



LUND UNIVERSITY

Global environmental governance in the Anthropocene: An introduction

Pattberg, Philipp; Zelli, Fariborz

Published in:
Environmental Politics and Governance in the Anthropocene

2016

Document Version:
Publisher's PDF, also known as Version of record

[Link to publication](#)

Citation for published version (APA):
Pattberg, P., & Zelli, F. (2016). Global environmental governance in the Anthropocene: An introduction. In P. H. Pattberg, & F. Zelli (Eds.), *Environmental Politics and Governance in the Anthropocene: Institutions and Legitimacy in a Complex World* (pp. 1-12). Routledge.

Total number of authors:
2

General rights

Unless other specific re-use rights are stated the following general rights apply:
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

Read more about Creative commons licenses: <https://creativecommons.org/licenses/>

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

LUND UNIVERSITY

PO Box 117
221 00 Lund
+46 46-222 00 00

ROUTLEDGE RESEARCH IN GLOBAL ENVIRONMENTAL
GOVERNANCE

Environmental Politics and Governance in the Anthropocene

Institutions and legitimacy in a complex
world

Edited by
Philipp Pattberg and Fariborz Zelli



Environmental Politics and Governance in the Anthropocene

The term Anthropocene denotes a new geological epoch characterized by the unprecedented impact of human activities on the Earth's ecosystems. While the natural sciences have advanced their understanding of the drivers and processes of global change considerably over the last two decades, the social sciences lag behind in addressing the fundamental challenge of governance and politics in the Anthropocene.

This book attempts to close this crucial research gap, in particular with regards to the following three overarching research themes: 1) the meaning, sense-making and contestations emerging around the concept of the Anthropocene related to the social sciences; 2) the role and relevance of institutions, both formal and informal as well as international and transnational, for governing in the Anthropocene; and 3) the role and relevance of accountability and other democratic principles for governing in the Anthropocene. Drawing together a range of key thinkers in the field, this volume provides one of the first authoritative assessments of global environmental politics and governance in the Anthropocene, reflecting on how the planetary-scale crisis changes the ways in which humans respond to the challenge.

This volume will be of great interest to students and scholars of global environmental politics and governance, and sustainable development.

Philipp Pattberg is Professor of Transnational Environmental Governance at the Institute for Environmental Studies (IVM), Vrije Universiteit Amsterdam, the Netherlands.

Fariborz Zelli is an Associate Professor at the Department of Political Science at Lund University, Sweden.

Routledge Research in Global Environmental Governance

Series Editors

Philipp Pattberg

*Vrije Universiteit Amsterdam and the Amsterdam Global Change Institute (AGCI)
the Netherlands*

Agni Kalfagianni

Utrecht University, the Netherlands

Global environmental governance has been a prime concern of policymakers since the United Nations Conference on the Human Environment in 1972. Yet, despite more than 900 multilateral environmental treaties coming into force over the past 40 years and numerous public–private and private initiatives to mitigate global change, human-induced environmental degradation is reaching alarming levels. Scientists see compelling evidence that the entire Earth system now operates well outside safe boundaries and at rates that accelerate. The urgent challenge from a social science perspective is how to organize the co-evolution of societies and their surrounding environment; in other words, how to develop effective and equitable governance solutions for today’s global problems.

Against this background, the Routledge Research in Global Environmental Governance series delivers cutting-edge research on the most vibrant and relevant themes within the academic field of global environmental governance.

Improving Global Environmental Governance

Best practices for architecture and agency

Norichika Kanie, Steinar Andresen and Peter M. Haas

Global Governance of Genetic Resources

Access and benefit sharing after the Nagoya Protocol

Edited by Sebastian Oberthür and G. Kristin Rosendal

How Effective Negotiation Management Promotes Multilateral Cooperation

The power of process in climate, trade and biosafety negotiations

Kai Monheim

Rethinking Authority in Global Climate Governance

How transnational climate initiatives relate to the international climate regime

Thomas Hickmann

Environmental Politics and Governance in the Anthropocene

Institutions and legitimacy in a complex world

Edited by Philipp Pattberg and Fariborz Zelli

Environmental Politics and Governance in the Anthropocene

Institutions and legitimacy in a
complex world

Edited by
Philipp Pattberg and Fariborz Zelli

 **Routledge**
Taylor & Francis Group
LONDON AND NEW YORK

First published 2016
by Routledge
2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN

and by Routledge
711 Third Avenue, New York, NY 10017

Routledge is an imprint of the Taylor & Francis Group, an informa business

© 2016 selection and editorial matter, Philipp Pattberg and Fariborz Zelli;
individual chapters, the contributors

The right of the editor to be identified as the author of the editorial material,
and of the authors for their individual chapters, has been asserted in
accordance with sections 77 and 78 of the Copyright, Designs and Patents
Act 1988.

All rights reserved. No part of this book may be reprinted or reproduced or
utilised in any form or by any electronic, mechanical, or other means, now
known or hereafter invented, including photocopying and recording, or in
any information storage or retrieval system, without permission in writing
from the publishers.

Trademark notice: Product or corporate names may be trademarks or
registered trademarks, and are used only for identification and explanation
without intent to infringe.

British Library Cataloguing-in-Publication Data

A catalogue record for this book is available from the British Library

Library of Congress Cataloging-in-Publication Data

[CIP data]

ISBN: 978-1-138-90239-8 (hbk)

ISBN: 978-1-315-69746-8 (ebk)

Typeset in Goudy
by Saxon Graphics Ltd, Derby

Contents

<i>List of figures</i>	vii
<i>List of tables</i>	ix
<i>Acknowledgements</i>	xi
<i>Notes on contributors</i>	xiii
1 Global environmental governance in the Anthropocene: An introduction	1
PHILIPP PATTBURG AND FARIBORZ ZELLI	
PART I	
Making sense of the Anthropocene	13
2 The Anthropocene and the body ecologic	15
MARCEL WISSENBURG	
3 Nature and the Anthropocene: The sense of an ending?	31
MANUEL ARIAS-MALDONADO	
4 Anthropocene: Delusion, celebration and concern	47
SIMON HAILWOOD	
5 Fair distribution in the Anthropocene: Towards a normative conception of sustainable development	62
SIMON MEISCH	
PART II	
Institutions in the Anthropocene	79
6 Mapping institutional complexity in the Anthropocene: A network approach	81
OSCAR WIDERBERG	

7	Transnational governance towards sustainable biofuels: Exploring a polycentric view	103
	CHRISTINE MOSER AND ROBERT BAILIS	
8	Governing the Arctic in the era of the Anthropocene: Does corporate authority matter in Arctic shipping governance?	127
	JUDITH VAN LEEUWEN	
9	International river governance: Extreme events as a trigger for discursive change in the Rhine river basin	145
	CHRISTINE PROKOPF	
PART III		
	Accountability and legitimacy in the Anthropocene	165
10	Democratic accountability in the Anthropocene: Toward a non-legislative model	167
	WALTER F. BABER AND ROBERT V. BARTLETT	
11	Monitoring commitments made under the Kyoto Protocol: An effective tool for accountability in the Anthropocene?	184
	MARTINA KÜHNER	
12	The legitimacy and transformation of global climate governance in the Anthropocene: Implications for the global South	198
	MARIJA ISAILOVIC	
13	The practices of lobbying for rights in the Anthropocene era: Local communities, indigenous peoples and international climate negotiations	213
	LINDA WALLBOTT	
14	Conclusions: Complexity, responsibility and urgency in the Anthropocene	231
	FARIBORZ ZELLI AND PHILIPP PATTBERG	
	<i>Index</i>	243

Figures

6.1	The institutional complex of global climate governance (public institutions only)	94
6.2	Betweenness and degree in the institutional complex for global climate change	96
7.1	Three tiers of institutions	106
7.2	Institutional script that regularizes implementation of environmental standards through third-party certification	114
7.3	Mapping of polycentric EU-RED governance on the three-tier structure	120

Tables

5.1	Nussbaum and Gewirth: Similarities and differences	71
6.1	Sample of international and transnational institutions in the institutional complex for global climate change governance	92
7.1	Qualifiers for recognition of standard systems under the EU-RED scheme	116
7.2	Twelve transnational sustainability schemes approved by the EU-RED (as of August 2014)	117
9.1	Number of articles on selected events	150
10.1	Adoption of a deliberative model of administrative accountability	173

Acknowledgements

We would like to acknowledge support from the Netherlands Organization for Scientific Research (CONNECT project on ‘Assessing and Reforming the Current Architecture of Global Environmental Governance’) and the Swedish Research Council Formas (NAVIGOV project on ‘Navigating Institutional Complexity in Global Climate Governance’).

Notes on contributors

Manuel Arias-Maldonado is Associate Professor in Political Science at the University of Málaga. His latest book is *Environment and Society: Socionatural Relations in the Anthropocene* (Springer, 2015).

Walter F. Baber is Senior Scientist at the US Center of the Stockholm Environment Institute. His research focus is on sustainability, resource use and environmental change in the developing world. He explores these issues principally, though not exclusively, in the context of energy.

Robert Bailis is Associate Professor at the Yale School of Forestry and Environmental Studies, Yale University. His research focus is on sustainability, resource use and environmental change in the developing world. He explores these issues principally, though not exclusively, in the context of energy.

Robert V. Bartlett is Gund Professor of the Liberal Arts at the University of Vermont. With Baber he is co-author of many articles and three books, including most recently *Consensus and Global Environmental Governance: Deliberative Democracy in Nature's Regime* (2015).

Simon Hailwood is Senior Lecturer in Philosophy at the University of Liverpool where he teaches moral, political and environmental philosophy. He has published widely in environmental and political philosophy and is the managing editor of the journal *Environmental Values*. His latest book is *Alienation and Nature in Environmental Philosophy* (Cambridge University Press, 2015).

Marija Isailovic is a researcher and PhD candidate at the Institute for Environmental Studies (IVM) at the Vrije Universiteit Amsterdam where she works on fragmentation in global environmental governance. She is a core member of the CONNECT-project team and Earth System Governance Project research fellow.

Martina Kühner is a PhD candidate at the Faculty of Arts and Social Sciences at Maastricht University in the Netherlands. As part of the NWO-funded project 'No carrots, no sticks: How do peer reviews among states acquire authority in global governance?' she investigates the role of global monitoring mechanisms and peer reviews in fostering sustainable development.

Simon Meisch is head of the 'Ethics of Science in the Research for Sustainable Development' Junior Research Group at the International Centre for Ethics in the Sciences and Humanities of the University of Tübingen. His research interests are water ethics and the ethics of science in the water sciences and governance. He has published on conceptual issues of ethics and the theory of sustainable development.

Christine Moser is a PhD candidate at the Faculty of Sustainability, Leuphana Universität Lüneburg, Germany.

Philipp Pattberg is Professor for Transnational Environmental Governance and the head of the Department of Environmental Policy Analysis (EPA), Institute for Environmental Studies (IVM), Vrije Universiteit Amsterdam. His most recent book is the *Encyclopedia of Global Environmental Governance and Politics* (co-edited with Fariborz Zelli).

Christine Prokopf is a researcher at the Chair of International Relations and Sustainable Development at the University of Münster, Germany.

Judith van Leeuwen is Assistant Professor at the Environmental Policy Group of Wageningen University, the Netherlands. Her research focus lies on the changing role of public and private actors (especially industry actors) given the increased fragmented and polycentric nature of environmental and marine governance.

Linda Wallbott is a researcher at the Institute for Political Science at the Westfälische Wilhelms-Universität Münster and PhD candidate at Goethe University Frankfurt in Germany.

Oscar Widerberg is a PhD candidate at the Institute for Environmental Studies (IVM) at the Vrije Universiteit Amsterdam working on fragmentation in global climate governance. He is a core member of the CONNECT-project team, an Earth System Governance Project research fellow, and affiliated with Trinomics.

Marcel Wissenburg is Professor of Political Theory and Head of the Department of Public Administration and Political Science at the Radboud University Nijmegen, the Netherlands.

Fariborz Zelli is Associate Professor at the Department of Political Science at Lund University. He is vice-chair of the Environmental Studies Section of the International Studies Association. His publications include a special issue of *Global Environmental Politics* on institutional fragmentation (as guest editor with Harro van Asselt, 2013) and, most recently, the *Encyclopedia of Global Environmental Governance and Politics* (co-edited with Philipp Pattberg, 2015).

1 Global environmental governance in the Anthropocene

An introduction

Philipp Pattberg and Fariborz Zelli

The meaning of the Anthropocene is contested. No agreement exists concerning a number of important issues, including the exact start date and appropriate stratigraphic markers, its normative implications and political consequences. In the social sciences, various disciplines have started to explore what the Anthropocene means for studying interactions between society and the environment. Broadly speaking, there have been two reactions to proposing the Anthropocene as a new epoch in planetary history. First, a positive reception of the concept, using it as an argument to call for more and better governance of the environment. And second, a critical notion that questions the rationales and interest-configurations underlying the Anthropocene hypothesis and further scrutinizes the resulting politics of the Anthropocene and its theoretical and normative implications.

These disagreements notwithstanding, the scale and scope of environmental challenges has significantly broadened as we are collectively entering the Anthropocene as an epoch of planetary-scale changes that threaten the very processes – from a stable climate to biodiversity – on which human development is ultimately based. In addition, the causes and consequences of global environmental change are increasingly acknowledged to be highly complex, constituting a class of wicked problems (Roberts 2000).

What does this mean for global environmental governance research? Global environmental governance, both as an empirical object and as a field of study, is likely to be transformed by the Anthropocene hypothesis. We see two alternative reactions. First, the Anthropocene hypothesis is greeted with much enthusiasm as it provides a strong argument for the relevance of environmental governance research. However, rather than critically engaging with what the Anthropocene means for global governance, research practice remains largely unaltered. Second, global environmental governance research is fruitfully challenged by the Anthropocene hypothesis, leading to a reorientation of theory and practice. In other words, is the Anthropocene hypothesis a constructive, reinvigorating challenge to the study of environmental politics, or rather just an ingenious framing that gives more weight to environmental concerns? We put forward three arguments why the Anthropocene is a substantial challenge but also an opportunity for the social sciences in general

and environmental governance research in particular to reorient itself in light of fundamental transformations.

First, the Anthropocene hypothesis calls into question long-held assumptions about the human-nature dualism and has therefore been associated with the end-of-nature discourse (see Wapner 2014). At the heart of most environmental activism of the last five decades lies the conviction that nature exists independent of human agency and that (supposedly) 'natural' states of our planet, such as a stable climate system, should be protected. However, if the nature-human dualism is questioned by the advent of the Anthropocene, what does this mean for popular conceptions of conservation, wilderness and sustainability and for environmental politics more generally?

One important realization is that the terms 'human' and 'nature' are both social constructions. If humans have developed (as all other current and historic species) through a natural process of evolution to become the dominant species on earth, then we must conclude that anthropogenic global change is a result of natural processes (by which we mean generic and stable patterns of cause and effect). Is not then human domination of nature 'natural'? However, how can nature, and what is natural, be appreciated other than through human norms and values? In Wapner's words (2014, p. 39): 'Nature, then, is not a separate realm, as many environmentalists assume but, because it is always interpreted through cultural lenses, is part and parcel of human affairs.' The challenge for global environmental governance scholarship is to scrutinize human agency as part of a broader 'earth-system' perspective.

Second, the notion of the Anthropocene, and the related idea of a unified human force that exerts unprecedented influence on the earth system, challenges political science scholarship in two ways. First, it urges scholars to take a more system-theoretical perspective in order to identify the system-wide drivers of anthropogenic global change. For example, social science knowledge is indispensable in analysing how historic and current human impacts (think of the Neolithic revolution, the European expansion of the fifteenth and sixteenth century AD and the advent of the nuclear age) have been triggered by a combination of technological progress and changes in political and economic organization and governance. And second, the social sciences, and political science and governance scholarship in particular, are urgently needed as a corrective to accounts of the Anthropocene that neglect the fact that human agency is not uniform across the planet, and that contributions to the problem and the distribution of risks and opportunities are highly uneven.

Third, the Anthropocene discourse places governance research in the centre of attention, as the central question becomes: how can we steer towards socio-natural co-evolution and a resulting safe operating space (in most interpretations: for human development)? As a result, this centrality opens up opportunities for genuine inter-disciplinarity, in which the social sciences are not just a 'junior partner' of the sciences, but contribute fundamental insights into drivers, solutions and complex feedbacks between agency, unintended consequences and reactions to these.

In this introduction, we discuss the key issues and guiding questions that will structure the entire volume. First, we introduce three defining characteristics that are reflected in different theoretical, conceptual and empirical discussions of the Anthropocene: urgency, responsibility and complexity. As a second step, we introduce the three broad areas of inquiry that are covered in this volume: 1) the meaning, sense-making and contestations emerging around the concept of the Anthropocene related to governance research; 2) the role and relevance of institutions, both formal and informal as well as international and transnational, and the implications of increasing institutional complexity for governing in the Anthropocene; and 3) the role and relevance of accountability and other democratic principles for governing in the Anthropocene.

The Anthropocene hypothesis

The term Anthropocene denotes a new epoch in planetary history, one that is characterized by the unprecedented impact of human activities on the earth's ecosystems:

Human activity is now global and is the dominant cause of most contemporary environmental change. The impacts of human activity will probably be observable in the geological stratigraphic record for millions of years into the future, which suggests that a new epoch has begun.

(Lewis and Maslin 2015, p. 171)

When this new epoch in planetary history began is a matter of intense debate and is, as of 2015, also under formal review with the Anthropocene Working Group of the International Commission on Stratigraphy (ICS), the international body that defines earth's geological timescale. Geologists of the future might well remember 16 July 1945 as the start of the Anthropocene, the day the first atomic bomb was exploded at the White Sands Proving Ground, New Mexico, under the code name 'Trinity'. Debris from more than 500 above-ground nuclear tests conducted between 1945 and 1963 (when the Limited Test Ban Treaty took effect) has created a detectable layer of radioactive elements in sediments all around the planet. However, other potential start dates have been put forward. In their original proposal of the Anthropocene, Crutzen and Stoermer (2000) suggest the beginning of the Industrial Revolution as an appropriate start date. In their own words:

To assign a more specific date to the onset of the Anthropocene seems somewhat arbitrary, but we propose the latter part of the 18th century, although we are aware that alternative proposals can be made ...

(Crutzen and Stoermer 2000, p. 17)

Other researchers (e.g. Ruddiman 2013) have suggested earlier start dates, highlighting the continuous influence of the human species on a planetary

scale since at least 3000 BC, when agriculture and livestock cultivation intensified and the first centralized political authorities emerged. An intermediate position between the early anthropogenic hypothesis and the nuclear hypothesis is taken by Lewis and Maslin (2015) who propose the noticeable decline in atmospheric CO₂ concentrations between 1570 and 1620 as a good marker for the start of the Anthropocene. On this account, the European expansion into the Americas resulted in the death of some 50 million indigenous people, triggering a re-growth of abandoned agricultural lands, causing a measurable decrease in CO₂ concentrations. The 'Orbis hypothesis' is interesting from a social sciences perspective, as the observed atmospheric changes coincide with the emergence of the capitalist world system (Wallerstein 1974). The meeting of European and American cultures and the related dip in atmospheric CO₂ concentrations illustrate the complex and unpredictable nature of human-nature interactions. While humans are a force of nature, this force is neither directional nor necessary.

Irrespective of ongoing debates among geologists and stratigraphers, the Anthropocene hypothesis has gained political ground as a symbolic representation of complex transformations within the earth system. As one observer notes, 'What you see here is, it's become a political statement. That's what so many people want' (cited in Monastersky 2015, p. 147). On this account, the Anthropocene hypothesis has become a rallying call for action in the light of scientific evidence that warns against global environmental change. For example, in 2001, the four international global change research programmes – the International Geosphere-Biosphere Programme (IGBP), the International Human Dimensions Programme on Global Environmental Change (IHDP), the World Climate Research Programme (WCRP) and the international biodiversity programme DIVERSITAS – jointly issued the Amsterdam Declaration on Global Change, warning that:

Human activities are significantly influencing Earth's environment in many ways in addition to greenhouse gas emissions and climate change. Anthropogenic changes to Earth's land surface, oceans, coasts and atmosphere and to biological diversity, the water cycle and biogeochemical cycles are clearly identifiable beyond natural variability. They are equal to some of the great forces of nature in their extent and impact. Many are accelerating. Global change is real and is happening now.

(Pronk 2002, p. 208)

There is in fact robust evidence that a number of 'planetary boundaries' (Rockström et al. 2009; Steffen et al. 2015) have already been crossed and urgent action in terms of governance and policy is required. Scientists have consequently argued for societal transformations that would steer away from paths that might lead to rapid and irreversible change, while ensuring sustainable livelihoods for all (Biermann et al. 2012). Suggestions reach from reforming and upgrading the

environmental agencies of the United Nations to strengthening considerations of equity and fairness in global environmental governance.

Governance challenges in the Anthropocene

The Anthropocene blurs all possible boundaries and puts human action in an ever closer connection to nature. Not only are there no spatial boundaries, also the temporal boundaries are open. Time has to tell to what extent we can change our behaviour to ever allow again for spaces untouched by human action. Possibly these days are numbered. This places an even bigger demand on governance, as the intentional and collective aspect of human action. To what extent are we to blame and could we have done better? And to what extent can we really induce change – of our societies and of the way that we affect the environment?

We see three characteristics as central in the governance discussion in the Anthropocene. None of them is new, but in their combination and intensity they set an unprecedented challenge. All contributors to this volume tried to address these challenges in their work – and could hardly avoid this, even if they had wanted to.

Urgency. The Anthropocene is marked by an unprecedented urgency to act. Its defining feature of the earth system comprehensively impacted by human actions implies that we need to be more vigilant than ever about irreversible impacts that should be avoided. This avoidance may, in many cases, imply immediate changes of course. To be clear, urgency does not consider hard targets like avoiding dangerous climate change or species loss altogether. In a system affected by human behaviour, species have been lost and extreme weather events indicate an increasing effect of climate change. The Anthropocene rather means to act as quickly as possible to achieve relative goals: mitigating climate change, losing less species, reducing the ozone depletion of the ozone layer. In addition, the notion of urgency also raises questions about irreversibility. In how far can the process that led to the Anthropocene be slowed down, stopped or even reversed?

Responsibility. Anthropocene also means a shift in responsibility. With mankind as a whole impacting nature as a whole it is more difficult than ever to assign clear-cut responsibilities for environmental damages and losses. This does not mean that such an assignment is impossible. But we need a more dynamic view of responsibility. Fault lines might run through societies and social groups and they might quickly change over time. These changes have to be mapped and assessed since they entail crucial questions of governance and social behaviour: Why do certain groups have a particular responsibility to act? Through which processes is responsibility shifted in the Anthropocene? Which actors gain responsibility, which actors lose out?

Complexity. Finally, the Anthropocene is marked by an ever-increasing material complexity. The human impact on nature goes back to an intricate sequence of intended and unintended causations and consequences, overlapping subjects and goals and the co-existence and mutual intrusion of different social and natural systems. This material complexity is partly mirrored in our efforts to

govern the Anthropocene with complex networks of institutions and processes that may be synergistic or conflictive.

Many disciplines have reacted to the Anthropocene hypothesis by re-examining their core assumptions, research objectives and normative underpinnings, including organizational studies (Hoffman and Devereaux Jennings 2015), geography (Johnson and Morehouse 2014), theology (Simmons 2014) and Asian studies (Philip 2014), to name a few examples. This volume aims to provide a similar critical reflection from the perspective of environmental governance research.

Structure of the book

The book is structured in three parts, each engaging with a different broad question about global environmental governance and the Anthropocene, and each addressing the cross-cutting challenges identified above.

Part I critically engages with the origins and conceptual issues surrounding the Anthropocene hypothesis. While it has received support from many natural scientists as a plausible descriptor of our current geological time, the reception from the social sciences has been mixed. Contributions to Part I enquire into the various interpretations of the Anthropocene concept, from celebratory and affirmative to critical and concerned, the relation between conceptual notions and political practices as well as into the concrete interests involved in arguing for the Anthropocene as a genuine characteristic of our current epoch.

Part II analyses the changing governance landscape in the Anthropocene by scrutinizing the increase and changing role of institutions, both intergovernmental and transnational, in governing the global and worldwide problems associated with the Anthropocene diagnosis. In more detail, global environmental governance research has highlighted the extent to which our responses to environmental problems have been broadened significantly to reach beyond the confines of formal, legally binding multilateral environmental agreements (MEAs). Consequently, global environmental governance in the Anthropocene poses new and challenging questions to the analyst.

Since the emergence of global environmentalism as a political topic and social movement in the 1960s and 1970s, there has been a proliferation of cross-border environmental governance arrangements. The 1990s witnessed a 'golden age' in international norm-setting where the number and type of intergovernmental environmental regimes increased substantially and states adopted well-known MEAs such as the UN Framework Convention on Climate Change and the Convention on Biological Diversity. Today, more than 1100 MEAs and an estimated 1500 bilateral agreements govern inter-governmental relations across different environmental domains forming a dense web of international public environmental law. From 2000 onwards, however, fewer MEAs have been adopted and a general 'stagnation' in international law-making has been observed (Pauwelyn et al. 2012). Instead, the new millennium saw the birth of a broad range of private and transnational institutions, public-private partnerships,

private norms and global public policy networks addressing environmental issues (Pattberg 2007). As a result, we observe the emergence of a patchwork of governance arrangements at all levels of the world political system (Biermann et al. 2009; Zelli 2011; Zelli and van Asselt 2013).

In other words, the structure of global environmental governance has changed dramatically. However, the implications of this governance transformation, both in terms of effectiveness to address the overarching challenge of sustainability and the resulting (re)configuration of political power are not well understood. Consequently, this part analyses relevance and implications of increased institutional complexity in the Anthropocene.

In Part III, authors study the principles, old and new, that can help us address these challenges, placing particular focus on the relevance of legitimacy and accountability. Recent scholarship in global environmental governance has highlighted the legitimacy challenges resulting from hyper-globalization and neo-liberal environmental policies, including the intensifying integration of non-state actors (in particular multinational corporations) in transnational rule-making. For example, Biermann and Gupta (2011) identify the process of globalization as a major driving force in the search for accountable and legitimate governance, strengthening the need for new rule-making institutions at all levels of the political system. In their words:

the complexities of globalization have also given rise to a stronger political role for actors beyond the nation-state, from multinational corporations and transnational advocacy groups to science networks and global coalitions of municipalities.

(Biermann and Gupta 2011, p. 1856)

On this account, the Anthropocene presents a unique challenge for democratic, legitimate and accountable global governance, as both drivers and solutions to global environmental change have become complex and disaggregated.

Following this broad overview, we briefly introduce the individual contributions to this volume.

In Chapter 2, Marcel Wissenburg critically engages with the problematic prescriptive notion of the Anthropocene by arguing for a comprehensive normative theory to embed the Anthropocene debate in current notions of politics. In more detail Wissenburg argues that the term 'Anthropocene' is different from other geological periods, as it denotes an artificial break in geological and climate history. Criteria for the definition of other geological periods are ethically and politically more or less neutral and give rise to few conflicts – at worst polite debates among academics. Defining the Anthropocene on the other hand, characterizing it, locating its beginning in time (see above) are all cause for heavily politicized controversies. The chapter therefore contends that a prescriptive use of the notion of an Anthropocene can only be justified, if at all, using comprehensive political theories, which would have to evolve from theories of the body politic into theories of the body ecologic.

In Chapter 3, Manuel Arias-Maldonado scrutinizes whether the Anthropocene concept denotes the end of nature. The philosophical answer to that question may determine the political answer to the phenomenon that is described by this geological-cum-historical notion. On this account, the notion of the Anthropocene might indeed confirm that nature has ended in a particular yet important way, but that such ending does not preclude further reflection about the human relation with the environment. In fact, such recognition makes possible another understanding of the task that lies ahead: a reflective re-organization of socionatural relations and a reconceptualization of sustainability that might open up potential avenues for fair and just governance in the Anthropocene.

Chapter 4 by Simon Hailwood identifies three interpretations and responses to the Anthropocene hypothesis: the first argues that the Anthropocene in fact signifies the 'end of nature' in the sense that the ubiquity and depth of human impact makes it no longer intelligible to raise concerns about human impacts on nonhuman nature. Although it is easy to see how the end of nature discourse can dovetail with the Anthropocene discourse, the chapter argues that this is a delusional reading of the situation. The second reaction is one of celebration, taking it as a sign that (aside from some significant malfunctions of the programme such as climate change) human mastery of nature for the sake of anthropocentric ends is proceeding apace and can be expected to increase indefinitely. The third interpretation is a critical one and takes the Anthropocene as a sign that we should be deeply concerned about the implications both for human interests and for nonhuman nature, and consider ways to lessen anthropogenic impacts on the latter.

Concluding the critical self-reflections on the Anthropocene concept, Chapter 5 by Simon Meisch discusses questions of distributive justice to provide an ethical foundation to the concept. Building on a normative understanding of sustainable development, the chapter asks which norms ought to steer political action and ethically inform governance within the Anthropocene. In more detail, the chapter first asks: what do we owe other contemporary and future human beings in a sustainable world? In answering this question, the paper employs two ethical approaches that base human rights on human dignity and aim to give a substantial account of human rights: Martha Nussbaum's *Capability Approach* and Alan Gewirth's *Principle of Generic Consistency*. And second, the chapter consequently engages with the question of to whom we have moral and political obligations and how these insights translate into political rules. While both might look like mere theoretical questions, they have practical impact on governing the Anthropocene.

Chapter 6 opens Part II on institutions with Oscar Widerberg's discussion of institutional complexity and fragmentation through a network perspective. The chapter starts from the assumption that the traditional manner of addressing global problems, by negotiating multilateral environmental agreements between states under the auspices of the United Nations, has been complemented by a surge in governance initiatives driven by smaller groups of countries, cities,

regions, international organizations, companies, non-governmental organizations and philanthropists. The chapter then moves on to explore how to best address this emerging heterogeneity and diversity methodologically. It suggests a network-based approach to map and measure the degree of fragmentation of global governance architectures. The approach is illustrated by a case study on global climate governance with a focus on networks involving public actors, including governments, municipalities and sub-national regions.

Chapter 7 by Christine Moser and Robert Bailis employs a polycentric perspective on institutional complexity in the Anthropocene, taking the field of sustainable biofuels governance in Europe as the empirical illustration. In more detail, the chapter starts from the assumption that little is known about the measurable effectiveness of novel modes of governance that may be more flexible to address some of the challenges in the Anthropocene. In its sustainable production of biofuels, the EU relies on hybrid governance, which can be considered such a novel governance approach: the 2009 Renewable Energy Directive provides an environmental meta-standard for sustainable biofuels production under which it accepts private certification systems as ‘quasi-implementing agencies’, including in non-EU countries of production. Synergies resulting from mixing public and private modes of governance are obviously assumed by policymakers. The question then arises how constructive interplay across levels is facilitated. The chapter thus interrogates the institutional design of biofuels governance as an illustration of institutional complexity in the Anthropocene.

Chapter 8 by Judith van Leeuwen explores the implications of increased accessibility of the Arctic due to climate change and the subsequent growth of maritime activities in the region, also from a polycentric governance perspective. Shipping routes become available which are economically attractive as they shorten the voyage between continents. The concern with regard to increased Arctic shipping relates both to operational pollution as well as possible accidents which would result in spillage of oil and/or cargo. In short, this chapter analyses how corporate environmental performance is influenced by both industry-specific characteristics as well as the polycentric nature of Arctic shipping governance. The chapter also examines which governance solutions, private or state-led, are ultimately preferred by actors and why this is the case.

In Chapter 9, Christine Prokopf analyses international river governance through the example of the Rhine river basin. The economic and social uses of rivers by humanity conflict with claims to protect and restore nature, i.e. the rivers’ ecosystems. Institutions like international river basin organizations are founded to address the resulting governance problems. This chapter assesses the relevance of contextual factors for the development of comprehensive institutional governance strategies that include economic, social and ecological considerations. In other words, what induces institutional change in the Anthropocene? The author illustrates how, ultimately, extreme events and their perceptions trigger this change. She thereby links large-scale global change to institutional innovation. To substantiate this argument, the chapter examines

the case of the International Commission for the Protection of the Rhine (ICPR).

Part III on accountability and legitimacy in the Anthropocene starts with Chapter 10 by Robert Bartlett and Walter Baber proposing a deliberative model of transnational democratic accountability to overcome the democratic deficit of governance in the Anthropocene. The primary mechanism for holding administrative agencies accountable in democratic states has been the practice of legislative oversight. Yet, humankind's ability to disturb the ecosystem in fundamental ways creates the need for effective governance responses, which will unavoidably rely on strong administrative capacities. What is more, two of the forces of globalization that combine to create this ecological challenge (the internationalization of capital and weakening of the Westphalian nation state) also conspire to make legislative oversight of administrative action unlikely, if not impossible. Drawing primarily on an analysis of the emerging administrative practices of the European Union, the chapter describes a model of democratic accountability that does not rely on legislative oversight.

Chapter 11 by Martina Kühner analyses the role of global monitoring mechanisms as an increasingly used tool of 'holding and being accountable'. The chapter contributes to the investigation of the significance of 'soft' instruments for improving accountability for and, ultimately, compliance with environmental actions agreed upon in the context of the complex, multi-actor environment of the Anthropocene. As a case study, the chapter puts the main focus on the parties of the Kyoto Protocol (KP) within the framework of the United Nations Framework Convention on Climate Change (UNFCCC). Finally, lessons learned from this case are translated into recommendations on how to set up a monitoring framework for climate action that exhibits both flexibility and effectiveness in times of the Anthropocene.

In Chapter 12, Marija Isailovic engages with the question of legitimacy related to the engagement of actors from the global South in governing the Anthropocene. The Anthropocene concept does not fully do justice to the specific position of the global South and its actors. Research and practice of negotiations and agenda-setting in global environmental governance have shown that differences in opinions, interests and norms as well as access to resources between the global North and global South are still considerable. Against this backdrop, this chapter offers a legitimacy-based understanding of ongoing transformations of world politics from a global South perspective. Rather than providing empirical evidence-based research, the question is how shifts in authority entail changes in legitimacy and what this implies for questions of complexity, responsibility and urgency to act.

Chapter 13 by Linda Wallbott asks critical questions about how indigenous peoples have built and exerted their agency in international negotiations on forests and genetic resources. She analyses how far the narrative of the Anthropocene provides for potentials and pitfalls for indigenous peoples' claims to more effective participation in international environmental negotiations. Which new spaces open up and which new fault lines emerge? The Anthropocene aims to capture the substantial impact of human activities on the earth system.

Yet, often it comes with a Western, anthropocentric bias – and also with some negative normative imprint, as it usually describes impacts such as biodiversity loss and climate change. On the other hand, the activities of indigenous peoples and local communities are often considered to contribute to the sustainability and stewardship of natural resources ‘in harmony with nature’. However, a linkage between these two images is rarely drawn, neither in actual debates nor in scientific analyses.

In our concluding chapter (Zelli and Pattberg, this volume), we summarize this broad survey of global environmental governance and the Anthropocene along the three guiding concepts explored throughout the book. Finally we distil a number of important avenues for future research on global environmental governance in the Anthropocene.

References

- Biermann, F., Abbott, K., Andresen, S., Bäckstrand, K., Bernstein, S. et al. (2012) Navigating the Anthropocene: Improving earth system governance. *Science* 335: 1306–1307.
- Biermann F. and Gupta A. (2011) Accountability and legitimacy: An analytical challenge for earth system governance. *Ecological Economics* 70: 1854–1855.
- Biermann, F., Pattberg, P., Van Asselt, H. and Zelli, F. (2009) The fragmentation of global governance architectures: A framework for analysis. *Global Environmental Politics* 9(4): 14–40.
- Crutzen, P. J. and Stoermer, E. F. (2000) *IGBP Newsletter* 41: 17–18.
- Hoffman, A. and Devereaux Jennings, P. (2015) Institutional theory and the natural environment: Research in (and on) the Anthropocene. *Organization & Environment* 28(1): 8–31.
- Johnson, E. and Morehouse, H. (2014) After the Anthropocene: Politics and geographic inquiry for a new epoch. *Progress in Human Geography* 38(3): 439–456.
- Lewis, S. L. and Maslin, M. A. (2015) Defining the Anthropocene. *Nature* 315: 171–180.
- Monastersky, R. (2015) The human age. *Nature* 519: 147–149.
- Pattberg, P. (2007) *Private Institutions and Global Governance: The New Politics of Environmental Sustainability*. Cheltenham: Edward Elgar.
- Pauwelyn, J., Wessel, A. and Wouters, J. (2012) *Informal International Lawmaking*. Oxford: Oxford University Press.
- Philip, K. (2014) Doing interdisciplinary Asian Studies in the age of the Anthropocene. *Journal of Asian Studies* 73(4): 975–1000.
- Pronk, J. (2002) The Amsterdam Declaration on Global Change. In W. Steffen, J. Jäger, D. Carson and C. Bradshaw, *Challenges of a Changing Earth*. Berlin, Heidelberg: Springer, pp. 207–208.
- Roberts, N. (2000) Wicked problems and the network approach to resolution. *International Public Management Review* 1(1): 1–19.
- Rockström, J., Steffen, W., Noone, K., Persson, A., Chapin III, F. S., Lambin, E. et al. (2009) Planetary boundaries: Exploring the safe operating space for humanity. *Ecology and Society* 14(2): 32.
- Ruddiman, W. F. (2013) The Anthropocene. *Annual Review of Earth and Planetary Sciences* 4: 45–68.

- Simmons, E. (2014) Theology in the Anthropocene. *Dialog – A Journal of Theology* 53(4): 271–273.
- Steffen, W., Richardson, K., Rockström, J., Cornell, S., Fetzer, I. et al. (2015) Planetary boundaries: Guiding human development on a changing planet. *Science* 347(6223): 736.
- Wallerstein, I. (1974) *The Modern World-System I: Capitalist Agriculture and the Origins of the European World-Economy in the Sixteenth Century*. New York and London: Academic Press.
- Wapner, P. (2014) The changing nature of nature. Environmental politics in the Anthropocene. *Global Environmental Politics* 14(4): 36–54.
- Zelli, F. (2011) The fragmentation of the global climate governance architecture. *Wiley Interdisciplinary Reviews: Climate Change* 2(2): 255–270.
- Zelli, F. and van Asselt, H. (2013) Introduction: The institutional fragmentation of global environmental governance. *Global Environmental Politics* 13(3): 1–13.

Index

- 15th Conference of Parties 89
- 1969/70 thiodan chemical pollution
 - 150–1, 153–4, 156
- 1983 Rhine river flood 150, 152,
 - 156–7
- 1986/87 Sandoz chemical plant fire
 - 149–56, 160–1
- 1988 Rhine river flood 150, 152,
 - 156–7
- 1993/94 Rhine river flood 150, 152,
 - 156–7
- 1995 Rhine river flood 149–52, 157–60
- 2008 to 2012 Kyoto Protocol
 - monitoring 189–95

- Abengoa RED Bioenergy
 - Sustainability Assurance (RBSA)
 - 118
- access issues, fair distribution in the Anthropocene 62–76
- accidents: Arctic shipping 127, 132, 135, 140; Rhine river basin 146, 149–56, 160–1
- accountability: biofuel sustainability
 - 104; commitment monitoring 184–97, 235; democratic accountability 167–83, 234; institutional complexity mapping 82; Kyoto Protocol 184–97, 235; polycentric governance 108–9
- accreditation aspects 113
- action plans, democratic accountability 176–7

- administrative accountability 167–81, 234
- advocates: Anthropocene 16–26; EU democratic accountability 170
- ‘affiliation networks’ 86–7, 91–9
- agency 64–6, 151–8
- Agenda 21 204
- Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic 133, 136
- alliances, indigenous societies
 - 224
- allocation, fair distribution 62–76
- Anthropocene: advocates 16–26; celebration, delusion and concern 47–61, 232–3; contextualization 15–19; definitions 32–3; delusion, celebration and concern 47–61, 232–3; fair distribution 62–78, 233; geo-engineering 15–16, 19–26; historical contextualization 15–19; institutional complexity mapping 81–99, 233–4; making sense of 36–40; moral diversity/gaps 15, 21–8; narrative 15–28, 232; nature and the 31–46, 232; original advocates 16–24; political diversity/gaps 15–28, 232; second circle advocates 24–6; sense of an ending? 31–46, 232
- ‘anti-domination’ 48, 55–60
- anti-fouling aspects 134

- Arctic Council 127, 132–3, 136–7, 141
- Arctic Marine Shipping Assessment of 2009 133
- Arctic shipping governance: corporate authority 127–44, 234
- Arles Declaration 149–50, 152
- assurance system criteria 116
- attribution of meaning, indigenous societies 224–7
- authority aspects, biofuel sustainability 105–6
- ballast water 134
- Barents Euro-Arctic Region 133
- benchmarking schemes 122
- Benton, Ted 53–4
- Berkhout, Frans 17, 26–7
- betweenness centrality 88, 95–7
- Biermann, Frank 25, 66, 73, 90
- biodiversity 33–4
- biofuel sustainability: transnational governance 103–26, 234
- Biomass Biofuels voluntary scheme 118
- Birnbacher, Dieter 36
- body ecologic theory development 15–16, 26–8
- bureaucratic officials 170–1
- C40 Cities Climate Leadership Group 95–7, 200, 202
- Cancun Agreements 221
- Capability Approach, fair distribution 63, 68–9, 71–6
- carbon markets 200–2
- CC *see* Compliance Committee
- CCWG *see* Clean Cargo Working Group
- CDM *see* Clean Development Mechanism
- celebration, Anthropocene, concern & delusion 47–61, 232–3
- centrality, institutional complexity mapping 88–9, 95–7
- certification: Arctic shipping governance 129, 131, 134–40; biofuel sustainability 104, 109–23; climate governance 203–4, 207; EU promotion over sustainability 120–2; transnational governance 104, 109–23
- chemical accidents/pollution 146, 149–56, 160–1
- circumventions, Anthropocene narrative 19–24
- cities, role in climate governance 207
- Cities Climate Leadership Group (C40) 95–7, 200, 202
- classification societies 138
- Clean Cargo Working Group (CCWG) 139–40
- Clean Development Mechanism (CDM) 201, 220
- Clean Shipping Index 139–40
- climate change: Anthropocene: delusion, celebration & concern 47, 51–2, 55, 59; Arctic shipping governance 127, 133; biofuel sustainability 103, 110–11, 122; governance: legitimacy/transformation 198–212, 235; institutional complexity mapping 81–5, 89–99, 233–4; Kyoto Protocol 89–98, 184–97, 201, 206, 220; nature and the Anthropocene 33–42; Rhine river basin 159–61
- climate negotiations, lobbying for rights practices 213–30, 235
- Climate Secretariat 186
- Codes, Arctic shipping governance 135–7, 141
- Coleridge, Samuel Taylor 145–6
- collaborative learning 176–7
- collective functions, biofuel sustainability 104–6, 110, 120
- comitology 171
- Commission on Sustainable Development (CSD) 194

- commitment monitoring: Kyoto Protocol 184–97, 235
 commodity chains 104, 110
 Community democratic accountability 171, 174
 competing policy models 174–5
 competitive rivalry 107
 complexity: Anthropocene 231–42; institutional complexity mapping 81–99, 233–4; Kyoto Protocol monitoring 195; of society recognition 15
 Compliance Committee (CC) 187, 190–1
 compliance monitoring 184–95, 235
 computational representation, density: institutional complexity mapping 93–5
 conceptualization, polycentric governance 105–9
 concern, Anthropocene, delusion & celebration 47–61
 Conference of Parties (COP) 89
 conflict resolution 107
 CONNECT-project 91–2
 consensus promotion 179–80
 constitutional functions, biofuel sustainability 105–6, 120
 contested meanings of indigeneity 217–19
 contextualization, Anthropocene 15–19
 controversy sources, Anthropocene narrative 16
 cooperatives 179
 COP *see* Conference of Parties
 corporate authority, Arctic shipping governance 127–44, 234
 Corporate Social Responsibility Standard 204
 Council of Ministers 133, 171, 180
 courts 174
 critical perspectives 21–5, 41–2, 44
 Cronon, William 51
 cross-border initiatives 89–90
 Crutzen, Paul 17–18, 23, 47, 52, 54, 198
 CSD *see* Commission on Sustainable Development
 databases 81, 84, 91, 97
 data collection 91–3
 decision-making procedures 104, 106–7, 109–10, 112, 116, 121, 123
 degree centrality 88, 95–7
 delegated act 175–6
 delegated authority 129–31, 137
 delegation 169–72
 deliberative accountability 172–81
 deliberative legitimacy 203
 delusion, Anthropocene, concern & celebration 47–61, 232–3
 democratic accountability 167–83, 234
 democratic destabilization 107
 democratic legitimacy 203
 democratic polycentric governance 109
 democratizing global climate governance 205–6
 density, institutional complexity mapping 87–9, 93–5
Der Spiegel newspaper 150, 153–9
Die Zeit newspaper 150, 153–9
 Di Paola, Marcello 58–9
 discrimination 219
 domination 41–3, 48, 55–60
 dualism, human–nature and the Anthropocene 36–9
 dual spatiality 214–17
 Dworkin, Ronald 66–7
 earth system governance: earth system science 15–28; fair distribution 62–76, 233
 EB *see* Enforcement Branch
 Eckersley, Robyn 20, 22
 ecological responsiveness 127, 130–1, 139, 168

- economic opportunities, Arctic
shipping governance 127, 129–32,
135, 138–41
- ecosystem method development,
Rhine river basin 153–6
- Ellis, Earl 40, 49, 51–4
- Emergency Prevention Preparedness
and Response committee 133
- emissions trading system (ETS) 201
- Endangered Species Act (ESA) 175
- ‘end of nature’ concept:
Anthropocene: delusion,
celebration & concern 48–52, 58,
60; Anthropocene narrative 21;
nature and the Anthropocene 37,
39–40, 43–5
- energy security 103
- enforcement, Kyoto Protocol
monitoring 185–95
- Enforcement Branch (EB) 187–8,
190, 192–5
- ‘entrepreneurial authorities’ 110–13,
116
- environmental governance: Arctic
shipping: corporate authority
127–41; climate governance
legitimacy/transformations 198–
212, 235; democratic accountability
167–9, 172–4, 177–81; institutional
complexity mapping 81–99, 233–4;
Kyoto Protocol 89–98, 184–97,
235; lobbying for rights practices
213–30, 235
- Environmental Performance Reviews
194
- environmental recombination 32, 34,
36
- environmental standards 103–4,
109–23, 127–31, 134–41
- equity dimensions 198
- ERT *see* Expert Review Teams
- ESA *see* Endangered Species Act
- ethical values 130–1
- ETS *see* emissions trading system
- EU *see* European Union
- European Commission 169, 171–7,
180
- European Council 171–2, 180
- European Parliament 171, 176, 180
- European Union (EU): climate
governance legitimacy/
transformations 201; democratic
accountability 168–77, 180–1;
Renewable Energy Directive
114–23; sustainable biofuel
governance 104, 114–23
- Euroseptics, democratic
accountability 169–70
- Exclusive Economic Zones 131–2
- Expert Review Teams (ERT) 187,
190–3, 195
- extreme events: Rhine river basin
145–63, 234
- Facilitation Branch (FB) 187–8,
190–2
- fair distribution 62–78, 233
- FB *see* Facilitation Branch
- feedstocks 103, 117–18, 123
- Ferguson, Adam 65
- fire events 146, 149–56, 160–1
- first generation advocates 15–24
- flag states 134–8
- Flood Action Plan 150, 159
- floods Rhine river basin 146–53,
156–61
- food production 59
- forests 202, 204, 207, 213–14, 218,
220–8
- Forest Stewardship Council (FSC)
207
- fouling issues 134
- FPIC *see* Free Prior and Informed
Consent
- fragmentation, institutional
complexity mapping 81–99, 233–4
- freedom rights 68–76
- Free Prior and Informed Consent
(FPIC) 221
- FSC *see* Forest Stewardship Council

- Fuel Quality Directive 98/70/EC 115
 future directions 194–5, 239–41
- Gaffney, Owen 17
- Generic Consistency 63–4,
 68–76
- generics rights 69–76
- ‘geodesic distance’ 93
- geo-engineering 15–16, 19–26
- Gewirth, Alan 63–4, 68–76
- GHG *see* greenhouse gases
- global environmental governance:
 Arctic shipping: corporate authority
 127–41; biofuel sustainability
 103–26, 234; climate governance
 legitimacy/transformations 198–
 212, 235; democratic accountability
 168, 170, 181; dual spatiality
 214–17; institutional complexity
 mapping 81–99, 233–4; Kyoto
 Protocol 89–98, 184–97, 235;
 lobbying for rights practices
 213–30, 235; transnational
 governance 103–26, 234
- global equity dimension 198
- global politics, indigenous societies
 217–28
- global South, climate governance
 legitimacy/transformations 198–
 212, 235
- global warming 15, 20, 22–3
- Goodin, Robert 55
- goods: institutional complexity 81–99,
 233–4; legitimate claims 69–70, 72;
 sustainable biofuels 103–23, 234
- governance: Arctic shipping corporate
 authority 127–44; biofuels
 sustainability 103–26, 234; climate
 governance legitimacy/
 transformations 198–212, 235;
 democratic accountability 167–74,
 176–81, 234; institutional
 complexity mapping 81–99, 233–4;
 international river governance
 145–63, 234; Kyoto Protocol
 89–98, 184–97, 235; legitimacy
 198–212, 235; lobbying for rights
 practices 213–30, 235; polycentrism
 103–26, 128–31, 234; Rhine river
 basin 145–63, 234; socio-political
 implications 25; sustainable biofuels
 103–26, 234; transformations
 198–212, 235
- Grain and Feed Trade Association
 Trade Assurance Scheme (GTAS)
 118
- Great Acceleration 81, 98
- Greek political philosophy 27
- Green Award 138–40
- green class notations 138–40
- green critique of Marx 53–4
- Greenergy Brazilian bioethanol
 verification programme 118
- greenhouse gases (GHG): Arctic
 shipping governance 127; biofuel
 sustainability 104, 115; institutional
 complexity mapping 89; Kyoto
 Protocol monitoring 186–7, 191,
 193
- Green, J. F. 110, 129, 137
- Grinevald, Jacques 17
- GTAS *see* Grain and Feed Trade
 Association Trade Assurance
 Scheme
- Guardian* newspaper 52–3
- hard instruments, Kyoto Protocol
 monitoring 186–95
- Hill, Thomas Jr. 56
- historical contextualization,
 Anthropocene 15–19
- history, indigenous societies 219–20
- Hobbs, 21
- Hornborg, A. 24–5, 27, 41
- human dignity 68, 71–5
- humanity: Anthropocene: delusion,
 celebration & concern 47–60,
 232–3; fair distribution in the
 Anthropocene 62–76, 233; nature
 relationships 31–44, 145–6, 148,

- 152–3, 155–61; Rhine river basin
145–6, 148, 152–3, 155–61
- human rights 65, 68–76
- human–nature dualism 36–9
- HVO Renewable Diesel Scheme for
Verification of Compliance with
RED 118
- hybrid authorities 84–5, 91–2, 123
- hybridization, nature and the
Anthropocene 32–40, 43–4
- ICPR *see* International Commission
for the Protection of the Rhine
- IGBP.net *see* International
Geosphere-Biosphere Programme
- IGC *see* intergovernmental
conferences
- IIPFCC *see* International Indigenous
Peoples Forum on Climate Change
- ILO Convention No. 169 223
- IMO *see* International Maritime
Organization
- impartiality, third-party certification
113
- independent governance units 107
- indigeneity, contested meanings of
217–19
- indigenous societies: Arctic shipping
governance 127, 132; democratic
accountability 178; global politics
217–28; history 219–20; land
219–28; lobbying for rights
practices 213–30, 235; natural
resources 220–8; REDD+ 220–8;
transnational governance/
institutions 218–20, 222
- industrial codes 129
- information-based standards 129
- institutional complexity 63, 75–6,
81–102, 233–4
- institutional design 186–8
- institutional governance: mapping
institutional complexity 81–102,
233–4; Rhine river basin 146–61;
sustainable biofuels 103–26, 234
- insurance 138
- intergovernmental conferences (IGC)
171
- Intergovernmental Panel on Climate
Change (IPCC) 191, 220
- intergovernmental regimes: climate
governance legitimacy/
transformations 202–3, 205, 208;
institutional complexity mapping
83–4, 91–2; Rhine river basin
146–7
- International Association of
Classification Societies 138
- International Association of
Independent Tanker Owners
(Intertanko) 138
- international climate negotiations
213–30, 235
- International Code for Ships
Operating in Polar Waters (Polar
Code) 135–7, 141
- International Commission for the
Protection of the Rhine (ICPR)
147–52, 155, 159–61
- International Convention for the
Prevention of Pollution from Ships,
as modified by the Protocol of 1978
(MARPOL 73/78) 134–5
- International Convention for the
Safety of Life at Sea 134–5
- International Convention on
Standards of Training, Certification
and Watchkeeping for Seafarers
134–5
- International Geosphere-Biosphere
Programme (IGBP.net) 17, 24
- International Indigenous Peoples
Forum on Climate Change
(IIPFCC) 223
- international law and relations 83–4,
91–2
- International Maritime Organization
(IMO) 127, 131, 133–8, 141
- International Oil Pollution
Prevention Certificate 135

- international organisations,
institutional complexity mapping
83–4, 91–2, 95, 98–9
- International Organization for
Standardization (ISO) 204
- international river governance
145–63, 234
- International Social and
Environmental Accreditation and
Labelling (ISEAL) Alliance 112,
119, 203
- International Sustainability and
Carbon Certification (ISCC) 117,
119
- Intertanko *see* International
Association of Independent Tanker
Owners
- IPCC *see* Intergovernmental Panel on
Climate Change
- ISCC *see* International Sustainability
and Carbon Certification
- ISEAL *see* International Social and
Environmental Accreditation and
Labelling
- Jamieson, Dale 55–6, 58–9
- joint production methods 104
- juristic deliberation 173–5
- justice theories 71–2
- Karafyllis, Nicole 34
- Katz, Eric 41
- Keohane R. O. 90, 98
- key concepts, institutional complexity
mapping 82–3
- Knight, Jasper 25–6
- Kyoto Protocol 184–97, 235; climate
governance legitimacy/
transformations 201, 206;
deforestation 220; institutional
complexity mapping 89–98
- labour divisions 113
- land, indigenous societies 219–28
- land-based biofuels 103
- language, rights lobbying practices
216–17
- Lee, K. 34
- legislation: Arctic shipping
governance 130–1; democratic
accountability 167–83, 234
- legitimacy: climate governance
198–212, 235; goods 69–70, 72;
institutional complexity mapping
82; polycentric governance 108–9
- Lewontin, Richard 37
- Lisbon Treaty 175–6
- lobbying for rights practices 213–30,
235
- local community rights lobbying
213–30, 235
- McKibben, Bill 49–50
- McKim, Robert 26–7
- McNeill, John 17
- Malm, A. 24–5, 27, 41
- management, Kyoto Protocol
monitoring 185, 188–94
- mapping institutional complexity
81–102, 233–4
- Marine Oil Pollution Preparedness
and Response in the Arctic 133,
136
- market-based climate governance
methods 201–2, 204–5
- MARPOL *see* International
Convention for the Prevention of
Pollution from Ships, as modified
by the Protocol of 1978
- Marx, green critique of 53–4
- mastery attitudes 48, 52–60
- MEA *see* Multilateral Environmental
Agreements
- media analysis 52–3, 150–9
- medieval political philosophy 27
- Memoranda of Understanding (MoU)
on Port State Control 136–7, 141
- methodological caveats 97–8
- Millennium Development Goals 204
- Mill, John Stuart 33

- mind/body dualism 55–6
 Ministers, Council of 133, 171, 180
 Minter, Ben 20, 26
 monitoring, reporting and verification (MRV) 187–95, 221–2
 morality: Anthropocene narrative 15, 21–8; deliberative democratic accountability 179; fair distribution 64–5, 69–76
 motivations, Arctic shipping
 governance: corporate authority 130–1
 MoU *see* Memoranda of Understanding
 MRV *see* monitoring, reporting and verification
 Multilateral Environmental Agreements (MEA) 184–5, 195
 multi-stakeholder standards 104, 111–15, 119, 121, 123

 ‘natural’ disasters 146–53, 156–61
 naturalist opponents 21–2
 natural resources, global
 environmental governance 213–28, 235
 nature: and the Anthropocene 31–46, 232; Anthropocene: delusion, celebration & concern 48–60; antidomination 58–60; biodiversity 33–4; climate change 33–42; critical theory perspectives 41–2, 44; definitions 33–4; domination 41–3, 58–60; ‘end of nature’ concept 37, 39–40, 43–5; environmental recombination 32, 34, 36; humanity relationships 31–44, 145–6, 148, 152–3, 155–61; hybridization 32–40, 43–4; politics 31–2, 35, 40–4; ‘pro-mastery’ of 48, 52–60; sense of an ending? 31–46; social systems 31, 33–44; socionatural-nature relations 31, 33–44; socio-political implications 32, 35

 negative rights 69
 nested polycentric governance 115–20
 Netherlands Technical Agreement (NTA) 117
 networked governance 81–99, 202–3, 208, 233–4
 newspapers 52–3, 150, 153–9
 NGO *see* non-governmental organizations
 NIMBY reactions 158
 node degrees 95
 non-governmental organizations (NGO): biofuel sustainability 112–13, 115, 117, 119, 122; climate governance legitimacy/transformations 201, 203–4; Kyoto Protocol 195
 non-hierarchical steering 200
 non-legislative democratic accountability models 167–83, 234
 non-mandatory shipping guidelines 135
 non-state actors, institutional complexity mapping 83–5, 95, 98
 non-state market driven (NSMD) initiatives 127–31, 137–41
 Nordic Council of Ministers 133
 normative issues: Anthropocene: delusion, celebration & concern 48, 55–6, 60; Anthropocene: fair distribution 62–78, 233; climate governance legitimacy/transformations 203; sustainable development conception 62–78, 233
 Northeast Passage 131–2
 Northwest Passage 131
 North–South divide 199–200, 205–6
 NSMD *see* non-state market driven initiatives
 NTA *see* Netherlands Technical Agreement
 Nussbaum, Martha 63, 68–9, 71–6

- OECD Environmental Performance Review 194
- oil pollution 127, 133–6
- Oldfield, Frank 17, 19, 23–4
- OMC *see* open method of coordination
- omissions, Anthropocene narrative 19–24
- open method of coordination (OMC) 169, 171–2
- operational functions, biofuel sustainability 105–6, 120
- operational pollution 127, 133–40
- opponents, Anthropocene narrative 21–3
- OPRC Convention 136
- original Anthropocene advocates 16–24
- Ostrom, E. 90, 98, 105–8
- outreach, indigenous societies 224
- oversights, EU democratic accountability 169–72
- Paris Memoranda of Understanding on Port State Control 136–7, 141
- perception of severe events 151–4, 156–8
- PGC *see* Principle of Generic Consistency
- ‘plastiglomerate’ rocks 34
- Plumwood, Val 50, 55, 58
- pluralism, independent governance units 107
- Polar Code 135–7, 141
- policy processes, democratic accountability 167–81, 234
- politics: bargaining 88–9; body ecologic 27–8; climate governance legitimacy/transformations 198–209, 235; diversity/gaps 15–28, 232; fair distribution 62–78, 233; indigenous societies 217–28; nature 31–2, 35, 40–4
- polling, EU democratic accountability 175, 178
- pollution: Arctic shipping governance 127, 133–40; Rhine river basin 146–56, 160–1
- polycentric governance: Arctic shipping: corporate authority 128–31; attributes 106–7; conceptualization 105–9; corporate authority 128–31; nested 115–20; sustainable biofuels 103–26, 234; transnational governance 103–26
- Port State Control 127, 135–7, 141
- positioning strategies, indigenous societies 222–7
- positive rights 69
- ‘post-natural worlds’ 39
- Preston, C. J. 21–2
- principal-agent models 107
- Principle of Generic Consistency (PGC) 63–4, 68–76
- private authorities: Arctic shipping governance 128–31, 137–41; climate governance legitimacy/transformations 200, 202, 206–8; transnational institutional complexity mapping 84–5
- private standards *see* environmental standards
- problem solving approaches, Rhine river basin 151–3, 155, 157, 159
- ‘pro-mastery’ reason 48, 52–60
- public actors: Arctic shipping governance 128; climate governance legitimacy/transformations 200, 202, 206–8
- public goods provision 103–23, 234
- radiation management 21–2
- Rawls, John 66–7
- RBO *see* River Basin Organisations
- RBSA *see* Abengoa RED Bioenergy Sustainability Assurance
- receding sea ice 131
- RED *see* Renewable Energy Directive
- RED Bioenergy Sustainability Assurance (RBSA) 118

- REDD *see* Reducing Emissions from Deforestation and Forest Degradation
- Reducing Emissions from Deforestation and Forest Degradation (REDD) 202, 204, 214, 220–8
- Regulatory standards institutions 201
- relationship types, institutional
complexity mapping 82, 85–7, 90, 97–8
- Renewable Energy Directive (RED) 114–23
- reporting processes, Kyoto Protocol monitoring 187–95
- responsibility 231–42; biofuel sustainability 123; fair distribution 63–5, 75; Kyoto Protocol monitoring 195; Rhine river basin 145–6, 148, 151–9, 161
- ‘restoration ecology’ 21
- Rhine Action Programme 149–52
- Rhine river basin governance 145–63, 234
- rights: fair distribution 65, 68–76; lobbying practices 213–30, 235
- River Basin Organisations (RBO) 145–8, 161
- river governance 145–63
- Robock, Alan 23
- Rosenau, J. N. 129
- ‘roundtabling’ standard schemes 112–14, 116–17
- routes, Arctic shipping 131–2
- rule-making, multi-stakeholder standards 111–13
- rural development, biofuel sustainability 103
- Safety of Life at Sea (SOLAS) 134–5
- salmon fishing 148–9
- Sandoz chemical plant, Schweizerhalle (Switzerland) 149–56, 160–1
- scale issues, institutional complexity mapping 97
- scepticism 48, 169–70, 185
- Schlosberg, David 55
- SDF *see* Sustainable Development Goals
- sea ice 131
- second circle Anthropocene advocates 24–6
- self-positioning 222–4
- Sen, Amartya 68–9, 71–6
- sense of an ending? 31–46, 232
- severe flood events 146–53, 156–61
- shipping governance: corporate authority in the Arctic 127–44, 234
- size issues, institutional complexity mapping 93
- SNA *see* social network analysis
- social capital 179
- social contexts: Capability Approach 73; principle of Generic Consistency 73
- social network analysis (SNA) 86
- social responsibility 127, 129–31, 139–40
- sociology of space 214–17, 222–8, 235
- socionatural-nature relations 31, 33–44
- socio-political implications 25, 32, 35
- soft instruments, Kyoto Protocol monitoring 184–96, 235
- SOLAS *see* Safety of Life at Sea
- sovereignty aspects 206
- space-making practices, rights lobbying practices 215–17, 222–8
- stakeholders 104, 111–15, 119, 121, 123, 130
- standards: Arctic shipping governance 127–31, 134–41; biofuel sustainability 103–4, 109–23; climate governance legitimacy/transformations 203–8
- Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 134–5

- state of the art, institutional complexity mapping 83–5
- state-led governance 83–5, 95, 98, 127–38, 141
- STCW *see* Standards of Training, Certification and Watchkeeping for Seafarers
- Steering Committee for the Barents Euro-Arctic Transport Area 133
- Steffen, Will 17–19, 23
- Stoermer, Eugene F. 17
- stream systems 145, 154
- structure, institutional complexity mapping 85–6
- sub-regional agreements 133
- sustainability: Arctic shipping governance: corporate authority 127, 130–3, 141; biofuels: transnational governance 103–26, 234; concept as a standard 25–6; fair distribution 62–78, 233; normative conceptions 62–78, 233
- Sustainable Development Goals (SDG) 194
- Swedish Clean Shipping Project 139
- system-level mappings 84
- TEBTEBBA indigenous organization 223
- technonatures 42–3
- terraforming 19, 22, 26
- thiodan pollution 150–1, 153–4, 156
- third-party certification 112–14
- timber 213–14, 218, 220–8
- TMN *see* transnational municipal networks
- traffic, Arctic shipping 131–2
- transformations, climate governance 198–212, 235
- transnational governance/institutions: Arctic shipping: corporate authority 129; climate governance legitimacy/transformations 200–9; democratic accountability 168–9, 172, 181; indigenous societies 218–20, 222; institutional complexity mapping 84–5, 91–2; polycentricity 103–26, 234; Rhine river basin 146, 149, 155; sustainable biofuels 103–26, 234
- transnational municipal networks (TMN) 202
- transparency 104
- treaties: democratic accountability 168, 171, 175–6; Rhine river basin 148–9, 155, 159
- UNCLOS *see* United Nations Convention on the Law of the Sea
- UNFCCC *see* United Nations Framework Convention on Climate Change
- United Nations Convention on the Law of the Sea (UNCLOS) 134
- United Nations Framework Convention on Climate Change (UNFCCC) 82, 84, 89–98; commitment monitoring 184, 186–9, 192, 196; lobbying for rights practices 214, 220–8
- United Nations (UN): Declaration on the Rights of Indigenous Peoples 221; indigenous society climate negotiations 214, 220–8; UNDRIP 221, 223, 225; UNPFII 222–3
- urban gardening 59
- urgency: Anthropocene 231–42; fair distribution in the Anthropocene 63, 75; Kyoto Protocol monitoring: accountability 195; transnational governance: biofuel sustainability 123
- VCR *see* Verified Carbon Standard
- VCS *see* Voluntary Carbon Credit Standard
- verification processes, Kyoto Protocol monitoring 187–95
- Verified Carbon Standard (VCR) 202
- Victor, D. G. 90, 98

- visual representation, density:
 - institutional complexity mapping 93–5
- Voluntary Carbon Credit Standard (VCS) 204
- ‘voluntary’ carbon markets 200–2
- voluntary green class notations 138–9
- voluntary standards *see* environmental standards

- watershed policies 174–8
- weaknesses, Anthropocene narrative 15–26

- well-being rights 68–76
- White, D. F. 42–3
- Wilbert, C. 42–3
- World Summit on Sustainable Development (WSSD) 204, 207
- World Wide Fund for Nature (WWF) 112, 119
- WSSD *see* World Summit on Sustainable Development
- WWF *see* World Wide Fund for Nature

- Zalasiewicz, Jan 17