholars have even referred to the

modular environmental regulation as an alternative to traditional approaches). Global environmental law, in this view, is not simply a version of “comparative law” as Dan Bodansky suggests. See DANIEL BODANSKY, *THE ART AND CRAFT OF INTERNATIONAL ENVIRONMENTAL LAW* 12-13 (2010) (characterizing global environmental law as “the subject of *comparative* rather than *international* environmental law”).

¹⁵⁸ See Yang & Percival, *supra* note 39, at 619-23, 627-30, 635-37 (discussing global regulation of consumer products and chemicals, the spread of environmental impact assessments, and nested forms of climate governance as emerging forms of global environmental law).

¹⁵⁹ See Frank Biermann & Klaus Dingwerth, *Global Environmental Change and the Nation State*, 4 *GLOBAL ENVTL. POL.* 1 (2004) (detailing how global environmental change challenges the traditional Westphalian system by undermining the idea of sovereignty); Sverker C. Jagers & Johannes Stripple, *Climate Governance Beyond the State*, 9 *GLOBAL GOVERNANCE* 385 (2003) (arguing for an approach to climate governance that includes non-state actors); Chukwumerije Okereke et al., *Conceptualizing Climate Governance Beyond the International Regime*, 9 *GLOBAL ENVTL. POL.* 58 (2009) (advocating for an approach to climate governance that incorporates the increasing visibility and influence of non-state actors).

¹⁶⁰ On the changing nature of sovereignty in response to global ecological disruptions, see, for example, Karen T. Litfin, *The Greening of Sovereignty: An Introduction*, in *THE GREENING OF SOVEREIGNTY IN WORLD POLITICS* (Karen T. Litfin ed., 1998). Litfin argues for an approach to sovereignty that moves beyond the “geological model” wherein sovereignty is seen as being “eroded” by efforts to address transboundary environmental problems.” *Id.* at 1. Instead, she argues for a more relational, malleable conception of sovereignty that changes over time. *Id.* at 1-2; see also Helen Stacy, *Relational Sovereignty*, 55 *STAN. L. REV.* 2029 (2003) (developing the concept of relational sovereignty). As with static notions of sovereignty and the “geological model,” the international regime concept, which is rooted in the normative assumption that independent, sovereign states can in principle develop cooperative approaches to global environmental problems, has also come under enormous pressure as scholars seek to understand and explain emerging forms of global environmental governance. See, e.g., Matthew Paterson, *Interpreting Trends in Global Environmental Governance*, 75 *INT’L AFF.* 793, 794-95

contemporary situation as one of "Post-Sovereign Environmental Governance," reading the prevalence of non-exclusive, non-hierarchical, and post-territorial governance forms in certain contexts as symptomatic of an incipient logic of "new governance" applied to environmental problems.¹⁶¹

The post-sovereign claim, however, proves too much. Indeed, it is only on the basis of a constrained and ultimately unrealistic view of the Westphalian system of sovereign nation states and its transformation in the current context that one can sustain such a conclusion.¹⁶² It is not at all clear, in other words, that there is a singular process called globalization that is leading toward a world that is somehow post-sovereign or post-territorial, much less that environmental governance is evolving towards some sort of post-sovereign future. Rather, the processes that are commonly

(1999) (reviewing scholarship that seeks to go beyond the international regimes literature to assess emerging forms of global environmental governance that "break down the traditional dominance of states in such matters, and presage alternative forms of global politics"); see also INSTITUTIONS FOR THE EARTH: SOURCES OF EFFECTIVE INTERNATIONAL ENVIRONMENTAL PROTECTION (Peter M. Haas et al. eds., 4th prtg. 2001) (arguing that effective international environmental protection will require modifications to traditional notions of state sovereignty). But see John Vogler, *Taking Institutions Seriously: How Regime Analysis Can be Relevant to Multilevel Environmental Governance*, 3 GLOBAL ENVTL. POL. 25, 38 (2003) (arguing for a "re-invigoration of the regime approach to global governance through an application of a social constructivist approach to institutions").

¹⁶¹ See Bradley C. Karkkainen, *Post-Sovereign Environmental Governance*, 4 GLOBAL ENVTL. POL. 72, 75 (2004) ("Post-sovereign governance exhibits three distinguishing characteristics: it is *non-exclusive*, *non-hierarchical*, and *post-territorial*." (emphasis in original). Karkkainen draws heavily on "new governance" theory and a series of empirical case studies of adaptive ecosystem management (primarily in the U.S. context) to suggest that these "new governance arrangements represent a nascent polycentric substitute for more familiar forms of sovereign authority"—a development that "stands in sharp contrast to the model of fixed, territorially delimited, exclusive jurisdictional boundaries upon which the Westphalian system of sovereign states, and public international law as conventionally understood, are founded." *Id.* at 74, 77.

¹⁶² See LAUREN BENTON, *A SEARCH FOR SOVEREIGNTY: LAW AND GEOGRAPHY IN EUROPEAN EMPIRES, 1400-1900*, at 279-90 (2010) (taking issue with traditional idea of territorial sovereignty through a close examination of the "production of variegated legal spaces" and "layered systems of sovereignty" associated with European empires); Andreas Osiander, *Sovereignty, International Relations, and the Westphalian Myth*, 55 INT'L ORG. 251 (2001) (taking international relations theory to task for theorizing against a conception of the "Westphalian system" that is largely imaginary when viewed in historical context); Benno Teschke, *Theorizing the Westphalian System of States: International Relations from Absolutism to Capitalism*, 8 EUR. J. INT'L REL. 5, 8 (2002) (arguing that the "decisive break towards modern international relations is not marked by the Westphalian Peace Treaties, but comes with the rise of the first modern state—post-revolutionary England").

grouped under the term “globalization” are better understood as ones resulting in the re-constitution of sovereignty and territory in multiple guises as global forms or projects of various kinds are instantiated in the vernacular institutions of national and sub-national formations.¹⁶³ Such processes inevitably result in forms of governance that are uneven, lumpy, contingent, and incomplete (whether in the context of climate change, human rights, trade or financial markets), raising serious questions for some observers about the analytical utility of the very concept of globalization.¹⁶⁴ The point, though, is not to debate the analytical merits of globalization (a polysemic term to be sure), but rather to avoid ascribing causal logic to a single, totalizing process.¹⁶⁵ By focusing

¹⁶³ See SASKIA SASSEN, *A SOCIOLOGY OF GLOBALIZATION* 4 (2007) (“Conceiving of globalization not simply in terms of interdependence and global institutions but also as inhabiting the national opens up a vast and largely unaddressed research agenda.”).

¹⁶⁴ As Frederick Cooper notes,

[b]ehind the globalization fad is an important quest for understanding the interconnectedness of different parts of the world, for explaining new mechanisms shaping the movement of capital, people, and culture, and for exploring institutions capable of regulating such transnational movement. What is missing in discussions of globalization today is the historical depth of the interconnections and a focus on just what the structures and limits of the connecting mechanisms are. It is salutary to get away from whatever tendencies there may have been to analyze social, economic, political, and cultural processes as if they took place in national or continental containers; but to adopt a language that implies that there is no container at all, except the planetary one, risks defining problems in misleading ways. The world has long been—and still is—a space where economic and political relations are very uneven; it is filled with lumps, places where power coalesces surrounded by those where it does not, where social relations become dense amidst others that are diffuse. Structures and networks penetrate certain places and do certain things with great intensity, but their effects tail off elsewhere.

Frederick Cooper, *What is the Concept of Globalization Good For? An African Historian's Perspective*, 100 *AFR. AFF.* 189, 189–90 (2001)

¹⁶⁵ See *id.* Eric Wolf makes a similar point regarding the importance of attending to relationships and processes:

The central assertion of this book is that the world of humankind constitutes a manifold, a totality of interconnected processes, and inquiries that disassemble this totality into bits and then fail to reassemble it falsify reality. Concepts like ‘nation,’ ‘society,’ and ‘culture’ name bits and threaten to turn names into things. Only by understanding these names as bundles of relationships, and by placing them back into the field from which they were abstracted, can we hope to avoid misleading inferences and increase our share of understanding.

ERIC R. WOLF, *EUROPE AND THE PEOPLE WITHOUT HISTORY* 3 (1982).

instead on the relationships, linkages, and mechanisms that constitute globalizing processes, we can understand and explain how particular actors, institutions, practices, and places cohere in specific global assemblages. Such an exercise, it is argued, should be at the center of efforts to understand the implications of globalization for environmental law and the ways in which global environmental law is taking shape.

3.2. *Unbundling and De-Nationalization*

Taking globalization seriously as a point of departure for understanding and elaborating global environmental law, whether as object of research or as program for action, complicates the traditional state-centric approach of international environmental law, eliciting a more direct examination of how the state as an institution and, more specifically, how particular states and state capacities are participating in globalizing processes. Virtually all of the literature on globalization, of whatever stripe, adheres to some version of the general proposition that the traditional Westphalian understanding of the state is under serious pressure.¹⁶⁶ Thus, scholars of various persuasions have remarked on the “unbundling” of territory and sovereignty as both a background condition and consequence of globalization, and the concomitant emergence of transnational regulatory regimes.¹⁶⁷ Much of the attention has focused on how sovereignty is being re-fashioned, often in the face of particular global challenges such as financial regulation, human rights, or environmental disruption,

¹⁶⁶ See Neil Brenner, *Beyond State-Centrism? Space, Territoriality, and Geographical Scale in Globalization Studies*, 28 *THEORY AND SOC'Y* 39, 47 (1999) (noting that the “bundling of territoriality to state sovereignty is [seen as] the critical characteristic of the modern interstate system”). For a critical examination of the foundations of the Westphalian conception of state territorial sovereignty, see Osiander, *supra* note 162; Teschke, *supra* note 162; see also BENTON, *supra* note 162.

¹⁶⁷ For an early statement on this process of “unbundling,” see John Gerard Ruggie, *Territoriality and Beyond: Problematizing Modernity in International Relations*, 47 *INT'L ORG.* 139, 171 (1993) (identifying the “unbundling” of territory and national sovereignty as a key feature in the transformation of the modern, Westphalian international order and arguing that “[t]he terrain of unbundled territoriality . . . is the place wherein a rearticulation of international political space would be occurring today”). Ruggie goes on to decry the general lack of attention to territoriality by students of international politics. See *id.* at 174 (“It is truly astonishing that the concept of territoriality has been so little studied by students of international politics; its neglect is akin to never looking at the ground that one is walking on.”).

and the resulting disaggregation of state capacity into its functional components, which in turn serve as key constituents of global regulatory networks.¹⁶⁸ Less attention has been directed to the manner in which territory (the other side of the Westphalian coin) is itself being re-constituted at multiple scales and mobilized on behalf of particular global projects.

Yet the very notion of an emerging *global* environmental law contains an implicit territoriality that departs rather starkly from the traditional understandings of territory in national and international environmental law, which have been based in large part on the model of sovereign states exercising authority over delimited national territories.¹⁶⁹ To be sure, international law has long struggled with how to conceptualize problematic spaces that extend above and beyond the jurisdictional reach of the territorial state—from the deep seabed to Antarctica to Outer Space—and the territorial reach of the state has itself changed significantly over time.¹⁷⁰ At the same time, the notion of extra-territorial jurisdiction over particular activities has been a pervasive feature of efforts to extend regulation beyond the borders of the territorial state.¹⁷¹

¹⁶⁸ See, e.g., SLAUGHTER, *supra* note 146, at 12–15 (discussing disaggregation of states and the constitution of global regulatory networks); see also BENTON, *supra* note 162, at 282–90 (discussing the “layered systems of sovereignty” associated with European empires); SASSEN, *supra* note 33, at 1–3 (discussing lack of attention by globalization scholars to the ways in which globalization takes place in and through particular national practices).

¹⁶⁹ See Brenner, *supra* note 166, at 47 (discussing the traditional model of the sovereign territorial state).

¹⁷⁰ See Jean Gottmann, *The Evolution of the Concept of Territory*, 14 SOC. SCI. INFO. 29, 30–32 (1976) (discussing the challenges of defining territorial rights in international law posed by outer space and the deep sea bed). J.H.W. Verzijl offers a more “graphic” view of the changing nature of territory:

State territory, conceived as the earthly space within which a State is entitled to exercise exclusive competencies, has gradually developed from a bi-dimensional, slightly spherical, plane into a tri-dimensional body, extremely irregular and complicated in shape, as far as coastal States with a continental shelf are concerned, showing to the eye of the imagination the peculiar configuration of a huge aerial skyscraper with a constantly soaring and broadening top structure, mounted partly on a thin terrestrial socle or pedestal and partly on an iceberg-like submarine terrace.

3 J.H.W. VERZIJL, INTERNATIONAL LAW IN HISTORICAL PERSPECTIVE: STATE TERRITORY 14 (1970).

¹⁷¹ See, e.g., KAL RAUSTIALA, DOES THE CONSTITUTION FOLLOW THE FLAG? THE EVOLUTION OF TERRITORIALITY IN AMERICAN LAW 94–96 (2009) (describing increased

And, of course, environmental law has long been pre-occupied with transboundary pollution, spillovers, and problems of the global commons. All of these approaches, however, have been constructed on the basis of a particular, naturalized understanding of national territory, illustrating what one scholar refers to as the "territorial trap."¹⁷²

In contrast, a more direct interrogation of the concept of territory as part of the effort to understand emerging structures of global environmental law trains attention to the manner in which space is produced and ordered as a precondition for environmental governance.¹⁷³ The challenge is to recover a more general conception of territory that is distinct from state sovereignty—one that is rooted in the application of certain calculative and cartographic practices to the creation of modern political and legal space (of which the Westphalian model is the original form, but one that is giving way to a more globalized and differentiated ordering of territory).¹⁷⁴ In this view, although territory is "integrally related to the state" by virtue of its dual instantiation with the concept of sovereignty in the Westphalian system, it is not "inherently tied to the state."¹⁷⁵

In other words, shifting the view from territory as jurisdiction to territory as a more abstract enterprise of creating calculable space and rendering it governable¹⁷⁶ (with concrete manifestations

extraterritorial application of U.S. domestic statutes starting in mid-twentieth century).

¹⁷² See John Agnew, *The Territorial Trap: The Geographical Assumptions of International Relations Theory*, 1 REV. INT'L POL. ECON. 53 (1994) (referring to the naturalized, and untheorized approach to territory in international relations scholarship as the "territorial trap").

¹⁷³ Few fields of law are more thoroughly spatial than environmental law. To date, however, there has been very little effort to develop a theoretical understanding of the complex spatialities of environmental law and governance. See David Delaney, *Environmental Regulation: Introduction*, in THE LEGAL GEOGRAPHIES READER: LAW, POWER, AND SPACE 218 (Nicholas Blomley et al. eds., 2001) (discussing the limited intersection between environmental law and geography). For a notable exception, see Osofsky, *supra* note 127.

¹⁷⁴ Legal scholars have typically viewed territory as synonymous with jurisdiction. See, e.g., Richard T. Ford, *Law's Territory (A History of Jurisdiction)*, 97 MICH. L. REV. 843, 866-67 (1999) (locating the historical emergence of territorial jurisdiction as the product of the science of cartography and the ideology of rational, humanist government).

¹⁷⁵ Stuart Elden, *Missing the Point: Globalization, Deterritorialization and the Space of the World*, 30 TRANSACTIONS INST. BRIT. GEOGRAPHERS 8, 8 (2010).

¹⁷⁶ See Michael Biggs, *Putting the State on the Map: Cartography, Territory, and European State Formation*, 41 COMP. STUD. SOC'Y & HIST. 374, 399 (1999) ("It is easy

in specific historical forms such as the territorial state) brings into focus the ways in which new forms of calculability allow for different renderings of territory, thereby opening up the possibility of new claims, legal and otherwise, over particular places and new forms of authority.¹⁷⁷ In this view, territory is less a background condition—a “container” for sovereign authority—than it is a political project focused on making space governable through particular technical and legal practices.¹⁷⁸ The widely remarked upon unbundling of sovereignty and territory does not, therefore, mark the end of territory as an important feature of the contemporary world order any more than it spells the end of sovereignty. Rather, “[t]he historical moment we call globalization demonstrates that the calculable understanding of space has been extended to the globe, which means that even as the state becomes less the focus of attention, territory remains of paramount importance.”¹⁷⁹

to say ‘the state mapped its territory,’ implying that a preexisting entity increased the quantity of its knowledge. It is much harder to say that, through the process of mapping, a new kind of territory and hence a new kind of state came into being.”); Stuart Elden, *Governmentality, Calculation, Territory*, 25 ENV’T & PLAN. D: SOC. & SPACE 562, 578 (2007) (“Territory is more than merely land, but a rendering of the emergent concept of ‘space’ as a political category: owned, distributed, mapped, calculated, bordered, and controlled.”). Charles Maier makes a strong argument for the importance of territoriality to political history:

Territoriality has been so pervasive a principle for organizing societies that only as it has begun to dissolve have social scientists and historians come to fathom its role. Epochs of world history hinge not only on the rise and fall of great powers or the successive struggles among mobilized social groups but on the attributes of political space, whether weakened or strengthened or rescaled into larger or smaller commanding units.

Charles S. Maier, *Consigning the Twentieth Century to History: Alternative Narratives for the Modern Era*, 105 AM. HIST. REV. 807, 809 (2000).

¹⁷⁷ According to Nikolas Rose,

[t]o govern, it is necessary to render visible the space over which government is to be exercised. This is not simply a matter of looking; it is a practice by which the space is re-presented in maps, charts, pictures and other inscription devices. It is made visible, gridded, marked out, placed in two dimensions, scaled, populated with icons and so forth. In this process, and from the perspective of its government, salient features are identified and non-salient features rendered invisible.

ROSE, *supra* note 108, at 36–37.

¹⁷⁸ See Stuart Elden, *Land, Terrain, Territory*, PROGRESS HUM. GEOGRAPHY ONLINEFIRST 12–14 (Apr. 21, 2010) (arguing for an understanding of territory as a “political technology”).

¹⁷⁹ Elden, *supra* note 175, at 8–9.

Instead of emphasizing the emergence of post-sovereign, deterritorialized forms of authority as evidence of some sort of master trend of globalization (an observation that seems a bit problematic in light of recent reassertions of national sovereignty), it would thus seem more fruitful to examine how new combinations of territory and authority are emerging out of specific globalizing processes that are taking place simultaneously above, below and through the state.¹⁸⁰ As an analytical matter, such a perspective moves away from the notion of the state as a unitary actor in an international system composed of formally equal sovereigns interacting under game-theoretic constraints toward an analysis of how particular states and their components participate in and provide important sites for certain globalizing processes.¹⁸¹ As will be discussed further in Section 4, this incipient “de-nationalization”¹⁸² is increasingly apparent in the environmental field as national and subnational authorities are mobilizing in pursuit of specific global environmental projects. And although there is considerable resistance in some quarters to

¹⁸⁰ See, e.g., SASSEN, *supra* note 33, at 386 (discussing “the formation of particular types of territoriality assembled out of ‘national’ and ‘global’ elements”). As examples, Sassen cites (1) the formation of a “global network of financial centers” as “a novel type of multisited territoriality” made up of financial centers that “inhabit national territories” but are “denationalized in specific and partial ways” given their constitutive role in the global capital markets; (2) “global networks of localized activists” and the constitution of global civil society that is enabled by global digital networks and represents a territoriality that “partly inhabits specific subnational spaces and partly gets constituted as a variety of specialized or partial global publics”; and (3) “new jurisdictional geographies” in which legal frameworks for rights and guarantees are becoming embedded in transnational systems, as evidenced by the ability to initiate legal actions involving multiple geographic sites across the globe from national courts or, alternatively, the manner in which international human rights norms get established and stabilized as part of national law. *Id.* at 386–88.

¹⁸¹ See *id.* at 227 (“Failure to differentiate state capacities, both across countries and inside a given national state, easily can keep globalization scholars from considering, let alone examining, how states may at times facilitate globalization.”).

¹⁸² See Saskia Sassen, *De-Nationalization: Some Conceptual and Empirical Elements*, 22 POLAR 1 (1999) (“One way of conceptualizing this insertion of the global in the national is as a partial and incipient ‘de-nationalization’ of what has been constructed as the national, or rather, particular elements of the national.”); Saskia Sassen, *The State and Globalization: Denationalized Participation*, 25 MICH. J. INT’L L. 1141, 1155 (2004) (“As particular components of national states become the institutional home for the operation of some of the dynamics that are central to globalization, they undergo change that is difficult to register or name. This is one instantiation of what I call a process of incipient de-nationalization.”).

some of the more overt efforts to de-nationalize environmental governance,¹⁸³ REDD and other emerging forms of climate governance demonstrate how new forms of calculability are already reshaping traditional understandings of territory – in part by opening up possibilities for new value forms and new claims on the environmental and resource practices taking place within the boundaries of the nation state.¹⁸⁴ This is happening from above and below and, while it hardly signals the withering away of the state, it does illustrate the ways in which the state is changing as it reorients its capabilities to participate in these new polycentric forms of global environmental governance.

3.3. *Pluralism, Fragmentation, Expertise*

At the same time that globalization puts pressure on the Westphalian state, it also brings into relief the plurality of normative orders governing behavior across various jurisdictions. Contemporary studies of globalization have thus brought with them a rejuvenated interest in legal pluralism, the central premise of which is that the world is constituted by a seemingly irreducible diversity of legal and non-legal normative orders that coexist with the law of particular states.¹⁸⁵ Initially the province of anthropologists and a few anthropologically minded legal scholars, legal pluralism in its early manifestations focused on the colonial encounter and the diversity of legal orders that arose out of the “intersections of indigenous and European law.”¹⁸⁶ More recently, a post-1970s “new legal pluralism” has turned inward to focus on the diversity of normative orders within the so-called advanced industrial societies of Europe and the United States.¹⁸⁷

¹⁸³ Witness the ongoing resistance by China and other countries to subject their domestic GHG mitigation efforts to robust international monitoring, reporting, and verification.

¹⁸⁴ See discussion *infra* Section 4.

¹⁸⁵ See Ralf Michaels, *Global Legal Pluralism*, 5 ANN. REV. L. & SOC. SCI. 243, 244 (2009) (reviewing basic strands of legal pluralism and its move “into the mainstream of legal discourse” as a response to the challenges of understanding law and legal order in the context of globalization).

¹⁸⁶ Sally Engle Merry, *Legal Pluralism*, 22 LAW & SOC’Y REV. 869, 872 (1988).

¹⁸⁷ Merry notes that

[t]he new legal pluralism moves away from questions about the effect of law on society or even the effect of society on law toward conceptualizing a more complex and interactive relationship between official and unofficial forms of ordering. Instead of mutual influences

Somewhat paradoxically, then, the turn to globalization has reinforced the importance of both of these strands of research through a general recognition that while certain globalizing processes seek to superimpose an order or a rationality on the contingent, the heterogeneous, and the local, in reality such processes work within and through existing normative orders. Instead of erasing normative diversity, globalization seems to be enhancing it. Legal pluralism, in short, appears to be woven into the very fabric of the world. "It is," as Clifford Geertz remarked, "the hardening condition of things."¹⁸⁸ Recognizing this fact, however, need not collapse into an "anything goes" approach to global governance or one that operates as an implicit apology for neoliberalism.¹⁸⁹ Rather, the task for global environmental law is to find ways to coordinate across and within this plurality of normative orders, building enabling environments that allow for the translation of global projects into the vernacular forms of a plural legal order. Easier said than done.

But it is even harder than that. Indeed, the fact of legal pluralism—and it is a fact that international law has historically ignored¹⁹⁰—finds its corollary in the increasing fragmentation of

between two separate entities, this perspective sees plural forms of ordering as participating in the same social field.

Id. at 873.

¹⁸⁸ CLIFFORD GEERTZ, *Local Knowledge: Fact and Law in Comparative Perspective*, in LOCAL KNOWLEDGE: FURTHER ESSAYS IN INTERPRETIVE ANTHROPOLOGY 167, 220 (1983).

¹⁸⁹ See Martti Koskenniemi, Member, U.N. Int'l Law Comm'n, Keynote Speech at Harvard University: Global Legal Pluralism: Multiple Regimes and Multiple Modes of Thought (Mar. 5, 2005), available at <http://www.helsinki.fi/eci/Publications/Koskenniemi/MKPluralism-Harvard-05d%5B1%5D.pdf> ("The problem with legal pluralism . . . is the way it ceases to pose demands on the world.").

¹⁹⁰ As Paul Berman notes,

[t]hose who study international public and private law have not, historically, paid much attention either to legal pluralism or social norms theory. This is because the emphasis traditionally has been on state-to-state relations. Indeed, international law has generally emphasized bilateral and multilateral treaties between and among states, the activities of the United Nations, the pronouncements of international tribunals, and (somewhat more controversially) the norms that states had obeyed for long enough that such norms could be deemed customary. This was a legal universe with two guiding principles. First, law was deemed to reside only in the acts of official, state-sanctioned entities. Second, law was seen as an exclusive function of state sovereignty.

international law into specialized, formal domains such as trade, environment, human rights, and security.¹⁹¹ Within the environmental field, moreover, there is further fragmentation into specialized problem areas like climate change, biodiversity, chemicals, ozone depletion, and the law of sea (to name only a few). And some of these specialized domains—climate change is probably the best example—are themselves fragmented into various functional and sector-specific areas.

One important consequence of this proliferation of specialized regimes is increased dependence on experts and expert systems and the concomitant de-politicization of questions previously reserved for politics and political economy.¹⁹² Indeed, a great deal

Paul Schiff Berman, *Global Legal Pluralism*, 80 S. CAL. L. REV. 1155, 1174 (2007). Similarly, David Kennedy remarks that with the

sheer density of rules and institutions in the global space [has come] the disorderliness, the pluralism, the uncertainty, the chaos, of all those rules and principles and institutions. The globalization of law, the legalizations of politics and economics, has brought with it a tremendous dispersion of law. . . . Some of this disorder is structured in one or another way—various federalisms, multiple jurisdictions, choices of law provisions, even races to the top and bottom. But some is also a matter of struggle and conflict, between legal orders, ideas, powers and traditions. Our picture will need to have room for all this disorder—there is no use denying or overlooking it, pretending coherence.

Kennedy, *supra* note 139, at 848.

¹⁹¹ See, e.g., Eyal Benvenisti & George W. Downs, *The Empire's New Clothes: Political Economy and the Fragmentation of International Law*, 60 STAN. L. REV. 595, 596 (2007) (discussing fragmentation as “the increased proliferation of international regulatory institutions with overlapping jurisdictions and ambiguous boundaries” that serves to undermine coherence and accountability in the international legal order). Benvenisti and Downs argue that despite a general lack of concern among legal scholars regarding the consequences of fragmentation, it poses “a more serious problem . . . because it operates to sabotage the evolution of a more democratic and egalitarian international regulatory system and to undermine the normative integrity of international law” by constraining the bargaining ability of weaker states, by providing powerful states with opportunities to seek more advantageous venues, and by obscuring the role of intentionality on the part of stronger states to “create a legal order that both closely reflects their interest and that only they have the capacity to alter.” *Id.* at 596–98; see also Nico Krisch, *International Law in Times of Hegemony: Unequal Power and the Shaping of the International Legal Order*, 16 EUR. J. INT'L L. 369, 382 (2005) (“Most predominant states have been active forces behind the development of international law, and they have made extensive use of the international legal order to stabilize and improve their position.”).

¹⁹² See Martti Koskenniemi, *The Fate of Public International Law: Between Technique and Politics*, 70 MOD. L. REV. 1, 4 (2007) (discussing the increasing fragmentation of international law into a series of specialized areas or regimes dominated by technical experts).

of contemporary global governance can be viewed as a field (or, more precisely, a series of partially overlapping fields) dominated by experts and expert systems without any real recourse to democratic process.¹⁹³ International environmental law and the entire project of Earth systems governance, for example, are deeply embedded within expert systems that have succeeded in taking fundamental issues of environmental responsibility, equity, even survival, and rendering them technical through a particular set of knowledge practices. Any coherent account of global environmental law will thus need to reckon with this fact, with specific attention to questions regarding the possibilities for accountability and participation in emerging forms of climate governance.¹⁹⁴

Recognizing pluralism and fragmentation as starting points for global environmental law thus means moving away from the notion that a top-down, comprehensive global architecture is necessary (much less possible) to respond to climate change or other global environmental problems. In keeping with the argument advanced in Section 1 above and as will be elaborated in Section 4 below, to the extent that REDD, and climate policy generally, are understood and pursued solely in such terms, they will never coalesce into effective forms of governance. On the other hand, simply recognizing the facts of pluralism and fragmentation hardly provides a practical way forward. Plural, polycentric, nested forms of new governance hold considerable appeal in the abstract, but we need much more experience, more thick description, of how these forms of governance are taking shape in various environmental domains, and how enabling environments that allow for coordination and translation across the diversity of normative orders can be constructed in a manner that builds upon the informal processes and institutions that all formal order depends upon.¹⁹⁵ We need, in other words, more attention to the connective tissues that bind and hold these forms together. The following case study explores these challenges in the

¹⁹³ See *id.*; Kennedy, *supra* note 139, at 846–47 (discussing rising dominance of experts and expertise in international law).

¹⁹⁴ This issue of ensuring accountability in the absence of state-centered democratic institutions has emerged as a principal concern of the growing literature on global administrative law. See *supra* note 142 and accompanying text.

¹⁹⁵ See SCOTT, *supra* note 45, at 310 (discussing how all formal order depends upon informal processes and institutions).

context of ongoing efforts to bring reduced emissions from deforestation and forest degradation into climate governance.

4. GLOBAL PROJECTS IN FARAWAY PLACES: REDD AS AN EMERGING FORM OF CLIMATE GOVERNANCE

The enthusiasm surrounding REDD as an emerging form of climate governance is apparent in the considerable traction that the issue has gained over the last several years. In stark contrast to the treatment of tropical deforestation under the Kyoto Protocol, REDD has emerged in the eyes of many as one of the few bright spots in recent international climate discussions, with near unanimous agreement among the UNFCCC Parties on the need to establish a new “REDD+ mechanism” that would provide “positive incentives” (*i.e.*, compensate in some fashion) to developing countries for national-level reductions in emissions from deforestation.¹⁹⁶ At the same time, policymakers involved in the design of greenhouse gas compliance systems in the United States and elsewhere are contemplating provisions that would allow eligible REDD activities to generate offset credits. California, for example, is considering what would be the first rules for compliance-grade REDD offsets,¹⁹⁷ and all of the major federal

¹⁹⁶ The Copenhagen Accord, for example,

recognize[s] the crucial role of reducing emission from deforestation and forest degradation and the need to enhance removals of greenhouse gas emission by forests and agree[s] on the need to provide positive incentives to such actions through the immediate establishment of a mechanism including REDD-plus, to enable the mobilization of financial resources from developed countries.

Copenhagen Accord, *supra* note 24, para. 6. The *Cancún Agreement* elaborates on this, establishing a number of principles and a workplan for further cooperation on REDD+. See *Cancún Agreement*, *supra* note 24 paras. 68–79 (establishing principles and guidelines for additional cooperation on “policy approaches and positive incentives” to build a viable REDD+ program); *Id.* annex II (establishing two-year REDD+ workplan for Subsidiary Body for Scientific and Technological Advice).

¹⁹⁷ See CAL. AIR RES. BD., PROPOSED REGULATION TO IMPLEMENT THE CALIFORNIA CAP-AND-TRADE PROGRAM, Appendix A: Proposed Regulation Order §§ 95991-95994 (Oct. 28, 2010) [hereinafter CAL. AIR RES. BD., PROPOSED REGULATION] (establishing requirements for sector-based offset credits and identifying REDD as a source of sector-based credits); CAL. AIR RES. BD., PROPOSED REGULATION TO IMPLEMENT THE CALIFORNIA CAP-AND-TRADE PROGRAM, Part I Vol. I, Staff Report: Initial Statement of Reasons II-48, III-22 to III-29 (Oct. 28, 2010) [hereinafter CAL. AIR RES. BD., Staff Report] (elaborating on sector-based offset program and proposing that “the first sector-based credits to be incorporated in the cap-and-trade program come from Board approved REDD sector-based crediting

climate bills introduced in the last two Congresses have included extensive provisions for REDD.¹⁹⁸ Meanwhile, the donor community, led by Norway, France, Japan and the United States, has pledged several billion dollars for “fast-start” REDD financing over the next several years,¹⁹⁹ complementing ongoing efforts by the World Bank’s \$300 million Forest Carbon Partnership Facility to promote REDD “readiness” and pilot activities in some thirty-seven tropical forest countries.²⁰⁰ Many of these tropical forest countries are in turn reforming their own laws and institutions to accommodate the possibility of REDD and establishing new mechanisms, such as Brazil’s Amazon Fund, to support national REDD programs.²⁰¹ And leading states and provinces in Brazil, Indonesia, and other tropical forest countries are establishing their own REDD programs—a reflection of the fact that many forest governance responsibilities have been “decentralized” to the provincial level and below.²⁰²

programs”) (quotation is at III-26). California has also been a leader in the Governors’ Climate and Forests Task Force (“GCF”), a unique multi-jurisdictional collaboration between 16 states and provinces from the United States, Brazil, Indonesia, Mexico, and Nigeria focused on the development of compliance-grade REDD programs. See *About GCF*, GOVERNOR’S CLIMATE AND FOREST TASKFORCE, <http://www.gcftaskforce.org/about.html> (last visited Nov. 24, 2010) [hereinafter GCF] (outlining the objectives and activities of the GCF).

¹⁹⁸ See, e.g., Clean Energy Jobs and American Power Act, S. 1733, 111th Cong. §§ 744(e), 753 (2009) (providing for recognition of international offset credits for certain REDD activities); American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. § 743(e) & tit. III, pt. E (2009) [hereinafter ACES] (recognizing offset credits from certain REDD activities and allocating a portion of emissions allowances for supplemental reductions of emissions from deforestation); Lieberman-Warner Climate Security Act of 2008, S. 3036, 110th Cong. tit. III, pt. H (2008) (providing set aside of emissions allowances to support efforts to reduce emissions from deforestation); American Power Act, S. ____, 111th Cong. § 756(c) (as circulated in draft form May 12, 2010) (recognizing offsets from certain REDD activities).

¹⁹⁹ See Beth Daley, *\$3.5b Pledge Buys Climate Talks; Poorer Nations Hail Tentative Deal to Protect Forests*, BOS. GLOBE, Dec. 17, 2009, at 6, available at http://www.boston.com/news/world/europe/articles/2009/12/17/35b_pledge_buoys_climate_talks (“The United States and five other countries pledged \$3.5 billion over the next three years to help developing countries protect trees . . .”).

²⁰⁰ See *About the FCPF*, FOREST CARBON PARTNERSHIP FACILITY, <http://www.forestcarbonpartnership.org/fcp/node/12> (last visited Nov. 24, 2010) (describing the work of the Forest Carbon Partnership Facility).

²⁰¹ See discussion *infra* Sections 4.2–4.3.

²⁰² See, e.g., Arun Agrawal et al., *Changing Governance of the World’s Forests*, 320 SCIENCE 1460, 1461 (2008) (discussing decentralization of forest governance over past several decades); Tanya Hayes & Lauren Persha, *Nesting Local Forestry Initiatives: Revisiting Community Forest Management in a REDD+ World*, 12 FOREST

Efforts to reduce emissions from deforestation are also gaining traction in various private sector initiatives. Multi-stakeholder commodity roundtables for soy, beef, and palm oil, for example, are exploring ways to reduce emissions from deforestation through supply chain certification schemes.²⁰³ At least half a dozen voluntary carbon market standards for REDD activities are in various stages of development.²⁰⁴ And the number of project-level REDD activities in tropical forest countries has grown substantially

POL'Y & ECON. 545, 545-46 (2010) (reviewing extensive research on forest governance decentralization and arguing for importance of decentralized forest governance structures for the success of REDD+ initiatives). Elinor Ostrom's research has been particularly influential in highlighting the effectiveness of decentralized forest governance. In her view,

[n]aive theories of institutions equate power and capability to regulate events with simple systems that are organized in a clear hierarchy of superior and subordinate relationships. Substantial recent research on forest institutions has challenged the presumption that centralized agencies achieve better regulation of forest resources than do more complex, polycentric institutions.

Elinor Ostrom, *Scales, Polycentricity, and Incentives: Designing Complexity to Govern Complexity*, in PROTECTION OF GLOBAL BIODIVERSITY: CONVERGING STRATEGIES 149, 150 (Lakshman D. Guruswamy & Jeffrey A. McNeely eds., 1998) (citations omitted).

²⁰³ See William Laurance et al., *Improving the Performance of the Roundtable on Sustainable Palm Oil for Nature Conservation*, 24 CONSERVATION BIOLOGY 377 (2010) (discussing efforts of the Roundtable on Sustainable Palm Oil to reduce deforestation impacts of palm oil production); Lesley K. McAllister, *Sustainable Consumption Governance in the Amazon*, 38 ENVTL. L. REP. 10873, 10878-80 (2008) (discussing "responsible sourcing" and certification schemes aimed at improving environmental performance of soy and beef industries in Brazil); Daniel C. Nepstad et al., *Globalization of the Amazon Soy and Beef Industries: Opportunities for Conservation*, 20 CONSERVATION BIOLOGY 1595, 1600-01 (2006) (discussing potential for environmental certification systems to reduce deforestation associated with soy and beef supply chains in Brazil).

²⁰⁴ These include pure carbon accounting standards such as the REDD methodologies being developed under the Voluntary Carbon Standard ("VCS") as well as project design standards focused on ensuring certain social and environmental co-benefits from REDD activities such as the Community, Climate and Biodiversity Alliance ("CCBA") standards. See VOLUNTARY CARBON STANDARD, <http://www.v-c-s.org/> (last visited Nov. 24, 2010) (providing background on program objectives of the Voluntary Carbon Standard); THE CLIMATE, COMMUNITY & BIODIVERSITY ALLIANCE, <http://www.climate-standards.org/> (last visited Nov. 24, 2010) (providing an overview of The Climate, Community and Biodiversity Alliance); see also ECOSYSTEM MARKETPLACE, STATE OF THE FOREST CARBON MARKETS 2009 (2010) (reviewing status of voluntary forest carbon standards).

since the mid 2000s, with significant involvement from numerous stakeholders and the private sector.²⁰⁵

To supporters, REDD represents nothing less than the last best hope for saving tropical forests on any significant scale and a critical element in the effort to avoid catastrophic disruption of the global climate system.²⁰⁶ Others see it as an essential low-cost mitigation option available in the near term; a way of reducing the costs of GHG reductions and providing much-needed flexibility in the transition to a low-carbon energy system.²⁰⁷ Still others view it as a key step toward engaging major developing countries such as Brazil and Indonesia in the climate protection effort and a potential pathway to a new paradigm for low-carbon land use.²⁰⁸

²⁰⁵ See ECOSYSTEM MARKETPLACE, *supra* note 204 (reviewing the status of REDD projects around the world).

²⁰⁶ See, e.g., *The World's Lungs: Forests, and How to Save Them*, ECONOMIST, Sept. 25, 2010, at 15, available at <http://www.economist.com/node/17093495> (noting that without a serious effort to make REDD work "the risk from climate change will be vastly increased and the planet will lose one of its most valuable, and most beautiful, assets").

²⁰⁷ See MCKINSEY & COMPANY, PATHWAYS TO A LOW-CARBON ECONOMY: VERSION 2 OF THE GLOBAL GREENHOUSE GAS ABATEMENT COST CURVE 116 (2009) (identifying avoided deforestation as large, low-cost abatement opportunity for GHG mitigation); NICHOLAS STERN, THE ECONOMICS OF CLIMATE CHANGE: THE STERN REVIEW 537 (2007) ("Curbing deforestation is a highly cost-effective way of reducing greenhouse gas emissions and has the potential to offer significant reductions fairly quickly."); Nabuurs et al., *supra* note , at 543 (noting high agreement and much evidence for conclusion that "[f]orestation can make a very significant contribution to a low-cost global mitigation portfolio that provides synergies with adaptation and sustainable development"). Reducing emissions from deforestation, according to these analyses, could therefore provide significant flexibility regarding both the sequencing of emissions reductions over time and the geographic and sectoral distribution of such reductions (where flexible). See LAWRENCE H. GOULDER & WILLIAM A. PIZER, THE ECONOMICS OF CLIMATE CHANGE 11 (2006) (discussing concept of "where" and "when" flexibility in context of GHG mitigation efforts). The enthusiasm for REDD as a low-cost, near-term abatement option (a point that the consultants from McKinsey & Co. have been making for several years) needs to be tempered with some recognition of the difficulties involved in getting the laws and institutions in place to make this happen. One afternoon in an Indonesian village is all it would take to dispel the view that this will be quick, easy, or even cheap.

²⁰⁸ Brazil and Indonesia are among the top global emitters when emissions from deforestation are included. See LARRY PARKER & JOHN BLODGETT, GREENHOUSE GAS EMISSIONS: PERSPECTIVES ON THE TOP 20 EMITTERS AND DEVELOPED VERSUS DEVELOPING NATIONS 6 (2008) ("Land-use practices in certain developing countries, notably Brazil and Indonesia, are having the effect of substantially upping their relative emissions ranks: The ranking of their cumulative net emissions from 1950 to 2000 rise from 18th to 5th, and 27th to 4th, respectively, when land use is taken into account."). For Brazil, emissions from deforestation

Critics, on the other hand, charge that REDD is simply another effort by polluters in the industrialized countries to avoid making real emissions reductions at home—another version of “carbon colonialism” aimed at appropriating cheap abatement opportunities from developing countries, enriching private companies, empowering certain state actors and driving new forms of enclosure, all of which pose grave threats to the rights and interests of indigenous peoples and local forest-dependent communities.²⁰⁹ Somewhere in the middle are those who consider REDD to be overly complex and unrealistic given the current state of forest governance (and governance generally) in many tropical forest countries, and thus an expensive distraction from the more pressing task of transitioning to a low-carbon energy system.²¹⁰

have historically accounted for some two-thirds of total emissions. In Indonesia, the proportion is around 80%. See Gustavo A. Silva Chávez, *Reducing Greenhouse Gas Emissions from Tropical Deforestation by Applying Compensated Reduction to Bolivia*, in AMAZON INSTITUTE FOR ENVIRONMENTAL RESEARCH, TROPICAL DEFORESTATION AND CLIMATE CHANGE 73 (Paulo Moutinho & Stephan Schwartzman eds., 2005).

²⁰⁹ See FRIENDS OF THE EARTH INTERNATIONAL, REDD MYTHS: A CRITICAL REVIEW OF PROPOSED MECHANISMS TO REDUCE EMISSIONS FROM DEFORESTATION AND DEGRADATION IN DEVELOPING COUNTRIES 7 (2008) (arguing that REDD could “[r]educe developing countries’ sovereignty over their natural resources, by prioritising investment decisions that focus on maximizing profits and allowing foreign investors to buy up forest ‘services,’” “[f]oster an ‘armed protection’ mentality that could lead to the displacement of millions of forest-dependent people, including by force,” and “[f]acilitate corruption and poor governance in countries with tropical forests, because of the large sums of money proposed and the complex nature of the financial mechanisms likely to be involved”); TOM GRIFFITHS WITH CONTRIBUTIONS FROM FRANCESCO MARTONE, FOREST PEOPLES PROGRAMME, SEEING REDD?: FORESTS, CLIMATE CHANGE MITIGATION AND THE RIGHTS OF INDIGENOUS PEOPLES AND LOCAL COMMUNITIES 1 (2009) (stressing that “many initial REDD concepts fail to acknowledge forest governance problems, do not propose forest tenure reform,” and contain no clear commitments to address indigenous rights and equity issues).

²¹⁰ See, e.g., WORLD BANK, ROOTS FOR GOOD FOREST GOVERNANCE OUTCOMES: AN ANALYTICAL FRAMEWORK FOR GOVERNANCE REFORMS 33 (2009) (“In the specific context of REDD, for example, it is widely agreed that without good governance and promotion of legality in the forest sector, REDD schemes have little opportunity to be successful.”); Rhitu Chatterjee, *The Road to REDD*, 43 ENVTL. SCI. & TECH. 557 (2009) (detailing difficulties associated with the implementation of a REDD project due to limitations in funding, science, monitoring, and complexities of institutions and indigenous rights); Manish Bapna, *Forests, Climate Change and the Challenge of REDD*, WORLD RESOURCES INSTITUTE (Mar. 9, 2010), <http://www.wri.org/stories/2010/03/forests-climate-change-and-challenge-redd> (last visited Nov. 28, 2010) (discussing significant challenges to REDD posed by the problem of weak governance in many tropical forest countries).

Put crudely, generalizations about REDD do not come easy and much depends on where one stands. Viewed from above, REDD looks like a paradigmatic attempt at Earth systems governance—a critical step in the effort to manage the terrestrial carbon cycle and bring it into larger structures of climate governance. Viewed from below, REDD looks like yet another forest conservation scheme; another iteration of what Tanya Li calls the “will to improve,” with massive implications for existing practices of forest governance and land use and plenty of reasons for skepticism.²¹¹ Viewed from the in-between, REDD looks like a host of mediating practices—principles of GHG compliance market design, carbon accounting standards, remote sensing technologies and MRV platforms, new forms of property, private investment decisions, NGO conservation agendas, national and subnational laws governing forests and land use, and various norms and principles regarding the participation and rights of local people—all of which *might* provide the glue to make the whole thing cohere into an effective form of climate governance.

For REDD to work, of course, many things will have to fall into place and no single development at any level will be enough to make the difference. As an emerging form of climate governance, REDD is quite fragile and, as noted in the introduction, could easily fall apart. Indeed, even if all of the necessary policy pieces fall into place regarding the establishment of an international REDD mechanism and/or the design of national and subnational GHG compliance systems that recognize efforts to reduce emissions from deforestation, unless REDD can be translated into the vernacular institutions of communities who live in and near tropical forests, it will surely fail.²¹² This goes beyond simply

²¹¹ See LI, *supra* note , at 6 (describing experiences with various “improvement schemes” in Indonesia and analyzing such schemes as a “distinct, governmental rationality”); SCOTT, *supra* note (discussing various state-sponsored schemes to improve the human condition).

²¹² As one commentator recently put it: “[m]ultispectral remote sensing, international negotiations, and merchant-bank deals appear to offer a heady mix of new opportunities to star-struck forest ecologists and conservationists, but REDD will come to nothing if the system is not supported by the people who own and live in the forests.” David Melick, *Credibility of REDD and Experiences from Papua New Guinea*, 24 CONSERVATION BIOLOGY 359, 361 (2010). A recent study of some eighty forest commons in ten countries identified positive links between local autonomy over forest resources and increased carbon storage in forests. See Ashwini Chhatre & Arun Agrawal, *Trade-offs and Synergies Between Carbon Storage and Livelihood Benefits from Forest Commons*, 106 PROC. NAT'L. ACAD. SCI. 17667, 17667 (2009) (discussing links between local autonomy over forest resources and

getting the incentives right “on the ground.” It goes to questions of meaning, significance, and value in these diverse and complicated places—questions that clearly exceed the methodological presuppositions of economics (not to mention law) and require sustained engagement with the work of interpretive social science and field-based research. Thus, to understand REDD and the conditions for making it work, it needs to be approached not simply as a global project but as an emerging global assemblage of people, practices, organizations, laws, technologies, and territories that is taking shape at multiple sites around the world. Hence, the notion of global projects in faraway places: REDD is a global project, but it is one that is being constituted in faraway places—places that are exceedingly complex and that will determine the fate of the effort. This section explores the REDD case from this perspective, focusing on how REDD has come to be constituted as a global project of potentially immense reach, the manner in which it is taking shape in faraway places all over the world, the changing natures of forest law and governance that are accompanying REDD, and the ways in which new forms of value are reshaping the relationship of the state to the forest, to local communities and to forest-dependent people.

4.1. *Making Forests an Object of Climate Governance*

Before deforestation could be approached as a viable object of climate governance it had to be understood as part of the climate problem. Although this may seem obvious from today’s perspective, such an understanding did not emerge overnight. Indeed, since the early 1980s, when the tropical forest crisis rose to

enhanced carbon storage). Of course, the concept of “community” is itself contested, and efforts to translate REDD into local institutions must be tempered with a critical appreciation for the politics of particular communities in particular contexts. See, e.g., Li, *supra* note 46, at 230–69 (discussing how “community forestry” has operated as a key vector of neoliberal development programs in Indonesia); Arun Agrawal & Clark C. Gibson, *Enchantment and Disenchantment: The Role of Community in Natural Resource Conservation*, 27 *WORLD DEV.* 629, 640 (1999) (criticizing tendency to embrace “community” as “a general answer to conservation-related woes”); Michael Watts, *The Sinister Political Life of Community: Economies of Violence and Governable Spaces in the Niger Delta, Nigeria*, in *THE SEDUCTIONS OF COMMUNITY: EMANCIPATIONS, OPPRESSIONS, QUANDARIES* 101, 101–42 (Gerald W. Creed ed., 2006) (critiquing the widespread conception of “community” as an “unalloyed good” through a careful analysis of communities of violence arising out of the crisis of secular nationalism in contemporary Nigeria).

the top of the international environmental agenda, conservationists and policymakers have pursued multiple forest protection efforts outside of the climate policy context, jumping from one approach to the next, with biodiversity, international trade, forest governance, and the third world debt crisis motivating some of the more prominent approaches to the problem.²¹³ While some of these approaches have resulted in important conservation victories, they have had very little impact on the problem as a whole. At the same time, efforts to fashion a comprehensive international legal instrument for forests, which began in earnest during the early 1990s, have been a spectacular failure, foundering on the fundamental conflict between the view of tropical forests as the “common heritage of mankind” and forests as “national patrimony,” as well as the perennial inadequacy of donor country financing.²¹⁴ Thus, although there have been a few notable success stories in the fight against tropical deforestation, particularly in the establishment of protected areas, three decades of efforts outside of the climate policy context have had little impact on the overall scale of the problem.²¹⁵

The recent support for a climate policy approach to deforestation stems in part from a recognition that past efforts to deal with the problem have not succeeded and a growing sense that deforestation and land use must be critical components of any climate protection effort given their significant contribution to global GHG emissions. But making deforestation into a viable object of climate governance has proved to be no easy task, depending on decades of scientific, technical, and institutional work aimed at developing a new way of *seeing* the problem of

²¹³ See Boyd, *supra* note , at 863–66 (discussing various approaches to deforestation outside of the climate policy context).

²¹⁴ *Id.* at 865, 880 n.144; see, e.g., Radoslav S. Dimitrov, *Hostage to Norms: States, Institutions and Global Forest Politics*, 5 GLOBAL ENVTL. POL. 1, 7–12 (2005) (discussing the history of efforts to develop international legal instrument on forests).

²¹⁵ This is evidenced by the fact that deforestation rates, despite some recent progress in Brazil, have not declined significantly during the last decade. See FOOD & AGRIC. ORG. OF THE UNITED NATIONS, GLOBAL FOREST RESOURCES ASSESSMENT 2010: MAIN REPORT 10 (2010) [hereinafter 2010 FOREST RESOURCE ASSESSMENT] (reporting gross average annual deforestation of 13 million hectares per year during 2000–2010).

deforestation—that is, a new way of constructing the problem as part of a larger effort to manage the global carbon budget.²¹⁶

Thus, intensive work in Earth systems science and carbon cycle research during the post-World War II period provided the conceptual foundation for viewing tropical forests as an important part of the global carbon budget, highlighting the contribution of tropical deforestation (and land-use change more generally) to global anthropogenic carbon emissions.²¹⁷ The resulting simplification of diverse tropical forest ecosystems to their functional, aggregated role in carbon cycling (forests collectively became a box or sub-unit in the larger terrestrial carbon budget, which was itself a box or sub-unit in the larger global carbon budget),²¹⁸ laid the groundwork for making forests an object of climate governance.²¹⁹

Complementing these developments, the use of increasingly powerful remote sensing capabilities enabled a previously unavailable synoptic view of changes in global forest cover, establishing the basis for mapping tropical forests as terrestrial carbon stocks and providing an objective, transparent platform for the monitoring, reporting, and verification of efforts to reduce deforestation.²²⁰ New “wall-to-wall” views of land cover change

²¹⁶ See Boyd, *supra* note , at 878–98 (discussing the scientific, technical, and legal practices involved in making deforestation into a viable object of climate governance).

²¹⁷ See *id.* at 880–84 (discussing conceptual advances in carbon cycle research that allowed forests and tropical deforestation to be understood as part of the larger effort to manage the global carbon budget).

²¹⁸ See, e.g., R.A. Houghton, *Balancing the Global Carbon Budget*, 35 ANN. REV. EARTH & PLANETARY SCI. 313, 316 fig.1 (2007) (illustrating role of vegetation and land use change in global carbon cycle).

²¹⁹ See Boyd, *supra* note , at 884 (concluding that the simplification and reduction of forest ecosystems to their role in the carbon cycle provided a necessary foundation for efforts to integrate forests into climate policy).

²²⁰ See *id.* at 884–91 (discussing advances in remote sensing of changes in land use and tropical deforestation); see also Asner, *supra* note 80 (reporting on use of high-resolution mapping of carbon stocks and emissions in the Amazon region); Asner et al., *supra* note 80 (discussing opportunities to use remote sensing to develop high-resolution forest carbon maps). Drawing on the work of Asner and others, Google is developing a new platform that will enable “online, global-scale observation and measurement of changes in the earth’s forests” by running high-performance processing of raw satellite data through the “Google cloud.” *Seeing the Forest Through the Cloud*, OFFICIAL GOOGLE BLOG (Dec. 10, 2009, 7:06 AM), <http://googleblog.blogspot.com/2009/12/seeing-forest-through-cloud.html>. According to Google, the new technology, known as Google Earth Engine, will provide a low-cost, publicly available, and transparent tool for forest

and remote sensing techniques have allowed deforestation, and its accompanying emissions, to be monitored at jurisdictional scales in a manner that was simply not possible a decade ago.²²¹ By “fundamentally alter[ing] the capacity to observe and monitor land change,”²²² this emerging remote sensing infrastructure has provided the technical basis for constructing new regulatory and management strategies to integrate terrestrial carbon into climate governance.

Finally, the ongoing development of certain legal and accounting techniques, combined with the elaboration of standards to ensure quality, have been critical in the effort to translate forest carbon into a compliance-grade asset.²²³ Specifically, the move to jurisdiction-wide accounting for deforestation (at national and provincial levels), which has itself been made possible by advances in remote sensing and the ability to map forest cover change over large areas, together with the application of particular legal tools and standards that deal with environmental integrity concerns such as emissions leakage, non-permanence and additionality, has placed REDD within (or closer to) an equivalence space that works for other fossil fuel related emissions.²²⁴

Together, these ways of seeing have rendered a set of phenomena previously viewed through the lens of biodiversity loss, trade, macro-economic imbalances, and governance failures of

monitoring, reporting and verification to support emerging REDD policy mechanisms. See *Introducing Google Earth Engine*, OFFICIAL GOOGLE BLOG (Dec. 2, 2010, 8:00 AM), <http://blog.google.org/2010/12/introducing-google-earth-engine.html>. (introducing Google Earth Engine platform, a free, universally accessible source of remote sensing data and mapping capabilities that will facilitate global-scale monitoring of the Earth's environment, with specific support for the development of systems to monitor, report and verify efforts to stop global deforestation).

²²¹ See Ruth DeFries et al., *Earth Observations for Estimating Greenhouse Gas Emissions from Deforestation in Developing Countries*, 10 ENVTL. SCI. & POL'Y 385, 389 (2007) (“High resolution data with nearly complete global coverage are available at low or no cost for early 1990s and early 2000s These data serve a key role in establishing historical deforestation rates”).

²²² B. L. Turner II et al., *The Emergence of Land Change Science for Global Environmental Change and Sustainability*, 104 PROC. NAT'L ACAD. SCI. 20666, 20666-67 (2007); see also DeFries, *supra* note , at 383 (“The synoptic view from remote sensing has transformed the perceived role of terrestrial vegetation in the [Earth] system.”).

²²³ See Boyd, *supra* note , at 891-98 (discussing various legal and accounting practices involved in translating forest carbon into compliance carbon).

²²⁴ See *id.*

various kinds comprehensible for climate mitigation efforts. In the process, a new abstraction (a new global form)—forest carbon—has emerged, opening up possibilities for applying particular legal technologies and new forms of property that are pulling tropical forests, and the many people who depend upon them, into new regulatory systems and new value chains that are potentially global in scope.²²⁵

4.2. *Global Projects in Faraway Places*

Without question, the effort to make deforestation into a viable object of climate governance represents a socio-technical achievement of the first order. But it is a long way from actually integrating deforestation into climate policy, something that depends upon a host of political and institutional factors operating in many different places—from the U.N. process, to regulatory design efforts in the United States and other jurisdictions, to a diverse range of national and sub-national practices in tropical forest countries. Thus, even if forest carbon can be fashioned into a compliance-grade asset for GHG mitigation efforts; even if REDD can be articulated as a coherent project of climate governance, the overall success of the effort depends upon the ways in which this all gets worked out in multiple sites around the world.

One very important site (or set of sites) where REDD is taking shape is in the design of GHG compliance markets—at international, regional, national, and subnational levels.²²⁶ These efforts endeavor to create a possible pathway for integrating REDD into climate policy by leveraging GHG compliance markets in a manner that channels financing to eligible REDD activities in tropical forest countries through the recognition of offset credits generated from REDD activities or the allocation of allowances (or revenues from the auctioning of such allowances) to such

²²⁵ For recent studies examining the emergence of new carbon property rights, particularly in the forest sector, see INTERNATIONAL UNION FOR CONSERVATION OF NATURE, *LEGAL FRAMEWORKS FOR REDD: DESIGN AND IMPLEMENTATION AT THE NATIONAL LEVEL*, (John Costenbader ed., 2009) [hereinafter IUCN], DAVID TAKACS, CONSERVATION INT'L, *FOREST CARBON: LAW & PROPERTY RIGHTS* (2009), and Samantha Hepburn, *Carbon Rights as New Property: The Benefits of Statutory Verification*, 31 SYDNEY L. REV. 239 (2009).

²²⁶ See Boyd, *supra* note 40, at 872-77 (reviewing various efforts to include REDD provisions in an international GHG compliance system, the EU Emissions Trading Scheme, U.S. federal cap-and-trade legislation, and in the California cap-and-trade system).

activities.²²⁷ California is currently the furthest along in terms of developing a regulatory framework that could accept compliance-grade credits from REDD activities, which would likely be tied to jurisdiction-wide reductions in specific states and provinces that meet certain eligibility requirements and formally link with California.²²⁸

Consistent with these efforts, REDD has also become a major focus of bilateral and multilateral climate change funding.²²⁹ This approach has been embraced by a number of governments, and is often talked about as part of a phased effort that leads to eventual full-scale engagement with existing and emerging GHG compliance markets.²³⁰ To date, several billion dollars in “fast start” financing have been made available, with more expected in the years ahead.²³¹

²²⁷ The REDD provisions in proposed federal climate legislation in the U.S. would do both. See, e.g., ACES, *supra* note 198.

²²⁸ See CAL. AIR RES. BD., PROPOSED REGULATION, *supra* note 197, §§ 95991-94 (Oct. 28, 2010) (establishing requirements for sector-based offset credits and identifying REDD as a source of sector-based credits); CAL. AIR RES. BD., CLIMATE CHANGE PROPOSED SCOPING PLAN: A FRAMEWORK FOR CHANGE 38 (Oct. 2008) (approved Dec. 2008) (identifying the possibility of accepting offsets in a California GHG compliance system from “those jurisdictions that demonstrate performance . . . in reducing emissions or enhancing sequestration through eligible forest carbon activities in accordance with appropriate national or sub-national accounting frameworks”).

²²⁹ See, e.g., ARILD ANGELSEN ET AL., MERIDIAN INST., REDUCING EMISSIONS FROM DEFORESTATION AND FOREST DEGRADATION (REDD): AN OPTIONS ASSESSMENT REPORT 4-11 (2009) (discussing options for the mobilization and delivery of international finance for REDD). For an overview of the current state of climate funding, including funding for REDD, see *Climate Funds Update*, THE GREEN POLITICAL FOUND., <http://www.climatefundsupdate.org> (last visited Nov. 24, 2010).

²³⁰ See ANGELSEN ET AL., *supra* note 229, at 3 (advocating a phased approach to REDD).

²³¹ Norway, for example, has committed one billion dollars for REDD activities in Brazil and one billion dollars for REDD activities in Indonesia. See *Brazil Offered \$1 Billion to Save Amazon Forest*, MSNBC (Sept. 16, 2008), <http://www.msnbc.msn.com/id/26744780/> (stating that Norway’s billion dollar donation to Brazil is contingent on clear documentation that deforestation is being reduced); *Norway Pledges \$1 billion for REDD as Indonesia Re-Affirms Commitment to Scheme*, ECOSYSTEM MARKETPLACE (May 27, 2010) http://www.ecosystemmarketplace.com/pages/dynamic/article.page.php?page_id=7569§ion=news_articles&eod=1 (describing Norwegian commitment to Indonesia for activities to reduce emissions from deforestation). The current 2011 U.S. appropriation for REDD activities is expected to be on the order of \$300 million, representing a part of the U.S. pledge of \$1 billion for REDD activities during 2010-12. See *U.S. International Climate Change Finance*, U.S. DEP’T OF STATE (Apr. 2010), <http://www.state.gov/documents/organization/140689.pdf> (last visited

As a result, much of the focus on REDD at the international level has been on developing the programmatic and institutional frameworks to channel bilateral and multilateral donor financing to REDD activities in tropical forest countries. Most of the attention, not surprisingly, has been directed at “capacity building” or what is sometimes referred to as “REDD readiness” in an effort to prepare tropical forest countries for participation in a future REDD mechanism or other GHG compliance systems. The result is a potentially far-reaching realignment of governmental institutions and practices to support REDD, illustrating precisely the process of “de-nationalization” referred to above.²³²

Indeed, as a consequence of the increasing flow of REDD funds to tropical forest countries, combined with growing internal support for REDD, particular organs of the state—Ministries of Environment, Forestry, Agriculture, even Finance—are being partially pulled out of their national administrative contexts, bulked up, and redirected toward this global project. At the same time, as will be discussed in the next section, new laws governing forests and land use are being enacted in order to prepare the ground for REDD by defining carbon rights, clarifying land tenure, and establishing new ecological zoning requirements.²³³ New institutions are also being established that directly challenge traditional conceptions of the state. In 2008, for example, Brazil created the Amazon Fund—a multi-stakeholder institution

Nov. 28, 2010) (emphasizing the U.S.’s commitment to REDD+ financing as part of its Copenhagen Accord commitment). Other major donor countries such as Germany and Japan have collectively pledged some one billion dollars. See WORLD RES. INST., SUMMARY OF CLIMATE FINANCE PLEDGES PUT FORWARD BY DEVELOPED COUNTRIES (2010) (summarizing climate pledges made by selected countries). Several multilateral entities are also providing significant financing for REDD activities. The World Bank’s Forest Carbon Partnership Facility has an initial capitalization of \$300 million, and the U.N. REDD program is currently funded at \$48 million. See *World Bank Offers \$300M for Forest Conservation, Emissions Reductions*, MONGABAY.COM (Oct. 15, 2007), http://news.mongabay.com/2007/1015-world_bank.html (stipulating the World Bank’s plan to “help developing countries build the technical, regulatory, and sustainable forestry capacity to reduce emissions from deforestation and degradation”) (internal quotations omitted); *UN REDD: More Countries, More Financing*, CARBON POSITIVE (Mar. 26, 2010), <http://www.carbonpositive.net/viewarticle.aspx?articleID=1941> (last visited Nov. 28, 2010) (introducing the U.N. REDD program).

²³² See *supra* Section 2.2; SASSEN, *supra* note 33, at 223 (discussing how formerly national agendas and “[p]articular components of the national state” are “denationalized” and reoriented toward the needs of a global economy).

²³³ See *supra* Section 3.3 (examining some of the implications of globalization for global environmental law).

governed by representatives from the states, the federal government and civil society that is independently administered by the country's largest private development bank, BNDES—to allocate more than \$1 billion in donor financing to various REDD activities.²³⁴ Indonesia is also developing a new institutional framework to allocate REDD-related financial flows in the wake of the Norwegian government's recent pledge of \$1 billion for REDD activities in that country.²³⁵

Subnational governments throughout the tropics are also mobilizing around REDD and will likely receive a portion of the interim REDD public financing discussed above given that much of forest governance (as an administrative matter) has been devolved to sub-national levels.²³⁶ In fact, many key states and provinces in large tropical forest countries are progressing faster on REDD than their respective national governments and, as a result, there is a considerable amount of REDD-related activity happening at provincial, district, and municipal levels. In Brazil, for example, the state of Amazonas has passed climate legislation that specifically addresses REDD.²³⁷ The State of Acre has recently enacted a comprehensive statewide environmental services program based on an elaborate multi-stakeholder process with

²³⁴ See Decreto No. 6.527, de 1 de agosto de 2008, DIÁRIO OFICIAL DA UNIÃO [D.O.U.] de 4.8.2008 (Braz.) (establishing the Amazon Fund). See generally FUNDO AMAZÔNIA, <http://www.amazonfund.gov.br/> (last visited Nov. 28, 2010) (describing the purpose, organization, and operation of the Amazon Fund).

²³⁵ See Fitriani Ardiansyah, *Untangling the Web of REDD Governance*, JAKARTA POST (Aug. 3, 2010), <http://www.thejakartapost.com/news/2010/08/03/untangling-web-redd-governance.html> (discussing proposed new institutional mechanisms for REDD within the Indonesian government in the wake of Norway's \$1 billion commitment).

²³⁶ See Agrawal et al., *supra* note 202 (describing recent shift toward decentralized forest governance); Krister Andersson, *Understanding Decentralized Forest Governance: An Application of the Institutional Analysis and Development Framework*, 2 SUSTAINABILITY: SCI., PRAC., & POL'Y 25 (2006) (evaluating local institutional strategies associated with effective forest governance); Hayes & Persha, *supra* note 201 (detailing research on forest governance decentralization and arguing that decentralized forest governance structures are necessary for the success of REDD+ initiatives).

²³⁷ The law encourages "the creation of market instruments to enable the execution of projects for reducing deforestation emissions." Lei sobre Mudanças Climáticas, Conservação Ambiental e Desenvolvimento Sustentável do Amazonas, PEMC-AM [Law of Climate Change, Environmental Conservation, and Sustainable Development], State Law No. 3135, arts. 2(II) & 3(I) (June 5, 2007) (State of Amazonas, Brazil).

REDD as the centerpiece.²³⁸ Mato Grosso has adopted an official deforestation reduction target and is working to regularize land tenure and register property owners as part of an innovative, remote-sensing based environmental licensing program.²³⁹ In Indonesia, East and West Kalimantan have both adopted province-level REDD programs as part of broader low-carbon development strategies that are tied directly to forest districts.²⁴⁰ Aceh has instituted a moratorium on logging, created a high-level REDD task force composed of government and non-governmental representatives, and placed most of the tropical forests in the province into two very large REDD projects, both of which depend upon significant involvement by local communities.²⁴¹ On the other side of the archipelago, Papua is working closely with NGOs and the private sector to develop province-level accounting frameworks and architectures for nesting project activities within this larger jurisdictional framework.²⁴² Many of these states and

²³⁸ See Do Sistema Estadual De Incentivos A Serviços Ambientais – Sisa [State System of Incentives for Environmental Services], Lei No 2.308 (Oct. 22, 2010) (State of Acre, Brazil).

²³⁹ See INSTITUTO CENTRO DE VIDA, REFERENCE DOCUMENT FOR THE DEVELOPMENT OF MATO GROSSO STATE'S REDD PROGRAM (Dec. 2009) (describing REDD activities in Mato Grosso); ELEC. POWER RESEARCH INST., BRAZIL'S EMERGING SECTORAL FRAMEWORK FOR REDUCING EMISSIONS FROM DEFORESTATION AND DEGRADATION AND THE POTENTIAL TO DELIVER GREENHOUSE GAS EMISSIONS REDUCTIONS FROM AVOIDED DEFORESTATION IN THE AMAZON'S XINGU RIVER BASIN, at 3-11 to 3-14 (2010) (describing Mato Grosso's REDD Program).

²⁴⁰ See Awang Faroek, Gubernur Provinsi Kalimantan Timur [Gov. East Kalimantan], Rencana Aksi Antisipasi Pemanasan Global Dan Mitigasi Perubahan Iklim Melalui Kaltim Hijau Tahun 2010–2014 [Presentation at the GCF Meeting, Banda Aceh, Indonesia] (May 2010), *available at* [http://www.gcftaskforce.org/documents/May_Aceh/Day_1_2/East%20Kalimantan%20Presentation%20\(May%2018%202010\).pdf](http://www.gcftaskforce.org/documents/May_Aceh/Day_1_2/East%20Kalimantan%20Presentation%20(May%2018%202010).pdf) (detailing East Kalimantan's REDD activities); West Kalimantan Redd Team, Presentation at the GCF Meeting, Banda Aceh, Indonesia: Overview of REDD in West Kalimantan Province (May 2010), *available at* [http://www.gcftaskforce.org/documents/May_Aceh/Day_1_2/West%20Kalimantan%20Presentation%20\(May%2018%202010\).pdf](http://www.gcftaskforce.org/documents/May_Aceh/Day_1_2/West%20Kalimantan%20Presentation%20(May%2018%202010).pdf) (discussing REDD activities in West Kalimantan).

²⁴¹ See Aceh, Presentation at the GCF Meeting, Banda Aceh, Indonesia, Aceh Province REDD Progress Update (May 2010), *available at* [http://www.gcftaskforce.org/documents/May_Aceh/Day_1_2/Aceh%20Presentation%20\(May%2018%202010\).pdf](http://www.gcftaskforce.org/documents/May_Aceh/Day_1_2/Aceh%20Presentation%20(May%2018%202010).pdf) (summarizing REDD activities in Aceh); *see also* JANE DUNLOP, REDD, TENURE AND LOCAL COMMUNITIES: A STUDY FROM ACEH, INDONESIA 11–16 (2009) (describing REDD initiatives in Aceh).

²⁴² See Noak Kapisa, Presentation at the GCF Meeting, Banda Aceh, Indonesia, REDD and a Low-Carbon Economy: Update from Papua Province, (May 2010), *available at* <http://www.gcftaskforce.org/documents/May>

provinces are also partnering with California and other jurisdictions from around the world through the Governors' Climate and Forests Task Force ("GCF") to develop frameworks for subnational approaches to REDD with the overall goal of generating compliance grade emissions reductions that could one day be accepted in emerging GHG compliance systems, such as California's cap-and-trade program, and other pay-for-performance schemes.²⁴³ While much of this work is still in a formative stage, some of it still just on paper, and while there are plenty of hurdles ahead, it indicates the critical role that subnational governments are playing in operationalizing REDD.

As a global project, then, REDD is taking shape in national and sub-national institutions all over the world: in Bonn, Oslo, Washington, and Sacramento; in Brasilia, Jakarta, and Mexico City. But also in the state and provincial capitals of Aceh, Acre, Amazonas, Chiapas, Cross River State, the Kalimantanans, Mato Grosso, Papua, and Pará. And finally, in a host of local communities and projects (large and small) scattered across the tropical world—from the Ulu Masen project on the northern tip of Sumatra,²⁴⁴ to the massive Xingu carbon project in the Brazilian Amazon,²⁴⁵ the Makira project in Madagascar,²⁴⁶ and the Madre de Dios Amazon REDD Project in Peru.²⁴⁷

[_Aceh/Day_1_2/Papua%20Presentation%20\(May%2018%202010\).pdf](#) (describing REDD activities in Papua).

²⁴³ See GCF, *supra* note 197 (describing GCF).

²⁴⁴ See DUNLOP, *supra* note 241, at 14 (describing the Ulu Masen project); GOV'T OF ACEH, REDUCING CARBON EMISSIONS FROM DEFORESTATION IN THE ULU MASEN ECOSYSTEM, ACEH, INDONESIA (2007), available at http://www.climatestandards.org/projects/files/Final_Ulu_Masen_CCBA_project_design_no_te_Dec29.pdf (summarizing key features of Ulu Masen project).

²⁴⁵ See ELEC. POWER RESEARCH INST., *supra* note 239, at 7-1 to 7-7 (describing the Xingu carbon project in Brazil).

²⁴⁶ See THE NATURE CONSERVANCY, CONSERVATION INTERNATIONAL & THE WILDLIFE CONSERVATION SOCIETY, REDUCING EMISSIONS FROM DEFORESTATION AND DEGRADATION (REDD): A CASEBOOK OF ON-THE-GROUND EXPERIENCE 10, 27-29, 37-38 (2010) (discussing the Makira project in Madagascar).

²⁴⁷ See GREENOXX, MADRE DE DIOS AMAZON REDD PROJECT (2009), available at http://www.climate-standards.org/projects/files/madre_peru/Madre_de_Dios_Amazon_REDD_Project_REVISED.pdf (outlining the features of the Madre de Dios Amazon REDD project); see also WOODS HOLE RESEARCH CTR., AN OVERVIEW OF READINESS FOR REDD: A COMPILATION OF READINESS ACTIVITIES PREPARED ON BEHALF OF THE FORUM ON READINESS FOR REDD (Tracy Johns et al. eds., 2009), available at www.cbd.int/forest/doc/overview-readiness-redd.pdf (compiling information on various REDD activities and projects around the world).

It is in these diverse and complicated places, and in the connections that get forged between them, where the proverbial rubber hits the road. Indeed, for all of the enthusiasm surrounding REDD as a beacon of hope in the international climate discussions,²⁴⁸ it will succeed or fail based on what happens in places far removed from the negotiating halls of the United Nations. The challenge is perhaps best posed as a series of questions: is it possible that one day local land-use decisions made in these faraway places could collectively translate into provincial or national level emissions reductions that could themselves be translated through a host of mediating institutions and technologies into “compliance grade” assets, which in turn could flow up into various GHG compliance markets or some other type of pay-for-performance scheme? And even if this is a realistic possibility, will there be institutions and laws in place to ensure that local communities participate on the basis of free prior informed consent, to guarantee that their rights and interests are protected, and to make sure that they get a fair shake in the distribution of benefits? Put another way, is it possible to imagine and build a set of enabling environments such that REDD can be made meaningful and valuable, in whatever form, for the Adat communities in Indonesia,²⁴⁹ for the tribes in the Amazon, for landless peasants and small landowners all over the tropics—but also for large agricultural producers, forestry companies, NGOs, remote sensing experts, merchant banks, and government regulators? It all seems a bit bracing when put in these terms. But these are the terms of engagement if REDD is ever going to be more than a noble experiment.

²⁴⁸ See Bryan Walsh, *In Copenhagen's Dark Mood, a Ray of Light for Forests*, TIME, Dec. 17, 2009, available at http://www.time.com/time/specials/packages/article/0,28804,1929071_1929070_1948263,00.html (stating that despite “the gloomy atmosphere in Copenhagen,” REDD has been a sign of hope).

²⁴⁹ Masyarakat Adat literally means “people who adhere to customary ways,” and has been variously translated to mean “customary communities,” “traditional communities,” or “indigenous peoples.” Tania Murray Li, *Masyarakat Adat, Difference, and the Limits of Recognition in Indonesia's Forest Zone*, 35 MOD. ASIAN STUD. 645, 645 (2001) (citing the formal definition of *masyarakat adat* as “people who adhere to customary ways”); see DUNLOP, *supra* note 241, at 17–27 (discussing recognition of Adat communities’ rights regarding land tenure and forest resources under Indonesian law).

4.3. *The Changing Natures of Forest Law*

Which brings us to law. In addition to the potentially significant changes in the organization of state capacities for forest governance (at multiple levels), REDD is also driving efforts to reform and revise laws governing forests, land use, and carbon within many tropical forest countries. And while much of this is being carried out in the context of REDD "readiness" and capacity building efforts, framed most often as a project of legal modernization, it is important to recognize, at a more general level, the considerable challenge that REDD poses for traditional legal conceptions of forests and their relationship to state sovereignty.

Forests, of course, have long had a special legal status in their relationship to the sovereign and to state projects of various kinds. The origins of the word itself are juridical, "referring to land that had been placed off limits by a royal decree,"²⁵⁰ most often for the purposes of ensuring an adequate supply of wild game for the royal hunt.²⁵¹ Given their special territorial status tied directly to the crown, these early "forests" were governed by a special body of forest law with its own "particularized legal bureaucracy" that was wholly outside of the common law.²⁵²

Notwithstanding this distinctive royal provenance, forest classification and mapping have also been intimately connected to the emergence of the modern state.²⁵³ In early European states such as Germany and France, for example, delineating the boundaries of forests and classifying their ownership and

²⁵⁰ As Robert Harrison notes,

[a] "forest," then, was originally a juridical term referring to land that had been placed off limits by a royal decree. . . . it could not be cultivated, exploited, or encroached upon. It lay outside the public domain, reserved for the king's pleasure and recreation. In England it also lay outside the common juridical sphere. Offenders were not punishable by the common law but rather by a set of very specific "forest laws."

ROBERT POGUE HARRISON, *FORESTS: THE SHADOW OF CIVILIZATION* 69 (1992).

²⁵¹ See *id.* at 69–70 (noting that forests were reserved for the enjoyment of the king).

²⁵² *Id.* at 73 (describing early forest law enforcement and the "particularized legal bureaucracy" of game wardens, forest sheriffs, and others especially appointed by the crown).

²⁵³ See Nancy Lee Peluso, *Whose Woods are These? Counter-Mapping Forest Territories in Kalimantan, Indonesia*, 27 *ANTIPODE* 383, 383 (1995) ("Mapping of forest resources is therefore an intrinsically political act: whether drawn for their protection or production, they are drawings of a nation's strategic space.").

production were central to the larger enterprise of cadastral mapping.²⁵⁴ In colonial and post-colonial states, particularly in the tropics, similar exercises have provided a way of extending jurisdiction over unruly spaces, excluding and disciplining certain populations, and defining natural resources as objects of state management and control.²⁵⁵ Forest law and forest mapping have thus been bound up in very direct ways with state directed processes of territorialization.²⁵⁶

To be sure, the history of forest law is a massively complex topic, given the layering and hybridization of multiple legal and normative orders across and within different jurisdictions.²⁵⁷ And it is well beyond the scope of this Article to attempt any sort of systematic treatment of the subject. But at the risk of over-generalization, it is clear that in many large tropical forest countries, official forest law has often been highly centralized at the national level, with the formal legal status of forests tied very directly to national identity and basic understandings of sovereignty.²⁵⁸ Making forests part of “state space,” in other words, has long been a key objective of forest law.²⁵⁹

²⁵⁴ See, e.g., ROGER J.P. KAIN & ELIZABETH BAIGENT, *THE CADASTRAL MAP IN THE SERVICE OF THE STATE: A HISTORY OF PROPERTY MAPPING* 132 (1992) (“Forest maps are thus an important category of early state maps. Initially concentration was on delineation of boundaries and codification of the rights of the monarch, the nobility, and the peasantry to ownership or use of the forest.”).

²⁵⁵ See NANCY LEE PELUSO, *RICH FORESTS, POOR PEOPLE: RESOURCE CONTROL AND RESISTANCE IN JAVA* (1992) (tracing efforts to extend state control over forests in Java); S. RAVI RAJAN, *MODERNIZING NATURE: FORESTRY AND IMPERIAL ECO-DEVELOPMENT 1800-1950*, at 55 (2006) (“By the end of the nineteenth century . . . [w]here there had once been state-sponsored forest destruction, there were now extensive state-sponsored regimes of scientific resource management.”); Peter Vandergeest & Nancy Lee Peluso, *Territorialization and State Power in Thailand*, 24 *THEORY & SOC’Y* 385, 391 (1995) (tracing the ways in which the classification and demarcation of major portions of national territory as “forest,” enhanced state control by extending state jurisdiction over such territory).

²⁵⁶ See discussion *supra* Section 2.2.

²⁵⁷ See Merry, *supra* note 186, at 876 (reviewing basic strands of legal pluralism and their importance in understanding law and legal order in the context of globalization); Nancy Lee Peluso & Peter Vandergeest, *Genealogies of the Political Forest and Customary Rights in Indonesia, Malaysia, and Thailand*, 60 *J. ASIAN STUDIES* 761 (2001) (discussing plural normative orders that helped create state dominated “political” forests and “customary rights” in Southeast Asia).

²⁵⁸ See Peluso & Vandergeest, *supra* note 257 (discussing the construction of the “political forest” as central to the larger project of establishing national identity).

²⁵⁹ See JAMES C. SCOTT, *THE ART OF NOT BEING GOVERNED: AN ANARCHIST HISTORY OF UPLAND SOUTHEAST ASIA* 10-11 (2009) (discussing strategies of bringing

Thus, the 1988 Brazilian Constitution states that “[t]he Brazilian Amazonian forest . . . [is] part of national patrimony”²⁶⁰ The Brazilian Forestry Code echoes this, providing that the conservation and management of all forests, public and private, are under the jurisdiction of the federal government.²⁶¹ The Indonesian Constitution of 1945 and the 1999 Forest Law, which revised and replaced the Basic Forest Law of 1967 after the fall of Suharto, provide that the vast majority of Indonesia’s forests are “state forests” owned and controlled by the central government for the benefit of the nation.²⁶² In other tropical forest countries, from Guyana to Cameroon to Thailand to Costa Rica, the bulk of the so-called forest estate is similarly controlled by the national government.²⁶³

Many aspects of forest law in tropical countries, of course, complicate this picture. The whole question of customary rights in Indonesia,²⁶⁴ the special status of indigenous territories in Brazil and other South American countries,²⁶⁵ and the substantial role of

forests and other formerly “ungoverned regions” into the ambit of state control); PELUSO, *supra* note 255, at 353 (discussing centrality of forest mapping for defining a “nation’s strategic space”).

²⁶⁰ CONSTITUIÇÃO FEDERAL [C.F.][CONSTITUTION] art. 225, ¶ 4 (1985) (Braz.), available at <http://www.v-brazil.com/government/laws/titleVIII.html>.

²⁶¹ See Lei No. 4.771, de 15 de Setembro de 1965, C. FLOR. art. 1 (Brazil) (extending federal jurisdiction over public and private forests for the common interests of all inhabitants of the country).

²⁶² See DUNLOP, *supra* note 241, at 21–27 (summarizing the evolution of Forestry Law in Indonesia and the dominance of the central government in controlling forest access and use).

²⁶³ See IUCN, *supra* note 225 (providing an overview of REDD legal and policy developments in several tropical forest countries, including Brazil, Cameroon, Guyana, and Papua New Guinea); TAKACS, *supra* note 225 (explaining legal and policy issues regarding REDD and forest carbon in Brazil, Costa Rica, Indonesia, and Madagascar).

²⁶⁴ See DUNLOP, *supra* note 241, at 23–25 (discussing specific provisions in Indonesia’s 1999 Forestry Law affecting adat (customary) communities); Daniel Fitzpatrick, *Disputes and Pluralism in Modern Indonesian Land Law*, 22 YALE J. INT’L L. 171, 173 (1997) (discussing conflict between legal reform under Indonesia’s Basic Agrarian Law of 1960 and adat (customary) law); Li, *supra* note 249, at 657–58 (describing ongoing efforts to define and secure recognition for customary rights in Indonesia); Peluso & Vandergeest, *supra* note 257, at 766 (tracing histories of how the construction of forests as objects of state management and control established the basis for reinscribing certain customary practices of forest use as “customary rights” and others as illegal activities).

²⁶⁵ See Anthony Stocks, *Too Much for Too Few: Problems of Indigenous Land Rights in Latin America*, 34 ANN. REV. ANTHROPOLOGY 85 (2005) (examining trends and challenges associated with indigenous land rights in Brazil, Peru, Bolivia,

community ownership in Papua New Guinea²⁶⁶ (not to mention the challenge of forest governance in weak or failed states in central Africa)²⁶⁷ all raise questions about the extent of state control in certain circumstances. Moreover, extensive efforts to decentralize forest management throughout the developing world since the 1980s have provided many local communities with considerable autonomy over the management of forests.²⁶⁸

Irrespective of these differences, however, the concept of forests as national patrimony continues to structure the underlying legal status of forests throughout the tropical world and beyond and has come to define the basic approach to forests under international law. Indeed, although forests – and tropical forests in particular – have long been an object of international concern, they have never had any sort of international legal status comparable to that of “common heritage” or “common concern” resources.²⁶⁹ Rather, forests have been treated in accordance with the long-

Colombia, and Nicaragua). Very little research to date has focused on the question of indigenous rights to carbon. In Brazil, for example, three such analyses have been conducted and the Brazilian government agency responsible for indigenous territories (FUNAI) has issued a concept note in response to requests from indigenous peoples seeking clarification regarding rights to carbon and legal frameworks governing REDD activities in indigenous territories. In general, these legal analyses conclude that indigenous communities have the legal autonomy to sign contracts to engage in REDD and other forest carbon activities subject to the Brazilian Constitution and existing international conventions to which Brazil is a party and which seek to protect the rights of indigenous peoples. See ELEC. POWER RESEARCH INST., *supra* note 239, at 8-1 to 8-5 (summarizing existing legal analyses on indigenous carbon rights in Brazil).

²⁶⁶ See IUCN, *supra* note 225, at 169-79 (discussing community land rights and REDD in Papua New Guinea).

²⁶⁷ See Simon Counsell, *Forest Governance in Africa* (S. Afr. Inst. of Int'l Aff., Occ. Paper No. 50, 2009) (discussing challenges of forest governance in various African countries).

²⁶⁸ See Agrawal et al., *supra* note 202 (discussing decentralization of forest governance over past several decades); Andersson, *supra* note 236 (analyzing how local institutional arrangements shape outcomes in the increasingly decentralized policy regimes of the non-industrialized world); Hayes & Persha, *supra* note 202 (reviewing extensive research on forest governance decentralization and arguing for the importance of decentralized forest governance structures for the success of REDD+ initiatives); Jacob Phelps et al., *Does REDD+ Threaten to Recentralize Forest Governance?*, 328 SCI. 312 (2010) (raising concerns about the possibility that REDD+ could reverse trends toward decentralization of forest governance).

²⁶⁹ See PHILLIPE SANDS, *PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW* 547 (2d ed. 2003) (“[T]ropical and other forests are not the ‘common heritage of mankind’ under international law, and were not identified as a ‘common concern’ to mankind in the forest principles.”).

standing principle of permanent sovereignty over natural resources as recognized in various United Nations resolutions and instruments.²⁷⁰ Based on this principle, tropical forest countries have heretofore consistently rejected efforts to “internationalize” forest resources under various multilateral environmental initiatives.²⁷¹

REDD, and the larger effort to bring forests into climate policy, challenges all of this in various ways. At the most general level, the conception of forests as key components of the global carbon cycle (and the recognition that deforestation is a major source of anthropogenic CO₂ emissions) pushes hard against the notion that forests are “natural resources” subject to the principle of permanent sovereignty. Rather, forests, or more specifically the services they provide (or are prevented from providing through deforestation) start to look much more like global public goods, given that the climate benefits that stem from protecting forests are both non-rival and non-excludable within and across generations.²⁷² Of course, these arguments have been made before, in the biodiversity context for example, with no real impact on the treatment of forests under international law,²⁷³ and it seems unlikely that REDD will change this in any formal way—at least in the near term.

²⁷⁰ See, e.g., Convention on Biological Diversity, pmbl., para. 4, art. 3 *opened for signature* June 5, 1992, 1760 U.N.T.S. 79 (entered into force Dec. 29, 1993) [hereinafter Convention on Biological Diversity] (reaffirming principle of sovereignty over natural resources); Declaration of Permanent Sovereignty over Natural Resources, G.A. Res. 1803 (XVII), pmbl., para. 4, U.N., 17th Sess., Supp. No. 17, U.N. Doc A/5217 (Dec. 14, 1962) (referring to the “inalienable right of all states to freely dispose of their natural wealth and resources in accordance with their national interests”); *Stockholm Declaration*, *supra* note 106, princ. 21 (stating that states have “the sovereign right to exploit their own resources pursuant to their own environmental policies” [subject to a] “responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other states or of areas beyond the limits of national jurisdiction.”).

²⁷¹ SANDS, *supra* note 269, at 546 (“Attempts by developed countries to ‘internationalize’ forest issues have so far been unsuccessful in legal terms, and the tropical forest resources of developing countries are carefully guarded as part of the national patrimony of these countries.”).

²⁷² See Inge Kaul et al., *Defining Global Public Goods*, in GLOBAL PUBLIC GOODS: INTERNATIONAL COOPERATION IN THE 21ST CENTURY 2, 3–12 (Inge Kaul et al. eds., 1999) (defining salient features of global public goods).

²⁷³ See Convention on Biological Diversity, *supra* note 270, pmbl., para. 4, art. 3 (reaffirming principle of sovereignty over natural resources).

But the very premise of REDD—putting an economic value on standing forests that derives from their functional role in the global carbon cycle—exerts considerable pressure on existing legal conceptions of forests by inserting them into new value regimes that are potentially global in scope. By quantifying and monetizing forest carbon in a manner that allows it to circulate globally, a functioning REDD system will increase the value of standing forests. These new value regimes will in turn usher in new rights and obligations (and new contests over such rights and obligations), begging for a rationalization of existing laws and practices governing forests, land use, and carbon.

This process is already underway in a number of tropical forest countries.²⁷⁴ Indonesia, for example, enacted the world's first national-level REDD regulations in 2009.²⁷⁵ Operating within the context of Indonesia's existing forest laws, these regulations expressly contemplate linkage with an international REDD mechanism, and empower the Ministry of Forestry to identify eligible lands for REDD activities, establish requirements and procedures for REDD projects, and create a licensing scheme to verify the effectiveness of carbon storage and distribute carbon credits.²⁷⁶ Several Indonesian provinces, including two, Aceh and Papua, that have special autonomy agreements with the central government, have also enacted their own REDD-related laws and programs.²⁷⁷ And in Adat (customary) communities throughout

²⁷⁴ See IUCN, *supra* note 225 (discussing REDD-related legal developments in several countries); TAKACS, *supra* note 225 (discussing legal developments regarding carbon property rights in the forest sector).

²⁷⁵ See Tata Cara Pengurangan Emisi Dari Deforestasi Dan Degradasi Hutan (REDD) [Implementation Procedures of Reducing Emissions from Deforestation and Forest Degradation], No. P.30/Menhut-II/2009 (2009) (Indon.) (defining the procedures for application, assessment, approval and duration of REDD activities, and specifying rights and obligations of the parties involved); Tata Cara Perizinan Usaha Pemanfaatan Penyerapan Dan/Atau Penyimpanan Karbon Pada Hutan Produksi Dan Hutan Lindung [Procedures for Licensing of Commercial Utilisation of Carbon Sequestration and/or Storage in Production and Protected Forests], No. P.36/Menhut-II/2009 (2009) (Indon.) (defining the licensing procedures for commercial utilization of carbon sequestration and/or storage in production and protected forests).

²⁷⁶ See sources cited *supra* note 275.

²⁷⁷ As part of the peace agreement with the Indonesian central government following the 2004 tsunami, Aceh operates under a special autonomy law that authorizes the government of Aceh to plan, manage, use and exploit "natural resources in the province . . . including minerals, geothermal energy, forests, agriculture, fisheries and sea resources." There is also a special clause in the law that re-affirms provincial control over the 2 million plus hectare Leuser

Indonesia, community leaders and their advocates are raising questions regarding how these emerging REDD programs will impact customary rights and practices with respect to forests.²⁷⁸

Brazil, which vigorously opposed the inclusion of avoided deforestation under the Kyoto Protocol on sovereignty grounds, amended its national forest law in 2006 to clarify government ownership of carbon rights on public concessions,²⁷⁹ and passed legislation in 2009 intended to simplify the land titling process and allow certain current occupants to gain legal title.²⁸⁰ The Brazilian Congress is also contemplating legislation that would establish a national system for REDD.²⁸¹ As noted above, moreover, several Brazilian states are developing sub-national legal and policy frameworks for REDD.²⁸² And indigenous peoples and their advocates are seeking clarity on carbon rights in the context of Brazil's existing laws regarding indigenous reserves.²⁸³

Many issues have yet to be resolved by these nascent legal developments, and it is impossible to predict how these various

ecosystem. In 2007, Aceh's first democratically elected Governor and former member of the Free Aceh Movement, Irwandi Yusuf, declared a moratorium on logging in the province and created a special Green Economic Development and Investment Strategy, known as Aceh Green, that focused on conserving the more than 3 million hectares of primary tropical forests in the province through REDD financing. In pursuit of these goals, the Aceh government has entered into agreements with NGOs and the private sector to establish two very large REDD projects covering most of the province. See DUNLOP, *supra* note 241, at 11-16 (describing REDD initiatives in Aceh).

²⁷⁸ See, e.g., *id.* at 28-51 (describing community issues associated with REDD activities in Aceh and Indonesia more generally).

²⁷⁹ See Decreto No. 11.284, de 2 de Março de 2006, DIÁRIO OFICIAL DA UNIÃO [D.O.U.] de 3.3.2006, art. 16, ¶ 1 (Braz.) (clarifying carbon rights with respect to forest concessions on public land).

²⁸⁰ See Reese Ewing, *Lula Signs Land Law Aimed at Reforming Amazon*, REUTERS, June 26, 2009, available at <http://www.reuters.com/article/idUSTRE55P62M20090626> (discussing Brazilian law aimed at clarifying land tenure).

²⁸¹ See Comissão de Meio Ambiente e Desenvolvimento Sustentável - Relatório, Projeto De Lei No 5.586, de 10 de Novembro de 2009 (proposing a national REDD+ system for Brazil).

²⁸² See Lei sobre Mudanças Climáticas, *supra* note 237 (identifying REDD as part of climate change legislation in the state of Amazonas); Do Sistema Estadual De Incentivos A Serviços Ambientais, *supra* note 238 (establishing REDD as centerpiece of a comprehensive state law for environmental services in the state of Acre).

²⁸³ See, e.g., Memorandum from Rodrigo Sales et al. to The Katoomba Group (Nov. 25, 2008) (on file with author) (discussing issues regarding legal title to forest carbon as part of Suruí carbon project in Brazil).

law reform efforts will proceed in particular jurisdictions. Among the more prominent issues in need of resolution are those pertaining to the new entitlement lines that REDD could create and the implications of this for existing structures of forest governance. As REDD credits are sold into GHG compliance systems or recognized in other pay-for-performance schemes, new obligations are created to maintain sufficient forest carbon stocks (that is, to prevent the carbon embodied in tropical forests from leaking into the atmosphere) in order to ensure the permanence of the credited reductions, and, thus, make sure that the atmosphere, along with the buyer and the compliance system to which the credits are tendered, is made whole.²⁸⁴ If and when REDD goes to scale, one potential result is that large areas of tropical forests could become encumbered with something akin to long-term servitudes. The implications of such a development for those who live in and near the forest could be quite significant, raising questions about who will have the obligation to ensure that forest carbon stocks are protected; who will bear the residual liability for so-called reversal risks (that is, the situation where previously credited emissions reductions are negated by future actions); who should have access to the revenues from avoided emissions; and what will happen to customary practices of forest use.²⁸⁵

Related to these issues are a host of unresolved questions regarding who actually owns (or should own) the carbon embodied in standing forests and how the revenues from a REDD system, which could be premised on payment for avoided emissions from reduced deforestation, would be translated into carbon benefits and distributed to local communities and other stakeholders. Indeed, the whole question of carbon ownership gets very complicated in the context of customary rights, indigenous reserves, and other forms of community ownership and use of

²⁸⁴ See Michael Dutschke & Arild Angelsen, *How Do We Ensure Permanence and Assign Liability?*, in *MOVING AHEAD WITH REDD: ISSUES, OPTIONS AND IMPLICATIONS* 77-85 (Arild Angelsen ed., 2008) (discussing various approaches to permanence in the context of REDD).

²⁸⁵ See Boyd, *supra* note 40, at 891-98 (discussing permanence and related liability issues regarding REDD). It is worth remembering in this context that there is a long history of criminalization of customary forest uses throughout the world as part of larger state-directed efforts to control forest resources. See, e.g., PELUSO, *supra* note 255, at 8-17 (discussing the criminalization of traditional practices of forest access and use); EDWARD P. THOMPSON, *WHIGS AND HUNTERS: THE ORIGIN OF THE BLACK ACT* (1975) (discussing the criminalization of customary forest use in England during the 17th and 18th centuries).

“state” forests. Efforts within Brazil and Indonesia to resolve these questions are only just beginning, and there are very legitimate concerns that in the absence of clarity on land and carbon rights, REDD will drive a new land grab of sorts by governments and other powerful actors, to the obvious detriment of local communities. Some commentators see this as an important reason to clarify and secure land tenure and carbon ownership in a manner that protects the rights of local communities living in and near the forest *before* proceeding with REDD.²⁸⁶

Finally, because of the increased value that REDD would place on standing forests, there are real concerns that without adequate safeguards a REDD system will foster a re-centralization of forest law and governance at the national level, a tendency that could be reinforced by the preference for national-level approaches to tracking deforestation and accounting for REDD under an international program.²⁸⁷ The new Indonesian REDD regulations discussed above illustrate this by vesting authority in the Ministry of Forestry. Furthermore, the Indonesian government has made recent statements suggesting that sub-national entities will not be allowed to proceed with certain REDD activities without permission from Jakarta. As a country’s forests are inserted into a REDD regime, in other words, the national government could emerge as the default choice for taking on new responsibilities and acquiring new authorities—but in a manner that is “de-nationalized” in the sense that these new responsibilities and authorities are tied to a particular global project. Thus, REDD has the potential to substantially bulk up the forest governance capacities of national governments even while it is putting those capacities in service to a global project. From a normative

²⁸⁶ See, e.g., LORENZO COTULA & JAMES MAYERS, *TENURE IN REDD: START-POINT OR AFTERTHOUGHT?* (2009) (emphasizing the importance of considering local forest-dependent communities and land tenure in REDD implementation); Benjamin Blom et al., *Getting REDD to Work Locally: Lessons Learned from Integrated Conservation and Development Projects*, 13 ENVTL. SCI. & POL’Y 164 (2010) (emphasizing importance of attending to rights and interests of local communities in developing REDD programs); J. Phelps et al., *What Makes a ‘REDD’ Country?*, 20 GLOBAL ENVTL. CHANGE 322, 329 (2010) (“The Philippines case study helps elucidate why governance, conservation priorities and rights frameworks should feed into more comprehensive REDD planning and sub-national analyses.”).

²⁸⁷ See Phelps et al., *supra* note 268, at 312 (“By monetizing forest carbon, REDD+ will substantially increase the market value of forests, including those previously considered marginal, incentivizing central governments to increase control.”).

standpoint, such a development poses considerable risks to the rights and interests of local communities because of the obvious potential to exacerbate the pre-existing pathologies of various rentier states across the tropical world—all of which puts a premium on building into any REDD regime (at multiple sites) legal protections and safeguards to allow such communities to control the terms on which they engage with REDD.²⁸⁸

4.4. *De-couplings*

At the most basic level, REDD seeks to create a new global form—forest carbon—that can be de-coupled from the physical forest and allowed to circulate in global value chains. In creating this novel asset class with potentially global reach, REDD thus establishes new circumstances under which land and forests acquire value,²⁸⁹ thereby creating new demands for resources, capabilities, laws, institutions, and expertise in order to realize these value forms and embed them in new entitlement structures and frameworks of authority. In the process, tropical forests, and the many people who depend upon them, are being pulled into emerging transnational regulatory systems, with substantial implications for existing structures of forest law and governance and, more generally, the relationship of the state to the forest, to conceptions of national territory, and to the multitude of local communities and other forest-dependent peoples. By de-coupling forest carbon from the forest ecosystem, REDD de-couples territory and accountability from their traditional instantiations in the state. Understanding what is gained and what is lost in this process with respect to existing practices of forest use and governance will

²⁸⁸ The World Bank estimates that some 60 million indigenous people are totally dependent on forests. In addition, about 350 million people are considered highly forest dependent, and 1.2 billion people are dependent on agro-forestry for some part of their livelihoods. IUCN, *INDIGENOUS PEOPLES AND REDD-PLUS: CHALLENGES AND OPPORTUNITIES FOR THE ENGAGEMENT OF INDIGENOUS PEOPLES AND LOCAL COMMUNITIES IN REDD-PLUS 2* n.2 (June 2010).

²⁸⁹ As Katherine Verdery notes,

my subject here is the circumstances under which land acquires value—and value of what kind and for whom. What forces come together, and how, to shape the value that land holds, so that people want to manipulate it, invoke it, own it, belong to it, identify with it? What kinds of resources need they have in order to realize the value they attribute to that object?

KATHERINE VERDERY, *THE VANISHING HECTARE: PROPERTY AND VALUE IN POSTSOCIALIST TRANSYLVANIA* 21 (2003).

require moving beyond the predominantly technical focus on carbon accounting and MRV that dominates much of the contemporary REDD policy discussion.

To that effect, the technical forms that are underwriting REDD can be seen as part of the larger effort to harness national territories and key elements of those territories (namely, the ability of tropical forests to store carbon) to a global project aimed at managing the Earth's carbon cycle and stabilizing the composition of the atmosphere. In the process, local and provincial-level structures of forest governance are (re)combining with national and transnational capabilities to create technical, legal, and institutional frameworks for generating compliance grade assets and moving them into GHG compliance systems and other pay-for-performance schemes. At the most general level, REDD thus embodies a distinctive territorial project that derives from new global forms of calculability and legibility that are in turn facilitating the processes of unbundling and de-nationalization discussed previously. The state emerges in all of this as a key mediating institution necessary to make REDD cohere as a nested, polycentric form of governance.²⁹⁰

Supporters of REDD have tended to view the prospects of these developments in a positive light, celebrating the potential of remote sensing technologies to produce new forms of information about tropical forests (and their embodied carbon) that are objective, transparent, open-access, largely free, and auditable;²⁹¹ embracing carbon finance (public and private) as a means of putting an economic value on standing tropical forests on a scale not possible under previous conservation efforts;²⁹² and promoting

²⁹⁰ Understanding the role of the state in this context thus requires

a shift away from looking at the state first and foremost as a leviathan machine, a set-apart sphere of command and decision, to looking at it against the background of the sort of society in which it is embedded—the confusion that surrounds it, the confusion it confronts, the confusion it causes, the confusion it responds to.

Clifford Geertz, *What Is a State If It Is Not a Sovereign? Reflections on Politics in Complicated Places*, 45 *CURRENT ANTHROPOLOGY* 577, 580 (2004).

²⁹¹ See, e.g., JOHAN ELIASCH, *CLIMATE CHANGE: FINANCING GLOBAL FORESTS: THE ELIASCH REVIEW* 145 (2008) (“Satellite images of changing forest cover provide a greater degree of transparency in monitoring forest emissions reductions than monitoring in other sectors.”).

²⁹² See, e.g., *Better REDD than Dead: Tropical Forests' Best Hope*, *ECONOMIST*, Sept. 25, 2010, at 8-9 (discussing potential of REDD to tap into large-scale carbon finance).

the seemingly inevitable rationalization of forest law and governance (framed in terms of clarity of land tenure and creation of new carbon rights) as key elements of a pathway to a new paradigm of forest governance.²⁹³

As a global project built upon these new forms of calculability, value, and ownership, therefore, one might argue, along with advocates of new governance, that REDD will create new opportunities to reform notoriously corrupt forest sector practices in many tropical forest countries²⁹⁴ by inserting them into new transnational networks of responsibility. GHG compliance markets, along with the prospect of performance-based public finance, in this view, provide a means for leveraging improved forest governance through enhanced transparency and accountability.²⁹⁵ Realizing such an optimistic view of REDD's potential, of course, is by no means assured, and even if it does come to pass it will be important to understand what is gained and what is lost in the process of inserting tropical forests and the people who live in them into larger transnational systems of value and regulation.

Nowhere is this more apparent than with respect to the rights and interests of local forest-dependent people. To date, various civil society and stakeholder groups have been working at multiple levels to ensure that social safeguards regarding informed consent, participation, and protection of rights and interests of forest-dependent people are being incorporated into some of the key sites

²⁹³ See, e.g., Arild Angelsen & Stibniati Atmadja, *What is this Book About?*, in MOVING AHEAD WITH REDD: ISSUES, OPTIONS AND IMPLICATIONS, *supra* note 284, at 1 (describing potential for REDD as a "win-win" strategy of reducing GHG emissions "because the potentially large financial transfers and better governance can benefit the poor in developing countries and provide other environmental gains on top of the climate-related benefits.").

²⁹⁴ See, e.g., THE WORLD BANK, SUSTAINING FORESTS: A DEVELOPMENT STRATEGY 31-32 (2004) (discussing poor governance and corruption in the forest sector).

²⁹⁵ These efforts recognize that California, the United States, and other jurisdictions contemplating provisions recognizing REDD in their own GHG compliance systems could exercise leverage akin to that enjoyed by large retailers over the environmental performance of global supply chains—what Michael P. Vandenberg calls "the new Wal-Mart effect." See Michael P. Vandenberg, *The New Wal-Mart Effect: The Role of Private Contracting in Global Governance*, 54 UCLA L. REV. 913, 918 (2007) ("The New Wal-Mart effect occurs when a mix of social, economic, and legal factors induces a firm to impose on its suppliers private environmental or other requirements that are traditionally the subject of government regulations.").

where REDD is taking shape. A key component of their strategy is to insert what might be called “accountability forcing” obligations or requirements into the design of provisions that would accept REDD credits in emerging GHG compliance systems. Thus, advocates for local forest-dependent communities and indigenous peoples are working in the U.N. process and the U.S. policy debates to embed the principle of free prior informed consent, strong protections for indigenous peoples’ rights and interests, and specific benefit sharing requirements for local forest-dependent communities in the eligibility criteria for bringing REDD credits into these compliance markets.²⁹⁶ In effect, the commodity itself becomes a point of leverage, its compliance-grade status contingent upon assurances that rights and interests of local people are protected in faraway places. Operationalizing this, of course, is exceedingly difficult. How, for example, will EPA or the California Air Resources Board (or other future regulators in charge of administering other GHG compliance systems) ensure that REDD credits come from activities that meet minimum social safeguards? What kinds of MRV will be necessary to provide such assurances? Who will monitor the monitors? What role, again, will governments in tropical forest countries play in all of this? How can this be done in a manner that does not impose massive transactions costs on the whole effort? These are the questions that will have to be answered if REDD is going to deliver in a manner that protects not only climate and tropical forests but also the rights, interests, and livelihoods of forest-dependent people.

²⁹⁶ Efforts under the UNFCCC to negotiate a REDD+ mechanism have been proceeding under the Ad Hoc Working Group on Long-term Commitments under the Convention (“AWG-LCA”). The recently adopted *Cancún Agreement* represents the outcome of the AWG-LCA work, and includes specific provisions regarding safeguards for indigenous and forest-dependent peoples in the context of REDD+. See *Cancún Agreement*, *supra* note 24, para. 69 & Annex I, paras. 2(c)–(d) (calling upon Parties to promote and support specific safeguards when undertaking REDD+ activities including “full and effective participation” and “[r]espect for the knowledge and rights of indigenous peoples and members of local communities, by taking into account relevant international obligations, national circumstances and laws, and noting that the General Assembly has adopted the United Nations Declaration on the Rights of Indigenous Peoples”). REDD provisions in proposed federal climate legislation in the United States also include specific safeguards regarding rights and interests of indigenous and forest-dependent peoples. See, e.g., ACES, *supra* note 198, § 743(e)(1)(E) (requiring that REDD offsets come from activities that give due regard to the rights and interests of indigenous and other local communities, are based upon robust stakeholder participation, and result in equitable sharing of benefits).

All of which may well turn out to represent an overly optimistic, even naïve, view of the possibilities that could come with a fully functioning REDD regime.²⁹⁷ As with any multi-faceted enterprise aimed at large-scale social change, there are many conflicting rationalizations and arguments for and against REDD; many reasons to doubt its prospects. And there is little question that if REDD goes to scale, something important will be lost as some of the last non-administered spaces on Earth are engulfed by this global project—a final “stage[] in the subordination of the surface of the planet to the needs of an industrial society.”²⁹⁸ Needless to say, the alternative—ongoing destruction of the world’s tropical forests with substantial additional carbon loading to the atmosphere—is surely much worse, highlighting once again the reality of triage and tragic choices that marks virtually all of climate policy. If anything, then, the REDD experience, still very much a work in progress, suggests that the road ahead will be much messier and much more complicated than advocates of top-down approaches to climate governance ever imagined.

5. CONCLUSION

In an influential 1970 essay, *The Search for Paradigms as a Hindrance to Understanding*, Albert Hirschman warned against seeking blueprints and grand strategies as roadmaps for “large-scale social change.”²⁹⁹ The best that we can do, according to

²⁹⁷ Such possibilities resonate with the optimistic view of global governance and accountability embraced by scholars of new governance and global administrative law. As Joshua Cohn and Charles Sabel suggest,

[t]he emergence of global politics is marked by a proliferation of political settings beyond domestic boundaries. This proliferation expands the range of relevant political actors, while shifting our understanding of political units and of relations among them: the emergence of human rights as limits on Westphalian sovereignty was a first step in this shift, but not the last.

Joshua Cohen & Charles F. Sabel, *Global Democracy?* 37 N.Y.U. J. INT’L L. & POL. 763, 763 (2005). See also Kingsbury et al., *supra* note 144, at 17 (discussing application of principles of administrative law to global governance).

²⁹⁸ KARL POLANYI, *THE GREAT TRANSFORMATION: THE POLITICAL AND ECONOMIC ORIGINS OF OUR TIME* 179 (Beacon Press 1957) (1944); see also SCOTT, *supra* note 259, at 4–9 (discussing the “last enclosure” of various non-state spaces around the world).

²⁹⁹ Albert O. Hirschman, *The Search for Paradigms as a Hindrance to Understanding*, 22 WORLD POL. 329, 343 (1970).

Hirschman, is to learn from experience and to have a “passion for what is possible.”³⁰⁰ As Hirschman and many others before and after recognized, the historical record is littered with various failed schemes to improve the human condition.³⁰¹ Indeed, if two generations of social research on the challenges of development have taught us anything it is that there is no one right way, no single recipe or algorithm that will, if followed, lead to economic growth, much less political stability, social order, rule of law, or any other desired outcome of social change.

And yet, climate policy seems to have missed these basic lessons. Seized by the conviction that there can and should be a blueprint for comprehensive climate governance, manifest most prominently in the Kyoto architecture and in the efforts to negotiate a successor treaty, the climate regime has stumbled through a series of disappointments, marked most recently by the dramatic failure to adopt a new treaty at the 2009 U.N. Climate Conference in Copenhagen and by the limited, non-binding workplan adopted at the 2010 climate meeting in Cancún. This Article has argued that the difficulties facing international climate policy stem from an unrealistic embrace of top-down, global approaches to the problem and a corresponding lack of attention to the realities of a plural, fragmented international legal and political order. This posture of “globalism,” which derives in part from a distinctive set of knowledge practices that has sought to make the Earth system into a unitary, governable domain, has pushed international climate policy into what appears to be an intractable political impasse regarding the prospects of fashioning a binding legal instrument capable of coordinating an effective global response to the problem.

To be sure, an alternative approach to climate governance that is more sensitive to the facts of globalization, pluralism, and fragmentation at multiple levels of authority cannot simply devolve into a naïve celebration of localism or, even worse, a fatalism that acknowledges the enormous complexity of it all, recognizes that the clock has run in terms of any possibility of achieving prudent stabilization targets, and urges that all remaining resources and attention be shifted to adaptation or, in more extreme cases, geoengineering. The “solutions” to climate

³⁰⁰ *Id.*

³⁰¹ See, e.g., SCOTT, *supra* note 45 (documenting various failed schemes to improve the human condition).

change, if they can even called that, will be as varied and complicated as the problem itself, assembled through many new connections across and within levels of governance, implicating a vast array of actors, institutions, laws, and values. Understanding how these varied and partial solutions are emerging thus becomes a critical component of the larger effort to learn from experience and expand the conditions of possibility for effective forms of climate governance.

Viewed from this perspective, post-Copenhagen climate governance looks much more like the messy, multi-layered forms of governance emerging in response to other global threats such as terrorism, financial crisis, or infectious disease—forms of governance marked not by a single, overarching regulatory system but a complex, nested set of institutions and actors. Wrapped up in all of this is a recognition that conventional regulatory structures associated with traditional notions of government cannot combat these problems effectively without tapping into a much broader and more fluid set of practices that spans multiple geographies and publics. Confronted by a set of problems arising out of the exceedingly complex interplay of social, economic, and ecological systems and faced with an increasingly tenuous sphere of competence, the contemporary state appears as only one element (albeit a critical one) in a broader emerging assemblage of actors, institutions, and knowledge practices. By taking these emerging assemblages on their own terms, by viewing them as partial, contingent forms of governance, and by seeking to understand how they hold together (or not) we can gain insight into the possibilities and the challenges of building enabling environments that can harness ongoing efforts and direct them toward realistic forms of climate governance.

The REDD case provides one example of how a particular form of climate governance is taking shape at multiple levels in many faraway places all over the world, illustrating just how messy, complicated, and contingent climate governance is once we look beneath the international process. Indeed, the complex, partial, emergent nature of REDD demonstrates clearly that if this is pursued in a singular, top-down fashion that ignores the vernacular institutions of national and sub-national formations it will surely fail. In order for nested, polycentric forms of climate governance to work, they will have to be assembled from above and below, with careful attention to who wins and who loses, careful attention to the tactical opportunities that emerge to

influence the assemblage in ways that enhance meaningful participation across and within the different nested levels. The project of global environmental law, if it is ever going to be more than a catch-all for the varied and variable forms of transnational environmental governance taking shape in multiple domains, will need to engage with all of this in much more direct fashion, which means getting out and working in these diverse and complicated places, getting out and understanding how global projects are being worked out in concrete institutional settings all over the world.