

This PDF is auto-generated for reference only. As such, it may contain some conversion errors and/or missing information. For all formal use please refer to the official version on the website, as linked below.

International Security in the Anthropocene

<https://www.e-ir.info/2015/02/23/international-security-in-the-anthropocene/>

SIMON DALBY, FEB 23 2015

Welcome to the Anthropocene

International relations scholars and security policymakers don't usually discuss political matters in geological terms. That is beginning to change in part because the implications of climate change are getting the attention of policy makers. Military thinkers in the US in particular are worried about the disruptions that climate change is already starting to cause (CNA 2014). Immediate problems requiring disaster assistance as well as longer-term changes that may feed violent conflict are now on the policy agenda in Washington even if key members of the US Congress explicitly reject claims that humanity is causing climate change. Both conflicts and disasters have obvious implications for security planning that bear on some of the core themes of international relations quite directly (Mayer 2012).

The longer term transformations of our planet due to human actions, frequently now discussed in terms of a new geological epoch called the Anthropocene, have much more profound consequences. The first few weeks of 2015 highlighted these things as plummeting oil prices and discussions of the rather limited success of the climate change conference in Lima in December 2014 coincided with the release of an updated version of an influential study of the "Safe Operating Space" for planet earth (Rockstrom et. al 2009; Steffen et.al 2015). While burning fossil fuels, and not only petroleum, is key to changing the composition of trace gases in the earth's atmosphere, and hence warming the planet, this discussion of "earth system boundaries", within which humanity can safely operate, suggests that other geophysical transformations are also happening that need urgent attention.

Simultaneously at the beginning of 2015 media coverage of the debate about the appropriate starting point for the new geological epoch of the Anthropocene focused on the presence of artificial radiological isotopes in sediments around the world (Zalasiewicz et al 2015). These are a new phenomenon, one caused by nuclear bombs and the numerous detonations of these devices in the atmosphere in the decades since the Second World War. Clearly geology and international security are connected directly here too; preparations for war are leaving distinct traces in the geological record of the planet. Whether this will end up being the key "golden spike" that geologists use as the marker for the beginning of a newly designated period in planetary history is yet to be decided; but the debate adds another link between international security and matters of geology.

The rest of this article will sketch out, all too briefly, just a few of the key themes that this discussion has generated. Crucially it suggests that how we now think about security needs a substantial overhaul because traditional assumptions of a stable environmental backdrop to geopolitics are simply no longer tenable.

Geology: The Human Context

Much geological research deals with very long time periods, the gradual emergence of various assemblages of species, plate tectonics and the movement of continents. Every now and again, however, dramatic changes accelerate matters, causing huge extinctions, as with the elimination of the dinosaurs, and the dramatic reorganization of the biosphere. Humanity is now causing one of these planetary phase transitions, the sixth extinction event on the planet (Kolbert 2014). With these changes go substantial alterations to the composition of the atmosphere too, notably the rise and fall of trace gases of which carbon dioxide is an especially important one

International Security in the Anthropocene

Written by Simon Dalby

because of its relatively long residence time in the atmosphere.

More recent parts of earth history have been marked by repeated ice ages interrupted by relatively brief “interglacial” periods. The latest one stretching over the last 11,000 years, called the Holocene by geologists, has given rise to human civilization. This geological period has had a relatively stable climate in comparison with the fluctuations of previous periods of glacial advance and retreat. These ice ages are predominantly shaped by subtle variations in the earth’s orbit which cause sunlight to fall disproportionately on the hemispheres with complicated variations in snow patterns, vegetation growth and subsequent atmospheric levels of carbon dioxide and methane, gases that often amplified the larger processes of change.

Recent research is suggesting that humanity may have, albeit inadvertently, started to change the planetary climate in the Holocene by changing the species mix of the planet by killing off many larger land animals, clearing forests and introducing agriculture (Ruddiman et.al 2014). All these generated methane emissions that might have caused enough heating to prevent the planet slipping back into another ice age thousands of years ago. More recently this line of argument suggests other human influences on the climate. Perhaps the Black Death that killed off substantial parts of humanity and allowed reforestation of previously cleared land reduced carbon dioxide levels enough to cause the “little ice age” in the late mediaeval period? Did European conquest of the Americas, an event that, by introducing new diseases, killed off as much as ninety percent of the population also cause reforestation with related carbon dioxide reduction that affected global climate too?

As Geoffrey Parker (2011) has documented in detail the climate disruptions of the seventeenth century with their dramatic impacts on agriculture around the world are a key, but until recently under-recognized factor, to the political upheavals that in many ways set in motion what we have subsequently come to understand as modernity, and the rise to political dominance of European powers in subsequent centuries. This recent environmental history research argues that these climatological events need to be understood to adequately contextualize the emergence of the modern international system.

Future Climates

Now climate has become a key matter for international politics as the December 2015 Paris conference looms. Put in the context of rapidly rising methane and carbon dioxide levels in the global atmosphere as a result of urban lifestyles, industrial production and agricultural activities, it is gradually dawning on politicians, and scholars too, that humanity is shaping the future of the planetary system quite profoundly. Where environmental determinist arguments used to suggest that climate had shaped the course of human civilizations it is now abundantly clear that the opposite is the case. Geopolitics is now about how humanity is shaping its environment, not the other way round (Dalby 2014).

Decisions about greenhouse gas emissions taken now are influencing how the planet’s climate will play out in coming centuries. Humanity has probably already averted the next ice age, and may well be leading to a planet without at least an icecap on the Arctic Ocean in summers later in this century, and possibly an ice-free Greenland somewhat later. Rising sea levels are already becoming obvious and this will have numerous direct consequences for coastal states. Clearly this is about security and international relations in numerous ways. The key point is that human actions are shaping the future context for international politics, and in the process raising key questions about what kind of climate humanity wants (Caseldine 2014), and who should decide quite literally how hot things should get.

Assuming that geopolitics in coming generations will continue to be about state rivalries in a more or less given context is obviously inadequate as either a guide to policy making or a premise for international relations scholarship. Now we have to collectively think about what kind of a planet humanity is creating, and how decisions are made about this so that the future context for humanity is shaped in ways that take the needs of future generations for a relatively stable climate seriously. Assumptions that there will necessarily be a stable geopolitical context for future international relations make as little sense in ecological terms as they do in terms of global political economy and contemporary processes of globalization. Living in the Anthropocene requires international relations thinking to get this key point clearly in focus.

International Security in the Anthropocene

Written by Simon Dalby

Related to this is the need to challenge another key formulation that has shaped modern thinking profoundly. The problem with climate change is, by geological standards, the extraordinarily rapid growth of greenhouse gases in the atmosphere caused by the use of fossil fuels to power civilization. Most of modern economics, and much of international politics either implicitly or explicitly assumes that humanity lives in a condition of scarcity, and that politics is about access and distributional struggles over access to limited resources. Whatever climate change might be it is not about too little resources. It is about the huge amounts of fossil fuels that we are currently burning with such profligacy. The problem with climate change isn't a matter of resource scarcity. It is about trying to arrange matters in the next few decades so that most of the remaining supplies of fuel stay unused and in the ground (McGully and Ekins 2015). If humanity is to avoid very dramatic destabilizations of the climate system we have known through the Holocene we simply can't burn the reserves that are a key part of major coal, gas and petroleum corporations' inventories, and of course their current economic valuations too.

Anthropocene Adaptations

While climate change gets most of the attention in the proliferating discussions of the Anthropocene it is important to emphasize that humanity is changing other aspects of the planet profoundly too (Whitehead 2014). The heightened level of carbon dioxide in the atmosphere is increasing the rate at which oceans absorb it. This makes seawater more acidic. This has effects on marine life in part because increased acidity makes it difficult for shellfish to make their shells. The oceans are also becoming polluted by many industrial products only most obviously the huge amounts of plastic that humanity has manufactured that are ending up there. The recent emergence of new "plastiglomerate" type sediments as a result of the accumulation of plastic waste has led to the suggestion that these will provide a geological marker for the human age (Corcoran, Moore and Jezvac 2014). Perhaps the term "Plasticene" is a better alternative for our times than the Anthropocene!

Humanity has also set in motion a dramatic reduction in the biological diversity of the planet, both by direct hunting and by land clearance for agriculture. Most of the fertile parts of the land surface of the planet have been remade by agriculture; these artificial ecologies are now the environmental context for our urban modes of living. Likewise nitrogen and phosphorous levels in these increasingly artificial ecosystems are very much higher than natural systems due to the introduction of artificial fertilizers in the last few generations to dramatically increase crop yields. These chemicals are also having effects on the oceans where they cause eutrophication where rivers carry them to the sea. Many rivers of course don't reach the sea any more having been dammed and diverted for agriculture, industrial purposes and to supply cities with water. As a result of all these simultaneous transformations the natural world is now going through an extinction event on the scale of earlier events that lead to the extinction of the dinosaurs. But, and this is a crucial part of the Anthropocene discussion, all this is now happening much faster than in earlier geological epochs (Barnosky et al 2012).

How humanity shapes these new circumstances matters greatly both in terms of practical policy in particular places and in international politics. It is especially important to note that ham-fisted and uncoordinated efforts to adapt to contemporary changes may generate perverse consequences (Dalby 2013). Critiques of land grabbing as it has come to be known recently, where states and corporations buy up access to agricultural land in the global South to improve access to food supplies as a replacement to sources disrupted by floods and droughts elsewhere, may undermine local food systems, disrupt land markets and rural political economies and further extend dependence on industrial agricultural systems using huge amounts of fossil fuels and artificial fertilizers (Sassen 2013). It may well be that ill considered unilateral attempts to adapt to climate change may cause more political problems, and garner more attention from security planners, than the immediate consequences of climate disruptions.

This is even more likely if serious attempts to artificially manipulate the amounts of solar radiation getting to the earth's surface are undertaken in coming decades (Hamilton 2013). The so called "solar radiation management" experiments that already being undertaken are very inconclusive, but raise numerous issues of governance. If one state decided to act unilaterally and inject sulfate aerosols into the stratosphere, and anomalous weather patterns, such as a disruption of the Asian monsoon system occurred soon afterwards, the potential for accusations and recriminations to be framed in terms of national security threats is considerable. Anticipating such scenarios and thinking seriously about how to cope with such technological issues is now key to Anthropocene geopolitics.

International Security in the Anthropocene

Written by Simon Dalby

Anthropocene Geopolitics

The debate about the Anthropocene makes clear that all this is about much more than what is usually encompassed in international relations scholarship on environmental politics. We are now “living after nature” (Wapner 2010) and in doing so need to focus on what humanity is now producing rather than in protecting a stable environment from the depredations of development. Keeping biological options open by protecting biological diversity is important, but this has to be done by more than establishing parks and nature reserves. Allowing species to migrate, and facilitating their abilities to do so by relocating them and generating habitats in new places and across national frontiers, is part of what now needs to be done. Ironically stable national boundaries may be an impediment to these things; there is a huge gap between existing governance structures and what is need to tackle issues related to the transformation of the biosphere in the Anthropocene (Galaz 2014).

Dramatically reducing the use of fossil fuels immediately will help slow the rate of transition that coming generations will face. Making such things as windmills and solar panels instead of building coal powered electricity generation stations matters greatly; climate change is a production issue, not a matter of environmental protection in the old senses of the term. Assumptions of rapid geological transformation have to be the premise for international relations scholarship in the next few decades, not least in terms of posing questions of how scholarship might facilitate intelligent policy making (Keohane 2015). There now simply isn't a stable environmental context to geopolitics. Recognizing that the world is changing very rapidly is now the key to successful social and economic adaptation to changing circumstances, and hence to the provision of meaningful modes of human security for future generations. Welcome to the Anthropocene!

References

- Barnosky, A.D. *et al* (2012) 'Approaching a State Shift in Earth's Biosphere' *Nature*, 486 (7 June). 52-58.
- Caseldine, C. (2014) "So what sort of climate do we want? Thoughts on how to decide what is 'natural' climate." *The Geographical Journal*, in press. doi: 10.1111/geoj.12131
- Corcoran, P.L., Moore, C.J. and Jazvac, K. (2014) 'An anthropogenic marker horizon in the future rock record' *GSA Today*, 24(6). 4-8.
- CNA Military Advisory Board (2014) *National Security and the Accelerating Risks of Climate Change*, Alexandria, VA: CNA Corporation.
- Dalby, S. (2013) 'Climate Change: New Dimensions of Environmental Security' *RUSI Journal*, 158(3). 34-43.
- Dalby, S. (2014) 'Environmental Geopolitics in the Twenty First Century' *Alternatives: Global, Local, Political* 39(1). 3-16.
- Galaz, V. (2014) *Global Environmental Governance, Technology and Politics: The Anthropocene Gap*, Cheltenham: Edward Elgar.
- Hamilton, C. (2013) *Earthmasters: The Dawn of the Age of Climate Engineering*, New Haven: Yale University Press.
- Keohane, R.O. (2015) 'The Global Politics of Climate Change: Challenge for Political Science' *PS: Political Science & Politics*, 48(1). 19-26.
- Kolbert, E. (2014) *The Sixth Extinction: An Unnatural History*, New York: Henry Holt.
- Mayer, M. (2012) 'Chaotic Climate Change and Security' *International Political Sociology*, 6(2). 165-185.
- McGlade, C. and Ekins, P. (2015) 'The geographical distribution of fossil fuels unused when limiting global warming

International Security in the Anthropocene

Written by Simon Dalby

to 20C' *Nature*, 517. (January) 187-190.

Parker, G. (2011) *Global Crisis: War, Climate Change and Catastrophe in the Seventeenth Century*, New Haven: Yale University Press.

Rockström, J. et.al (2009) 'A safe operating space for humanity', *Nature*, 461. (24 September) 472–475.

Ruddiman, W., Vavrus, S., Kutzbach J., He, F., (2014) 'Does pre-industrial warming double the anthropogenic total?' *The Anthropocene Review* in press DOI 10.1177/2053019614529263.

Sassen, S. (2013) 'Land Grabs Today: Feeding the Disassembling of National Territory' *Globalizations*, 10(1). 25-46.

Steffen, W. et.al (2015) 'Planetary boundaries: Guiding human development on a changing planet' *Science* (15 January) in press. / DOI 10.1126/science.1259855.

Wapner, P. (2010) *Living through the End of Nature: The Future of American Environmentalism*, Cambridge MA: MIT Press.

Whitehead, M. (2014) *Environmental Transformations: A Geography of the Anthropocene*, London: Routledge.

Zalasiewicz, J. et. al (2015) 'When did the Anthropocene begin? A mid-twentieth century boundary level is stratigraphically optimal' *Quaternary International*, in press. doi:10.1016/j.quaint.2014.11.045.

About the author:

Professor Simon Dalby is CIGI Chair in the Political Economy of Climate Change at the Balsillie School of International Affairs and Professor of Geography and Environmental Studies at Wilfrid Laurier University, Waterloo, Ontario. He is author of *Environmental Security* (University of Minnesota Press, 2002), *Security and Environmental Change* (Polity, 2009), and co-editor (with Shannon O'Lear) of *Reframing Climate Change: Towards Ecological Geopolitics* (Routledge 2016).