

## THE CAMBRIDGE COMPANION TO LITERATURE AND THE ANTHROPOCENE

The Anthropocene is a proposed geological epoch marking humanity's alteration of the Earth: its rock structure, environments, atmosphere. *The Cambridge Companion to Literature and the Anthropocene* offers the most comprehensive survey yet of how literature can address the social, cultural and philosophical questions posed by the Anthropocene. This volume addresses old and new literary forms – from novels, plays, poetry and essays to exciting and evolving genres such as 'cli-fi', experimental poetry, interspecies design, gaming, weird, ecotopian and petro-fiction, and 'new' nature writing. Studies range from the United States to India, from Palestine to Scotland, while addressing numerous global signifiers or consequences of the Anthropocene: catastrophe, extinction, 'fossil capital', warming, politics, ethics, interspecies relations, deep time and Earth. This unique *Companion* offers a compelling account of how to read literature through the Anthropocene and of how literature might yet help us imagine a better world.

JOHN PARHAM is Professor of Environmental Humanities at the University of Worcester. He has authored or co-edited five books including *Green Media and Popular Culture* (Palgrave Macmillan, 2016) and (with Louise Westling) *A Global History of Literature and the Environment* (Cambridge University Press, 2017). He has edited the journal *Green Letters: Studies in Ecocriticism* for nineteen years.

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Edited by John Parham  
Frontmatter  
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THE CAMBRIDGE  
COMPANION TO  
LITERATURE AND THE  
ANTHROPOCENE

EDITED BY  
JOHN PARHAM  
*University of Worcester*



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A 2009 'In the Air' example showing Santiago, <http://intheair.es/santiago/>. Architect: Nerea Calvillo; Collaborators: Katha Caceres, Francisco Calvo, Christian Oyarzun and Ricardo Vega; Funding: Video and Media art biennale of Chile BVAM09 and the Spanish Agency of Cooperation and Development (AECID).

## Contributors

HEATHER ALBERRO recently completed her PhD on the postanthropocentric worldviews and ecotopian potentialities of radical environmental activists at Nottingham Trent University's Department of Politics and International Relations. Her work spans a range of disciplines including green utopianism, critical post-human theory, environmental sociology, environmental ethics, ecocriticism and political ecology. Heather also serves as co-convenor for the Political Studies Association's (PSA) environmental politics specialist group and as Chair of the PSA's Early Career Network (ECN).

HANNES BERGTHALLER is a professor at the Department of Foreign Languages and Literatures at National Chung-Hsing University, Taiwan. His work focuses on the literature and cultural history of modern environmentalism, social systems theory and neo-cybernetics, and environmental philosophy. Together with Eva Horn (University of Vienna, Austria), he co-authored *The Anthropocene: Key Issues for the Humanities* (Routledge, 2020).

MANDY BLOOMFIELD is an associate professor of modern and contemporary literature at the University of Plymouth. Her publications include *Archaeopoetics: Word, Image, History* (University of Alabama Press, 2016) and numerous articles on contemporary eco-poetics in journals such as *Contemporary Literature*, *Green Letters*, *Configurations* and *Critical Quarterly*.

ASTRID BRACKE writes on twenty-first-century British fiction and non-fiction, eco-criticism and narratology, climate crisis and floods. Her monograph, *Climate Crisis and the Twenty-First-Century British Novel*, was published by Bloomsbury Academic in 2018. She is an alumna of the Rachel Carson Center for Society and Environment in Munich, and



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currently works as a lecturer of British literature at HAN University of Applied Sciences, Nijmegen (Netherlands).

BYRON CAMINERO-SANTANGELO is a professor of English and environmental studies at the University of Kansas. His research and teaching interests include African literature and popular environmentalism, post-colonial studies, environmental humanities and environmental ethics and justice. His book *Different Shades of Green: African Literature, Environmental Justice, and Political Ecology* was published by Virginia University Press in 2014. He is also the author of *African Fiction and Joseph Conrad: Reading Postcolonial Intertextuality* (SUNY Press, 2005) and co-edited *Environment at the Margins: Literary and Environmental Studies in Africa* (Ohio University Press, 2011).

ALEND A. Y. CHANG is an associate professor in film and media studies at the University of California, Santa Barbara (UCSB), and author of *Playing Nature: Ecology in Video Games* (University of Minnesota Press, 2019). Chang is also a founding co-editor of the open-access journal *Media+Environment* and co-directs the Wireframe media studio at UCSB.

EILEEN CRIST received her Bachelor's in sociology from Haverford College and her PhD, also in sociology with a specialisation in life sciences and society, from Boston University. She is recently retired from Virginia Tech where she taught for twenty-two years. Her work focuses on the extinction crisis and the destruction of wild places, pathways to halt these trends, and inquiries surrounding humanity's relationship with the planet. She is co-editor of a number of books, including *Gaia in Turmoil: Climate Change, Biodepletion, and Earth Ethics in an Age of Crisis* (MIT Press, 2009) and *Keeping the Wild: Against the Domestication of Earth* (Island Press, 2014). She has published many academic papers as well as popular writings, and is associate editor of the online journal *The Ecological Citizen*. Her most recent book, *Abundant Earth: Toward an Ecological Civilization*, was published by University of Chicago Press in 2019.

SEAN CUBITT is a professor of film and television at the University of Melbourne. His publications include *Ecomedia* (Rodopi, 2005), *The Practice of Light: Genealogies of Visual Media* (MIT Press, 2014), *Finite Media: Environmental Implications of Digital Technology* (Duke University Press, 2017) and *Anecdotal Evidence: Ecocritique from Hollywood to the Mass Image* (Oxford University Press, 2020). He is series editor for Leonardo Books at MIT Press.

*List of Contributors*

DAVID HIGGINS is an associate professor of English literature at the University of Leeds. His most recent book is *British Romanticism, Climate Change, and the Anthropocene* (Palgrave Macmillan, 2017). He is currently working on a co-written history of British nature writing and a monograph on climate pessimism.

ANDREAS MALM teaches human ecology at Lund University. He is the author of numerous articles on fossil capital, power, Marx and warming, among other subjects, and author of the books *Fossil Capital: The Rise of Steam Power and the Roots of Global Warming* (Verso, 2016) and *The Progress of This Storm: Nature and Society in a Warming World* (Verso, 2018). His forthcoming book *Corona, Climate, Chronic Emergency* is in press with Verso.

PIPPA MARLAND is a Leverhulme Early Career Fellow at the University of Leeds, exploring the representation of farming in modern British nature writing. She has published widely on ecocriticism, nature writing and eco-poetry and is currently completing a monograph entitled *Ecocriticism and the Island: Readings from the British-Irish Archipelago* for the Rowman and Littlefield 'Rethinking the Island' series.

JOHN PARHAM is a professor of environmental humanities at the University of Worcester. He has authored or co-edited five books including *Green Man Hopkins: Poetry and the Victorian Ecological Imagination* (Rodopi, 2010), *Green Media and Popular Culture* (Palgrave Macmillan, 2016) and (with Louise Westling) *A Global History of Literature and the Environment* (Cambridge University Press, 2017). He is co-editor of the journal *Green Letters: Studies in Ecocriticism* and has published extensively on 'Victorian ecology', contemporary literature and green popular culture, including essays on punk, anime and 'digital cli-fi'.

SABA PIRZADEH is an assistant professor of English and environmental literature at Lahore University of Management Sciences, Pakistan. She completed her PhD in English from Purdue University on a Fulbright fellowship in 2016. Her work has been published in *ISLE: Interdisciplinary Studies in Literature and Environment*, *South Asian Review*, *Parergon*, *South Asian Popular Culture*, *Interventions* and the *Routledge Handbook of Ecocriticism and Environmental Communication*.

STANISLAV ROUDAVSKI is a senior lecturer at the University of Melbourne's Faculty of Architecture, Building and Planning. He designs for animals and plants as well as humans. His experiments

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contribute to knowledge by using scientific evidence and advanced technologies in concert with cultural, political and historical analyses.

SAM SOLNICK is a senior lecturer in English at the University of Liverpool where he co-directs the Literature and Science Hub. He has published widely in the environmental humanities including the monograph *Poetry and the Anthropocene* (Routledge, 2017).

TESS SOMERVELL is a British Academy postdoctoral fellow at the University of Leeds, working on a project titled 'Georgic Climates: Writing the Weather in Eighteenth-Century Poetry'. Previously, she was a research fellow at Leeds, working with David Higgins on the AHRC-funded project 'British Romantic Writing and Environmental Catastrophe'.

LAURA DASSOW WALLS is the William P. and Hazel B. White Professor of English at the University of Notre Dame, where she teaches nineteenth-century American literature, transcendentalism and the history of ecological thought. Her books include *Henry David Thoreau: A Life* (University of Chicago Press, 2017), *The Passage to Cosmos: Alexander von Humboldt and the Shaping of America* (University of Chicago Press, 2009), *Emerson's Life in Science: The Culture of Truth* (Cornell University Press, 2003) and *Seeing New Worlds: Henry David Thoreau and Nineteenth-Century Natural Science* (University of Wisconsin Press, 1995).

SABINE WILKE is the Joff Hanauer Distinguished Professor in Western Civilization and a professor of German. Her research and teaching interests include modern German literature and culture, intellectual history and theory, cultural and visual studies, and the environmental humanities. With assistance from the Alexander von Humboldt Foundation, Wilke founded a transatlantic research network on the environmental humanities.

ZAINOR IZAT ZAINAL is a senior lecturer in the Department of English at Universiti Putra Malaysia, where she teaches Malaysian literature in English and miscellaneous other subjects related to world literature. Currently, she is vice president of the Association for the Study of Literature and Environment ASEAN (ASLE-ASEAN). Her primary research interest is post-colonial ecocriticism, with particular emphasis on Malaysia.

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This *Companion* was completed during the Covid-19 pandemic. The Anthropocene is equally complex, multifaceted and unsettling. Understanding how literature and culture can help address it – indeed, whether they can do so at all – is a formidable task. We hope that these chapters illuminate how we might live through the Anthropocene, and that this book might serve a more pleasurable purpose as well: that of introducing us to or reacquainting us with the authors and artists discussed in these pages.

Finally, I'd like to thank my partner, Elaine Jones, who was with me as I finished the book during a lockdown: sharing space, sharing meals and sharing the rewards which come from living life – if only temporarily – at a slightly slower pace.

## *Chronology*

This timeline shows the Anthropocene and relevant literary works.

### Deep History

4.5 billion (Ga) BCE	Earth believed to have formed from an accretion of dust and gases and the collision of large planetesimals
4.44–4.41 Ga BCE	Water vapour enters the atmosphere, creating oceans (from volcanic gas emissions or ice delivered by comets)
4.37 Ga BCE	Oldest known crystals (zircon), discovered in Western Australia (1999)
4.28 Ga BCE	Oldest known rocks, found in volcanic deposits in Quebec (2001)
3.5 Ga BCE	Evidence of life on Earth, discovered from microfossils of single-celled organisms
3 Ga BCE	Earliest certain presence of viruses
2.4 Ga BCE	Photosynthesis begins – cyanobacteria organisms adapt to use water as an electron donor; the released oxygen accumulates in the atmosphere ('the Great Oxygenation')
2.3 Ga BCE	Possible 'Snowball Earth' (first Ice Age); as the ice melts, more oxygen accumulates in the atmosphere
2 Ga BCE	First supercontinent, Columbia/Nuna

### 'Explosion' of Life (Cambrian Period)

535 million (Ma) BCE	Likely explosion of life, forms fossilised in sedimentary rocks; first vertebrates begin to appear
500 Ma BCE	Animals may have begun exploring land at this time Tectonic shifts create continents including the supercontinent of Gondwana, the present-day 'global South' of Australasia, Antarctica, India, Africa and South America
489 Ma BCE	Second 'explosion' – the Great Ordovician Biodiversification Event – creating many species, especially marine life
465 Ma BCE	Plants begin to colonise the Earth

444 Ma BCE	First mass extinction, with 86 per cent species loss (mainly marine creatures) in a severe Ice Age
420 Ma BCE	Fish evolve
397 Ma BCE	First four-legged animals
386 Ma BCE	Oldest known fossilised tree, found in New York State (2008)
375 Ma BCE	Second mass extinction, possibly owing to plants stirring up the earth and releasing nutrients into the ocean
359–299 Ma BCE	Carboniferous Period of global warmth and lush forests; rich deposits of coal laid in North America and Europe
250 Ma BCE	Third (and greatest) mass extinction; volcanic eruptions in Siberia and methane released by methanosarcina; 96 per cent species loss
200 Ma BCE	Fourth mass extinction opens the way for dinosaurs
200–175 Ma BCE	Supercontinent of Pangaea breaks up, gradually forming the present-day continents
150 Ma BCE	'First bird' – <i>archaeopteryx</i> – fossil remains discovered in Bavaria (2010)
130 Ma BCE	Flowering plants and insects evolve together
70 Ma BCE	Grasses evolve
65–66 Ma BCE	Fifth extinction event at the end of the Cretaceous Period owing to asteroid impact; dinosaurs become extinct; mammals diversify
55 Ma BCE	Early primates evolve
34 Ma BCE	Mountain ranges form – Himalayas, Alps, Andes, Rockies
4 Ma BCE	Antarctica freezes over
4 Ma BCE	<i>Australopithecines</i> (early human ancestor) walks on two legs; fossil remains of 'Lucy' (3.2 Ma BCE) discovered in Hadar, Ethiopia (1974)
2.5 Ma BCE	Hominids begin to use stone tools and develop meat-rich diets
1.8–1.5 Ma BCE	<i>Homo erectus</i> , first hunter-gatherer, masters fire; existed approximately nine times as long as <i>homo sapiens</i>
500,000 BCE	Earliest evidence of purpose-built shelters – wooden huts found near Chichibu, Japan
195,000 BCE	<i>Homo sapiens</i> ; oldest modern human remains – two skulls – found in Ethiopia (1997)
150–100,000 BCE	Humans begin to develop speech
50,000 BCE	'Great leap forward'; humans survive potential extinction, create more sophisticated tools and hunting techniques, and develop clothing and rituals
44,000 BCE	Oldest known cave art (Indonesia)
25,000 BCE	Dreamtime stories/songlines of indigenous people in Australia/ New Zealand preserve memories of geological events (e.g. volcanic eruptions, changes in sea levels)

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### The Holocene

11,700 BCE	Last Ice Age ends; Neolithic Revolution; development of human settlement and early agriculture
8000 BCE	Forest clearance begins (Eurasia)
5500 BCE	Transition from Stone to Bronze Age; humans begin smelting and working with copper and tin
5000 BCE	Technological improvements in farming; rice irrigation begins in East Asia
5000–3200 BCE	Writing starts to evolve
4000–3500 BCE	First civilisation, Sumerians (Mesopotamia); c.2100 estimated composition of the Sumerian <i>Epic of Gilgamesh</i> .
2100–1700 BCE	Narrative literature created (Egypt) Woolly mammoth becomes extinct possibly owing to human activity
1500–1200 BCE	Sanskrit scriptures and hymns passed down orally, including <i>Aranyakas</i> , wilderness texts composed by recluses meditating in forests
750 BCE	The <i>Odyssey</i> (first transmitted orally; later attributed to Homer)
550 BCE	<i>Ramayana</i> (first transmitted orally; authorship attributed to Valmiki)
2 BCE–1558 CE	<i>Popul Vuh</i> – K'iche/Maya text – inscribed on pottery, walls, bark paper
77 CE	Pliny the Elder, <i>Natural History</i>
222–589	Six Dynasties (China), landscape poetry
13th century	Icelandic Sagas
1492	Columbus arrives in Americas. Great Dying of Indigenous peoples. Last fall in global temperature.
1592	<i>The Journey to the West</i> (Chinese folk epic, attributed to Wu Cheng'en)

### Modernity

1610	'Columbian exchange' – trade networks link Europe, the Far East, Africa, Asia and the Americas; CO <sub>2</sub> levels (recorded in glacial ice) begin to rise
1669	Nicolaus Steno demonstrates that rock strata signify periods of time
1758	Linnaeus names <i>Homo sapiens</i> (and 12,000 other plants and animals)
1778	Georges-Louis Leclerc (Comte de Buffon), <i>Epochs of Nature</i>
1784	James Watt invents the steam engine
1785	William Cowper, <i>The Task</i>
1788	James Hutton, <i>Theory of the Earth</i>
1798	Wordsworth and Coleridge, <i>Lyrical Ballads</i>
1800	Human population reaches 1 billion
1815	William Smith – establishment of succession via fossil record allows for more precise dating of Earth
1818	Mary Shelley, <i>Frankenstein</i>
1830–3	Charles Lyell, <i>Principles of Geology</i> ; proposes calling the postglacial era 'Recent'; name amended to the 'Holocene' by French geologist Paul Gervais (1867)

*Chronology*

1834	Ralph Waldo Emerson, 'The Relation of Man to the Globe', lecture in Boston
1837	Henry David Thoreau begins to keep a journal
1840s	Fly ash (SCP) starts to accumulate
1845–7	Alexander von Humboldt, <i>Cosmos</i>
1850	CO <sub>2</sub> level reaches 285 ppm, the upper limit of Holocene variability (260–285 ppm)
1852–3	Charles Dickens, <i>Bleak House</i>
1854	Thomas Jenkyn proposes 'Anthropozoic' to indicate visible human agency on the Earth; adopted by Antonio Stoppani in 1873
1859	Charles Darwin, <i>On the Origin of Species</i>
1860	Walt Whitman, 'Kosmos'
1880–1900	Sea levels begin to rise
1895	H. G. Wells, <i>The Time Machine</i>
1900	CO <sub>2</sub> reaches 296 ppm, exceeding Holocene variability
1904	Baldomero Lillo, <i>Sub Terra</i>
1905	Fritz Haber, German chemist, invents an industrial process for fixing nitrogen from the atmosphere; enables production of chemical fertiliser
1907	Leo Baekeland creates the first synthetic, mass-produced plastic (Bakelite)
1908	Ford's Model T leaves the production line in Detroit
1913	British geologist Arthur Holmes publishes the first geologic timescale
1918	Georg Kaiser, <i>Gas I: A Play in Five Acts</i> , performed in Frankfurt (28 November)
1927	Upton Sinclair, <i>Oil!</i>
1935	First attempted ice sheet analysis
1936	Tasmanian tiger becomes extinct

## The Great Acceleration

1945	Human population reaches 3 billion 40 million motor vehicles Global sea levels risen by 3 inches since 1880 Commercial production of plastic accelerates First atomic bomb test, Alamogordo, New Mexico (16 July); atomic bombs detonated over Hiroshima and Nagasaki (August)
1950	CO <sub>2</sub> reaches 311 ppm
1950s	Wholesale production begins of broiler chicken (bred for meat production) Dramatic global increases in SCP accumulation
1953	Jean Giono, <i>The Man Who Planted Trees</i>
1954	First nuclear power plant generating domestic energy, Obninsk, Soviet Union
1957	Nevil Shute, <i>On the Beach</i>
1957–8	International Geophysical Year – ice core drilling begins



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- 1962 Aldous Huxley, *Island*  
 Ghassan Kanafani, *Men in the Sun*
- 1964 Peak in radionuclides (atoms emitting radiation) found in tree rings  
 (Poland) subsequent to nuclear weapons testing
- 1970 Air passengers globally reach 310 million  
 Jabra Ibrahim Jabra, *The Ship*
- 1971 Greenpeace founded
- 1974 J. G. Ballard, *Concrete Island*
- 1975 Ernest Callenbach, *Ecotopia*
- 1976 Marge Piercy, *Woman on the Edge of Time*
- 1977 Global Commission on Stratigraphy establishes GSSP's ('golden  
 spikes') to identify geologic periods
- 1979 *Earth First!* forms
- 1984 Bhopal pesticide plant leaks 30 tons of toxic gas – regarded as the  
 world's worst industrial disaster  
 Ray Bradbury, 'The Toynbee Convector'
- 1985 Global production of concrete reaches 1 billion tons  
 Ursula K. Le Guin, *Always Coming Home*
- 1986 Chernobyl nuclear disaster
- 1990 Kim Stanley Robinson, *Pacific Edge*  
 Karen Tei Yamashita, *Through the Arc of the Rainforest*
- 1991 Mudrooroo adapts Heiner Müller's 'The Task'
- 1992 Andrew C. Revkin speculates (*Global Warming*) that we are entering  
 an 'Anthocene', 'a geological age of our own making'  
 Formation of ASLE (Association for the Study of Literature and  
 Environment)  
 Marwan Darwish, 'The Penultimate Speech of the "Red Indian" to  
 the White Man'
- 1993 Liyana Badr, *A Balcony over the Fakihani*
- 1995 First United Nations Framework Convention on Climate Change  
 (UNFCCC) conference, Berlin  
 Motor vehicles reach 700 million
- 1996 Luis Sepúlveda, *The Story of a Seagull and The Cat Who Taught Her to Fly*
- 1997 UNFCCC adopts Kyoto Protocol – legally binding reductions in  
 greenhouse gas emissions  
 First mass-produced electric vehicle (Toyota Prius)  
 Yachtsman Charles Moore discovers the Great Pacific Garbage Patch  
 Yan Lianke, *The Years, Months, Days*
- 2000 Paul Crutzen and Eugene Stoermer propose the 'Anthropocene';  
 possible Global Boundary Stratotype Sections and Points  
 (GSSPs): global dispersal of radiation; atmospheric carbon  
 dioxide; fly ash from burning fossil fuels; nitration and phosphate  
 in soil; species extinction; 'techno-fossils' – plastic, buried  
 concrete, chicken bones  
 Human population reaches 6 billion  
 Air passengers globally reach 1.674 billion  
 Global sea levels risen 7 inches since 1880  
 CO<sub>2</sub> 369 ppm

- Early 2000s      Buen Vivir movement begins, South America
- 2001              Adam Nicolson, *Sea Room: An Island Life*
- 2002              Chloe Hooper, *A Child's Book of True Crime*
- 2003              Margaret Atwood, *Oryx and Crake* (first of the *MaddAddam* trilogy)
- 2004              *The Day After Tomorrow* (dir. Roland Emmerich)  
 Keri Hulme, *Stonefish*
- 2005              Brenda Hillman, *Pieces of Air in the Epic*  
 Michel Houellebecq, *The Possibility of an Island*  
 Kathleen Jamie, *Findings*
- 2006              *An Inconvenient Truth* (dir. Davis Guggenheim)
- 2007              Sarah Hall, *The Carhullan Army*  
*There Will Be Blood* (dir. Paul Thomas Anderson)
- 2009              CO<sub>2</sub> 387 ppm.  
 Sub-commission on Quaternary Stratigraphy establishes Anthropocene Working Group (AWG) to consider evidence for geological signatures of a new epoch  
 UNFCCC (Copenhagen) – proposals for a new global climate agreement are retracted  
 Zakaria Ali, *The Dam*  
 Margaret Atwood, *The Year of the Flood*  
 Keris Mas, *Jungle of Hope*  
 Yvonne Reilly, *Styrofoam*
- 2010              Approximately 121 million tons of nitrogen p.a. fixed from the atmosphere (safe level estimated at 35 million tons)  
 Susan Abulhawa, *Mornings in Jenin*  
*Gasland* (dir. Josh Fox)  
 Chuah Guat Eng, *Days of Change*  
 Ian McEwan, *Solar*  
 Dale Pendell, *The Great Bay: Chronicles of the Collapse*  
 Ed Roberson, *To See the Earth Before the End of the World*
- 2011              An earthquake and a tsunami provoke the Fukushima nuclear disaster  
*Fate of the World* (Red Redemption)  
 Magnus Mills, *Explorers of the New Century*  
*A New Beginning* (Daedalic Entertainment/Lace Mamba)
- 2012              Kathleen Jamie, *Sightlines*  
 Barbara Kingsolver, *Flight Behaviour*  
 Robert Macfarlane, *The Old Ways: A Journey on Foot*
- 2013              *Queers in Love at the End of the World* (Anna Anthropy)  
 Margaret Atwood, *MaddAddam*  
 Alexis Wright, *The Swan Book*
- 2014              Sixth mass extinction and defaunation – massive decline in species and populations, emptying of land and oceans; WWF/Zoological Society of London estimate 50 per cent loss of individual animals since 1970  
 Stephen Collis, 'Notes Towards a Manifesto of the Biotariat'  
 Chang-rae Lee, *On Such a Full Sea*  
 Jeff Vandermeer, 'Southern Reach Trilogy'

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- 2015 *El Botón de Nácar* [*The Pearl Button*] (dir. Patricio Guzmán)  
 Antonia Honeywell, *The Ship*  
 Clare Morrall, *When the Floods Came*  
 Juliana Spahr, 'Dynamic Positioning'  
*Submerged* (Uppercut Games)
- 2016 Anthropocene proposal debated at the International Geological Congress  
 Amitav Ghosh, *The Great Derangement*  
 Jennifer Haigh, *Heat and Light*  
 Ella Hickson, *Oil*  
 Amy Liptrot, *The Outrun*  
 Magnus Mills, *The Field of the Cloth of Gold*
- 2017 An estimated 75 per cent drop in insects since 1989  
 Adam Nicolson, *The Seabird's Cry*  
 Osama Siddique, *Snuffing Out the Moon*
- 2018 Air passengers globally reach 4.233 billion  
 Worldwide PC sales at 259.4 million  
 Optical fibre production reaches 325 million kilometres  
 Estimated 23 billion broiler chickens worldwide  
 Extinction Rebellion created  
 Natasha Carthew, *All Rivers Run Free*  
 Richard Powers, *The Overstory*
- 2019 AWG affirms Anthropocene proposal by 88 per cent, Cape Town;  
 radiation levels agreed as GSSP  
 Scientists in California calculate that plastic deposited in the fossil record has doubled every fifteen years since 1945  
 CO<sub>2</sub> 415 ppm (May)  
 David Gange, *The Frayed Atlantic Edge: A Historian's Journey from Shetland to the Channel*  
 Amitav Ghosh, *Gun Island*  
 Robert Macfarlane, *Underland – A Deep Time Journey*
- 2020 Covid-19 outbreak in China (December)  
 Covid-19 declared a global pandemic by World Health Organization (11 March)  
 Estimated 11,000 fewer air-pollution-related deaths in Europe and global CO<sub>2</sub> emissions decreased by 17 per cent (April)  
 Deb Olin Unferth, *Barn 8*  
 CO<sub>2</sub> 417 ppm (May)

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