

Media, Arts and Humanities Sustainability Educator Toolkit

MEDIA, ARTS AND HUMANITIES SUSTAINABILITY EDUCATOR TOOLKIT

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MEDIA, ARTS AND HUMANITIES SUSTAINABILITY EDUCATOR TOOLKIT

*"Isn't this the very reason we were born into this
age?" said Courage,*

*"to make the huge transition that the age
demands?"*

*Isn't that the weight you feel — the weight of
changing ages?"*

— Kae Tempest

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Link to Google doc for comments/suggestions: bit.ly/MAHSustainabilityEducator

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INTRODUCTION

What is sustainability?

It isn't simply defined. Sustainability is to do with responsibly stewarding limited or fragile resources; it is to do with aligning our activities to the actual capacities of the planet, for the benefit of all those alive now and for future generations. Sustainability is to do with fostering wellbeing and flourishing for all humans, life, and ecological processes. Sustainability is linked to all kinds of issues in social and ecological justice.

Sustainability sometimes gets divided into environmental, social, and economic sustainability. This toolkit places some emphasis on **environmental sustainability**, but also emphasises that all three aspects are inseparable. Sustainability is a field of research and practice in its own right. But it is also a basic *modus operandi* and philosophy: sustainability is relevant to all teaching and learning. Our teaching practices themselves must be sustainable, but we can also embed sustainable themes in our teaching. Sustainability might be about finding solutions to environmental, social, or economic problems. Sustainability is also always closely tied to politics, power, and knowledge. We think that Media, Arts and Humanities have an unrealised potential in surfacing and thinking through these issues.

The United Nations' seventeen **Sustainable Development Goals** (SDGs) form one important touchstone. Universities, organisations and governments use the SDGs as an overarching framework to steer and assess the impact of our work. However, as educators, we don't need to accept the SDGs as the final word on sustainability. Our role includes creating space for critical debate around the SDGs (and around the term "sustainability" itself).

The University of Sussex, where this toolkit was put together in mid-2022, has a commitment to embedding sustainability across our curriculum within the Ethical Educators workstream of our Sustainability Strategy. We offer this toolkit as a first step toward that important goal.

The toolkit's six themes surfaced through participatory workshops with colleagues in the Schools of Media, Arts and Humanities (MAH) and Education and Social Work (ESW); they may evolve in coming years.

Further Reading / Resources

Haladay, Jane, and Scott Hicks. "Preface." In *Narratives of Educating for Sustainability in Unsustainable Environments*, xi–xxviii. Michigan State University Press, 2018. www.jstor.org/stable/10.14321/j.ctt1trkk1t.4

University of Sussex Sustainability Strategy. www.sussex.ac.uk/about/sustainable-university/policy-and-strategy/strategy

HOW TO USE THIS TOOLKIT

How to use this toolkit

This toolkit is filled with suggestions from colleagues across the University of Sussex's School of Media, Arts and Humanities, and beyond. It is aimed at supporting **educators** (at Sussex and elsewhere) to build themes, concepts and practices related to sustainability into our teaching. It makes no attempt to be comprehensive or polished. Think of it as a grab-bag of inspirations, provocations, and helpful signposts. You can ...

- **Browse** for inspirations for your teaching.
- **Contribute!** Get in touch with your own case study, activity seeds specific to your subject area, or any other content, suggestions or requests: j.c.walton@sussex.ac.uk, a.e.oji@sussex.ac.uk, alicee@sussex.ac.uk. Or suggest directly on the Google doc at bit.ly/MAHSustainabilityEducator.
- Or even read it start-to-finish, if you like.

There is a focus on media, arts and humanities perspectives, and a focus on the University of Sussex. However, we hope it will be useful more widely across disciplines and universities.

This toolkit is complemented by a crowdsourced living document of links and resources. We have been inspired by the commitment to decolonising the curriculum in the past few years. Now it is time to embed sustainability – and acknowledge the deep relationship.

PART I

THEME #1: PLANETARY BOUNDARIES & DOUGHNUTS



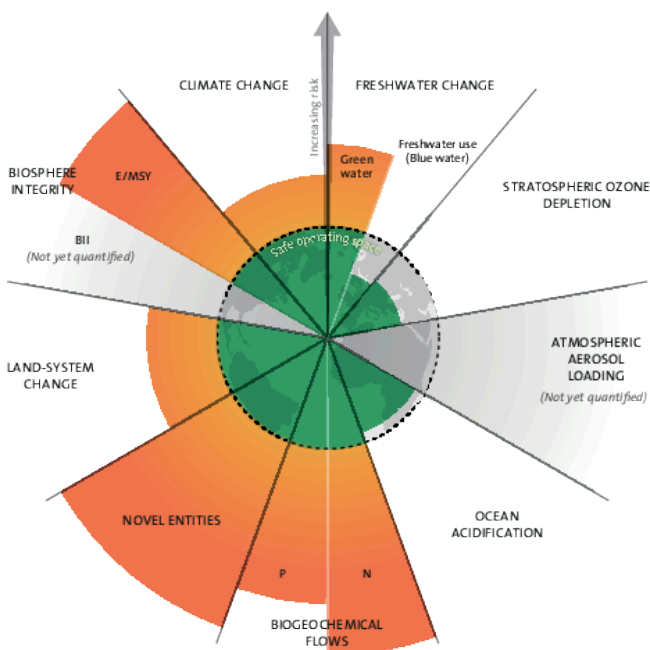
Off the coast of Greenland, Arnatassiaq and her father Niels Molgaard, from the nearby village Qeqertag, divert an iceberg using their powerful small boat to prevent it dragging down their fishing nets

1.

WHAT IS THE PLANETARY BOUNDARIES MODEL?

Everything is interconnected

Human lives are irrevocably linked with all other living beings; planetary systems link and interact; life is enlaced with life and wider ecological processes across the world. For an educator who is embedding sustainability into teaching, such connectivity is a gift. Sustainability can emerge organically from almost any topic imaginable. You could rush into a seminar at random and yell, “How does this relate to sustainability?” and the question would probably be relevant and fruitful. Yet this complexity can also feel overwhelming.



Designed by Azote for Stockholm Resilience Centre, based on analysis in Wang-Erlandsson et al (2022)

The **Planetary Boundaries model** (Rockström et al. 2009) is one way to simplify things — by focusing on core planetary processes. Proposed in 2009, the model has grown influential in both environmentalist and policy circles. It identifies **nine key systems** which are at risk due to human activity, endangering the Earth’s habitability for most known life.

Inevitably, the Planetary Boundaries model is also open to **interpretation and misinterpretation**. For example, planetary boundaries are related to the concept of **tipping points**: thresholds that trigger massive and often irreversible change once crossed. But although the creators of the Planetary Boundaries model have proposed measurable thresholds, they never really

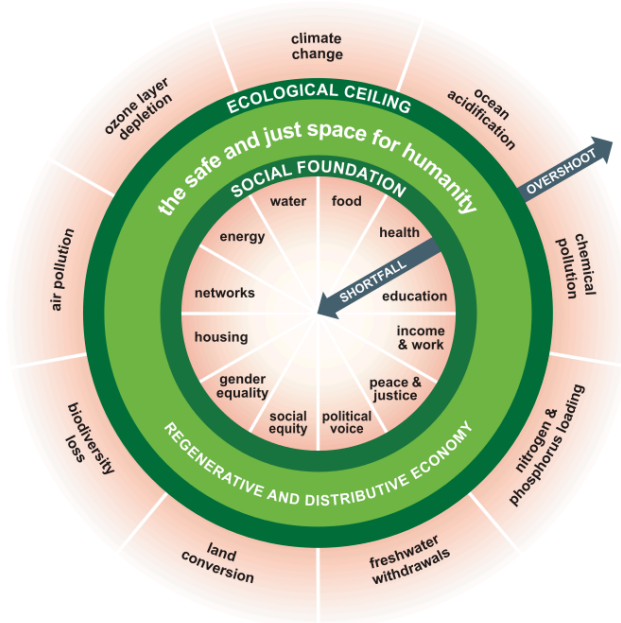
meant these to represent tipping points (Rockström, Richardson, and Steffen 2017). Tipping points are by nature very difficult to identify with confidence until it is too late (see Music Case Study for *complexity literacy*).

The planetary boundaries model has also been **criticised**. For example, a Resource-Producer-Consumer-Waste (RPCW) model has recently been proposed. According to the RPCW approach, the

Planetary Boundaries model is too focused on **overall levels of consumption and pollution** (e.g. freshwater uses, or greenhouse gas emissions), and needs more emphasis on **distribution** and **waste management** (Downing et al. 2020)

2.

WHAT IS DOUGHNUT ECONOMICS?



The Doughnut of social and planetary boundaries

An influential variation of the Planetary Boundaries model is Kate Raworth's **Doughnut Economics** (Raworth 2015). This combines the **planetary boundaries** with **social boundaries** (inspired by UN Sustainable Development Goals, see next section).

So on the doughnut model, our task is to keep our activities within the **safe and just space**, where planetary boundaries are not crossed, and essential human needs are met.

Under one analysis, our current ecological and social crises are the result of a fundamentally unsustainable growth-based economic model.

Raworth flips the growth model. Rather than prioritising economic growth, the Doughnut framework imagines an economy which prioritises **meeting the needs of people without overshooting Earth's ecological ceilings or undermining social foundations**. The idea is to switch from a degenerative to a regenerative economy for the new century. Raworth is neither pro- nor anti-economic growth: the point is to entirely shift how we value true prosperity.

Critics suggest that for the model to work people would have to “magically” become indifferent to how well we do compared to others, and not really care about wealth and income. But perhaps we would be happier that way? The Doughnut model was formally adopted by Amsterdam in April 2020; Brussels and the Canadian city of Nanaimo have since followed suit.

See also **Degrowth & Postgrowth** later in this toolkit.





One or more interactive elements has been excluded from this version of the text. You can view them online here: <https://openpress.sussex.ac.uk/sustainabilityeducatortoolkit/?p=38#oembed-1>


3.


THE NINE PLANETARY BOUNDARIES EXPLAINED


Climate change	Greenhouse gases (especially carbon dioxide) trap heat in the atmosphere and warm the planet. The main source of greenhouse gases is burning fossil fuels (oil, gas, and coal). Other activities such as burning biomass (e.g. wood) and making cement also release greenhouse gases.
Biodiversity loss	Loss of plant and animal species has been more rapid in the past half century than at any time in human history.
Ocean acidification	Carbon dioxide (e.g. from burning fossil fuels) is dissolved into oceans, rivers, and lakes. Corals and planktons struggle to survive in acidic waters — and the effect ripples up the food chain.
Ozone depletion	Thinning of the ozone layer in the atmosphere, allowing more dangerous radiation in. It was caused by the release of CFCs and other chemicals. Following international agreement to limit the use of such chemicals, the hole in the ozone layer has been healing, and should be completely restored by around 2075. However, climate-fuelled wild fires pose a new threat.
Nitrogen and phosphorus	Nitrogen and phosphorus are key ingredients in fertilisers. They also occur in natural biogeochemical flows, but heavy fertiliser use is damaging ecosystems. In particular, runoff into rivers and oceans can have catastrophic effects on marine life. One visible sign is algal bloom — overgrowth of algae or bacteria as a thick froth, scum, or slick, often toxic.
Land system change	This mainly refers to the clearing of wilderness for agriculture, settlements, or other purposes. Forests, wetlands and grasslands are carbon sinks; disturbing them releases carbon back into the atmosphere. Habitat destruction also drives biodiversity loss.
Freshwater	The extraction of water from rivers, lakes, groundwater, and soil moisture.
Aerosols	Aerosols are particles or droplets suspended in the air. They include things like dust, sea spray, wildfire smoke, and volcanic ash. They also come from human sources, such as burning fossil fuels or biomass. Breathing in aerosol pollution harms human health. Some aerosols reflect radiation, so they are actually putting a brake on climate change. A lot of the science around the full impact of aerosols remains uncertain.
Novel entities	This one is a bit of a catch-all for all kinds of toxic, long-lived, and/or unpredictable things we release, or hope to safely store — e.g. radioactive waste, heavy metals, pesticides, genetically engineered organisms.



4.


PLANETARY BOUNDARIES & DOUGHNUTS: FURTHER READING / RESOURCES


 Rockström, Johan, Will Steffen, Kevin Noone, Åsa Persson, F. Stuart Chapin, Eric F. Lambin, Timothy M. Lenton, et al. 2009. 'A Safe Operating Space for Humanity'. *Nature* 461 (7263): 472–75. <https://doi.org/10.1038/461472a>. "Identifying and quantifying planetary boundaries that must not be transgressed could help prevent human activities from causing unacceptable environmental change, argue Johan Rockström and colleagues." More-or-less the origin of the **Planetary Boundaries model**.


 Aspects of the Planetary Boundaries model have evolved. See Ten Years of the Planetary Boundaries Framework for presentations in 2019 at the Royal Swedish Academy of Sciences.


 Montoya, José M., Ian Donohue, and Stuart L. Pimm. 2018. 'Planetary Boundaries for Biodiversity: Implausible Science, Pernicious Policies'. *Trends in Ecology & Evolution* 33 (2): 71–73. <https://doi.org/10.1016/j.tree.2017.10.004>. This is a critique of the planetary boundaries framework; a response counters that Montoya et al. misrepresent their use of tipping points.

  ASU's Center for Science and the Imagination operates at the intersection of future studies and the arts and humanities. They've published open access anthologies of climate themed speculative fiction.

 Acaroglu, Leyla. 2021. 'Tools for Systems Thinkers: The 6 Fundamental Concepts of Systems Thinking'. *Disruptive Design* (blog). 11 March 2021. A nice accessible introduction to some principles of **systems thinking**.

 Raworth, Kate. 2017. *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist*. London: Random House Business Books. Accessible primer critiquing **mainstream economics**. Exploratory mapping of **promising alternatives**.

 Raworth, Kate. 2017. A Doughnut for the Anthropocene: humanity's compass in the 21st century. *The Lancet Planetary Health*. 1 (2): e48–e49. [https://doi.org/10.1016/S2542-5196\(17\)30028-1](https://doi.org/10.1016/S2542-5196(17)30028-1)

 The Doughnut Economics Action Lab (DEAL) is a hub of crowdsourced, curated resources relating to the Doughnut.

5.

PLANETARY BOUNDARIES & DOUGHNUTS: ACTIVITY SEEDS

1. Diverse economies

J.K. Gibson-Graham's *A Postcapitalist Politics* (2006) and *Handbook of Diverse Economies* (2020) aim to construct a new language of economic diversity, by attending to the more-than-capitalist practices that already exist, and to their latent potentials. You could invite students to identify ways of coordinating action, allocating resources, etc., that exist outside markets and money (in the texts you're teaching, or in their own experience). In what ways might these be part of extractivist capitalism nonetheless? How might they articulate alternatives? J.K. Gibson-Graham might be interestingly read with / against Nick Srnicek and Alex Williams's *Inventing the Future: Postcapitalism and a World Without Work* (2015), which is impatient with "[h]orizontalism, localism, nostalgia, resistance and withdrawal" (p. 48).

2. Safe operating spaces

Encourage students to think about how **'safety'** — and related concepts such as risk, predictability, security, freedom — operate across various social, cultural, and historical contexts. "Security has become one of neoliberalism's signature growth industries, exemplified by the international boom in gated communities, as walls have spread like kudzu" (Rob Nixon, *Slow Violence and the Environmentalism of the Poor*, p. 20). "As the climate crisis has become increasingly difficult to ignore, many of the world's most powerful state and corporate actors have shifted from a discourse of denial and scepticism to a discourse of securitization" (Thomas and Gosink, 'At the Intersection of Eco-Crises, Eco-Anxiety, and Political Turbulence: A Primer on Twenty-First Century Ecofascism'). Choose a literary text or piece of media, and examine how it constructs (perhaps deconstructs) the boundaries between 'safe' and 'unsafe.' Here are a handful of critical texts that may say interesting things about safety (not all explicitly linked with sustainability):

- Beck, Ulrich. 1992. *Risk Society: Towards a New Modernity. Theory, Culture & Society*.
- Dupré, Denis, and Preston Perluss. 'Mastering Risks: An Illusion: Truth and Tropes on Jeopardy'. *Research in International Business and Finance* 37 (1 May 2016): 620–28. <https://doi.org/10.1016/j.ribaf.2015.12.001>.
- Mythen, Gabe. 2021. 'The Critical Theory of World Risk Society: A Retrospective Analysis'. *Risk Analysis* 41 (3): 533–43. <https://doi.org/10.1111/risa.13159>.

- Collins, Patricia Hill. 2000. 'The Power of Self-Definition' in *Black Feminist Thought: Knowledge, Consciousness, and the Politics of Empowerment*. New York: Routledge.
- anonymous refused. 2014. 'For Your Safety and Security ...'. Tumblr. 2014. anonymousrefused.tumblr.com/.
- Hanhardt, Christina B., Jasbir K. Puar, Neel Ahuja, Paul Amar, Aniruddha Dutta, Fatima El-Tayeb, Kwame Holmes, and Sherene Seikaly. 2020. 'Beyond Trigger Warnings: Safety, Securitization, and Queer Left Critique'. *Social Text* 38 (4 (145)): 49–76. <https://doi.org/10.1215/01642472-8680438>.
- Douglas, Mary. 1992. *Risk and Blame: Essays in Cultural Theory*. London; New York: Routledge.
- Scoones, Ian, and Andy Stirling, eds. 2020. *The Politics of Uncertainty: Challenges of Transformation*. Pathways to Sustainability. Abingdon, Oxon; New York, NY: Routledge.
- Wallace, Molly. 2016. *Risk Criticism: Precautionary Reading in an Age of Environmental Uncertainty*. Ann Arbor: University of Michigan Press.
- Levontin, Walton et al. 2022. *Communicating Climate Risk: A Toolkit*. AU4DM / COP26 Universities Network.

3. Data over time

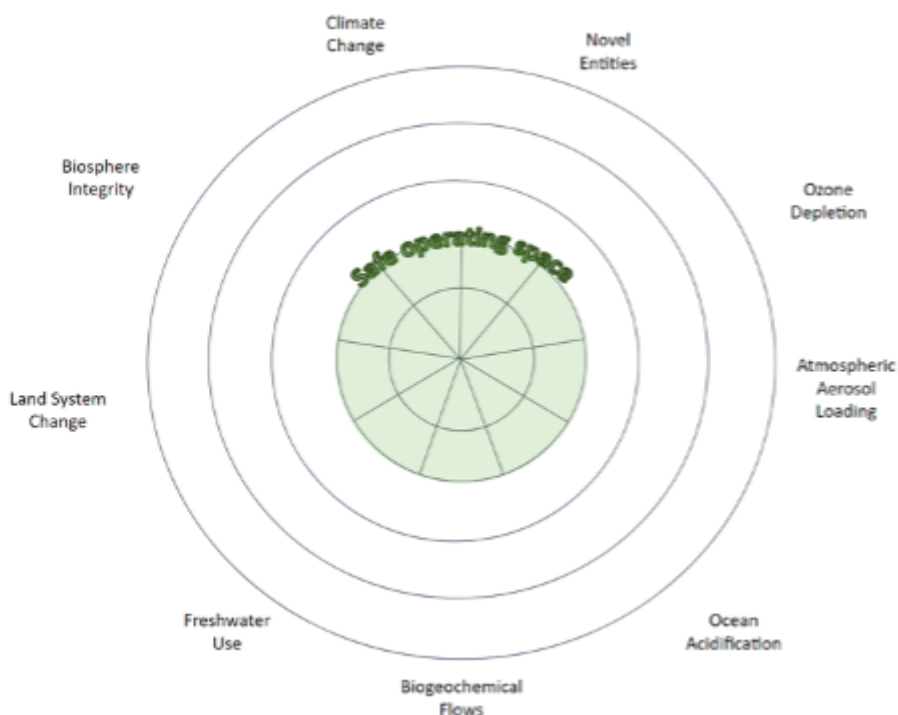
The National Doughnuts dataset is an interactive tool that lets students compare data on planetary boundaries over time and across nations. (Unfortunately it only seems to go up to 2015). Here is a related article in The Conversation. There are also plenty of other tools and activities in the Doughnut Economics Action Lab database.

4. The Planetary Boundaries model: scope, use, and alternatives.

What are the benefits and drawbacks of the Planetary Boundaries model? What is this model for, and what is it not for? Challenge students to come up with alternative ways of formulating the same set of issues, e.g. focusing more on justice and intersectionality, and/or on theories of change.

5. Mapping our preconceptions

How are ideas about environmental degradation generated, circulated, transformed? Planetary boundaries are pretty important, so why isn't there greater public awareness? Experiment with inviting students to share preconceptions (e.g. "Nine boundaries have been identified, what do you think they are?") — reassuring them that 'wrong' answers are exactly what we're interested in for this exercise! For example, a recent study compared students and scientists' "conceptions on socioeconomic growth within planetary boundaries" in order to "develop instructional guidelines for teaching based on these findings" (Lampert, Niebert, and Wilhelm 2021). Students incorrectly identified population growth as the primary cause of environmental degradation. Students could fill out a blank diagram to estimate the relative seriousness of different issues:



6. Systems thinking

Explore **emergence**, **tipping points** and **interventions** by pointing to examples from the texts and media you're teaching, and/or create exercises and games to illustrate these principles. Emergence, in a nutshell, is when a system exhibits behaviours, because of the interactions of its parts, which would be difficult or impossible to foresee just from examining the parts on their own. A tipping point is when a system crosses a critical threshold such that its behaviour rapidly reorganises. There are various online tools, like Loopy, that students could use to construct models of systems. Could you use it to create a model of a poem, a film, a novel? Why, why not? What happens when you try? Meadows, Sweeney and Martin-Mehers's *The Climate Change Playbook* (2016) contains some teaching inspiration. One activity ('Triangles') has players walking around slowly, each player trying to establish themselves equidistant between their two 'reference point' players — one chosen at random, one who is the same for the whole group. The activity can illustrate that unpredictable complex behaviour can arise from simple rules (how long will the system take to reach an equilibrium?), and also that not all interventions are equal — stopping the universal reference point has a much bigger impact than stopping any other player.

7. Historicise systems thinking

Students could also explore the history, politics, culture and aesthetics of these concepts. In this toolkit, we generally *like* "systems thinking" — it is a flexible and empowering framework, which reminds us that we cannot rely on simplistic distinctions between society and nature, and it is a way for arts and humanities students to explore issues in model construction that doesn't require heavy maths. Then again, systems thinking also has its own politically and ethically complex history. Systems theory and systems thinking emerges from an intellectual mix that includes Operations Research shaped by WWII and Cold War

funding priorities (see e.g. RAND Corporation, The Cowles Foundation, Macy Foundation Conferences, American Society for Cybernetics, MIT Sloan System Dynamics). Its interest in feedback loops and emergence can be traced back through neoclassical economics and classic political economy, including Adam Smith's invisible hand and self-interested butcher, brewer, and baker, and Bernard de Mandeville's "Private Vices, Public Virtues". Philosophy and literary and cultural theory also offer many resources for **critiquing systems thinking**. As West et al. point out, "sustainability researchers are increasingly drawing on scholarship from the 'relational turn' in the humanities and the social sciences to propose a paradigm shift for sustainability science: away from focusing on interactions between entities, towards emphasizing continually unfolding processes and relations" (West et al. 2020).

8. Interconnections

Students are randomly assigned dimensions of the doughnut to portray. They mingle with the other dimensions and discuss possible interconnections. See the DEAL database for a full activity description. Alternatively, get students to use an online tool to build their own models of trade-offs and complementarities.

9. Check out Earth Overshoot Day

– a simple concept that reminds us that we are living beyond our means. Ask students to read through the solutions suggested to #moveTheDate and discuss which they feel more and less empowered by: <https://www.overshootday.org>.

10. Browse the resource table for more ideas

E.g. Sustainability Exchange, DEAL.

6.

PLANETARY BOUNDARIES & DOUGHNUTS: QUOTATIONS

Systems thinking. “At the heart of systems thinking lie three deceptively simple concepts: stocks and flows, feedback loops, and delay. They sound straightforward enough but the mind-boggling business begins when they start to interact. Out of their interplay emerge many of the surprising, extraordinary and unpredictable events in the world. If you have ever been mesmerised by the sight of thousands of starlings flocking at sunset – in a spectacle poetically known as a murmuration – then you’ll know just how extraordinary such ‘emergent properties’ can be. Each bird twists and turns in flight, using phenomenal agility to stay a mere wingspan apart from its neighbours, while tilting as they tilt. But as tens of thousands of birds gather together, all following these same simple rules, the flock as a whole becomes an astonishing swooping, pulsing mass against the evening sky” (Raworth 2017).

Visibility. “[...] what’s interesting about recycling culture is that the mysterious curvature of social space-time, the curvature marked by the bend in the tube beneath the toilet bowl, disappears. We know where our shit goes. There are even some new pages about it in Richard Scarry’s popular children’s book *Busy, Busy Town* [...] The lack of invisible places in our social space prevents us from separating public and private, local and global. [...] This was already the case in Tibet, where in charnel grounds outside the village the sky butcher chopped up your corpse to be eaten by the vultures, the ultimate ecological funeral” (Morton 2010).

The circular economy means minimising waste by recycling, reusing, repurposing, refurbishing, repairing, remanufacturing, sharing, and often also renting and leasing. A circular economy is distinguished from a linear economy, where resources are extracted and processed into goods and waste. But the term circular economy is controversial, since it now has associations of green growth, techno-solutionism, and overly optimistic assumptions about potential efficiency gains. “As a reformist agenda, the circular economy has appeal to policy makers because it promises a win–win outcome, shifting attention away from ‘trade-offs and constraints’ to ‘synergies and opportunities’ under the guise of a suitable policy framework [...] With a management and technocentric bias driving the circular economy agenda, a growing body of research has criticized the noticeable absence of socio-cultural and political issues” (Corvellec, Stowell, and Johansson 2022).

Cultivating viewpoint diversity. “The underlying irony of the climate pedagogy under discussion here is that it recruits objectivity in the service of activism. Instructors of environmental humanities, I want

to say, ought to question this strategy on both counts, resisting scientization and abjuring explicit partiality. [...] Students should be required to identify and engage with counter-positions, in their written work especially, to habituate them to the value of including ‘naysayers.’ Assessment criteria should explicitly value openness to viewpoint diversity as the foundation of originality. Instructors can of course declare their interest in hearing a range of views and demonstrating fairness in those they challenge, thereby modeling the “tone from the top.” At the same time, there is a danger that political identity, like any other vector of intersectionality, can be reified and thereby implicitly placed beyond rational challenge” (Garrard 2021).

The entombed poem. “Let us never forget: that the poem was entombed in a collapse of the earth.” Édouard Glissant, *Poetics of Relation*.

Policy and planning. “Taking the doughnut principles as the point of departure, the idea is not to provide a policy recipe but rather to help policymakers and planners identify and redesign networks, sectors, and economic activities that overshoot planetary boundaries or do not contribute to the social foundations” (Wahlund and Hansen 2022).

Interventions. “Places to Intervene in a System (in increasing order of effectiveness):

12. Numbers: Constants and parameters such as subsidies, taxes, and standards
13. Buffers: The sizes of stabilizing stocks relative to their flows
14. Stock-and-Flow Structures: Physical systems and their nodes of intersection
15. Delays: The lengths of time relative to the rates of system changes

PART II

THEME #2: SUSTAINABLE DEVELOPMENT GOALS



Woman and child
in floodwater,
Jakarta

7.

SUSTAINABLE DEVELOPMENT GOALS



The **Sustainable Development Goals** were set up in 2015 by the United Nations General Assembly, following on from the Millennium Development Goals. A 2017 resolution set up specific targets, indicators and timelines for each of the goal, many with a target date of 2030. Many institutions (including Sussex) like to map a range of their activities against the SDGs as a way of understanding their ethical impact. Some SDGs have an explicitly environment focus, for example: **SDG 13: Climate Action**, **SDG 14: Life Below Water**, **SDG 15: Life on Land**. Others have more of a social focus, e.g. **SDG 4: Quality Education**, **SDG 5: Gender Equity**.

The Sustainable Development Goals can be taught critically. As Belda-Miguel *et al* argue:

... the SDGs do not overcome the depoliticisation of aid discourses and policies as they still frame development problems as technical, managerial and measurable problems. For example, issues of power and key political issues such as redistribution are totally absent from the Agenda (Belda-Miguel, Boni, and Calabuig 2019)

When developing this toolkit, we asked workshop participants to arrange virtual sticky notes on a spectrum from “Most Important” to “Least Important.” The SUSTAINABLE DEVELOPMENT GOALS sticky flew back and forth like a tennis ball. A wise participant explained why: the SDGs are hugely important to how the university, the sector, the country, and the whole world is approaching sustainability ... but at the scale of a module or a lesson, they often feel unsatisfactory. Seventeen is too many things to hold in your head; many goals are far from self-explanatory; and **many goals embed assumptions which require critical examination.**

For example, what about **growth**? There is an especially complex relationship between **SDG8: Decent Work and Economic Growth** and **SDG13: Climate Action**. As Stephen McCloskey puts it:

How do the goals square the circle of combating climate change while enabling poor and middle-income countries to higher levels of growth with the enhanced global consumption of carbon which that implies? The goals seem to be fatally hitched to the same tried and failed economic system that created climate change, global inequality and social polarisation in the first place (McCloskey 2019).

See “Degrowth and Post-Growth” later in this toolkit. One approach might be: “The Global North needs degrowth, the Global South needs green growth, and everywhere needs more intersectional justice.” Others go further, arguing that “green growth” is only an alluring illusion, and/or that development discourse should be rejected altogether.



8.

SDGS: FURTHER READING / RESOURCES

■ Haladay, Jane, and Scott Hicks. 2018. *Narratives of Educating for Sustainability in Unsustainable Environments*. East Lansing: Michigan State University Press. “For the writers here, fostering sustainability in higher education means focusing on place, creating positive relationships with humans and other beings, and creating administrative structures that will maintain new approaches for the long-term, showing how teaching environmentally is at once intensely site-specific yet powerfully global, deeply personal yet visibly public.”

📖 Hillerbrand, Rafaela. 2018. ‘Why Affordable Clean Energy Is Not Enough. A Capability Perspective on the Sustainable Development Goals’. *Sustainability* 10 (7): 2485. <https://doi.org/10.3390/su10072485>. “Energy is a paradigmatic example of a sociotechnical system. We contend that, by not considering this sociotechnical nature, the SDGs run the risk of implicitly defending a certain variant of technological optimism and determinism.”

📖 Gough, Annette. 2021. ‘Education in the Anthropocene’. In *Oxford Research Encyclopedia of Education*, by Annette Gough. Oxford University Press. <https://doi.org/10.1093/acrefore/9780190264093.013.1391>. “Education in an Anthropocene context necessitates a different pedagogy that provides opportunities for learning to live in and engage with the world and acknowledges that we live in a more-than-human world. It also requires learners to critique the Anthropocene as a concept and its associated themes to counter the humanist perspective, which fails to consider how the nonhuman and material worlds co-shape our mutual worlds. In particular, education in the Anthropocene will need to be interdisciplinary, transdisciplinary, or cross-disciplinary; intersectional; ecofeminist or posthumanist; indigenous; and participatory.”

📖 Wanner, Thomas. 2015. ‘The New “Passive Revolution” of the Green Economy and Growth Discourse: Maintaining the “Sustainable Development” of Neoliberal Capitalism’. *New Political Economy* 20 (1): 21–41. <https://doi.org/10.1080/13563467.2013.866081>.

Sussex Spotlight: Trade-offs and Synergies among the SDGs

This policy brief from the Sussex Sustainability Research Programme explores interconnections between the SDGs. Where are there potential synergies? Where might pursuing one goal make

it harder to achieve another? “The challenge now is to sort through the large number of possible interactions among SDGs in order to uncover and exploit the most important synergies while minimising the effects of trade-offs.” The report includes examples and recommendations.

Joseph Alcamo, Caroline Grundy, and Jorn Scharlemann. 2018. ‘Interactions among the SDGs and why they are important’. Sussex Sustainability Research Programme.

9.

SDGS: ACTIVITY SEEDS

Explore one or more SDGs, or the SDGs as a whole, in a **constructively critical manner**. Some angles might include:

- Apply critical theory

Support students to explore the SDGs through lenses such as post-development theory and practice; historical materialist understandings of ideology; the construction and dismantling of nature/culture binaries; techno-solutionism and the construction of political situations as technical problems; species exceptionalism and the disruption of anthropocentric views; interspecies justice and fresh ways of encountering the more-than-human world; feminist standpoint theory; Science and Technology Studies; diverse economies research; degrowth and post-growth; etc. This could feed into exercises where students rewrite one or more SDGs.

- Curate the goals

There is a lot of information here. Invite students to find ways of communicating it visually and/or interactively.

- Create a model

Divide into groups, each equipped with big sheets of paper, Post-it notes, and the seventeen SDGs on seventeen cards. Ask students to arrange the SDGs so that related goals are clustered together. Then ask them to identify some plausible connections between the goals. When progress is made on one, how might it help with another? Where might trade-offs lie? Emphasise that model-making will be a simplified picture of reality, and encourage students to emphasise the relationships they think are most important.

- Gaps in the goals

There is a lot of ambition here, but what might the SDGs leave out? Challenge students to propose a new SDG. And/or play a game. One group argues for something that is missing from the SDGs, then

another group must try to argue that the proposal is already covered under an existing SDG. A third group adjudicates. Rotate these roles over several rounds, and award points.

- Explore assumptions

What do the SDGs assume about justice and the good life? Are the SDGs purely ‘goals,’ or do they also embed assumptions about how those goals should be achieved? What are the politics of the SDGs? Invite students to revise and improve some of the SDGs.

- Working within imperfect frameworks

Once students are aware of the limitations of the SDGs, explore what these limitations entail. Should the goals themselves change? How might this happen? Should institutions adopt alternatives? Are there workarounds or creative interpretations of the goals? Can we use the goals more effectively by being aware of their limitations? Sometimes changing a paradigm or ontology might be a good leverage point. But sometimes it might not be.

10.

SDGS: QUOTATIONS

Postdevelopment. The introduction to *Pluriverse: A Postdevelopment Dictionary* offers the following critique of the SDGs:

- “No analysis of how the structural roots of poverty, unsustainability, and multidimensional violence are historically grounded in state power, corporate monopolies, neo-colonialism, and patriarchal institutions
- Inadequate focus on direct democratic governance with accountable decision-making by citizens and self-aware communities in face-to-face settings
- Continued emphasis on economic growth as the driver of development, contradicting biophysical limits, with arbitrary adoption of GDP as the indicator of progress
- Continued reliance on economic globalization as the key economic strategy, undermining people’s attempts at self-reliance and autonomy
- Continued subservience to private capital, and unwillingness to democratize the market through worker-producer and community control
- Modern science and technology held up as social panaceas, ignoring their limits and impacts, and marginalizing ‘other’ knowledge
- Culture, ethics, and spirituality sidelined and made subservient to economic forces
- Unregulated consumerism without strategies to reverse the global North’s disproportionate contamination of the globe through waste, toxicity, and climate emissions
- Neoliberal architectures of global governance becoming increasingly reliant on technocratic managerial values by state and multi-lateral bureaucracies.” (Kothari et al. 2019)

Solutionism. “Too often, ideas of transformation and sustainability are framed around particular, expert-defined ‘solutions’, with uncertainties blanked out. Typically asserted with great confidence, burgeoning notions around, for example, ‘smart cities’, ‘climate-smart agriculture’, ‘clean development’, ‘geo-engineering’, ‘green growth’ or ‘zero-carbon economies’ act to suppress appreciation of many forms of uncertainty. [...] [S]ome highly uncertain issues that should remain open for political debate are imagined in circumscribed, biased and one-directional ways. The loudest voices and most powerful interests thus come to enjoy a disproportionate influence in defining what is meant by ‘progress’. The contrast could hardly be greater with the potentially open arena for political deliberation constituted by the United Nations’ Sustainable Development Goals. Arguably, for the first time in history, these establish a globally-shared discourse enabling the exercise of agency not only over the possibility of progress but also with

regard to its direction. The general orientation is clear – towards equality, well-being and ecological integrity; but the particularities of what these values might mean in practice – and how best to go about realising them – remain deeply uncertain.” (Scoones and Stirling 2020, 1–2)

Colonialism and the UN. “It is increasingly obvious that climate change is a contemporary manifestation of colonialism and arguably a natural outcome of imperial policies from previous centuries. However, what is less often discussed are the historical economic and political patterns that were enshrined through colonialism, and which continue to lead to global warming. The structures and institutions of colonialism also continue to impact our ability to address the climate emergency. The United Nations and its agencies were established well before anyone envisioned the contemporary globalized world with problems such as climate change and pandemics that defy national boundaries because of the fast and frequent global movement of people and emissions. These are problems that require transnational and even international cooperation to achieve solutions” (Oates 2021).

Culture and economic demand. “Culture generates desires — for vehicles and appliances, for certain kinds of gardens and dwellings — that are among the principal drivers of the carbon economy. A speedy convertible excites us neither because of any love for metal and chrome, nor because of an abstract understanding of its engineering. It excites us because it evokes an image of a road arrowing through a pristine landscape; we think of freedom and the wind in our hair; we envision James Dean and Peter Fonda racing toward the horizon; we think also of Jack Kerouac and Vladimir Nabokov” (Ghosh 2016, 9–10).

Instrumentalizing culture? “Functionality is however not to be confused with the instrumentalizing attitude sometimes found in debates on the role of literature in sustainability or ecological contexts [...] Rather, it helps define and bring to bear on educational practice a number of specific literary-discursive affordances which can be summarized and identified in the following points:

- the combination of present short-term concerns with a long-term perspective of culture-nature co-evolution
- a double orientation on past and future, cultural memory, and cultural creativity
- an attention both to life-sustaining diversities and to “connecting patterns” (Bateson 1973) across the boundaries of categories, discourses, and life-forms
- a critical sensorium for asymmetries of power both in cultural systems and in their relations to their environments
- the staging of the multilayered interactivity between self and other, mind and matter, and humans and the nonhuman world as a condition of life and survival on the planet
- the autopoietic dynamics of the text as a complex self-generating system, which turns it into an ecological force in language and discourse
- a participatory concept of sustainability that describes no objectively given set of properties but a potentiality of texts that comes alive in the transactive complexities of the aesthetic experience, in its ever new actualizations within always changing historical, social, and individual conditions

In this sense, imaginative texts are a form of regenerative energy, an ever-renewable source of creative energy across cultures for ever new generations of readers. A creative and sustainable teaching practice can and should use this insight and model teaching sequences and competence expectations accordingly” (Bartosch and Zapf 2021).

PART III

THEME #3: CLIMATE CHANGE & CLIMATE JUSTICE



Surfers' peaceful protest against new offshore drilling application in the Great Australian Bight, 2019

11.

CLIMATE CHANGE AND CLIMATE JUSTICE: FAQ

1. Why is the climate changing?

Carbon and other greenhouse gases are released into the atmosphere (especially from burning fossil fuels like oil, gas, and coal). Some emissions are then safely removed again (e.g. absorbed by trees), but some hang around in the atmosphere. This traps the sun's energy in the atmosphere, causing average planetary temperatures to rise (called **global warming** or global heating).

2. Why is it bad?

Consequences already include wildfire, storms, floods, drought, loss of soil moisture, famine, disease, heatwaves, loss of arctic ice and rising sea levels, ocean acidification, loss of biodiversity, wildlife extinction, and more.

3. What are we doing about it?

Climate action is usually divided into **adaptation** and **mitigation**. Adaptation means doing things to prepare for a hotter climate, such as investing in resilient agriculture, relocating coastal communities, hardening infrastructure, building flood defences, etc. Reducing poverty and inequality has been shown to improve resilience to climate impacts. Mitigation is about doing things to slow and eventually halt global warming. Mitigation includes reducing carbon emissions (by reducing demand for energy, and also by switching from fossil fuels to renewable sources of energy such as solar and wind) as well as increasing the planet's absorptive capacity (reforestation, wetland preservation, restorative agriculture, carbon removal technologies, etc.).

4. What does climate justice mean?

There are many approaches to climate justice, but we can start by asking: Who is responsible for climate change? Who is affected by climate change? How might climate change reinforce existing injustices, or create opportunities to address them? Consider:

- Those who have contributed the least to climate change stand to lose the most from it.

- The Global South has contributed very little toward greenhouse gas emissions in the past, but is more vulnerable to climate risks. This includes physical risks, such as extreme weather events. It also includes transition risks — environmentally progressive regulation tends to favour wealthy countries and companies, who have spare capacity to adjust how they do business.
- Climate impacts exacerbate existing inequalities, meaning marginalised communities are the most vulnerable. Across both the Global North and the Global South, it is women, ethnic minorities, Indigenous communities, and the poor who are most exposed to the impacts of climate change.
- Intergenerational justice is another aspect of climate justice. Younger people are at the frontline of problems caused by previous generations.
- Climate change means ‘the status quo’ is not an option. In this sense, climate justice is exciting. Climate change has often been associated with losses and blockages: the biodiversity we will lose, the carbon-intensive pleasures we will have to deny ourselves, the frustrations of climate activism in the face of greenwashing, delay or denial. But climate change also provides chances for creativity, imagination, disruption, transformation, revolution. Many of these positive energies are associated with climate justice. What we have learned about our planet is obliging us to build new kinds of society: this opens up new choices about what kinds of society they will be.

5. How much time do we have left to tackle climate change?

This gets asked a lot, but it’s probably best to reframe the question. Not long ago, conversations around climate change tended to revolve around, “When will we start to take serious action?” That has now changed. Questions are now about implementation (“*How* are we taking action?”) and justice (“Which ‘we’ is taking action, and for whom?”).

At the Paris Agreement in 2015, world leaders agreed to limit warming to 1.5 degrees above pre-industrial levels. To have a decent shot at this means we need to peak global carbon pollution immediately (2025 by the very latest), halve carbon pollution by 2030, and get to net zero by 2050. Climate action *is* already happening; but mitigation is not happening fast enough; there are significant benefits to doing things sooner rather than later, and doing them decisively rather than half-heartedly. We also need to accept that things are already changing and develop realistic climate adaptation plans.

6. What is net zero?

Net zero refers to a situation in which carbon emissions are balanced by carbon removals. According to the latest science, once the world as a whole achieves net zero, average global temperature will no longer rise (Matthews and Caldeira 2008). Net zero is also a target at other scales, e.g. country, city, institution, individual, event, product. There are worthwhile criticisms of the net zero paradigm (and other terms including **real zero** and **net negative** have been suggested as alternative rallying points); however, net zero is by far the dominant paradigm of current policymaking and strategy.

UK universities now have net zero targets. “SOS-UK, alongside the National Union of Students (NUS), the University and College Union (UCU) and People & Planet (P&P) are calling for all UK universities and

colleges to publicly commit to being net zero emissions for scopes 1, 2 and 3 by 2030 to tackle the climate emergency and ecological crisis” (SOS-UK, 2021). The University of Sussex’s own net zero target date is currently 2035. Keep in mind that the pathway to net zero can be as important as the target date itself: the important bit is cutting carbon pollution as rapidly as possible.

Sussex Spotlight: Transformative Climate Justice

A **literature review** by Sussex researchers is an excellent introduction to the complexities of the term **climate justice**. Newell et al. (2021) point out how the term’s ‘meaning, scope and practical implications are still contested’ and that ‘the broader landscape within which climate justice is situated is rapidly changing’. A **transformative** approach to climate justice is recommended, ‘focusing on the social and institutional relations and inequalities that both produce climate change and profoundly shape responses to it’. Three strands of transformative climate justice are described: (1) inclusive climate justice, drawing on traditions of pedagogies of the oppressed, and linking a broad range of social movements and alliances; (2) ‘deepening’ climate justice by paying greater attention to extraction (not just emissions), to climate disaster responses, and to ecocentric law; and (3) governance for climate justice, including strengthening democratic decision-making around climate change.

Peter Newell, Shilpi Srivastava, Lars Otto Naess, Gerardo A. Torres Contreras, and Roz Price. 2021. ‘Toward Transformative Climate Justice: An Emerging Research Agenda’. *WIREs Climate Change* 12 (6): e733. <https://doi.org/10.1002/wcc.733>

7. How should we talk to students, colleagues and other people about climate change?

Climate change communication is a huge field. Three quick insights are worth bearing in mind. (1) Mix in positivity and hope. Getting bombarded with the scale and complexity of the challenges can be disempowering and counterproductive. (2) Try to find models for action. In other words (even setting aside optimism vs. pessimism), effective communication identifies actual ways of being, thinking, talking and (especially!) doing. Don’t just focus on the constraints that climate action creates, also explore the possibilities it opens up. (3) It’s OK not to know everything. Climate change is a huge topic. We often need to make changes on the basis of knowledge that feels very fragmentary.

8. What is the difference between carbon emissions and greenhouse gas emissions?

Often “carbon emissions” is really just shorthand for greenhouse gas emissions (if numbers are involved, the other gases may be translated into their carbon equivalents). A variety of greenhouse gases (carbon dioxide, methane, nitrous oxide, and others) contribute to global warming. Carbon is the biggest contributor (methane is in second place). “Carbon pollution” is another way of referring to the same thing.

9. Which sectors contribute the most to climate change?

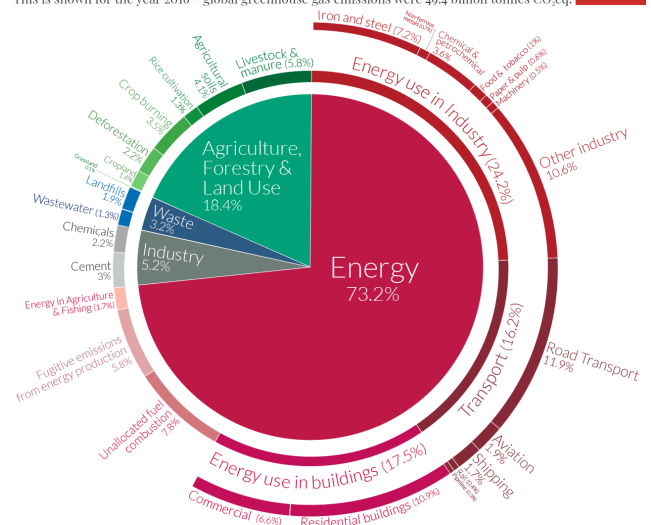
It can also be illuminating to break down emissions by **sector** (see diagram). Keep in mind that some of these sectors are much easier to decarbonise than others. Some of the biggest contributors are:

- Energy use in industry
- Agriculture, forestry, and land use
- Energy use in buildings (commercial and residential)
- Transport (road, aviation, shipping)

Some of the figures might be surprising. Aviation is still a fairly substantial contributor (and symbolically important), but we talk about flying a *lot* more than we talk about, say, making cement (which is in roughly the same ballpark).

Global greenhouse gas emissions by sector
This is shown for the year 2016 – global greenhouse gas emissions were 49.4 billion tonnes CO₂eq.

Our World in Data



OurWorldinData.org – Research and data to make progress against the world's largest problems.
Source: Climate Watch, the World Resources Institute (2020).
Licensed under: CC-BY by the author Hannah Ritchie (2020).

Research and data to make progress against the world's largest problems

10. Which countries have contributed the most to climate change?

Carbon footprint can also often be broken down by **country**, and this is important for climate negotiations (the UN COPs etc.). But whenever looking at breakdowns by country, check four things.

- First, rankings typically don't reflect **historic emissions** — some countries (like the UK) that may appear to be leading the charge on climate change are actually the ones who got us into this fix to begin with.
- Second, don't forget about **population sizes**, and check on both absolute and per capita figures. China and India may be among the biggest emitters today, but on a per capita basis they drop way down the list.

- Third, carbon pollution is usually calculated on a **production basis** (aka territorial basis), i.e. how much carbon is emitted within national borders. So countries like the UK seem to be doing very well. But the UK consumes lots of goods produced overseas, whose carbon emissions go on other countries' balance sheets. Why are they calculated like this? Well, emissions *can* instead be calculated on a **consumption basis** (aka trade-adjusted basis). Depending whether you use production vs. consumption accounting, you'll get different results, although not as dramatically different as cumulative emissions vs. current emissions, or net emissions vs. per capita emissions.
- Finally, stats sometimes include fossil fuel emissions but don't include land use emissions (deforestation etc.). If land use is left out, it disguises the carbon contribution of countries like Brazil, Indonesia, Canada, India.

11. Is overpopulation causing climate change?

No. It may sound strange, but it's true. As Kartha et al. (2020) point out, nearly half of emissions growth between 1990 and 2015 was attributable to the richest 10%, and the impact of the poorest 50% was 'practically negligible'.

The idea that overpopulation is a major driver of climate change is not only inaccurate, but also has dubious ethical and political connections: "the intersection of population growth and climate change rhetoric has often adopted hegemonic discourses subtly laced with racist and sexist undertones—placing the burden of our climate crisis on the Global South and oftentimes pointing to birth control for women of color in the 'third world' as the solution to this problem" (Dyett and Thomas 2019).

Andreas Malm describes the environmental campaigning of movements like Earth First!, Animal Liberation Front and Earth Liberation Front: "Their campaigns of 'monkeywrenching' or 'ecotage' prospered in a certain subculture that reached its apogee in the 1990s, mingling punk and hardcore with dumpster diving and veganism, spiritual voyages and holistic medicine with squatting and guerrilla gardening, fanzines with herbs. The EFL, ALF and ELF drank from two ideological wells: deep ecology and animal liberation. Both have lost their street cred since then. Neither has much bearing on the climate crisis. Deep ecology is, as Northern environmentalism has come to realise with very few holdouts, a deeply reactionary type of ecology, which locates the source of the malaise in human civilisation as such, zooms in on overpopulation and prescribes the contraction of humanity to a fraction of its current size as the remedy"

12. What is geoengineering and will it save us?

Geoengineering is a catch-all term for all kinds of large-scale technical interventions in the climate. It is mostly highly speculative. Solar geoengineering (or solar radiation management) refers to a set of imaginary technologies that have been proposed as a means to increase the reflectivity of the Earth's atmosphere (e.g. mass spraying aerosols in the stratosphere). Solar geoengineering proposals have attracted fierce criticism from a variety of scholars and environmental groups. Other geoengineering proposals include ideas for manually repairing arctic ice sheets. See also Negative Emissions Technologies (NETs) below: *sometimes*

NETs are also classified as a form of geoengineering, although it's probably better to consider them a separate category of climate technology.

13. What are 'nature based solutions'? What are Negative Emissions Technologies (NETs)?

Mitigating climate change requires **reducing** emissions, including (a) switching to renewable energy like solar power, wind power, etc. and (b) limiting the demand for energy in the first place. But it also requires (c) **removing** carbon from the atmosphere and safely storing it ('sequestering' it). That's where nature-based solutions and NETs come in.



The bathtub metaphor is sometimes used. We have left this bath running for so long, we now need to simultaneously reduce emissions *and* increase net removals.

Planting trees removes carbon from the atmosphere. So does rewetting peatlands, restoring coastal ecosystems such as mangrove belts, salt marshes and seagrass meadows, etc. These are called **nature-based solutions**.



Negative Emissions Technologies (NETs) are another way to remove carbon. These include as Bio-Energy with Carbon Capture and Storage (BECCS), Direct Air Capture with Carbon Storage (DACCS), and enhanced weathering (spreading finely ground silicate rock over wide areas). Some of these technologies have been proven to work on a small scale, others are more speculative. Critiques of NETs often focus on feasibility, resource intensity, unwanted side effects, uncertainties, governance, justice, and the role of anticipated techno-fixes in justifying continued extractivism and fossil fuel burning. NETs are however currently a major part of official decarbonisation policy globally, and criticisms of NETs often stop short of fully thinking through the implications of rejecting them. There are opportunities to engage students in humanistic study and debate around NETs, e.g. drawing on technofeminism and/or Science and Technology Studies.

14. When will we run out of oil, coal and gas?

Hold up! There is now a strong consensus that this is the wrong question to be asking. We cannot safely use up the reserves we have already discovered, let alone worry about discovering more. Hence the slogan, "Leave it in the ground." To put it another way, the problem isn't running out of fossil fuels, it's running out of *carbon budget* (the amount of carbon we can still release and have a decent chance of limiting warming to well below 2 degrees).



12.

CLIMATE CHANGE AND CLIMATE JUSTICE: FURTHER READING / RESOURCES

  Where can I find out more about **climate justice**? Newell et al. (2021) provide a useful overview of the term ‘climate justice.’ Other good resources: Climate Justice Glossary, Climate in Colour, Climate Justice Syllabus, Climate Action Network, Greenpeace, ASU Center for Science and the Imagination, Friends of the Earth, Panafrican Climate Justice Alliance, Julie’s Bicycle Climate Justice Resources.



Climate justice keywords

agroecology, Alliance of Small Island States, alterglobalization, buen vivir, capitalocene, carbon colonialism, climate activism, climate and intersectionality, climate refugees, **climate reparations**, Coalition for Rainforest Nations, community land management, convivialism, damage and loss, degrowth, diverse economies, diversity of tactics, Earth Jurisprudence, ecoanarchism, ecofeminism, ecolocalism, ecosocialism, ecoterrorism, energy sovereignty, environmental racism, environmental stewardship, **extractivism**, folk politics, food sovereignty, fossil capital, fossil fascism, gift economies, Group of Mountain Landlocked Developing Countries, horizontalidad, International Disaster Relief Law, kawsak sachá, kyosei, Least Developed Country Fund, “leave it in the ground,” liberation theology, minobimaatisiwin, Most Affected Peoples and Areas, nayakrishi andolon, new water paradigm, open source appropriate technology, people-centred energy transition, permaculture, **pluriverse**, post-development, post-economia, post-scarcity, queer love, rewilding, scarcity economics, slow violence, soft law, solarpunk, sumak kawsay, **system change, the commons, transformative climate justice**, Ubuntu, undevelopment, voluntary simplicity, worker-led production

  Where can I find out more about **climate science**? Major journals include *Nature* and *Journal of Climate*. The Intergovernmental Panel on Climate Change (IPCC) reviews and synthesises climate science and produces giant thousand-page reports. The United Nations Framework Convention on Climate Change secretariat (UNFCCC) is the United Nations entity tasked with supporting the global response to the threat of climate change.

Climate science keywords



adaptation and maladaptation, aerosol cooling, AMOC, anoxic event, anthropogenic climate change, arctic methane emissions, atmosphere, baseline scenario, biosphere, blue carbon, carbon budget, **carbon cycle**, carbon dioxide, climate change indicators, **carbon removal**, climate feedbacks, climate model, cryosphere, decoupling, deforestation, Earth System Model, extreme weather events, f-gases, **fossil fuels and biomass**, global climate regime, global warming potential, **greenhouse effect**, greenhouse gases, ground-level ozone, hydrological cycle, hydrosphere, infrared radiation, Integrative Assessment Modelling, jungle dieback, land surface, **land-use change**, methane, **mitigation and adaptation**, model downscaling, model ensemble, model uncertainty, nature based solutions, nitrogen cycle, nitrous oxide, ocean acidity, ocean temperature, organic farming, phosphorus cycle, planetary boundaries, radiative forcing, risk cascades, sea level rise, **tipping points**, waste minimisation, water scarcity, **weather vs. climate**, wildfires

  Where can I find out more about **climate policy**? Some good resources include the Doughnut Economics Action Lab, Wellbeing Economy Alliance, Carbon Brief, Carbon Tracker, UK Climate Risk, Global Justice Now, Stir to Action, New Economics Foundation, *The Dasgupta Review on the Economics of Biodiversity*, *WIREs Climate Change*.

Climate policy keywords



Annex I Parties, Annex II Parties, attribution science, Beyond GDP, blended finance, cap-and-trade, carbon leakage, carbon market, carbon offsets, carbon price, **carbon tax**, carbon trading, certified emission reductions, circular economy, citizen science, Clean Development Mechanism, climate adaptation, climate change litigation, climate finance, climate mitigation, climate resilience, climate risk, climate-related disclosures, co-benefits, **damage and loss**, **decoupling**, degrowth vs. green growth, development banks, Earth Jurisprudence, ecocide, **ecosystem services**, energy transition, environmental discount rate, ESG investing, Food and Agriculture

Organisation, fugitive fuel emissions, Glasgow Compact, Global Environment Facility, green bonds, Independent Assessment Report, International Energy Agency, International Sustainability Standards Board, just transition, Kyoto Protocol, legal fragmentation, Nationally Determined Contributions, nature-based solutions, **Net Zero**, Paris Agreement, participatory design, postgrowth, Rapid Transition Alliance, REDD+, rights of nature, social cost of carbon, Shared Socioeconomic Pathways, **stranded assets**, TCFD, UNFCCC, United Nations Permanent Forum on Indigenous Issues, Voluntary Carbon Standard

  Where can I find out more about **climate and the arts and humanities**? As well as this toolkit, some resources include Energy Humanities, SOS-UK, Environmental Humanities @ TORCH, The Association for the Study of Literature and the Environment (ASLE-UK).

Climate and the arts and humanities keywords

animal studies, **anthropocene**, anticipatory mourning, capitalocene, chthulhucene, critical humanism, dark ecology, degrowth, **ecocriticism**, ecofeminism, ecohorror, ecomaterialism, ecomodernism, econtology, ecopathy, ecosocialism, ecosphy, ecstatic humanism, embodied materialism, **environmental humanities**, **energy humanities**, general ecology, immanent humanism, interspecies entanglement, interspecies justice, making kin, marginalisation-degradation, material semiotics, nature writing, natureculture, noosphere, petrocultures, plantationocene, postanimalism, postgrowth, posthumanism, sociotechnical imaginary, technoanimalism, the in/human, the more-than-human, transcorporeality

  Where can I find out more about **climate and technology**? Try this book → Buck, Holly Jean. 2020. *After Geoengineering: Climate Tragedy, Repair, and Restoration*. London: Verso. Other resources include the Climate Justice Glossary, Digital Humanities Climate Coalition, Critical Algorithm Studies: A Reading List, Hack Education, *Catalyst, Bulletin of Science, Technology, and Society*, Global Forest Coalition, Geoengineering Monitor, Biofuelwatch, Low Carbon Research Methods, Climate Change & Digital Humanities Zotero Library.

Climate technologies keywords

afforestation, after-zero society, algorithmic governance, appraisal optimism, automation anxiety, biochar, biofuels, biomimetic, carbon dioxide capture and storage, carbon farming, chemurgy movement, citizen science, climate analytics, climate technology, critical algorithm studies, climate smart agriculture, critical data studies, critical design, critical metric studies, Critical Technical Practice, cultural lag, Direct Air Capture, enhanced oil recovery, enhanced weathering, **epistemological luddism**, geoengineering, horizon scanning, hydrogen colour spectrum, legacy thinking, lock-in, medianatures, natural carbon removal, **Negative Emissions Technologies**, neocybernetics, networked affect, no innovation without representation, platform capitalism, platform socialism, positivism, post-internet, posthuman critical theory, scientism, sociotechnical imaginary, Sociotechnical Systems Theory, solar radiation management, techno-fixes, techno-optimism, **techno-solutionism**, techno-utopianism, tipping points, **tools for conviviality**, wetlands restoration

13.

CLIMATE CHANGE AND CLIMATE JUSTICE: ACTIVITY SEEDS

1. **Collectively act as a small group.** There are actions individuals can take, and there are actions that large entities can take (states, multinational corporations). But what about a group of, say, fifteen to twenty students plus their valiant tutor? Divide students into groups and have them brainstorm ideas for an action that feels achievable within six weeks. Each group presents its proposal, and then the class collectively votes which action to pursue. They could use texts or themes from the module for additional inspiration. (If there are no obvious links, support students to come up with creative links). You could frame the exercise as an experiment in agency and affect — not trying to solve everything at once, but exploring what we can change, and how the attempt makes us feel.
2. **Attempt to influence a much more powerful actor.** For example, try to get an institution to bring forward its net zero date by one year. In a situation where every year counts, isn't it odd that organisations are still thinking in five-year increments?
3. **Learn about specific ongoing environmental justice struggles.** The Environmental Justice Atlas is one good starting point. Explore ways of creating connections, raising awareness, offering resources, and building solidarity.
4. **Explore how violence relates to climate change.** Rob Nixon writes in *Slow Violence and the Environmentalism of the Poor*: “Maintaining a media focus on slow violence poses acute challenges, not only because it is spectacle deficient, but also because the fallout’s impact may range from the cellular to the transnational and (depending on the specific character of the chemical or radiological hazard) may stretch beyond the horizon of imaginable time” (Nixon 2011, 47). Nixon’s term “**slow violence**” can be usefully explored in relation to concepts such as systemic violence, structural violence, techno-racism, and disciplinarity.

Malm et al. write: “Whiteness and its surrounding negations were fixed in place during this particular century of violence from the core. Modern racism, in other words, is unthinkable without techno-racism [...] And no technological complex was as pivotal as this one: the steamboats, the railroad cars and all the other steam-powered machines of white Europe” (Malm 2021b).

Cara Daggett draws on Kate Manne’s understanding of misogyny as the demarcation and punishment of deviance in order to reinforce patriarchal power, to argue that defence of fossil fuels is a violent compensatory practice. “Those regions that have emitted the most carbon dioxide are positioning themselves to profit from a warming earth by advancing a militarised and corporatised version of climate

security. Petro-masculinity, like fossil fuel systems, arguably has global dimensions. However, like other masculinities, petro-masculinity should be understood as manifesting in multiple, and locally specific, ways. This article focuses upon its most prominent recent appearance: in new authoritarian movements in the US” (Daggett 2018).

Then there is violence as **resistance or intervention**. Andreas Malm: “But if destroying fences was an act of violence, it was violence of the sweetest kind. I was high for weeks afterwards. All the despair that climate breakdown generates on a daily basis was out of my system, if only temporarily; I had had an injection of collective empowerment. There is a famous line in *The Wretched of the Earth* where Frantz Fanon writes of violence as a ‘cleansing force’. It frees the native ‘from his despair and inaction; it makes him fearless and restores his self-respect’. Few processes produce as much despair as global heating. Imagine that, someday, the reservoirs of that emotion built up around the world – in the global South in particular – find their outlets. There has been a time for a Gandhian climate movement; perhaps there might come a time for a Fanonian one. The breaking of fences may one day be seen as a very minor misdemeanour indeed” (Malm 2021a).

5. **Explore theories of change.** How do things happen? How do big things happen? Because media, arts and humanities scholars have a special interest in culture, and because the reductive instrumentalisation of culture is a real and pervasive danger, we can sometimes slip into the habit of undertheorising how change occurs. Sometimes we might narrowly emphasise the cultural and psychological features of big political and social shifts — “We need a fundamental transformation of our worldview,” “This text challenges such-and-such an entrenched power system and articulates such-and-such an alternative ontology,” etc. Perhaps the urgency and complexity of climate change asks us to create more space in our teaching for a plurality of theories of change. For example, Donella Meadows’s ‘Leverage Points: Places to Intervene in a System’, the system’s mindset or paradigm is only one of twelve points where intervention is possible.
6. **Foster critical literacy of scientific claims.** This could be a sidelong way to come at sustainability, climate science, and climate justice themes. Find STEM / social sciences articles related to themes you are teaching, and support students to develop collaborative, reflexive and critical understandings. Often it’s possible to make useful evaluations even based on a fragmentary understanding.
 - Focusing on experiment design and methodology is sometimes a good way in: what did the researchers actually do? What could such an activity demonstrate in principle, and how well does this correlate with the article’s main claims (including what a casual reader might garner at a glance?)?
 - Psychology and social sciences may have relatively easy learning curves and help to build confidence in reading STEM texts.
 - And/or, have students comparatively close-read media reports and the scientific studies they are based on: are qualifications lost (or maybe introduced)? How does tone and register shift? How do connotations shift when language is simplified?

- Deepen the collaboration by exploring collaborations with STEM colleagues or other relevant experts.
 - It could also be interesting to apply theory around reparative reading vs. paranoid reading (Eve Kosofsky Sedgwick) when reading texts well outside our comfort zones.
7. **Activities from the Existential Toolkit for Climate Justice Educators.** Invite students to make a mind map or spectrum of ecological emotions; to practice mindfulness exercises; to roleplay a future descendent; or to write a letter to a future self. See www.existentialtoolkit.com.

14.

CLIMATE CHANGE AND CLIMATE JUSTICE: QUOTATIONS

“On one side, there is the pursuit of climate justice as being primarily an endeavour of social practice, a driver of change. Its main preoccupation is with social change. Its site is predominantly that of civil society and activism. This general attitude can be referred to as climate justice as social movement, its operative term being ‘movement.’ On the other side, there is a body of sustained work whose focus is on climate justice as an object of formal inquiry. This endeavour prioritises the consistency with which conceptions of justice are formulated in light of norms and principles” (Boran 2019, 26).

An article critical of the concept of net zero suggests that net zero “is a great idea, in principle. Unfortunately, in practice it helps perpetuate a belief in technological salvation and diminishes the sense of urgency surrounding the need to curb emissions now. [...] We have arrived at the painful realisation that the idea of net zero has licensed a recklessly cavalier “burn now, pay later” approach which has seen carbon emissions continue to soar. It has also hastened the destruction of the natural world by increasing deforestation today, and greatly increases the risk of further devastation in the future” (Dyke, Watson, and Knorr 2021).

PART IV

THEME #4: ECOCENTRISM



Volunteers and veterinarians bandaging a coati's paws after a wildfire in the Brazilian Pantanal

15.

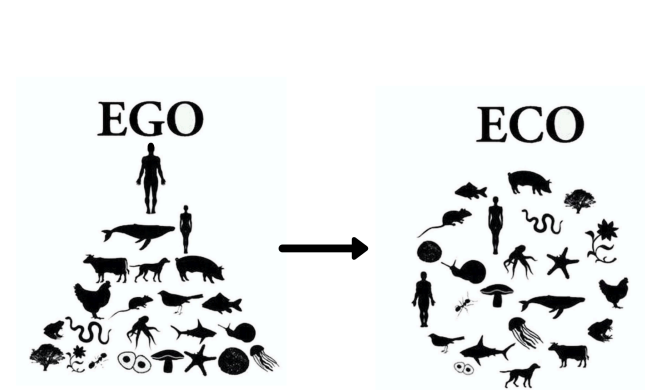
ECOCENTRISM IN POLICY AND LAW

“This shift in perspective – from pyramid to web, from pinnacle to participant – also invites us to move beyond anthropocentric values and to recognise and respect the intrinsic value of the living world.”

— Kate Raworth

One obvious criticism of the SDGs is that they are still fundamentally centred on humans (and in fact, on one particular vision of human flourishing, based on economic growth). Even conservation agendas are largely driven by the concept of **ecosystem services** which place *extrinsic* value on natural processes in terms of what they can do for us as humans. Intuitively, we need to think beyond human needs and place *intrinsic* value on other life forms and natural processes. Various philosophical and legal shifts are underway that do just that.

1. What is anthropocentrism? What is ecocentrism?



Instead of seeing humans (or Man) as the master of the universe, ecocentrism invites us to recognise ourselves in a web of life ...

Most environmental law is **anthropocentric** (human-centred). That doesn't mean it ignores nature. Human wellbeing depends on nature, so laws which protect humans may also indirectly protect nature.

Most policymaking takes a similar approach. **Natural capital** provides many benefits to humans. Monetary values can be assigned to these services, which assists policymakers making complex decisions. These benefits are sometimes called **ecosystem services**.

However, this anthropocentric approach is at odds with many Indigenous perspectives, as well as the overlapping discourses of Earth Jurisprudence and Rights of Nature. These approaches emphasise the *intrinsic* moral value of natural entities, rather than their value to humans. Yes, bees pollinate our crops which sustain our economies. But those bees and those plants also matter in their own right.

Sussex Spotlight: 'Harmony with Nature: towards a new deep legal pluralism'

In this article Helen Dancer (School of Law, Politics and Sociology, University of Sussex) explores the “histories, ontologies and discourses that have shaped two contrasting approaches to human-Earth relations in debates and legal frameworks for sustainable development. Anthropocentric discourses of nature as service-provider underpin the dominant approaches within ecology and economics. Ecocentric discourses of Nature as subject are reflected in Rights of Nature movements, particularly in the Americas, and at an international level, in the United Nations Harmony with Nature Programme.” Dancer argues “a deep legal pluralism that both decentres anthropocentric thinking on the environment and decentres the state in the development of Earth law. This places responsibility for the environment and the equitable sharing of power at the heart of legal frameworks on human-Earth relations and recognises the diversity of ontologies that shape these relationships in law and practice.”

Dancer, Helen. 2021. 'Harmony with Nature: Towards a New Deep Legal Pluralism'. *The Journal of Legal Pluralism and Unofficial Law*, 53 (1): 21–41. <https://doi.org/10.1080/07329113.2020.1845503>

2. What are ecosystem services?

Ecosystem services is an anthropocentric approach to land management and policymaking. Ecosystem services can be divided into:

1. Provisioning Services: Water, fish, livestock, vegetables, fruit, medicines, timber, wood fuel, fossil fuels, etc.
2. Regulating Services: Carbon storage, water purification, decomposition, pollination, erosion control, etc.
3. Cultural Services: Recreation, spirituality, knowledge, beauty, enriched experience and imagination, etc.
4. Supporting Services: The services that underlie these services. Habitats for biodiversity, photosynthesis, nutrient cycling, etc.

In this toolkit, we contrast the ecosystem services with ecocentrism. But we should be clear: advocates of ecosystem services usually don't see themselves as indifferent to nature — quite the opposite! How would they answer their ecocentric critics? And how might the ecocentric critique develop in response? See Activity Seeds for more ideas exploring debates around ecosystem services.

3. What is Earth Jurisprudence?

What role does law play in ecological and social sustainability? How does nature relate to the law? How can our legal frameworks be improved to address environmental crises, and help us to live justly with animals, plants, insects, micro-organisms, rivers, mountains, ecosystems? How might legal controversies be ways into thinking through cultural presuppositions about the nature of nature? These are some of the questions explored by **Earth jurisprudence**, which seeks to recognise that humans as part of a wider community of beings, and that the wellbeing of every member of that community depends on the wellbeing of the Earth as a whole.

Cormac Cullinan has influentially suggested that the laws of the universe constitute a 'great jurisprudence' which is 'neither right nor wrong'; an 'Earth jurisprudence' would be a set of legal theories 'to a large extent derived from, and consistent with' this 'great jurisprudence'. Peter D. Burdon writes:

"In contrast to anthropocentric legal philosophies, Earth Jurisprudence represents an ecological theory of law. Central to Earth Jurisprudence is the principle of Earth community. This term refers specifically to two ideas. First that human beings exist as one interconnected part of a broader community that includes both living and nonliving entities. Further, the Earth is a subject and not a collection of objects that exist for human use and exploitation. [...] This principle does not deny the moral status of human beings or claim that all forms of non-human nature have moral equivalence with humanity.⁸ Instead, it seeks to shift our focus away from hierarchies and asserts that all components of the environment have value. It takes the wellbeing or common good of this comprehensive whole as the starting point for human ethics." (Burdon 2012)

4. What are Rights of Nature / environmental personhood?

Rights of Nature are an important aspect of Earth Jurisprudence. Non-human living entities have the moral right to exist and to thrive—so shouldn't they be able to turn to the courts for justice, just like people can? **Environmental personhood** is now emerging in some jurisdictions. This designates certain environmental entities (for example an animal, a species, a river, an ecosystem) the status of a **legal person**. For example:

Fluvial ecosystems have been at the heart of some of the most emblematic cases pushing forward the frontier of what has been called a 'rights revolution for Nature' [...] This 'revolutionary' shift is displayed, for example, by the case of the Whanganui River in New Zealand, whose legal personhood was recognized through a legal entity called Te Awa Tupua (Whanganui River Claims Settlement) Act 2017 New Zealand. [...] Similarly, there is the case of the Atrato River, located in Colombia, which was recognized in 2016 as an entity with legal personhood and the right to be protected, conserved, maintained and restored. (Charpleix 2018)

It's easy to get confused about legal personhood, and the headlines often don't help ("Should rivers have the same rights as humans?" "Science shows dolphins are people too!" — that kind of thing). Put simply, legal personhood just means possessing one or more legal rights. You don't have to be a human to be a legal person — corporations have long been legal persons. As Steven Wise put it, some years ago: "Some people think we're trying to get human rights for chimpanzees. We're not. We're trying to get chimpanzee rights for chimpanzees."

A closely related concept is **legal standing for nature**, which means giving environmental persons the ability to litigate their grievances in court. But a river can't appear in court—can it? Environmental personhood generally assumes that humans will act as **guardians**.

One criticism of this approach is that environmental persons may become vulnerable to lawsuits themselves.

Sussex Spotlight: The UK Earth Law Project

The UK Earth Law Judgments Project (Helen Dancer and Bonnie Holligan) addresses a critical global issue in a way that is new for the UK. Following in the footsteps of feminist judgments projects, and the recent Wild Law Judgment Project led by Australian scholars, the project reimagines important UK legal judgments from a range of perspectives within the field of Earth Law.

5. How do natural entities benefit from legal personhood? Are there other ways of protecting them?

Being a legal person doesn't entail human rights (to life, to dignity, etc.) or anything resembling them. So by itself, legal personhood for natural entities will not necessarily curb exploitative treatment. It would depend on the precise nature of their rights, among other factors.


On the other hand, natural entities can (and already do) enjoy many legal protections *without* being legal persons. For example, in UK law animals are not persons. Animals are property. However, that does not mean owners can mistreat them. They are protected by animal welfare legislation (Animal Welfare Act 2006, and previously the Protection of Animals Act 2011). Animals that are "under human control" are protected from "unnecessary suffering." It is also a legal offence to fail to provide care for an animal you are responsible for, including suitable food and water, and the chance to follow "normal behaviour." The recent Animal Welfare (Sentience) Act 2022 legally confirms the sentience of a wide range of animals. Then


there are criminal offences for polluting, and laws obliging environmental impact assessments. Do such laws acknowledge the intrinsic value of non-humans? This is an open question you could explore with students.


So why is there such excitement around Rights of Nature? Well, they don't exist in a vacuum. These recent developments belong to the wider ecocentric movement (or set of movements). In this sense, they seek not only to transform statutes or introduce new precedents, but rather fundamentally to transform the cultural and ethical grounding of that law — to unleash fresh forms of reasoning and new structures of feeling to ripple through the law in ways that may be difficult to foresee. Do students see real revolutionary potential in the Rights of Nature movement? If Rights of Nature are increasingly recognised, how might extractivist power dynamics attempt to adapt?


16.


ECOCENTRISM: FURTHER READING / RESOURCES


 The Earth Law Center's recent literature review is a great gateway to more resources. For even more (but less curated), see the UN Harmony with Nature project's 'Expert Library.'


 Rights of Nature in Ecuador and Bolivia (Wikipedia).

 Web of Life Activity (Project Learning Tree): Students can learn about food webs, and what can happen if a species is removed from an ecosystem.

 Livecams (explore.org): Students can watch live videos of animals within their habitats and discuss what elements make up healthy ecosystems.

 British Animal Studies Network.

 A special issue of *Educational Sciences* on ecocentric education, a special issue of *Environmental Education Research* on new materialisms and environmental education, and a special issue of *The Ecological Citizen* on ecocentric visions.

 Global Alliance for the Rights of Nature, Nonhuman Rights Project, International Rights of Nature Tribunal

 Thomas Berry's website

Sussex Spotlight: Rights of Nature: Los Cedros Hearing

In a landmark ruling on December 2021, Ecuador's highest court decreed that plans to mine for copper and gold in the protected cloud forest of Los Cedros are unconstitutional and violate the rights of nature and revoked the mining permits.

Mika Peck in Life Sciences, University of Sussex, has been investigating the ecological importance of Los Cedros since the mid-90s. He compared the significance of the ruling to Thomas Paine's (also a Sussex man) *Rights of Man* – a key text in the American Revolution: "It is important for the world to reflect on the limits of nature and to seriously question the effectiveness of current conservation policies and actions," he said. "Policy frameworks that place humans in context as a part of nature, integrated into a system that balances intrinsic

rights between legitimate subjects of the law, rather than placing humans as above, or apart from, nature, will be a necessary part of addressing the serious environmental issues that our planet is facing. This ruling is as important to nature as Thomas Paine's *Rights of Man* were to our own species." (Quotations from Guardian article).

17.

ECOCENTRISM: ACTIVITY SEEDS

1. Debate anthropocentrism: is it inevitable?

But ... we *are* human, right? Invite students to contest, problematise, or qualify this claim if they like. (They might draw on a variety of posthumanist, critical humanist, postcolonial, and new materialist theory). If we accept that we are human (in some sense), can we ever truly transcend anthropocentrism? Might there be dangers in convincing ourselves that we have transcended that positionality? How far is it possible to know the other? How far is it possible to see the world from non-human perspectives? Do the answers to these questions change according to context (legal contexts, for example)? Use provocations like these, and make space for students to develop their own nuanced understandings of anthropocentrism and ecocentrism. Some relevant quotations from Bennett and Zylinska:

“We at first may see only a world in our own image, but what appears next is a swarm of ‘talented’ and vibrant materialities (including the seeing self). A touch of anthropomorphism, then, can catalyze a sensibility that finds a world filled not with ontologically distinct categories of beings (subjects and objects) but with variously composed materialities that form confederations. In revealing similarities across categorical divides and lighting up structural parallels between material forms in ‘nature’ and those in ‘culture,’ anthropomorphism can reveal isomorphisms” (Jane Bennett, *Vibrant Matter: A Political Ecology of Things*, p.99).

“This (non- or post-humanist) human — one that could be written in quotation marks, placed under erasure, or, as I have done here, preceded by a qualifying adjective — entails the realization on the part of many theorists who still keep using this term that we are in (philosophical) trouble as soon as we start speaking about the human, but it also shows a certain intransigence that makes (some of) us hang on to the vestiges of the concept that has structured our thinking and philosophy for many centuries” (Joanna Zylinska, *Minimal Ethics for the Anthropocene*, p.62).

2. More-than-Human Voices

Invite students to think about how a text represents (or does not represent) various environmental agencies. Invite students to consider how they might go about composing and/or creating work from other-than-human perspectives, with other-than-human collaborators, and/or for other-than-human audiences.

3. Explore and debate ecosystem services. Some angles ...

- *Policy.* Why put a price on nature? E.g. within urban environments, green and blue spaces mitigate the ‘urban heat island’ effect through photosynthesis and other mechanisms. What do the Office of National Statistics mean when they value this at £244 million (ONS 2019)? They’re not really implying we could sell the cool air by the canal or the leafy shade in the park on eBay. It is a price tag without a market. The ONS are offering data that can feed, fairly easily, into the complex calculations of policymakers juggling many different priorities. Where does this price tag come from? Without supply and demand determining prices, how do students imagine that such economic valuations are made?
- *Risk.* Similarly, ecosystem services may also appear less absurd when placed in the context of decision theory and risk management. When the future is uncertain, how do you choose wisely? One answer is that you quantify the uncertainty as much as possible, and try to take actions that are robust across a variety of possible futures, taking into account the probability of each. When ecosystems are transformed into numeric representations, that enables the statistical manipulation of those representations.
- *Value.* You may say, “I value our friendship,” or, “That laptop is valuable,” or, “Kindness is an important value,” or, “The values were inputted correctly into the spreadsheet.” What is the relationship between these different senses of value? Do they illuminate what it might mean to value nature? Is “value” an anthropocentric concept — if so, what does it mean to say nature has intrinsic value? Does value imply commodification, or can something be valued without being a commodity, or a commodity without being valued?
- *Carbon offsets.* Ecosystem services can be marketised, e.g. in carbon credit trading mechanisms. For many educators in media, arts and humanities, this whole topic might feel like a slippery slope to a lot of dense technical detail. Sliding down that slope could be exciting. Alternatively, you could approach the topic in a looser and more speculative way, inviting students to weave creative narratives about the *potential* pitfalls of a carbon credit mechanism. Set up some premises — how is the mechanism supposed to work? Who are the buyers and who are the sellers? Where and how is the carbon being emitted and where and how is it being removed? How might the story unfold in different genres and modes — science fiction, horror, detective fiction, satire, farce? Focus on unexpected side-effects, and attempted solutions to problems that actually make things worse.
 - The Climate Ad Project uses the analogy of ‘murder offsets’: imagine if, whenever you wanted to murder somebody, all you had to do was pay somebody else not to murder two people? The total number of murders goes down, everybody’s happy! Who could object to such an elegant system? Of course, offsetting should only be used for residual murders. Students could be invited to critically analyse this analogy.

Arguments in favour of ecosystem services

Advocates may find the criticisms a bit mystifying. They may agree that nature has intrinsic value, yet think of ecosystem services as the most **practical means** of recognising that value. If decision-makers don't have numbers to work with (however approximate those numbers are), well ... they might just leave nature out of their calculations altogether! So if you *really* care for the spirit of the forest, wouldn't you want to shield it with — not just passion and poetry, but also — a business case? Ecosystem services doesn't claim to be the perfect framework, but isn't it better than nothing?

Advocates of ecosystem services may also offer arguments based on **equity and justice**. Consider a country in the Global South with extensive forests. The entire world benefits from the existence of these forests. Within an ecosystem services framework, the value of these forests can be quantified, and wealthy countries in the Global North can contribute fairly to their conservation (rather than free-riding). This is roughly the idea behind the REDD+ mechanism, for example, and behind **carbon offsetting** more generally. It aims to unlock climate finance for the Global South.

Ecosystem services may occasionally be defended on **epistemological** grounds. Advocates may point to the complexity of climate change (and other ecological crises), and the challenge of **coordinating** a response to it. They may argue that ecosystem services are vital for creating effective markets, capable of integrating a wide variety of preferences and local knowledges, so that we can coordinate our action in the face of such complexity. (Within political economy, this kind of argument has roots in the earlier socialist calculation debate, and the Efficient Markets Hypothesis). See also the point about **risk** (above).

Sample critical responses

Is placing a value on *some* nature necessarily 'better than nothing'? What if it perpetuates a worldview and an economic system that devastates the environment in the long term? Furthermore, the word 'value' can also be interestingly equivocal: a vegan environmentalist and the owner of a commercial fishery may both 'value' the fish living in a river, but they probably do so in different ways (the fish might think so). You also needn't accept that environmental valuations are the only 'practical' way to approach the complexities of ecological stewardship: for example, more can be done to strengthen participatory, democratic decision-making.

Are considerations of justice really best served by these kinds of transactional relationship? Who has had the most power to shape the terms of the transaction? Consider how fiercely Global North countries (including former colonial powers) have resisted climate reparations proposals from the Global South. Further, letting wealthy actors buy credits to harm biodiversity, or to emit carbon, widens their strategic options, and might exacerbate inequality. Even if these problems can be addressed, some may still object on principle to commodifying the 'right' to moral wrongdoing: e.g. the Climate Ad Project's use of the analogy of 'murder offsets'.

Here, critics may point to many examples where such approaches have failed in the past. Some things may lend themselves to being marketised, but nature doesn't really seem to be one of them: there are huge challenges around transparency, certification, accountability, and additionality of such "services." For example, Lisa Song investigated a number of offset schemes and concluded: "In case after case, I found that carbon credits hadn't offset the amount of pollution they were supposed to, or they had brought gains that were quickly reversed or that couldn't be accurately measured to begin with. Ultimately, the polluters got a guilt-free pass to keep emitting CO₂" (Song 2019).

4. Guardians, trustees, delegates, interpreters, proxies.

What are the different ways that one person can stand in for another, or for an animal, or a species, or an ecosystem, or some other entity? For example, you could explore the **zoöps** model from Het Nieuwe Instituut. A 'zoöp' is an organisation whose governance includes representation of the voices and interests of non-human life. "The Speaker for the Living acts as a representative of the other-than-human life in the

spatial and operational sphere of our organisation. To the best of their abilities, the Speaker will help to translate the interests of other-than-human life to what we do and should not do.”

5. Animal Trials

Use Late Medieval animal trials as a starting point for wider discussions about anthropocentrism and ecocentrism.

Useful resources:

- Evans, E.P. 1906. *The Criminal Prosecution and Capital Punishment of Animals*
- Cohen, Esther. 1986. ‘Law, Folklore and Animal Lore’
- Vatomsky, Sonya. 2017. ‘When Societies Put Animals on Trial’
- Minou, Arjomand. 2018. *Staged: Show Trials, Political Theater, and the Aesthetics of Judgment*. New York: Columbia University Press.
- Leeson, Peter T. 2013. ‘Vermin Trials’. *The Journal of Law and Economics* 56 (3): 811–36.

Angles:

- *Invented trials*: Although many animal trials did take place, many were inventions. Engage students in assessing the credibility and legitimate uses of sources about animal trials.
- *Historicising jurisprudence*: How did the legal system reflect assumptions and circumstances which may now seem very distant to many of us?
- *Humour*: Why do these trials seem funny? What might the absurdity conceal and/or reveal?
- *Corporate personhood*: Can animal trials illuminate corporate personhood and vice-versa?
- *Theatre*: Jean-Baptiste Racine’s *The Litigants* (1668), Citron the dog is put on trial for having stolen a capon from the kitchen. Aristophanes’s *The Wasps* (422 BCE) features a bowl, a pestle, a cheese-grater, a brazier and a pot as witnesses in a dispute. There is a rich literature on theatre and the law, including the performativity of legal processes. See e.g. Arjomand, Minou. 2018. *Staged: Show Trials, Political Theater, and the Aesthetics of Judgment*. New York: Columbia University Press.

6. The Anthropocene and the Planetary Boundaries Model

The term **Anthropocene** was coined to describe the current period in planetary history, when human activity has been significantly impacting earth systems. Similar to the Planetary Boundaries model (see earlier in this toolkit), *Anthropocene* attempts to create a compelling and scientifically legitimate way of describing our past activities, and our obligation to change course. To generalise a bit: the Planetary Boundaries model is built around a set of measurable (or potentially measurable) phenomena. There has been plenty of controversy about just what to measure and how. The term Anthropocene is looser: it is

widely used within nature writing and the environmental humanities, but hasn't gained much traction in stratigraphical and geological science. There are different proposals about when the Anthropocene began (about 70 years ago, about 250, about 12,000).

Students might be invited to **compare the two terms**, especially as they relate to the construction of **scientific knowledge**. Jill S. Shneiderman's chapter 'The Anthropocene Controversy' in *Anthropocene Feminism* (2017) is a good introduction to the history of the term *Anthropocene*, which began to be widely used after 2000. Shneiderman is a sympathetic critic of the term. Partly inspired by Londa Schiebinger's work on how mammals came to be called mammals (rather than, say, "Pilosa," "the hairy ones"), Shneiderman examines the term *Anthropocene* through feminist and postcolonial lenses. What are the implications of proposing *Anthropos*, the human, as a monolithic actor? Does this sideline the differences between different humans, including "intersecting systems of oppression" (187)?

And/or students might be introduced to **alternative framings**, such as **Capitalocene**, the **Plantationocene**. Simply picking 'the best' name might not be terribly interesting, but what could be very interesting is investigating the distinctive presuppositions and power of each one. Shneiderman writes: "If one accepts the idea that there is convincing geological evidence for a new epoch (as I do), then there is clearly a need to name that epoch. [...] the history of science shows that it is healthy for science to endure questioning about nomenclature from within and outside of the scientific community. So it is a good sign that scholars from varied disciplines have taken interest in and continue to challenge and propose alternative names or this new epoch."

The Anthropocene is also (of course) **anthropocentric**: Shneiderman contrasts the Copernican revolution and Darwin's theory of natural selection which, like climate change, were scientific revelations with wide and deep implications beyond scientific enquiry — but which *decentred* the human. What -cene might we want to nurture? In *Staying with the Trouble* (2016) Donna Haraway suggests **Chthulucene**, a vision based on making kin across many species: "The chthonic powers of Terra infuse its tissues everywhere, despite the civilizing efforts of the agents of sky gods to astralize them and set up chief Singletons and their tame committees of multiples or subgods, the One and the Many. Making a small change in the biologist's taxonomic spelling, from thulhu to chthulu, with renamed *Pimoa chthulu* I propose a name for an elsewhere and an elsewhen that was, still is, and might yet be: the Chthulucene. I remember that *tentacle* comes from the Latin *tentaculum*, meaning 'feeler,' and *tentare*, meaning 'to feel' and 'to try'; and I know that my leggy spider has many-armed allies. Myriad tentacles will be needed to tell the story of the Chthulucene" (31).

18.

ECOCENTRISM: QUOTATIONS

“What constitutes sustainability—or the contexts or system dynamics that one wishes to maintain—is a normative choice” (Downing et al. 2020).

“The perception that humans are separate *from* and doing things *to* nature reflects a particular, historically situated view of the material world. It is a legacy of the Enlightenment, the very same era during which many elements of our current legal system were established” (Benson 2019).

“It is not inevitable, nor is it wise, that natural objects should have no rights to seek redress on their own behalf. It is no answer to say that streams and forests cannot have standing because streams and forests cannot speak. Corporations cannot speak, either; nor can states, estates, infants, incompetents, municipalities, or universities. Lawyers speak for them, as they customarily do for the ordinary citizen with legal problems” (Stone 2010).

Elmar Altvater, ‘The Capitalocene, or, Geoengineering against Capitalism’s Planetary Boundaries’, in *Anthropocene or Capitalocene*, ed. Jason W. Moore (2016): “The Capitalocene is about ideology as well as energy, class, and machinery. In the Capitalocene, ‘nature’ has been transformed into a capital asset. Nature has been reduced to something that can be valued and traded and used up just as any other asset: industrial capital, human capital, knowledge capital, financial claims, and so forth. This is the ideological way of incorporating nature into capitalist rationality and its monetary calculus. This is, of course, the dominant way of thinking in mainstream economics” (Parenti and Moore 2016)

“The educator who truly loves the new generation, on the contrary, will decide to share with them something she herself considers to be intrinsically good. However, not to impose a particular view of the world, but to offer this new generation the opportunity to first relate to the world” (Vlieghe and Zamojski 2019).



PART V

THEME #5: INDIGENOUS KNOWLEDGES



A farmer in Tunisia uses stones to build a jessour for water harvesting

19.


INDIGENOUS KNOWLEDGES


Decolonising the curriculum and embedding sustainability intersect in many ways. Indigenous knowledges sit at one intersection. We need to ensure — against the grain of various exclusionary and marginalizing dynamics — that our teaching includes the perspectives of a variety of Indigenous scholars, creative practitioners, activists and other voices. Within the classroom, the term ‘Indigenous’ is often best used as a stepping stone to something more specific (an essay, a writer, a community, a history). At the same time, we can also reflect on commonalities and diversity within Indigenous thought and practice. We can also reflect on the construction and operation of indigeneity as a category of law and policy. Angles include:


- **Epistemologies, ontologies, cosmologies.** What variety of ways of being and knowing are there? (see also Case Study #5 Sumak Kawsay)
- **Social movements and alliances.** How is extractivism being resisted by Indigenous groups?
- **Sovereignty.** How do Indigenous nations articulate alternatives to Westphalian sovereignty and settler colonialism?
- **Diverse economies.** What alternative forms of economic life currently exist alongside capitalism?
- **Indigenous futurisms.** How do various Indigenous writers imagine the future?
- **Contextualising and critiquing indigeneity.** Where does the concept come from, what does it do, what is done with it?


20.


INDIGENOUS KNOWLEDGES: FURTHER READING / RESOURCES

 United Nations Declaration on the Rights of Indigenous People, adopted by the UN General Assembly in 2007.

 UNESCO: Local and Indigenous Knowledge Systems. “UNESCO’s Local and Indigenous Knowledge Systems programme (LINKS) promotes local and indigenous knowledge and its inclusion in global climate science and policy processes. LINKS has been influential in ensuring that local and indigenous knowledge holders and their knowledge are included in contemporary science-policy-society fora on issues such as biodiversity assessment and management (CBD, IPBES), climate change assessment and adaptation (IPCC, UNFCCC), natural disaster preparedness (ISDR) and sustainable development (Rio+20, Future Earth).”

 **Worldwide Indigenous Science Network**, founded in 1989. “Traditional knowledge passed on orally and intergenerationally is the last reservoir of sustainable knowledge for our planet. Historical colonialism and genocide, and ongoing globalization, have severed the knowledge of who we are, where we come from, and what we’re here for. It’s led to devastating social, economic and environmental impacts as Indigenous communities are often located in/near intact ecosystems. Often, the target of the most extreme violence are community Elders and Indigenous Cultural Practitioners (ICPs) who serve as leaders and teachers, passing on traditional cultural knowledge and environmental histories as well as social and land management strategies that sustain healthy human populations alongside healthy natural ecosystems, ensuring the survival of their cultures and, ultimately, the planet.”

 Pascoe, Bruce. 2014. *Dark Emu: Aboriginal Australia and the Birth of Agriculture*. “If we could reform our view of how Aboriginal people were managing the national economy prior to colonisation, it might lead us to reform the ways we currently use resources and care for the land. Imagine turning our focus to the exploitation of meat-producing animals indigenous to this country. Imagine freeing ourselves from the overuse of superphosphates, herbicides and drenches. Envisage freeing ourselves from the need of fences, and instead experimenting with grazing indigenous animals and growing indigenous crops.” Published in 2014, this book sparked tremendous debate.


 Kimmerer, Robin Wall. 2020. *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants*. Penguin Ecology. London: Penguin Books. Kimmerer’s highly influential book of


essays brings together her Western scientific knowledge as a botanist with her traditional knowledge as a member of the Potawatomi Nation. “I could hand you a braid of sweetgrass, as thick and shining as the plait that hung down my grandmother’s back. But it is not mine to give, nor yours to take. *Wiingaashk* belongs to herself. So I offer, in its place, a braid of stories meant to heal our relationship with the world. This braid is woven from three strands: indigenous ways of knowing, scientific knowledge, and the story of an Anishinabekwe scientist trying to bring them together in service to what matters most. It is an intertwining of science, spirit, and story—old stories and new ones that can be medicine for our broken relationship with earth, a pharmacopoeia of healing stories that allow us to imagine a different relationship, in which people and land are good medicine for each other.”


■ Gilio-Whitaker, Dina. 2019. *As Long as Grass Grows: The Indigenous Fight for Environmental Justice, from Colonization to Standing Rock*. Boston, Massachusetts: Beacon Press. “Books are born for many reasons. This one emerged as a result of many years of research and activism, which for me has always focused on environmentalism, Native sovereignty, and their intersection. If what the preeminent Indian law scholar Felix Cohen said was true, that Indians are the United States’ miner’s canary that signals the poison gas of the political atmosphere, to extend the metaphor, then in the larger world dominated by the fossil fuel industry all humans have become the miner’s canary. On a planet with a rapidly changing climate and undergoing what many scientists believe is the Earth’s sixth mass extinction, the future of humanity is looking about as bright as it did for American Indians in 1953 when Cohen wrote those words railing against federal Indian policy (known as termination, which was every bit as menacing as it sounded). From an American Indian perspective, we’re all on the reservation now.”


■ Dillon, Grace L. (ed.). 2012. *Walking the Clouds: An Anthology of Indigenous Science Fiction*. Tucson: University of Arizona Press. “It might go without saying that all forms of Indigenous futurisms are narratives of *biskaabiiyang*, an Anishinaabemowin connoting the process of ‘returning to ourselves,’ which involves discovering how personally one is affected by colonization, discarding the emotional and psychological baggage carried from its impact, and recovering ancestral traditions in order to adapt in our post-Native Apocalypse world. This process is often called ‘decolonization,’ and as Linda Tuhiwai Smith (Maori) explains, it requires changing rather than imitating Eurowestern concepts. [...] *Walking the Clouds* confronts the structures of racism and colonialism and sf’s own complicity in them” (Dillon 2012).

📖 Whyte, Kyle P. 2018. ‘Indigenous Science (Fiction) for the Anthropocene: Ancestral Dystopias and Fantasies of Climate Change Crises’. *Environment and Planning E: Nature and Space* 1 (1–2): 224–42. <https://doi.org/10.1177/2514848618777621>. “Portrayals of the Anthropocene period are often dystopian or post-apocalyptic narratives of climate crises that will leave humans in horrific science-fiction scenarios. Such narratives can erase certain populations, such as Indigenous peoples, who approach climate change having already been through transformations of their societies induced by colonial violence. This essay discusses how some Indigenous perspectives on climate change can situate the present time as already dystopian. Instead of dread of an impending crisis, Indigenous approaches to climate change are motivated through dialogic narratives with descendants and ancestors.”

 Johnson, Danielle Emma, Meg Parsons, and Karen Fisher. 2021. 'Indigenous Climate Change Adaptation: New Directions for Emerging Scholarship'. *Environment and Planning E: Nature and Space*. <https://doi.org/10.1177/25148486211022450>. "Although Indigenous peoples' perspectives and concerns have not always been accommodated in climate change adaptation research and practice, a burgeoning literature is helping to reframe and decolonise climate adaptation in line with Indigenous peoples' lived experiences. In this review, we bring together climate adaptation, decolonising and intersectional scholarship to chart the progress that has been made in better analysing and responding to climate change in Indigenous contexts."

 Kidman, Joanna. 2020. 'Whither Decolonisation? Indigenous Scholars and the Problem of Inclusion in the Neoliberal University'. *Journal of Sociology* 56 (2): 247–62. <https://doi.org/10.1177/1440783319835958>. "Indigenous academics who mobilise a form of public/tribal scholarship alongside native publics and counter-publics often have an uneasy relationship with the neoliberal academy which celebrates their inclusion as diversity 'partners' at the same time as consigning them to the institutional margins. This article traces a cohort of Māori senior academics in New Zealand whose intellectual labour is structured around public/tribal scholarship and examines how this unsettles and challenges the problem of neoliberal inclusivity in settler-colonial institutions."

 Graeber, David, and David Wengrow. 2021. *The Dawn of Everything: A New History of Humanity*. London: Allen Lane. This book seeks to illuminate the great variety of societies that have existed throughout human history (against simplistic narratives of the inevitably lost egalitarianism of hunter-gatherer 'small bands'). The early chapters draw extensively on the Wendat philosopher and statesman Kandiaronk: "we find here all the familiar criticisms of European society that the earliest missionaries had to contend with – the squabbling, the lack of mutual aid, the blind submission to authority – but with a new element added in: the organisation of private property." See also John Steckley's *Untold Tales: Four Seventeenth-Century Hurons* (1981) and *The Eighteenth-Century Wyandot: A Clan-Based Study* (2014).

 Yunkaporta, Tyson, and Donna Moodie. 2021. 'Thought Ritual: An Indigenous Data Analysis Method for Research'. In *Thought Ritual: An Indigenous Data Analysis Method for Research*, 87–96. Brill. https://doi.org/10.1163/9789004461642_006. "When Indigenous methodologies focus primarily on data collection in their design, the result can be a perpetuation of colonisation through the data analysis phase [...] In order to resolve this issue, Yunkaporta designed the Indigenous data analysis approach outlined in this chapter. This aligns a relationally responsive approach with hybridised Indigenous versions of complexity theory and thought experiment in order to make the approach recognisable to the academy."

21.

INDIGENOUS KNOWLEDGES: QUOTATIONS

Decolonization is not a metaphor. “Because settler colonialism is built upon an entangled triad structure of settler-native-slave, the decolonial desires of white, nonwhite, immigrant, postcolonial, and oppressed people, can similarly be entangled in resettlement, reoccupation, and reinhabitation that actually further settler colonialism. The metaphorization of decolonization makes possible a set of evasions, or ‘settler moves to innocence’, that problematically attempt to reconcile settler guilt and complicity, and rescue settler futurity” (Tuck and Yang 2012).

Resisting extractivism in Canada. “Through fluid modes of resistance, communities across Canada are reshaping the governance of extractive industries. Ongoing approval of extractive projects, amidst uncertainty about consultation and consent process, has been met with strong resistance from communities and movements. In some cases, their efforts have led to delaying, altering and halting projects as well as to legislative victories, new legal precedents and evolving relationships between peoples, and between people and resources in Canada (Black et al., 2014; Gosine and Teelucksingh, 2008). These resistance efforts have been led largely by Indigenous people, sometimes with support from allies and environmental groups. People have set up temporary blockades and long-term protest camps, launched international boycotts, manually shut down pipelines, taken industry to court and taken to the street en masse to draw attention to injustice and to amplify the voices and demands of those resisting (EJAtlas, 2020). A watershed moment in recent history was the emergence of the Idle No More Movement in 2012 against the Canadian government’s dismantling of environmental protection laws and calling for respect of Indigenous rights and the protection of land, water, and sky. This movement sparked an unprecedented continent-wide network of urban and rural Indigenous people (K.N.N. Collective, 2014). In 2020, again a wide network of Indigenous communities and their allies mobilized to #ShutDownCanada, in solidarity with Wet’suwet’en land defenders resisting the Coastal Gas Link pipeline in BC in face of violent police repression. By blockading rail lines, port entrances, and ferry terminals, these coordinated resistance efforts brought economic activity to a halt, showing “rather forcefully the power that non-elites have to stop economic power in its tracks” (Shantz, 2020, n.p.). We see here the vast networks of frontline struggles joining forces, centring Indigenous struggles, and coalescing around transformative goals such as land restitution (#LandBack) and Indigenous self-determination (Pasternak et al., 2019)” (Gobby et al. 2022).

Complicated relationships with environmentalism. “Many historians trace the genealogy of the modern environmental movement to the ideals of mid-nineteenth-century naturalists and the creation

of the national park system, and the preservation movement that started it. Born from the Manifest Destiny ideologies of western expansion, the preservation movement was deeply influenced by a national fixation on the imagined pre-Columbian pristine American wilderness and the social Darwinist values of white superiority. As this chapter reveals, those legacies carried forth into twentieth-century environmental organizing. The result was a contentious— and sometimes openly antagonistic—relationship between modern environmentalists and American Indians, making the attainment of environmental justice for Native people more difficult” (Gilio-Whitaker 2019).

Political boundaries. “What happens to nationalism, to political boundaries, when allegiance lies with winds and waters that know no boundaries, that cannot be bought or sold?” (Kimmerer 2020).

Submerged lifeworlds. “[...] I seek new approaches by analyzing submerged and emergent perspectives within the extractive zone, or the potential for forms of life that cannot be easily reduced, divided, or representationally conquered or evacuated. [...] My objective is to decolonize the Anthropocene by cataloguing life otherwise, or the emergent and heterogeneous forms of living that are not about destruction or mere survival within the extractive zone, but about the creation of emergent alternatives. Unlike these doomsday approaches that play with destruction scenarios on the scale of the planetary, I study at the level of submerged life worlds within Indigenous territories, while pointing to African-descendent territories and ontologies, modes of living that, even if not often perceivable, exist alongside extractive capitalism. For the spaces, movements, artwork, and intellectual and activist genealogies I study, the paradigm of “no future” has already taken place and we are now on the other side of colonial catastrophe” (Gómez-Barris 2017).

Fire. “In his thirty-two-minute independent film *Mencer: Ni Pewma* (2011), Mapuche filmmaker Francisco Huichaqueo draws attention to the current dystopic landscape of the southern territories in Chile. [...] The collective act of lighting fire to the land becomes the supreme example of communal sacrifice, and, to borrow Richard’s phrase, its own ‘ritual exorcism’ of settler violence. Invoking the nightmare (or *ni pewma*, bad dream) as a descent into colonial and neocolonial hell, Huichaqueo’s visual language experiments with the dystopic surreal as a way out of the trap of realist representation” (Gómez-Barris 2017).

Bureaucratic Orientalism. “[...] my main thesis is that it takes modern means to become traditional, to be indigenous. A form of ‘bureaucratic Orientalism’ — to borrow Edward Said’s term (Said, 1978) — has been devised, constructing and reaffirming the Other through the minutiae of administrative procedures and contemporary representational processes” (Hirtz 2003).

A concept in the world. “In sharp contrast to the increasingly cautious academic approach to indigeneity, however, the concept has traveled, been transformed, and enthusiastically deployed the world over” (Dove 2006).

Dismantling the Indigenous vs. Western knowledge binary. “Certainly, what is today known and

classified as indigenous knowledge has been in intimate interaction with western knowledge since at least the fifteenth century. In the face of evidence that suggests contact, variation, transformation, exchange, communication, and learning over the last several centuries, it is difficult to adhere to a view of indigenous and western forms of knowledge being untouched by each other” (Agrawal 1995).

PART VI

THEME #6: DEGROWTH & POSTGROWTH



Workers at the Nordex USA Nacell manufacturing facility

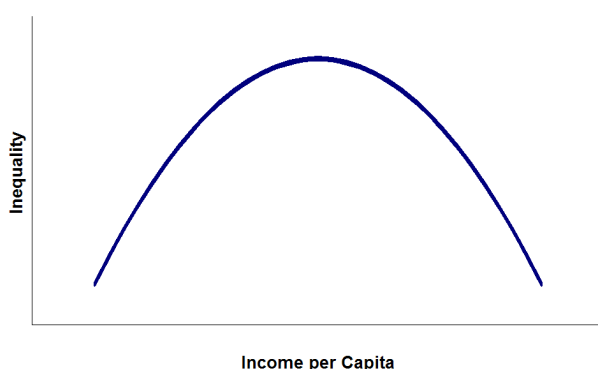
22.

DEGROWTH AND POSTGROWTH

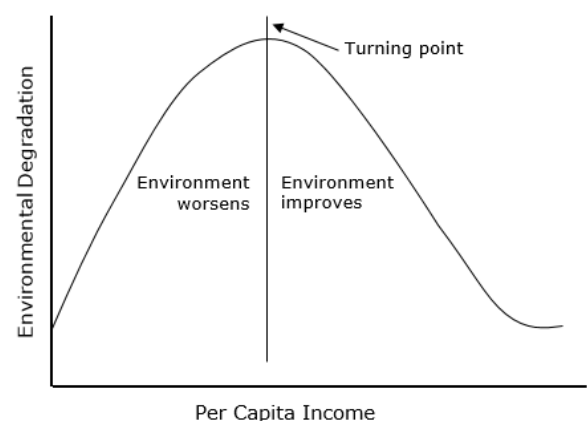
Modern economies are based on the theory of **economic growth**, but indefinite growth is not feasible in a finite planet. Degrowth and postgrowth are overlapping philosophies that recognise the need for profound socio-ecological transformation. There is indeed a limit to growth, so planetary boundaries and social wellbeing must be protected to avoid or limit possible tradeoffs. (See Doughnut Economics illustration under Theme 1 for more).

Degrowth is a movement to reduce the environmental impact of human activities, and tends to focus on reorganising patterns of economic activity, to reduce unnecessary human consumption, production, pollution, infrastructure creation, resource use, and trade. For example, some degrowth transitions to reduce pollution can aim to cap CO₂ emissions, cap resource use and extraction, suspend new infrastructure, such as new nuclear plants, dams, and highways, promote organic farming, and tax activities known to destroy the environment to reduce waste generation (Cosme, Santos, and O'Neill 2017).

Proponents of “green growth” claim that we can **decouple** economic growth from environmental degradation, saying that indefinite economic growth eventually *will* become possible without crossing planetary boundaries. Degrowth and postgrowth advocates argue that this is not possible (or at least, not possible quickly enough to prevent irreversible ecological catastrophes).



Original Kuznets curve



Environmental Kuznets curve, showing hypothesised development

Sometimes the green growth argument visualises the Environmental Kuznets Curve. This claims that a country's economic development initially leads to a deterioration in the environment, but after a certain level of development has been reached, it can afford to produce in more environmentally friendly ways. At this point, decoupling supposedly takes place. Even from the perspective of climate change alone, there are two big problems with this argument:

- 1) **It probably isn't true** — the empirical evidence is mixed at best. Some countries, including the UK, do appear to have decoupled GDP growth from carbon emissions. But this is partly because the UK has deindustrialised. Many manufactured goods (and food, and other resources) are now imported. This strategy wouldn't work for the planet as a whole.
- 2) We've got a **tight carbon budget** for limiting global warming to well below two degrees. Even if economic development really were reliably characterised by the environmental Kuznets curve, there is not enough capacity to keep pursuing fossil-driven development for a few more years. Global carbon emissions need to peak and start to fall right away.

Degrowth is a transformative initiative that proposes a reduction in production and consumption for wealthy nations, a reduction in material throughput reflected in prudent lifestyles and lean economy. Degrowth is also often connected with proposals to use alternative economic indicators ("Beyond GDP"), to measure what is really valuable, rather than using GDP growth as a proxy for all policy success. Think of degrowth as a practical reaction in support of climate and environmental justice. The target is to reduce the ecological impact of economic development, decrease economic inequalities, and improve the overall well-being of humans.

However, degrowth proposals have been **criticised** on the grounds that they do not apply to developing countries or countries in the Global South, considering their high levels of deprivation, inequality and conventionally slow economic growth rates. In reality, many developing countries are not willing to give up on economic growth as much as they yearn for ecological protection. In recent years, more work has been done to **join up degrowth with decolonial work and postdevelopment theory**. In this sense, degrowth challenges the standard development paradigm from a social as well as an ecological standpoint — observing the double-edged nature of development, which can both improve quality of life for many people in the short term, and yet further neocolonial power relations.

Irrespective of existing debates, the motive for degrowth is to improve quality of life and advance environmental sustainability. Degrowth emphasises changing priorities of society from economic growth and production to a society based on sustainability, wellbeing, concern for environment and co-operation.

Degrowth Proposals

1. Income and wealth redistribution both within and between countries

Policy proposals on the redistribution of wealth and income within and between countries tend to focus on four major domains, namely **socioeconomic opportunities, equity, access to goods and services, and global governance** (Cosme et al., 2017). Various forms of **Universal Basic Income** (UBI), also known as citizen's income, have been proposed and piloted. These propose to delink income from wage employment to cushion individuals from uncertain market dynamics. Delinking the basic or citizen's income from wage employment promotes access to goods and services, especially the socially important ones like food and healthcare. However, UBI is also **controversial** for many reasons, including the risk that it will be used to shrink public sector services. Furthermore, introducing maximum pay ratios or salary caps is likely to promote equity in wealth and income redistribution. Another strategy is reducing the size of companies to promote equity in income and wealth distribution whilst allocating differentiated responsibilities to the Global North and Global South. This is in line with feminist scholars advocating for the need to remain gender and geographically sensitive when implementing degrowth policies at a global level while paying attention to governance.

But differences in pay slips is only a small part of the story. Income from capital (owning property, stocks and bonds, etc.) is currently a far more powerful driver of inequality. Reform of the finance sector, often including a strong progressive **wealth tax**, is also part of many degrowth programmes. There are other ideas such as promoting job sharing among the populace, **reducing the number of working days in a week** to guarantee work opportunities for everyone. Thus, redistributing wealth and income between and within countries centres around socioeconomic opportunities, equity, global governance, and access to goods and services.

2. Reduce environmental impact of human activities

As a concept that has transitioned to a movement, degrowth advocates propose reducing the environmental impact of human activities. This includes reducing unnecessary human consumption, pollution, infrastructure creation, production, resource use, and trade. For example, some of the proposals to reduce pollution aim to cap CO₂ emissions, promote organic farming, and tax human activities known to destroy the environment. Kallis (2011) proposes the need to reduce overconsumption by regulating advertising, suspending new infrastructural development activities, putting caps on CO₂ emissions, creating a strong and progressive tax system that targets environmentally damaging activities, mitigating large-scale and resource-intensive production, banning nuclear output and other activities that heavily damage the environment, regulating resource use and extraction, and putting more investment in sources of renewable energy. Along similar lines, Hall (2011) proposes regulating the tourism industry to protect the environment and incentivise local production and consumption. Therefore, policy proposals on

environmental protection as a primary goal of degrowth primarily focus on reducing consumption and production, regulating resource use and extraction, curbing pollution, and enhancing trade's social and ecological efficiency.

3. Transition from a materialistic to a participatory and convivial society

What might a convivial and participatory society be like? Advocates tend to focus on four major topics, namely: **free time, democracy and participation, voluntary simplicity and downshifting, and community building, education and value change**. No surprise here, because reducing working hours for everyone as proposed in the category of 'Income and wealth redistribution' will promote **free time**. Free time is a significant social indicator of quality of life, since it reduces dependence on economic activity. Apart from free time, degrowth crusaders suggest that people might embrace **frugality** to lower overconsumption and overindulgence. Because human livelihoods are interdependent, frugality and voluntary simplicity may pose risks: in practice, some people make their basic living by supporting the overconsumption of others. While frugality and efficiency are inseparable within the degrowth landscape, frugal lifestyles need to be voluntary, but policies that facilitate or encourage frugality are welcome.

Another proposal under this theme is the need to promote **political participation**, for example by creating caps on political and electoral spending. Other ways of promoting democracy and participation within a degrowth framework include creating democratic institutions tasked with advancing degrowth proposals, and making these democratic institutions independent. Democratisation of workplaces is another aspect of promoting political participation. Overall, there is consensus among degrowth scholars on a convivial and participatory society within a degrowth framework. Recommendations range from investing in socially important public welfare sectors, to enhancing value change and increasing investment in restoring and strengthening local communities.

Finally but most importantly, degrowth advocates propose the need to **introduce and incentivise educational programmes on the ecological limit of the planet and sustainability strategies that can be adopted to reduce the risk of exceeding this limit ...** without forgetting the need to preserve and promote traditional language, techniques and knowledge as a way of community building.

4. Degrowth and postgrowth

Degrowth and postgrowth have a lot in common, and sometimes the terms may be used interchangeably. One way of looking at postgrowth is as a recent effort to rebrand, reboot, and refocus degrowth (since degrowth is by now a somewhat broad and heterogenous movement). Tim Jackson distinguishes degrowth and postgrowth quite strongly in his influential *Prosperity without Growth* (2009 and 2017):

The dilemma of growth has us caught between the desire to maintain economic stability and the need to remain within ecological limits. On the one hand, endless growth looks environmentally unsustainable; on the other hand, degrowth appears to be socially and economically unstable. [...] [W]e need convincing macroeconomics for a 'post-growth' society. One in which neither economic stability nor decent

employment rely inherently on relentless consumption growth. One in which economic activity remains within ecological scale. One in which our ability to flourish within ecological limits becomes both a guiding principle for design and a key criterion for success. [...] [D]egrowth advocates have no problem at all accepting the first horn of the growth dilemma: that growth is unsustainable. But they tend to deny the validity, or at least diminish the importance, of the second. Degrowth is not necessarily the same thing as negative growth, argue its advocates. And so it doesn't have to lead to instability. But this isn't an entirely satisfactory answer – in part, because it gives us too little to go on in building a post-growth macroeconomics.

In *Doughnut Economics*, Kate Raworth suggests “growth agnosticism” rather than degrowth.

23.

DEGROWTH: ACTIVITY SEEDS

Like the other activity seeds in this toolkit, these are deliberately flexible and light-touch: you'll know how best to root them in your teaching. Some examples for classwork or homework are:

- **Influence behavioural change.** As 'homework', set students tasks to contribute to a reduction in production and consumption of energy. At the end of the session, encourage students to use less carbon for the next week and have them report back in the next class. Suggest ways they can do this – hire a bicycle, use timed heating, reduce shower time, ditch plastic bottles and straws, start using reusable water bottles, sort waste (recycle, general and compost). Invite them to brainstorm and research more ideas. Frame it as a learning exercise: ask students to reflect on what makes these changes possible or impossible, easy or hard, cheap or expensive, satisfying or frustrating. Based on these observations, what kind of behaviour change could be driven simply by raising awareness? What changes might require bigger social shifts to become properly established? What sort of social shifts — changes to university policy, or at the local government or national level, or even more profound and wide-reaching shifts? How do these behaviour changes relate to privilege and oppression? You could play with a competitive element: who managed to reduce their personal carbon footprint by the most?
- **Ask students which nations can degrow easily and which nations cannot and why.** This is a follow-up to the debates on degrowth not being easily applicable to every region, particularly poorer countries who are trying to attain 'developed' status by catching up to wealthier countries. Further reading: Escobar, Arturo. 2015. 'Degrowth, Postdevelopment, and Transitions: A Preliminary Conversation'. *Sustainability Science* 10 (3): 451–62. <https://doi.org/10.1007/s11625-015-0297-5>.
- **Put your imaginations to work.** Here students are nudged to imagine their life in a degrowth society. What would change, what would the secondary effects be? How might people internalise the values of a degrowth society? What would life beyond GDP reliance really look like?
- **Debate public perceptions of green growth vs. degrowth.** Allocate students to groups for this activity. Critics of degrowth tend to see it as a relatively radical stance, and an impractical one. Proponents of degrowth may or may not agree that it is a revolutionary philosophy. They generally see green growth as impractical and illusory, sustained by a series of misleading discourses: **greenwashing, discourses of delay, techno-fixes, and climate denialism.** Explore degrowth in relation to these discourses. Further reading: Lamb, William F., Giulio Mattioli, Sebastian Levi, J.


Timmons Roberts, Stuart Capstick, Felix Creutzig, Jan C. Minx, Finn Müller-Hansen, Trevor Culhane, and Julia K. Steinberger. 2020. 'Discourses of Climate Delay'. *Global Sustainability* 3. <https://doi.org/10.1017/sus.2020.13>.

- **Debate GDP and alternative macroeconomic indicators.** GDP (Gross Domestic Product) is effectively a measure of monetary transactions over the course of a year. Economic growth means that this number (adjusted for inflation) is going up. There are obvious limitations to this as a method for gauging the overall success: for example, GDP can't differentiate between building new housing, and building housing to replace housing lost in a natural disaster.
 - Invite students to think imaginatively about measurement and governance. If they could magically measure *anything*, what would be most useful to steer public policy?
 - Why might wellbeing be challenging to define? Why might it be challenging to measure? What are some of the perils and pitfalls of capturing happiness data directly (compare Bhutan's Gross National Happiness)?
 - How does GDP growth relate to growth at a smaller scale? Why do companies (and other organisations, including universities) always try to grow? What are the pitfalls? Can we imagine alternatives?
 - Why do some people advocate so fiercely for Beyond GDP metrics? How might decentring GDP be an effective intervention? Is it really that radical — couldn't economies continue in just the same way as they did before, even if they measure success in new ways?
- **Debate Universal Basic Income.** UBI has proponents (and critics) from both the left and the right. Why is this the case? Are they really talking about the same thing?


24.

DEGROWTH AND POST-GROWTH: FURTHER READING / RESOURCES

 *Pluriverse: A Post-Development Dictionary* (AUF, 2019). Edited by Ashish Kothari, Ariel Salleh, Arturo Escobar, Federico Demaria and Alberto Acosta. Download full ebook for free (PDF). Creative Commons licence.


 'Green growth vs degrowth: are we missing the point?' Includes a nice accessible introduction to decoupling.

 Ecology and Society: Planetary Boundaries: Exploring the Safe Operating Space for Humanity

 Assessing the degrowth discourse: A review and analysis of academic degrowth policy proposals.

 World Economic Forum: Beyond GDP

 Convivialist Manifesto (and Second Convivialist Manifesto).

 Beyond Growth 2023 Conference.

25.

DEGROWTH AND POST-GROWTH: QUOTATIONS

Origins. “Protests erupted around the world in the 1960s and 1970s to highlight international civil rights, anti-war, feminist, gay liberation and student concerns along with a range of environmental and anti-consumerist issues. [...] As all kinds of movements proliferated, changes in laws, policies and everyday culture ensued. [...] It is in this context of heightened debate and widespread dismay that the degrowth movement sprang to life in Europe and spread further afield. The term ‘décroissance’, later translated into ‘degrowth’ in English, began as a provocative slogan used by activists in the early 2000s. The French political scientist and editor Paul Ariès has referred to degrowth as a ‘missile word’, intentionally making people question the ‘growth is good and more growth better’ flag under which all nations seemed to have united in economic terms” (Liegey and Nelson 2020).

Misunderstandings. “Most significantly, the word ‘degrowth’ has misled to the extent that its prefix and association with words such as decline and diminish seem to indicate that degrowth means austerity, puritanism and even poverty. The minimalist simple-living aspect of degrowth seems to confirm such suspicions. Especially since the global financial crisis broke during 2007–8, with persisting consequences, degrowth sounds unsettling. In contrast, degrowth theorists and activists see degrowth as establishing secure and safe lives, fulfilling everyone’s needs in collaborative and collective ways, as celebratory and convivial. [...] The degrowth principle of living within Earth’s regenerative limits in socially equitable and collectively supportive ways addresses both global and environmental crises” (Liegey and Nelson 2020).

Degrowth and postdevelopment. “In other words, to fully understand the emergence and potentiality of degrowth and postdevelopment it is important to consider, first, the entire ensemble of TDs [Transition Discourses] and, second, the bridges that can be established between northern and southern TDs, to come up with a clearer picture of what might constitute a radical and effective politics for transformation. Succinctly stated, those engaged in transition activism and theorising in the North rarely delve into those from the South; conversely, those in the South tend to dismiss northern proposals too easily or to consider them inapplicable to their contexts” (Escobar 2015).

“First, it is important to resist falling into the trap, from northern perspectives, of thinking that while the North needs to degrow, the South needs ‘development’; conversely, from southern perspectives, it is important to avoid the idea that degrowth is “ok for the North” but that the South needs rapid growth, whether to catch up with rich countries, satisfy the needs of the poor, or reduce inequalities; while

acknowledging the need for real improvements in people's livelihoods, public services, and so forth, it is imperative for groups in the South to avoid endorsing growth as the basis for these improvements; a key criteria is that growth and the economy should be subordinated to BV [and the rights of nature, not the other way around]" (Escobar 2015)

"Two key areas of debate closely related to PD [postdevelopment] are the notions of Buen Vivir (Good Life or collective well being according to culturally appropriate conceptions; *sumak kawsay* in Quechua and *suma qamanã* in Aymara) and the rights of Nature. Defined as a holistic, de-economized view of social life, Buen Vivir "constitutes an alternative to development, and as such it represents a potential response to the substantial critiques of postdevelopment" (Gudynas and Acosta 2011, p. 78). Very succinctly, the Buen Vivir (BV) grew out of indigenous struggles as they articulated with social change agendas by peasants, Afro-descendants, environmentalists, students, women, and youth. Crystallised in the recent Ecuadorian and Bolivian constitutions, the BV "presents itself as an opportunity for the collective construction of a new form of living" (Acosta 2010, p. 7; Gudynas 2011a, b). Echoing indigenous ontologies, the BV makes possible the subordination of economic objectives to ecological criteria, human dignity, and social justice. Buen Vivir is not purely an Andean cultural-political project, as it is influenced by critical currents within Western thought, and it aims to influence global debates (Escobar 2015).

"[...] given degrowth's focus on 'planned yet adaptive ... downscaling of the economy', or on reducing material throughput, one critical issue is overlooked. What if *topology* matters as much as scale, when considering economic and political structures? The word topology attends to *patterns of social relations* – both among people (mediated by discourses, institutions and practices) and more materially with 'nature' (mediated through technologies, economies and ecologies). [...] A crucial feature of the pluriverse, is the rich diversity of socio-material topologies. These entail *radically different patterns* of relating, for example, with animals and plants as persons, with forests as powerful sacred forces, and with other worlds through intercultural hospitality" (Stirling and Saurabh 2021).

Conviviality. The term conviviality was used by Ivan Illich in his 1970s writing about freedom, technology and technocratic society. In recent years convivialism has been transformed by its encounter with degrowth (including via the 2013 *Convivialist Manifesto*).

"As an alternative to technocratic disaster, I propose the vision of a convivial society" (Illich 1973).

From the *Convivialist Manifesto* (2013):

- "Principle of common humanity: beyond differences of skin colour, nationality, language, culture, religion, wealth, gender, or sexual orientation, there is only one humanity, which has to be respected in each and every one of its members.
- Principle of common sociality: human beings are social beings for whom the greatest wealth is the

wealth of social relationships.

- Individuation principle: in agreement with the two aforementioned principles, a legitimate politics is one which enables anyone to assert and develop, at best, their singular individuality, by increasing his or her power to be and behave without harming others.
- Mastered and creative confrontation principle: because everyone is destined to express his or her singular individuality, it is natural for humans to oppose each other. It is, however, legitimate to do so only as long as it does not endanger the framework of common sociality which makes this rivalry a fertile and non-destructive one.”

“Redistributive taxation, taxes on international capital movement and a tightened control on tax havens, is hoped to secure enough funds to finance low economic cost-high welfare public investments, e.g. in community education or health and in convivial goods, such as new public squares, open spaces, community gardens, etc.” (Kallis 2011).

Beyond GDP. “The concept of ‘gross domestic product’ (GDP) was created and used in the mid-1930s to measure the impact of the New Deal on the US economy. Subsequently, GDP would become the main indicator of the state of national economies [...] Although often regarded in positive ways, GDP growth simply indicates a total monetary amount of production and services traded, disregarding any of the environmental and social implications of its components. Hence, a fire in a chemical factory is good for GDP growth. Meanwhile a very pleasant ride on a bike in the forest with friends and family is not even captured by GDP. Efforts have been made to correct such absurdity, for instance by creating metrics such as the Genuine Progress Indicator (GPI). However, the GDP maintains its status as the prime indicator of the state of society, blinding us to the key social and environmental challenges that we face as humans on planet Earth” (Liegey and Nelson 2020).

PART VII

CASE STUDIES

26.

CASE STUDY #1: READING FILMS ECOCRITICALLY (FILM STUDIES)

We often explore films in which the environment is very prominent. But we can also read any film (or novel, or photograph, or object) in an ecocritical manner. For me, there are three possible methodologies of ecocritical reading.

#1 Thematic. Students can analyse character, story, plot, mise-en-scène, etc. with an attention to questions of climate or environment. They can also attend to ‘background’ details — plants, animals, insects, weather, infrastructure, energy use, assumptions embedded in dialogue. In a famous scene in *The Graduate* (1967), Benjamin Braddock (Dustin Hoffmann) is approached at a party by his father’s new law partner, Mr. Robinson (Murray Hamilton). Benjamin fears a confrontation about his secret affair with Mrs. Robinson (Anne Bancroft). Instead, in serious tones, arm around Benjamin’s shoulders, Mr. Robinson imparts the wisdom of the day: “There’s a great future in plastics.” Of course Mr. Robinson doesn’t mention that plastics are made from fossil fuels, or the centuries they can take to decompose. This moment beside the pool can be interpreted in terms of plot tension. Students can explore how capitalist logic intersects with gender, race, and social class, as one middle class white man gives his unsolicited investment advice to another. An ecocritical reading can do all this, as well as reflecting on mid-century extractivism and expansionism, and rival visions of “the future.”

#2 Perceptual. Sharon Lockhart’s *Double Tide* (2009) comprises two long takes of a woman digging clams. Filmed on a rare day when there is a double low tide, one at dawn and one at dusk, the film uses the technique of close-miking the clam harvester, while shooting at a distance, slowly and incrementally zooming in. Sensory perception is drawn to the sucking sounds of clams being pulled out of the mud, while the deliberate yet infinitesimal movement of the camera allows the viewer to appreciate the vastness of the changing landscape as well as the labouring figure who ever so slowly comes into view. A film like *Double Tide* requires the viewer to alter their viewing habits, to slow down their perception, to train their eyes and ears to notice the minutiae of the image, and to recognise the interplay between the environment and the human laborer. Yet we can also train ourselves to attend to any film like this. We might even dwell in this way on a fast-paced action scene (perhaps with the sound down) to find its sliced-up fragments of sky, mountain, sea, meadows, fields, waterfalls, and what-have-you. How are these flashes instrumentalised within the action sequence?

#3 Material. Cinema can be very resource intensive. Action blockbusters, for example, are filled with

explosions and flames. Some effects are tangential, such as a chase scene that passes through a fireworks display. While the plot might not require such pyrotechnics, these serve to make the scene more spectacular. Yet the fireworks are set off in the real world, perhaps over multiple takes, and they pollute the real world. Visual effects can be added as CGI, but digital technology also has ecological impact. As well as production, we can think about the materiality of viewing. What is the carbon cost of platforms like YouTube and Netflix? How have pandemic lock-downs transformed our norms around the moving images, from ballet on Marquee TV to meetings on Zoom? Training ourselves in the material ecocritical approach allows us to look past the story, and to calculate (or at least register) the material effects of the image on screen.

Alisa Lebow

27.

CASE STUDY #2: GAMES, ECOCRITICISM, & SYSTEMS THINKING (ENGLISH)

Video Games: Critical and Creative Writing is an elective module that combines game studies, game design, and writing for games. There are ways to explore sustainability in all three strands.

#1 Game studies. Some games we study already have prominent ecological themes. For example, *No Man's Sky* (2018) uses procedural generation to create billions of unique ecosystems for players to explore. But what might it mean that all this biodiversity is encountered framed through the same set of game mechanics? What relationships between the human and the nonhuman are encouraged or presupposed by these mechanics? *Octodad: The Dadliest Catch* (2014) challenges the player to be a 'good dad' in a white, middle class, heteronormative family. We discuss Bo Ruberg's excellent reading of Octodad as a game about queerness and passing ... but also explore the fact that the main character is literally an octopus. In a week on so-called 'serious' games, we discuss games from Red Cross Red Crescent Climate Centre developed to foster climate resilience. At other points, students may be invited to develop ecocritical readings of games whose ecological themes are less prominent, e.g. *Night in the Woods*, *Baba is You*, *The Passage*, *Hades*, *Queers in Love at the End of the World*.

#2 Writing for games. "Do you like our owl?" Our week on writing dialogue involves comparative close readings of 'the same' scene from two versions of *Blade Runner*, the movie and the game (plus a similar scene from *The Big Sleep* (1964)). Both versions feature a luxury artificial owl. Now that I've taught these texts a few times, I have a sense for how meticulous moment-by-moment attention might open up themes such as critical conservation, posthumanism and critical humanism, ecofeminism, natureculture, interspecies entanglement, or technologically-mediated relations with animals. For me the challenge is now to resist steering the collaborative interpretation too much. I use leading questions, but when the answers are unexpected, I try to support students to develop fresh readings. If it goes well, we all feel like Private Investigators and/or Wise Owls. In a different week, on worldbuilding, I suggest students move between wild and silly brainstorming exercises, and more considered periods where they try to connect up their ideas cohesively. There are ecological angles to both. The brainstorming phase might estrange or dislodge unexamined assumptions about environment, economy, governance, property, the commons, etc. The phase where they revise is a good opportunity for some systems thinking. Where does waste go? What makes energy? What invisible infrastructures are implied? What processes might interact in non-obvious ways?

#3 Game design. Games are a great way to teach **emergence**. For instance, the improv game *Assassin* and Conway's *Game of Life* are two systems whose rules are fairly simple, but whose emergent dynamics are not easy to predict. There are also opportunities to think about 'balance' and **feedback loops** in both ecosystems and games. A reinforcing feedback loop: a warming climate increases demand for air conditioning, which may lead to higher carbon emissions. A balancing feedback loop: more evaporation results in more clouds forming, reflecting more solar radiation. A predator-prey cycle (rabbits and foxes) is an example of both kinds of loop at once: growth in the rabbit population produces growth in the rabbit population; but growth in the rabbit population also produces growth in the fox population. Games are filled with subtle and not-so-subtle feedback loops. In a combat game, you might defeat an enemy but lose health and ammo, making the next victory less certain (a balancing feedback loop). When you position a Tetris piece incorrectly, it reduces your time and space in placing the next one, making more errors likely (a reinforcing feedback loop).

28.

CASE STUDY #3: THE POLITICAL ECOLOGY OF THE GARDEN (EDUCATION & SOCIAL WORK)

In the northern part of Sussex campus, on the edge of the Downs, is the **Sussex Forest Food Garden**. There is a second-year elective module associated with the garden, rooted in a civic ecology model. Students design an aspect of the garden, which they then hand over to the next year's cohort to plant. The module emphasises working with the land and communities – within and beyond the university – and fostering resilience through interrelationships between the natural world and collective human action. It makes space for student agency to respond to human-induced climate change and biodiversity loss, and embraces the uncertainty inherent in such a complex, contingent and indeterminate endeavour.



In Week 3, students are taught about interpreting the politics of landscapes, especially gardens. We use a chapter in Rebecca Solnit's *Orwell's Roses* (2021). As Solnit writes: "A garden is an ideal version of nature filtered through a particular culture [...] A garden is what you want (and can manage and afford), and what you want is who you are, and who you are is always a political and cultural question. It's true even of vegetable gardens – of whether you plant cabbages or chillies – though more so with pleasure gardens" (Solnit 2021). There is a **lecture** and a **workshop**.

#LECTURE. 1a. Landscape as language. A poem can be about a garden. Can a garden be about a poem? Anne Whiston Spirn writes in *The Language of Landscape* that landscape "contains the equivalent of words and parts of speech – patterns of shape, structure, material, formation, and function. All landscapes are combinations of these. Like the meanings of words, the meanings of landscape elements (water for example) are only potential until context shapes them. Rules of grammar govern and guide how landscapes are formed, some specific to places and their local dialects, other universal. Landscape

is pragmatic, poetic, rhetorical, polemical. Landscape is scene of life, cultivated construction, carrier of meaning. It is a language” (Spirn 1998, 15).

1b. Landscape intertextuality. By exploring poetry, song, paintings, and other culture about landscapes, we can open up the landscapes themselves as forms of culture. And like other forms of culture, landscapes have embedded politics we can attempt to locate and debate. Solnit writes that “nature is political. So are gardens. Flowers. Trees. Water. Air. Soil. Weather.” (p.154). As the poet and “avant-gardener” Ian Hamilton Finlay writes, ‘Certain gardens are described as retreats when they are really attacks’ (cited in Solnit, p. 150). Finlay’s own installation-garden, Little Sparta, is intricately expressive, filled with hundreds of artworks including sculptural concrete poetry.

1c. Contextualising garden features historically. But Finlay’s Little Sparta may feel like an extreme case — a garden that practically sings its stories. How can we learn to decipher the other gardens, the ones that only whisper and murmur? Here we benefit from **historicising**. At first, a garden may feel like it’s just a mix of the unavoidable and the arbitrary. Things are the way they are because (a) that’s how they work best, or (b) because somebody happened to like them that way (or just didn’t care). Exploring the histories behind a few features can transform the garden as a whole, allowing meaning and potential meaning to pervade it through and through.



Sir Joshua Reynolds, 1761-66. The Honourable Henry Fane (1739-1802) with Inigo Jones and Charles Blair

We focus especially on the **C18th English garden**. As the century began, stiff neoclassical formalism was going out of fashion among the landed elite. Nature was no longer seen as an unruly realm in need of taming. Instead, the work of landscape designers like William Kent and Capability Brown was praised for subtlety and sensitivity to nature's existing beauties.

The ha-ha — a fence concealed in a ditch, creating a boundary, while preserving the illusion that the estate is continuous with the surrounding countryside — is a very neat illustration. More broadly, as Solnit writes: “The same kind of laborious earthmoving and outdoor plumbing as at Versailles might be employed, but to make serpentine streams and rolling terrain that hid the handiwork behind it. Nature was supreme except that English taste and money were her master.”

Such gardens did enact an aesthetic revolution, eventually feeding into the rustic spinneys and ruined hermitages of Romantic garden landscapes. But Solnit describes how these gardens also made a deeply conservative argument, that “English aristocracy and the social hierarchy were themselves natural, that the aristocrats' power and privilege was rooted in the actual landscape, even as the humbler dwellers in the landscape were uprooted in the enclosure acts and driven to industrial labor in cities or to emigration.”

1d. Enclosures of the commons began in the Middle Ages. Raymond Williams writes: “Poets have often lent their tongues to princes, who are in a position to pay or to reply. What has been lent to shepherds, and at what rates of interest, is much more in question [...] Sidney's *Arcadia* [1593], which gives a continuing title to English neo-pastoral, was written in a park which had been made by enclosing a whole village and evicting the tenants” (Williams 1973). Between 1725 and 1825, as English landowners began to frame themselves as unobtrusive stewards of nature's wisdom and beauty, they also appropriated around 6 million acres of common land. Uprooted, impoverished rural working class were driven to the industrialising cities.

Commons historian Peter Linebaugh describes a trinity of brutally transformative forces at the time: **enclosure, slavery, mechanization**. As Solnit writes, “There might be virtuous ways to love nature, but the love of nature is no guarantee of virtue” (156). She cites English Heritage (2013): “Both the merchants and the members of the British landed elite who were involved in the proliferation of country houses in the late 17th century (the latter to consolidate their status and the former to gain entry into that elite) increasingly utilised notions of gentility, sensibility and cultural refinement in part to distance themselves from their actual connections to the Atlantic slave economy” (in Solnit 2021, 163).

1e. We finish by jumping forward and exploring George Orwell's relationship with gardening. “The source of his self-regenerative power lay in his joy in the ordinary, common experiences of day-to-day existence and particularly of contact with nature” (George Woodcock, Orwell's friend, cited in Solnit, 46).

#WORKSHOP. Writing the Sussex Forest Food Garden. If landscapes can be interpreted, then they can also be written. “Landscape architects, gardeners and architects have been ‘writing’ landscape stories since the early days of civilization” (Alon-Mozes, 2012, 31). This session aims to support and inspire

students to decide what they want to do, and what they want to say, with the Sussex Forest Food Garden. It is in three parts:

- 2a. Identify the political & cultural in landscape stories
- 2b. Identify potential themes for the Forest Food Garden landscape story
- 2c. Consider uncertainty in garden designs (both in the terms of metaphor and natality)

2a. In small groups, students discuss the Spirn quotation from the lecture: “Landscape is scene of life, cultivated construction, carrier of meaning. It is a language.” (Spirn 1998, 15). They come up with **examples of landscape as language**, and feed these back to the whole group.

We use these as springboard into a discussion of **metaphors**. Plants provide us ‘with metaphors and meanings and images, with stems, offshoots, grafts, roots and branches, information trees, seeds of ideas, fruits of our labor, cross-pollinations, ripeness and greenness, and with the symbolic richness of the things we do to our domesticated plants: weeding and pruning, sowing and reaping, and so much more’ (Rebecca Solnit, 2021, p. 126). Students are invited to explore these, and suggest more of their own.

‘Il faut cultiver notre jardin’ (Voltaire). Within sustainability discourse, gardening metaphors are common. But by now it’s clear that gardening is not just one thing! Different gardens have different politics. So if we do accept a role as the planet’s gardeners, this raises as many questions as it answers, as Clark and Munn (1986) point out: “What kind of garden do we want? What kind of garden can we get? The first of the questions—‘What kind of garden do we want?’—ultimately calls for an expression of values. The values on which we have based this study—the kinds of garden we want—are suggested in our choice of title: *The Sustainable Development of the Biosphere*. The common sense meaning of ‘sustainable’ is a good first approximation of our intended meaning. We seek to distinguish gardening strategies that can be sustained into the indefinite future from those that, however successful in the short run, are likely to leave our children bereft of nature’s support.”

2b. Experiment with designs inspired by literary texts.

In pairs, students are asked to spend about fifteen minutes doing the following:

- Read *one* of the three texts (Louise Glück’s ‘Nostos’, Danielle Legros Georges’s ‘Lingua Franca with Flora’ and Michael Rosen and Helen Oxenbury’s ‘We’re Going on a Bear Hunt’).
- Identify one or two themes to translate into a garden design.
- Sketch a rough garden design that incorporates these themes (focusing on the themes, not the literary texts).

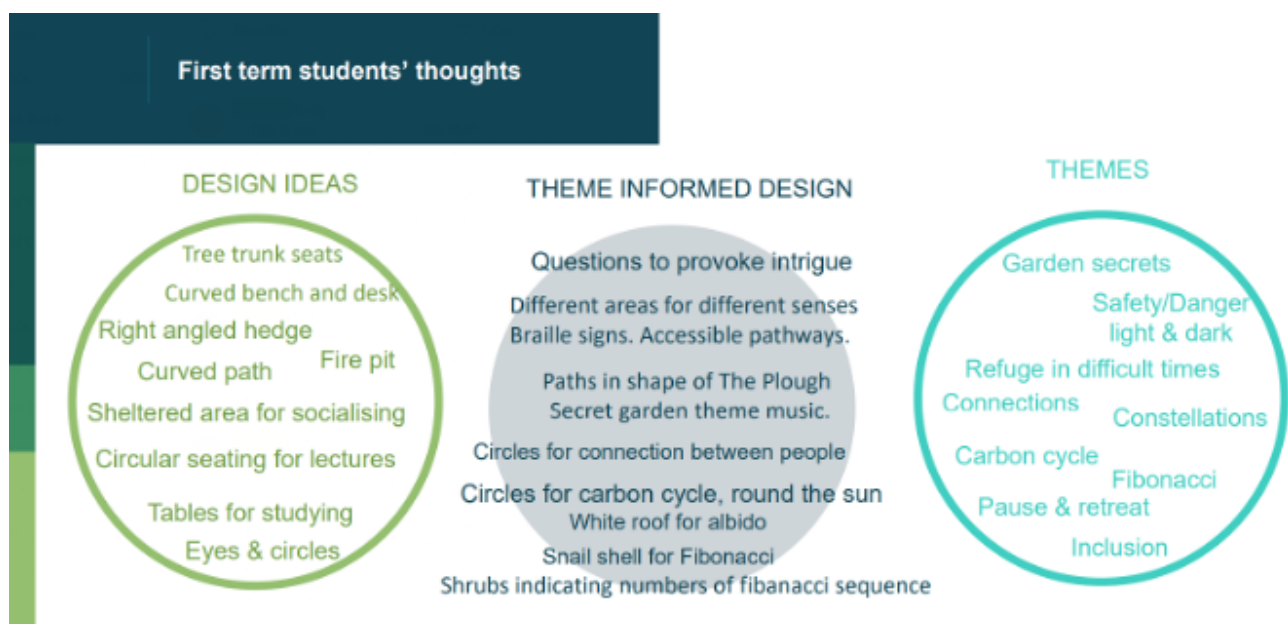
2c. Identify themes for the Forest Food Garden 'landscape story'.

Again in pairs:

- Think of narratives / themes that you feel already exist or should be included in the landscape story of the FFG social areas and perennial shrub planting.
- Write each theme on a separate Post-it.
- When completed, place your Post-its on the wall.
- Then we all come together as a group to cluster, discuss, and **agree on key themes**.

Thoreau writes in *Walden* (1854): “Why concern ourselves so much about our beans for seed, and not be concerned at all about a new generation of men? We should really be fed and cheered if when we met a man we were sure to see that some of the qualities which I have named, which we all prize more than those other productions, but which are for the most part broadcast and floating in the air, had taken root and grown in him. Here comes such a subtle and ineffable quality, for instance, as truth or justice, though the slightest amount or new variety of it, along the road. Our ambassadors should be instructed to send home such seeds as these, and Congress help to distribute them over all the land.”

Conclude the session by bringing these themes together with the theme of **uncertainty**. How do we design for and with uncertainty?



“Emancipation is also knowing that one cannot place one’s thinking into other people’s heads, that one cannot anticipate its effect. I’ve said what I have to say, and people will make of it what they will . . . I never say what should be done or how to do it. I try to redraw the map of the thinkable in order to bring out the impossibilities and prohibitions that are often lodged at the very heart of thought that imagines itself to be subversive” (Rancière, 2007, 269).

29.

CASE STUDY #4 FEEDBACK MUSICIANSHIP (MUSIC)

In *Generative Arts and Musical Machines*, and other practical music modules like *Interactive Music Systems* and *Studio Project*, we explore feedback musicianship as a way to develop *complexity literacy*, *systems thinking* and open-ended, collaborative modes of interaction with other agencies.

What is a feedback instrument? A feedback instrument can be roughly defined as a musical instrument where recurrent circulation of signals is fundamental to its behaviour. The circulation of signals (be they acoustic waves, continuous values in a computer, discrete information or otherwise) leads to the instrument having complex, nonlinear behaviours, in response to both the external environment, and to the history of its own internal states. Jimi Hendrix's feedback guitar is a very simple form. Alvin Lucier's *I am Sitting in a Room* another. Feedback instruments develop this idea to create systemic instruments in which this positive feedback is tunable, creating musical instruments that require a new approach to interaction and technique: they may be electro-acoustic, software or hybrid, sometimes self-resonating and always self-willed!

Complexity literacy. Building these instruments and then playing them gives us an intuitive, sensory and embodied experience of complex systems: simple parts — a mic, an amp, some strings and a wooden box — when coupled together with positive feedback give rise to non-linear and often unpredictable behaviours and dynamics. The sonic output is **emergent** — the whole is 'more than the sum of the parts'.

Letting others be and adaptive improvisation. These instruments and systems often feel like they have a 'life of their own': their sonic output is not completely controlled by the performer, but determined by their history and other events in the environment. Musically, this breaks down traditional models of control and mastery in instrumental performance. Experimenting with ways to interact with them musically provides an interesting experimental playground for exploring **uncontrol** and ways of interacting with other agencies in the wider world — be that other humans, or other life forms. Students quickly understand non-linearities experientially: a small change in one parameter (string length or gain) can have both minimal and highly significant changes in the system behaviour. This helps to make sense of — a la **tipping points** We also learn to adapt and improvise a dance between our own intentions and desires and the lives of other agencies.

Coupling & interconnectedness. When the feedback loop contains a microphone, these

instruments are sensitive to the wider environment – small sounds and movements in the room can affect their behaviour. Again, this provides a model for experiencing our own environmental connections.

Resource recycling. Students learn practical electronics, which involves microchips (currently a global shortage, so a good way to think about relationship between politics, goods and resources) and analogue electronics including switches and solenoids. These can be quite expensive, so we have a week dedicated to Bricolage and Skip Diving where we disassemble domestic and workplace electronics such as printers, hard-drives and even car parts and learn how to salvage and reuse components. This gives practical experience of resource waste and recycling, and in learning new skills and getting something for free, students realise that some things that are good for the environment are also good for them – **mutualism!**.

Systems mapping. In designing and analysing these instruments, students get a feel for systems mapping, which can be applied in wider contexts.

Alice Eldridge and Chris Kiefer

30.

CASE STUDY #5 SUMAK KAWSAY (LIBERAL ARTS)

In the Liberal Arts 1st year modules *Hope and Fear: Cultures, Climates, Ecologies* and *Record and Present* we explore how ecological and social systems interact. In early weeks we look at the role of colonialism in the ecological crises and consider alternatives to ‘development’. In week 2 we welcome Kichwa national Paccha Chuji Turner to share insight into the indigenous cosmovision of Kichwa communities of Amazonian Ecuador, Sumak Kawsay. We later explore some of the themes in a follow-up workshop by listening to other organisms in an extended field listening session.

Sumak Kawsay — loosely translated as “Harmonious Living” — is a holistic way of feeling, thinking and acting with and within the world. Although rooted in Amazonian and Andean Kichwa cosmovisions, it can also be seen as a philosophy shared by Indigenous Peoples globally, each with their own meanings, views, understandings and interpretations of the cosmos. Since the late 20th century, in the face of a globalized hegemonic and systemic model of development that is consuming life on Earth it has emerged as a political proposal and as an alternative form of existing that strives for the protection of and harmonious relationship with Mother Earth. **Sumak Kawsay** is too broad to define and summarize, but some core principles are:

Relationality. Acknowledging, understanding, feeling and acting upon the interconnection and interdependence of all beings that are part of the Pacha Mama (Mother Nature or Cosmos). This is the principle that allows us to see and feel each other, and understand that each one of us has a role in the infinite web of life. Our existence is based on respectful, reciprocal, and healthy relationships with ourselves, with our ayllu (family and community), our territory, and the beings we share it with.

Reciprocity. Reciprocity travels across all the spheres of life — from human, nonhuman, spiritual and territorial relationships. It lies within a system that holds as its prime concern the wellbeing of the community: a system that is not based on competition, accumulation, and individualism, but on respect, harmony, and solidarity within the family, the community, and the territory.

Spirituality. Going beyond the physical realm, there is a cosmic connection between all the beings and energies within the Pacha Mama. Every being has samay (spirit), including what some may consider as inert matter: water, wind, fire, earth, rocks. Everything is alive, therefore deserves respect.

Sumak Kawsay is about the harmonious, reciprocal, and respectful relationship with Pachamama, where it's implicit that she will react if abused and exploited. It offers a holistic alternative to the systemic concept of development, whose values hover around materialism and profitability. Sumak Kawsay values life as a whole in Allpa Mama – Mother Earth – and strives for a planet fully alive and free. Students are invited to reflect on existing or potential social structures and opportunities within their own local communities where these principles do or might play out. For example in Open Source Creative Coding communities, prestige is similarly awarded to those who work hard and share the most.

This summary of Sumak Kawsay was written by Paccha Chuji Turner; the class is run in collaboration with Alice Eldridge (Music) and Evan Killick (School of Global Studies, Sussex).

APPENDIX: RESOURCE TABLE

Resource	Comments
Semi-annotated bibliography	Very similar to the bibliography as below, but with extra
Crowdsourced list of educator resources	A big living document — please feel free to add resource

Crowdsourced list of educator resources: some highlights

Name / link	Type of resource	Comments	Keywords
SOS-UK	Organisation	“SOS-UK is a student-led education charity focusing on sustainability.” Partnering with UCU to deliver workshops on decolonisation and decarbonisation. Other programmes, resources, accreditation	climate justice; decoloniality; decarbonisation
Sustainability Exchange	Resource Hub	Very large collection of resources ...	sustainability; risk
Library of UN materials for climate learning	Resource Hub	More than two thousand entries. Reports, policy documents, guidance documents, audiovisual resources, and more.	UN; climate policy; climate change
UNFCCC Education and Training Resources	Resource Hub	United Nations Framework Convention on Climate Change’s curated links list.	climate change
Glossary for Climate Justice	Overview	A primer from the Latin American and Caribbean Platform for Climate on climate change. It has sections on ‘false solutions’ and ‘people’s proposals and solutions.’	climate justice

Teachers Climate Guide	Toolkit / Book	Created for Finnish schools, but more widely applicable. Broken down across a variety of subjects (Biology, History, Physical Education, Mathematics, Visual Arts, Textiles, etc.)	climate change; schools
Restore Our Earth Lessons and Activities	Toolkit	Introductions and suggested activities on the topics of ecosystem services, the carbon cycle, food sustainability, ecosystem restoration, and civic engagement. Each topic has suggested activities for beginner, intermediate and advanced levels.	ecosystem services; carbon cycle; food sustainability; ecosystem restoration; civic engagement
UK Student Climate Network Resource Pack	Resource Pack	Aimed at younger learners (Key Stage 3 / 4). Slides with clear key messages and suggested activities. Covers climate justice, the climate movement, climate science, climate engineering, and a Green New Deal.	schools; climate justice; climate action; climate engineering; Green New Deal
<i>Pluriverse: A Postdevelopment Dictionary</i>	Book	A relatively recent collection from a postdevelopment perspective.	postdevelopment; diverse economies; pluriverse
Faculty for a Future: Recommended Resources	Resource Hub	Faculty for a Future aims to support academics to transform our research, teaching, and public engagement. Their recommended resources section include arts and humanities. Currently (July 2022) appears mainly to be a curated aggregation of MOOCs that tackle sustainability topics (SDGs, Systems Thinking, etc.) from more introductory social sciences perspectives. But watch this space.	climate change; climate justice; sustainability; MOOCs
Pathways to Sustainability – STEPS Centre	Online Course + Resource Hub	“This online course gives you an introduction to the STEPS Centre’s core conceptual approach, the Pathways Approach to sustainability. The course covers theories, methodologies and practical examples.” The STEPS Centre, part of The Institute of Development Studies, also offers many other publications and resources.	sustainability; online learning; pathways approach; MOOCs

APPENDIX: WHY DID WE MAKE THIS?

Five points that informed this toolkit:

1. We wanted to help educators to really embed sustainability **within existing media, arts and humanities curricula**. Our scoping work revealed a wealth of wonderful resources, but many felt a bit generic and high level: basically introductions to sustainability science and policy. These can perhaps be usefully incorporated into arts and humanities teaching, but their uptake might be limited by the feeling that important things would be dislodged. We wanted to focus on resonances between sustainability and all the things the arts and humanities are already exploring (the environmental humanities, ecopoetics, new materialism, postcolonial studies, and much more). We soon found out how challenging this was — ‘media, arts and humanities’ is so broad, so how can you tailor sustainability to so many different things? — but hopefully this toolkit is at least fairly interdisciplinary, and hints at future cross-pollination possibilities.
2. We wanted to **make something quickly**. The Sussex Humanities Lab, where this toolkit originated, sometimes plays host to hackathons, games jams and makerspaces — we wanted to draw on that improvisational ethos and energy. In addressing the environmental crisis in the early-to-mid 2020s, every year, every month counts, but the rhythms of academic life, from grant writing to curriculum development, aren’t always best suited to acting fast. We wanted to create something that was good enough for now, and might spark ideas and enthusiasm for even bigger and better things in the future.
3. We were interested in **activities and formats**, especially the kind that educators might include into their existing teaching at short notice. Many of the resources out there are very *content*-focused, so we thought some focus on *form* would be useful. We did drift toward content, and away from activities and formats, compared with our initial aspirations. But hopefully the Activities Seeds at least start to address the gap we identified.
4. We hoped to approach sustainability as something that can be **generative rather than restrictive**. Many educators are under all kinds of (unsustainable!) pressures, and sometimes sustainability can be wrongly framed as another set of boxes to tick, or another bunch of prohibitions and obstacles. We have tried to emphasise sustainability as something fruitful and inspiring, even a source of energy.
5. We hoped **not to reinvent the wheel** too much. That’s why the core team invited colleagues from across the school and university to contribute (and thank you again to everybody who has). It’s also why this toolkit is so full of signposting to resources elsewhere, including the crowdsourced living

document of links and resources, the bibliography on the next page, the quotations sprinkled throughout, and the big list of keywords in the Climate Justice section.

BIBLIOGRAPHY

- Acaroglu, Leyla. 2021. 'Tools for Systems Thinkers: The 6 Fundamental Concepts of Systems Thinking'. *Disruptive Design* (blog). 11 March 2021. <https://medium.com/disruptive-design/tools-for-systems-thinkers-the-6-fundamental-concepts-of-systems-thinking-379cdac3dc6a>.
- Adams, Carol J., ed. 1995. *Ecofeminism and the Sacred*. New York, N.Y: Continuum.
- Agrawal, Arun. 1995. 'Dismantling the Divide Between Indigenous and Scientific Knowledge'. *Development and Change* 26 (3): 413–39. <https://doi.org/10.1111/j.1467-7660.1995.tb00560.x>.
- Aisher, Alex, and Vinita Damodaran. 2016. 'Introduction: Human-Nature Interactions Through a Multispecies Lens'.
- Alaimo, Stacy. 2010. *Bodily Natures: Science, Environment, and the Material Self*. Bloomington: Indiana University Press.
- Alcamo, Joseph, Caroline Grundy, and Jorn Scharlemann. 2018. 'Interactions among the SDGs and Why They Are Important'. SSRP.
- Allan, Rob, Georgina Endfield, Vinita Damodaran, George Adamson, Matthew Hannaford, Fiona Carroll, Neil Macdonald, et al. 2016. 'Toward Integrated Historical Climate Research: The Example of Atmospheric Circulation Reconstructions Over the Earth'.
- Alon-Mozes, Tal. 2006. 'From "Reading" the Landscape to "Writing" a Garden'. *Journal of Landscape Architecture* 1: 30–37. <https://doi.org/10.1080/18626033.2006.9723362>.
- Anaya, S. James. 2000. *Indigenous Peoples in International Law*. New York; Oxford University Press.
- anonymous refused. 2014. 'For Your Safety and Security ...'. Tumblr. 2014. <https://anonymousrefused.tumblr.com/>.
- Arjomand, Minou. 2018. *Staged: Show Trials, Political Theater, and the Aesthetics of Judgment*. New York: Columbia University Press.
- Attlee, Edwina, Phineas Harper, and Maria Smith, eds. 2019. *Gross Ideas: Tales of Tomorrow's Architecture*. London]: [Oslo: Architecture Foundation; Oslo Architecture Triennale.
- Barrell, John. 2010. *The Idea of Landscape and the Sense of Place 1730 – 1840: An Approach to the Poetry of John Clare*. Cambridge: Cambridge Univ. Press.
- Barry, Peter, and William Welstead. 2017. *Extending Ecocriticism: Crisis, Collaboration and Challenges in the Environmental Humanities*. Manchester: University Press. <https://doi.org/10.2307/j.ctv18b5dz8>.
- Bartosch, Roman, ed. 2021. *Cultivating Sustainability in Language and Literature Pedagogy: Steps to an Educational Ecology*. London; New York: Routledge.
- Bartosch, Roman, and Hubert Zapf. 2021. 'Teaching Sustainable Texts: The Value of Cultural Ecology'. In *Cultivating Sustainability in Language and Literature Pedagogy*. Routledge.
- Bassett, Caroline, and Ben Roberts. 2019. 'Automation Now and Then: Automation Fevers, Anxieties and Utopias'. *New Formations* 98 (98): 9–28. <https://doi.org/10.3898/NEWF:98.02.2019>.
- Bauder, Harald, and Rebecca Mueller. 2021. 'Westphalian Vs. Indigenous Sovereignty: Challenging Colonial Territorial Governance'. *Geopolitics* 0 (0): 1–18. <https://doi.org/10.1080/14650045.2021.1920577>.

- Beck, Ulrich. 1992. *Risk Society: Towards a New Modernity*. Theory, Culture & Society. London; Newbury Park, Calif: Sage Publications.
- Bedford, Timothy. 2022. 'Constructing a Transformative Sustainability Pedagogy: Teacher Empowerment for a Sustainable Future'. *Journal of Teacher Education for Sustainability* 24 (1): 5–18. <https://doi.org/10.2478/jtes-2022-0002>.
- Belda-Miquel, Sergio, Alejandra Boni, and Carola Calabuig. 2019. 'SDG Localisation and Decentralised Development Aid: Exploring Opposing Discourses and Practices in Valencia's Aid Sector'. *Journal of Human Development and Capabilities* 20 (4): 386–402. <https://doi.org/10.1080/19452829.2019.1624512>.
- Bendell, Jem. 2022. 'Replacing Sustainable Development: Potential Frameworks for International Cooperation in an Era of Increasing Crises and Disasters.' Preprint. SOCIAL SCIENCES. <https://doi.org/10.20944/preprints202205.0180.v1>.
- Bens, Jonas. 2020. *The Indigenous Paradox: Rights, Sovereignty, and Culture in the Americas*. 1st edition. Pennsylvania Studies in Human Rights. Philadelphia: University of Pennsylvania Press.
- Benson, Melinda Harm. 2019. 'New Materialism: An Ontology for the Anthropocene'. *NATURAL RESOURCES JOURNAL* 59: 31.
- Benyus, Janine. 2015. 'The Generous City'. *Architectural Design* 85 (4): 120–21. <https://doi.org/10.1002/ad.1939>.
- Bergh, Jeroen C. J. M. van den. 2022. 'A Procedure for Globally Institutionalizing a "beyond-GDP" Metric'. *Ecological Economics* 192 (February): 107257. <https://doi.org/10.1016/j.ecolecon.2021.107257>.
- Bergthaller, Hannes, and Peter Mortensen. 2018. *Framing the Environmental Humanities*. Boston: BRILL.
- Boast, Hannah (ed.). 2022. *Hydrofictions: Water, Power and Politics in Israeli and Palestinian Literature*. Edinburgh University Press.
- Boran, Idil. 2019. 'On Inquiry into Climate Justice'. In *Routledge Handbook of Climate Justice*, edited by Tahseen Jafry, Karin Helwig, and Michael Mikulewicz. Abingdon, Oxon; New York, NY: Routledge.
- Bruyere, Vincent. 2018. *Perishability Fatigue: Forays Into Environmental Loss and Decay*. Critical Life Studies. New York: Columbia University Press. <https://doi.org/10.7312/bruy18858>.
- Buchan, Bruce. 2001. 'Liberalism and Fear of Violence'. *Critical Review of International Social and Political Philosophy* 4 (3): 27–48. <https://doi.org/10.1080/13698230108403355>.
- Buck, Holly Jean. 2020. *After Geoengineering: Climate Tragedy, Repair, and Restoration*. London: Verso.
- Bulfin, Ailise. 2015. "'To Arms!': Invasion Narratives and Late-Victorian Literature". *Literature Compass* 12 (9): 482–96. <https://doi.org/10.1111/lic3.12253>.
- Burdon, Peter D. 2012. 'A Theory of Earth Jurisprudence.' *Australasian Journal of Legal Philosophy*, no. 37: 28–60. <https://doi.org/10.3316/agispt.20125077>.
- . 2014. *Earth Jurisprudence: Private Property and the Environment*. Routledge. <https://doi.org/10.4324/9780203797013>.
- Burgess, Adam, Jamie Wardman, and Gabe Mythen. 2018. 'Considering Risk: Placing the Work of Ulrich Beck in Context'. *Journal of Risk Research* 21 (1): 1–5. <https://doi.org/10.1080/13669877.2017.1383075>.
- Caminero-Santangelo, Byron. 2014. *Different Shades of Green: African Literature, Environmental Justice, and Political Ecology*. Acls Humanities E-Book. Charlottesville: University of Virginia Press.
- Caouette, Dominique, and Dip Kapoor. 2015. *Beyond Colonialism, Development and Globalization: Social Movements and Critical Perspectives*. Vol. 56766. London: NBN International.

- Carmin, JoAnn, and Julian Agyeman, eds. 2011. *Environmental Inequalities Beyond Borders: Local Perspectives on Global Injustices*. Urban and Industrial Environments. Cambridge, Mass: MIT Press.
- Carroll, Clint and Project Muse. 2015. *Roots of Our Renewal: Ethnobotany and Cherokee Environmental Governance*. <http://ezproxy.uniandes.edu.co:8080/login?url=https://muse.jhu.edu/book/40477/>.
- Carson, Hampton L. 1917. 'The Trial of Animals and Insects. A Little Known Chapter of Mediæval Jurisprudence'. *Proceedings of the American Philosophical Society* 56 (5): 410–15.
- Carson, Rachel. 1962. *Silent Spring*. Boston; Cambridge, Mass.: Houghton Mifflin; Riverside Press.
- Challe, Tiffany. 2021. 'The Rights of Nature — Can an Ecosystem Bear Legal Rights?' *State of the Planet* (blog). 22 April 2021. <https://news.climate.columbia.edu/2021/04/22/rights-of-nature-lawsuits/>.
- Chandler, David, and Julian Reid. 2018. "Being in Being": Contesting the Ontopolitics of Indigeneity'. *The European Legacy* 23 (3): 251–68. <https://doi.org/10.1080/10848770.2017.1420284>.
- Chapron, Guillaume, Yaffa Epstein, and José Vicente López-Bao. 2019. 'A Rights Revolution for Nature'. *Science* 363 (6434): 1392–93. <https://doi.org/10.1126/science.aav5601>.
- Charpleix, Liz. 2018. 'The Whanganui River as Te Awa Tupua: Place-Based Law in a Legally Pluralistic Society'. *The Geographical Journal* 184 (1): 19–30. <https://doi.org/10.1111/geoj.12238>.
- Chen, Mel Y. 2012. *Animacies: Biopolitics, Racial Mattering, and Queer Affect*. Perverse Modernities. Durham [N.C.: Duke University Press.
- Chrulew, Matthew, ed. 2022. *Phase Change: Imagining Energy Futures*. Twelfth Planet Press.
- Chung, Sae Hoon Stan. 2019. 'The Courage to Be Altered: Indigenist Decolonization for Teachers: Indigenist Decolonization for Teachers'. *New Directions for Teaching and Learning* 2019 (157): 13–25. <https://doi.org/10.1002/tl.20327>.
- Cimadamore, Alberto, Maurice Mittelmark, Gro Therese Lie, and Fungisai P. Gwanzura Ottemöller. 2016. *Development and Sustainability: The Challenge of Social Change*. Vol. 4. International Studies in Poverty Research. London: Bloomsbury Academic & Professional.
- Clark, W. C., and R. E. Munn. 1986. *Sustainable Development of the Biosphere*. Cambridge: Cambridge University Press. <https://iiasa.dev.local/>.
- Clarke, David A. G., and Jamie Mcphie. 2020. 'New Materialisms and Environmental Education: Editorial'. *Environmental Education Research* 26 (9–10): 1255–65. <https://doi.org/10.1080/13504622.2020.1828290>.
- Cochran, Patricia A. L., Catherine A. Marshall, Carmen Garcia-Downing, Elizabeth Kendall, Doris Cook, Laurie McCubbin, and Reva Mariah S. Gover. 2008. 'Indigenous Ways of Knowing: Implications for Participatory Research and Community'. *American Journal of Public Health* 98 (1): 22–27. <https://doi.org/10.2105/AJPH.2006.093641>.
- Cohen, Esther. 1986. 'Law, Folklore and Animal Lore'. *Past & Present*, no. 110: 6–37.
- Corvellec, Hervé, Alison F. Stowell, and Nils Johansson. 2022. 'Critiques of the Circular Economy'. *Journal of Industrial Ecology* 26 (2): 421–32. <https://doi.org/10.1111/jiec.13187>.
- Cosme, Inês, Rui Santos, and Daniel W. O'Neill. 2017. 'Assessing the Degrowth Discourse: A Review and Analysis of Academic Degrowth Policy Proposals'. *Journal of Cleaner Production* 149 (April): 321–34. <https://doi.org/10.1016/j.jclepro.2017.02.016>.
- Cronon, William, ed. 1996. *Uncommon Ground: Rethinking the Human Place in Nature*. New York, NY: Norton.

- Crowdy, Joe. 2017. 'Queer Undergrowth: Weeds and Sexuality in the Architecture of the Garden'. *Architecture and Culture* 5 (3): 423–33. <https://doi.org/10.1080/20507828.2017.1365541>.
- Daggett, Cara. 2018. 'Petro-Masculinity: Fossil Fuels and Authoritarian Desire'. *Millennium* 47 (1): 25–44. <https://doi.org/10.1177/0305829818775817>.
- Dakos, Vasilis, Blake Matthews, Andrew P. Hendry, Jonathan Levine, Nicolas Loeuille, Jon Norberg, Patrik Nosil, Marten Scheffer, and Luc De Meester. 2019. 'Ecosystem Tipping Points in an Evolving World'. *Nature Ecology & Evolution* 3 (3): 355–62. <https://doi.org/10.1038/s41559-019-0797-2>.
- Damodaran, Vinita, Anna Winterbottom, and Alan Lester. 2015. *The East India Company and the Natural World*. Palgrave Studies in World Environmental History. Houndsmills, Basingstoke, Hampshire, UK: Palgrave Macmillan.
- Dancer, Helen. 2015. *Women, Land and Justice in Tanzania*. Eastern Africa Series. Suffolk, England: James Currey.
- . 2021. 'Harmony with Nature: Towards a New Deep Legal Pluralism'. *The Journal of Legal Pluralism and Unofficial Law* 53 (1): 21–41. <https://doi.org/10.1080/07329113.2020.1845503>.
- De Loughry, Treasa. 2019. 'Polymeric Chains and Petrolic Imaginaries: World Literature, Plastic, and Negative Value'. *Green Letters* 23 (2): 179–93. <https://doi.org/10.1080/14688417.2019.1650661>.
- DeLoughrey, Elizabeth M. 2019. *Allegories of the Anthropocene*. eScholarship, University of California. <https://escholarship.org/uc/item/9650s7k8>.
- Deming, Alison Hawthorne, and Lauret E. Savoy, eds. 2011. *The Colors of Nature: Culture, Identity, and the Natural World*. Minneapolis, Minn: Milkweed Editions.
- Despard, Erin. 2012. 'Cultivating Security: Plants in the Urban Landscape'. *Space and Culture* 15 (2): 151–63. <https://doi.org/10.1177/1206331211430019>.
- Dillon, Grace L. 2012. *Walking the Clouds: An Anthology of Indigenous Science Fiction*. Tucson: University of Arizona Press.
- Dinzelbacher, Peter. 2002. 'Animal Trials: A Multidisciplinary Approach'. *The Journal of Interdisciplinary History* 32 (3): 405–21.
- Dolley, Jonathan, Fiona Marshall, Bradley Butcher, Jeremy Reffin, James Alexander Robinson, Baris Eray, and Novi Quadrianto. 2020. 'Analysing Trade-Offs and Synergies between SDGs for Urban Development, Food Security and Poverty Alleviation in Rapidly Changing Peri-Urban Areas: A Tool to Support Inclusive Urban Planning'. *Sustainability Science* 15 (6): 1601–19. <https://doi.org/10.1007/s11625-020-00802-0>.
- Dombroski, Kelly. 2020. 'Caring Labour: Redistributing Care Work'. In *The Handbook of Diverse Economies*, by J. Gibson-Graham and Kelly Dombroski, 154–62. Edward Elgar Publishing. <https://doi.org/10.4337/9781788119962.00025>.
- Dornelles, André Z., Emily Boyd, Richard J. Nunes, Mike Asquith, Wiebren J. Boonstra, Izabela Delabre, J. Michael Denney, et al. 2020. 'Towards a Bridging Concept for Undesirable Resilience in Social-Ecological Systems'. *Global Sustainability* 3 (July): a20 1–12. <https://doi.org/10.1017/sus.2020.15>.
- Douglas, Mary. 1992. *Risk and Blame: Essays in Cultural Theory*. London; New York: Routledge.
- Dove, Michael R. 2006. 'Indigenous People and Environmental Politics'. *Annual Review of Anthropology* 35 (1): 191–208. <https://doi.org/10.1146/annurev.anthro.35.081705.123235>.
- Downing, Andrea Sophia, Manqi Chang, Jan J. Kuiper, Marco Campenni, Tiina Häyhä, Sarah Cornell, Uno Svedin,

- and Wolf Mooij. 2020. 'Learning from Generations of Sustainability Concepts'. *Environmental Research Letters*, February. <https://doi.org/10.1088/1748-9326/ab7766>.
- Drydyk, Jay, and Lori Keleher, eds. 2019. *Routledge Handbook of Development Ethics*. London; New York: Routledge, Taylor & Francis Group.
- Du Bois, W. E. B. 1999. *Darkwater: Voices from Within the Veil*. Dover Thrift Editions. Mineola, N.Y: Dover Publications.
- Duile, Timo. 2021. 'Paradoxes of Indigeneity: Identity, the State, and the Economy in Indonesia'. *Dialectical Anthropology* 45 (4): 357–81. <https://doi.org/10.1007/s10624-021-09640-7>.
- Dungy, Camille T., ed. 2009. *Black Nature: Four Centuries of African American Nature Poetry*. Athens: University of Georgia Press.
- Dupré, Denis, and Preston Perluss. 'Mastering Risks: An Illusion: Truth and Tropes on Jeopardy'. *Research in International Business and Finance* 37 (1 May 2016): 620–28. <https://doi.org/10.1016/j.ribaf.2015.12.001>.
- Dyett, Jordan, and Cassidy Thomas. 2019. 'Overpopulation Discourse: Patriarchy, Racism, and the Specter of Ecofascism'. *Perspectives on Global Development and Technology* 18 (1–2): 205–24. <https://doi.org/10.1163/15691497-12341514>.
- Dyke, James, Robert Watson, and Wolfgang Knorr. 2021. 'Climate Scientists: Concept of Net Zero Is a Dangerous Trap'. *The Conversation*, 2021. <http://theconversation.com/climate-scientists-concept-of-net-zero-is-a-dangerous-trap-157368>.
- Eckersley, Robyn. 1995. 'Liberal Democracy and the Rights of Nature: The Struggle for Inclusion'. *Environmental Politics* 4 (4): 169–98. <https://doi.org/10.1080/09644019508414232>.
- Eldridge, Alice. 2013. 'Improvising with Self-Observing Systems: A Duet for Cellist and Adaptive Delay Network'. Universidade do Porto.
- Eldridge, Alice. 2022. 'Computer Musicking as Onto-Epistemic Playground On the Joy of Developing Complexity Literacy and Learning to Let Others Be'. *Journal of Creative Music Systems*, March. <https://doi.org/10.5920/jcms.1038>.
- Elliott, Alexander, J. Cullis, and Vinita Damodaran. 2017. *Climate Change and the Humanities: Historical, Philosophical and Interdisciplinary Approaches to the Contemporary Environmental Crisis*. Basingstoke: Palgrave Macmillan.
- Emmett, Robert S., and David E. Nye. 2017. *The Environmental Humanities: A Critical Introduction*. The MIT Press. Cambridge: The MIT Press. <https://doi.org/10.7551/mitpress/10629.001.0001>.
- Ergas, Christina. 2021. *Surviving Collapse: Building Community Toward Radical Sustainability*. New York: Oxford University Press.
- Escobar, Arturo. 2011. *Encountering Development: The Making and Unmaking of the Third World*. Acls Humanities E-Book. Princeton: University Press.
- . 2015. 'Degrowth, Postdevelopment, and Transitions: A Preliminary Conversation'. *Sustainability Science* 10 (3): 451–62. <https://doi.org/10.1007/s11625-015-0297-5>.
- . 2020. *Pluriversal Politics: The Real and the Possible*. Latin America in Translation. Durham: Duke University Press.
- European Court of Human Rights. 2022. 'Factsheet – Environment and the ECHR'. Council of Europe. https://www.echr.coe.int/Documents/FS_Environment_ENG.pdf.

- Evans, E.P. 1906. *The Criminal Prosecution and Capital Punishment of Animals*, by E. P. Evans—A Project Gutenberg EBook. London: William Heinemann. <https://www.gutenberg.org/files/43286/43286-h/43286-h.htm>.
- Evers, Larry, and Ofelia Zepeda, eds. 1995. *Home Places: Contemporary Native American Writing from Sun Tracks*. Sun Tracks, v. 31. Tucson: University of Arizona Press.
- Fanning, Andrew L., Daniel W. O'Neill, Jason Hickel, and Nicolas Roux. 2022. 'The Social Shortfall and Ecological Overshoot of Nations'. *Nature Sustainability* 5 (1): 26–36. <https://doi.org/10.1038/s41893-021-00799-z>.
- Fechter, Anne-Meike, and Heather Hindmann. 2011. *Inside the Everyday Lives of Development Workers: The Challenges and Futures of Aidland*. Boulder, CO: Lynne Rienner Publishers.
- Fechter, Anne-Meike, and Anke Fleur Schwittay. 2020. *Citizen Aid and Everyday Humanitarianism: Development Futures?* Thirdworlds. London; Routledge.
- Feder, Helena, ed. 2021. *Close Reading the Anthropocene*. Milton Park, Abingdon, Oxon; New York, NY: Routledge Taylor & Francis Group.
- Feeny, Simon. 2020. 'Transitioning from the MDGs to the SDGs: Lessons Learnt?' In *Moving from the Millennium to the Sustainable Development Goals: Lessons and Recommendations*, edited by Sefa Awaworyi Churchill, 343–51. Singapore: Springer. https://doi.org/10.1007/978-981-15-1556-9_15.
- Felli, Romain, and David Broder. 2021. *The Great Adaptation: Climate, Capitalism and Catastrophe*. London: Verso.
- Fierro, Lucía Gallardo. 2017. 'Re-Thinking Oil: Compensation for Non-Production in Yasuní National Park Challenging Sumak Kawsay and Degrowth'. *Sustainability Science* 12 (2): 263–74. <https://doi.org/10.1007/s11625-016-0389-x>.
- Finney, Carolyn. 2014. *Black Faces, White Spaces: Reimagining the Relationship of African Americans to the Great Outdoors*. Chapel Hill: The University of North Carolina Press.
- Fukurai, Hiroshi, and Richard Krooth. 2021. 'Earth Jurisprudence, the Rights of Nature, and International Rights of Nature Tribunals'. In *Original Nation Approaches to Inter-National Law: The Quest for the Rights of Indigenous Peoples and Nature in the Age of Anthropocene*, edited by Hiroshi Fukurai and Richard Krooth, 213–46. Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-59273-8_6.
- Gaard, Greta Claire. 2017. *Critical Ecofeminism*. Lanham: Lexington Books.
- Garrard, Greg. 2021. 'Cultivating Viewpoint Diversity in Ecocritical Pedagogy'. In *Cultivating Sustainability in Language and Literature Pedagogy*. Routledge.
- Ghosh, Amitav. 2016. *The Great Derangement: Climate Change and the Unthinkable*. The Randy L. and Melvin R. Berlin Family Lectures. Chicago: The University of Chicago Press.
- Gibson, Katherine, Deborah Bird Rose, and Ruth Fincher. 2015. *Manifesto for Living in the Anthropocene*. Brooklyn, NY: Punctum Books. <https://doi.org/10.21983/P3.0100.1.00>.
- Gibson-Graham, J. K. 1996. *The End of Capitalism (as We Knew It): A Feminist Critique of Political Economy*. Minneapolis: University of Minnesota Press.
- Gibson-Graham, J. K. 2006. *A Postcapitalist Politics*. Minneapolis: University of Minnesota Press.
- Gibson-Graham, J. K., Jenny Cameron, and Stephen Healy. 2013. *Take Back the Economy: An Ethical Guide for Transforming Our Communities*. Minneapolis; London: University of Minnesota Press.
- Gibson-Graham, J. K., and Kelly Dombroski, eds. 2020. *The Handbook of Diverse Economies*. Cheltenham: Edgar Elgar. <https://www.communityeconomies.org/publications/books/handbook-diverse-economies>.

- Gifford, Terry. 1996. 'The Social Construction of Nature'. *Interdisciplinary Studies in Literature and Environment* 3 (2): 27–35.
- Gilani, Sabrina. 2010. 'Transforming the "Perpetrator" into "Victim": The Effect of Gendering Violence on the Legal and Practical Responses to Women's Political Violence'. *Australian Journal of Gender & Law* 1.
- Gladwin, Derek. 2018. *Ecological Exile: Spatial Injustice and Environmental Humanities*. Routledge Environmental Humanities. Milton: Routledge. <https://doi.org/10.4324/9781315641478>.
- Gleeson, Tom, Lan Wang-Erlandsson, Samuel C. Zipper, Miina Porkka, Fernando Jaramillo, Dieter Gerten, Ingo Fetzer, et al. 2020. 'The Water Planetary Boundary: Interrogation and Revision'. *One Earth* 2 (3): 223–34. <https://doi.org/10.1016/j.oneear.2020.02.009>.
- Gobby, Jen, Leah Temper, Matthew Burke, and Nicolas von Ellenrieder. 2022. 'Resistance as Governance: Transformative Strategies Forged on the Frontlines of Extractivism in Canada'. *The Extractive Industries and Society* 9 (March): 100919. <https://doi.org/10.1016/j.exis.2021.100919>.
- Gordon, Gwendolyn. 2017. 'Environmental Personhood'. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.2935007>.
- Gough, Annette. 2021. 'Education in the Anthropocene'. In *Oxford Research Encyclopedia of Education*, by Annette Gough. Oxford University Press. <https://doi.org/10.1093/acrefore/9780190264093.013.1391>.
- Graeber, David, and David Wengrow. 2021. *The Dawn of Everything: A New History of Humanity*. London: Allen Lane.
- Grant, Hollie, and Philippe Le Billon. 2021. 'Unrooted Responses: Addressing Violence against Environmental and Land Defenders'. *Environment and Planning C: Politics and Space* 39 (1): 132–51. <https://doi.org/10.1177/2399654420941518>.
- Greyson, Lauren. 2019. *Vital Reenchantments: Biophilia, Gaia, Cosmos, and The Affectively Ecological*. Earth, Milky Way: Punctum Books. <https://doi.org/10.21983/P3.0240.1.00>.
- Gómez-Barris, Macarena. 2017. *The Extractive Zone: Social Ecologies and Decolonial Perspectives*. Dissident Acts. Durham: Duke University Press.
- Grossman, Zoltán, and Alan Parker, eds. 2012. *Asserting Native Resilience: Pacific Rim Indigenous Nations Face the Climate Crisis*. Corvallis, OR: Oregon State University Press.
- Grove, Richard, Vinita Damodaran, and Satpal Sangwan. 2000. *Nature and the Orient: The Environmental History of South and Southeast Asia*. Delhi; Oxford University Press.
- Gruen, Lori, ed. 2018. *Critical Terms for Animal Studies*. Critical Terms. Chicago, IL: University of Chicago Press. <https://press.uchicago.edu/ucp/books/book/chicago/C/bo22991992.html>.
- Grusin, Richard A., ed. 2017. *Anthropocene Feminism*. 21st Century Studies. Minneapolis: University of Minnesota Press.
- Gunderson, Ryan, Diana Stuart, and Brian Petersen. 2019. 'The Political Economy of Geoengineering as Plan B: Technological Rationality, Moral Hazard, and New Technology'. *New Political Economy* 24 (5): 696–715. <https://doi.org/10.1080/13563467.2018.1501356>.
- Haladay, Jane, and Scott Hicks. 2018. *Narratives of Educating for Sustainability in Unsustainable Environments*. East Lansing: Michigan State University Press.
- Hall, C. Michael. 2011. 'Policy Learning and Policy Failure in Sustainable Tourism Governance: From First- and

- Second-Order to Third-Order Change?' *Journal of Sustainable Tourism* 19 (4–5): 649–71. <https://doi.org/10.1080/09669582.2011.555555>.
- Haltermann, Ingo, and Julia Tischler. 2020. *Environmental Change and African Societies*. Climate and Culture; Volume 5. Leiden, The Netherlands; Brill.
- Hanhardt, Christina B., Jasbir K. Puar, Neel Ahuja, Paul Amar, Aniruddha Dutta, Fatima El-Tayeb, Kwame Holmes, and Sherene Seikaly. 2020. 'Beyond Trigger Warnings: Safety, Securitization, and Queer Left Critique'. *Social Text* 38 (4 (145)): 49–76. <https://doi.org/10.1215/01642472-8680438>.
- Haraway, Donna. 2015. 'Anthropocene, Capitalocene, Plantationocene, Chthulucene: Making Kin'. *Environmental Humanities* 6 (1): 159–65. <https://doi.org/10.1215/22011919-3615934>.
- Hardt, Lukas, John Barrett, Peter G. Taylor, and Timothy J. Foxon. 2020. 'Structural Change for a Post-Growth Economy: Investigating the Relationship Between Embodied Energy Intensity and Labour Productivity'. *Sustainability* 12 (962): 1–25.
- Harrington, Cameron, and Clifford Shearing. 2017. *Security in the Anthropocene: Reflections on Safety and Care*. Edition Politik. Bielefeld: transcript.
- Hartal, Gilly. 2018. 'Fragile Subjectivities: Constructing Queer Safe Spaces'. *Social & Cultural Geography* 19 (8): 1053–72. <https://doi.org/10.1080/14649365.2017.1335877>.
- Hayashi, Robert. 2011. *Haunted by Waters: A Journey through Race and Place in the American West*. <http://www.vlebooks.com/vleweb/product/openreader?id=none&isbn=9781587297229>.
- Haynes, Doug. 2020. "Falling into the Sky": Gravity and Levity in Pynchon's *Mason & Dixon*'. *Space and Culture* 23 (4): 357–69. <https://doi.org/10.1177/1206331219877141>.
- Heise, Ursula K., Jon Christensen, and Michelle Niemann. 2017. *The Routledge Companion to the Environmental Humanities*. Routledge Literature Companions. London: Routledge. <https://doi.org/10.4324/9781315766355>.
- Hilaire, Jérôme, Jan C. Minx, Max W. Callaghan, Jae Edmonds, Gunnar Luderer, Gregory F. Nemet, Joeri Rogelj, and Maria del Mar Zamora. 2019. 'Negative Emissions and International Climate Goals—Learning from and About Mitigation Scenarios'. *Climatic Change* 157 (2): 189–219. <https://doi.org/10.1007/s10584-019-02516-4>.
- Hill Collins, Patricia. 2000. *Black Feminist Thought: Knowledge, Consciousness, and the Politics of Empowerment*. 2nd ed. New York: Routledge.
- Hillerbrand, Rafaela. 2018. 'Why Affordable Clean Energy Is Not Enough. A Capability Perspective on the Sustainable Development Goals'. *Sustainability* 10 (7): 2485. <https://doi.org/10.3390/su10072485>.
- Hirtz, Frank. 2003. 'It Takes Modern Means to Be Traditional: On Recognizing Indigenous Cultural Communities in the Philippines'. *Development and Change* 34 (5): 887–914. <https://doi.org/10.1111/j.1467-7660.2003.00333.x>.
- Hosseini, S. A. Hamed, James Goodman, Sara C Motta, and Barry K Gills. 2020. *The Routledge Handbook of Transformative Global Studies*.
- Hourdequin, Marion. 2021. 'Environmental Ethics: The State of the Question'. *The Southern Journal of Philosophy* 59 (3): 270–308. <https://doi.org/10.1111/sjp.12436>.
- Howe, Cymene, Anand Pandian, Matthew Archer, Anindita Banerjee, Jessica Barnes, Debbora Battaglia, Sarah Besky, et al. 2019. *Anthropocene Unseen*. Brooklyn, NY: punctum books. <https://doi.org/10.21983/P3.0265.1.00>.
- Hultman, Martin, and Paul M. Pulé. 2018. *Ecological Masculinities: Theoretical Foundations and Practical Guidance*. Routledge Studies in Gender and Environments. Abingdon, Oxon: New York, NY, Routledge.
- Ionel, ZAMFIR. n.d. 'A Universal Right to a Healthy Environment', 2.

- Ivanaj, Vera, Kim Poldner, and Paul Shrivastava. 2014. 'HAND / HEART / HEAD: Aesthetic Practice Pedagogy for Deep Sustainability Learning'. *The Journal of Corporate Citizenship* 2014 (54): 23–46. <https://doi.org/10.9774/GLEAF.4700.2014.ju.00005>.
- Jafry, Tahseen, Karin Helwig, and Michael Mikulewicz, eds. 2019. *Routledge Handbook of Climate Justice*. Abingdon, Oxon; New York, NY: Routledge.
- James, Erin, and Eric Morel. 2020. *Environment and Narrative: New Directions in Econarratology*. Columbus: The Ohio State University Press.
- Johnson, Danielle Emma, Meg Parsons, and Karen Fisher. 2021. 'Indigenous Climate Change Adaptation: New Directions for Emerging Scholarship'. *Environment and Planning E: Nature and Space*, June, 25148486211022450. <https://doi.org/10.1177/25148486211022450>.
- Jonik, Michael. 2018. *Herman Melville and the Politics of the Inhuman*. Cambridge, United Kingdom; Cambridge University Press.
- Kallis, Giorgos. 2011. 'In Defence of Degrowth'. *Ecological Economics* 70 (5): 873–80. <https://doi.org/10.1016/j.ecolecon.2010.12.007>.
- Kesington, Zafirah. 2019. 'How Intersectional Is Your Climate Justice?' *GLOBUS* (blog). 23 November 2019. <https://globuswarwick.com/2019/11/23/how-intersectional-is-your-climate-justice/>.
- Kidman, Joanna. 2020. 'Whither Decolonisation? Indigenous Scholars and the Problem of Inclusion in the Neoliberal University'. *Journal of Sociology* 56 (2): 247–62. <https://doi.org/10.1177/1440783319835958>
- Kimmerer, Robin Wall. 2020. *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants*. Penguin Ecology. London: Penguin Books.
- King, Tiffany Lethabo. 2019. *The Black Shoals: Offshore Formations of Black and Native Studies*. Durham; London: Duke University Press.
- Koh, Adeline, and Dorothy Kim. 2021. *Alternative Historiographies of the Digital Humanities*. Brooklyn, NY: punctum books. <https://doi.org/10.53288/0274.1.00>.
- Kohn, Eduardo. 2013. *How Forests Think: Toward an Anthropology Beyond the Human*. Berkeley: University of California Press.
- Kopnina, Helen. 2020. 'Ecocentric Education: Introduction to a Special Collection of Essays'. *Education Sciences* 10 (9): 217. <https://doi.org/10.3390/educsci10090217>.
- Kothari, Ashish, Ariel Salleh, Arturo Escobar, Federico Demaria, and Alberto Acosta, eds. 2019. *Pluriverse: A Post-Development Dictionary*. New Delhi: Tulika Books and Authorsupfront.
- Lacy, Mark J. 2002. 'Deconstructing Risk Society'. *Environmental Politics* 11 (4): 42–62. <https://doi.org/10.1080/714000646>.
- Lamb, William F., Giulio Mattioli, Sebastian Levi, J. Timmons Roberts, Stuart Capstick, Felix Creutzig, Jan C. Minx, Finn Müller-Hansen, Trevor Culhane, and Julia K. Steinberger. 2020. 'Discourses of Climate Delay'. *Global Sustainability* 3. <https://doi.org/10.1017/sus.2020.13>.
- Lampert, Irene, Kai Niebert, and Markus Wilhelm. 2021. 'Instructional Guidelines Based on Conceptions of Students and Scientists About Economic and Population Growth Within Planetary Boundaries'. *International Journal of Science and Mathematics Education*, August. <https://doi.org/10.1007/s10763-021-10200-2>.
- Latour, Bruno. 2004. *Politics of Nature: How to Bring the Sciences into Democracy*. Cambridge, Mass.; Harvard University Press.

- Leeson, Peter T. 2013. 'Vermin Trials'. *The Journal of Law and Economics* 56 (3): 811–36. <https://doi.org/10.1086/671480>.
- Liegey, Vincent, and Anitra Nelson. 2020. *Exploring Degrowth: A Critical Guide*. FireWorks. London: Pluto Press.
- MacGregor, Sherilyn. 2021. 'Making Matter Great Again? Ecofeminism, New Materialism and the Everyday Turn in Environmental Politics' *Environmental Politics* 30 (1–2): 41–60. <https://doi.org/10.1080/09644016.2020.1846954>.
- Machingura, Fortunate, and Steven Lally. 2017. 'The Sustainable Development Goals and Their Trade-Offs'. Overseas Development Institute.
- Mahony, Martin, and Georgina Endfield. 2018. 'Climate and Colonialism'. *WIREs Climate Change* 9 (2): e510. <https://doi.org/10.1002/wcc.510>.
- Malin, Stephanie A., and Stacia S. Ryder. 2018. 'Developing Deeply Intersectional Environmental Justice Scholarship'. *Environmental Sociology* 4 (1): 1–7. <https://doi.org/10.1080/23251042.2018.1446711>.
- Malm, Andreas. 2016. *Fossil Capital: The Rise of Steam-Power and the Roots of Global Warming*. London; New York: Verso.
- . 2021. *How to Blow up a Pipeline: Learning to Fight in a World on Fire*. London; New York: Verso.
- Martin, D. M., and M. Mazzotta. 2018. 'Non-Monetary Valuation Using Multi-Criteria Decision Analysis: Sensitivity of Additive Aggregation Methods to Scaling and Compensation Assumptions'. *Ecosystem Services* 29 (February): 13–22. <https://doi.org/10.1016/j.ecoser.2017.10.022>.
- Maru, Natasha, Michele Nori, Ian Scoones, Greta Semplici, and Anna Triandafyllidou. 2022. 'Embracing Uncertainty: Rethinking Migration Policy Through Pastoralists' Experiences'. *Comparative Migration Studies* 10 (1): 1–18.
- Matthews, H. Damon, and Ken Caldeira. 2008. 'Stabilizing Climate Requires Near-Zero Emissions'. *Geophysical Research Letters* 35 (4). <https://doi.org/10.1029/2007GL032388>.
- Marx, Leo. 2010. 'Technology: The Emergence of a Hazardous Concept'. *Technology and Culture* 51 (3): 561–77.
- Mbah, Marcellus, Sandra Ajaps, and Petra Molthan-Hill. 2021. 'A Systematic Review of the Deployment of Indigenous Knowledge Systems towards Climate Change Adaptation in Developing World Contexts: Implications for Climate Change Education'. *Sustainability* 13 (9): 4811. <https://doi.org/10.3390/su13094811>.
- McCloskey, Stephen. 2019. 'The Sustainable Development Goals, Neoliberalism and NGOs: It's Time to Pursue a Transformative Path to Social Justice'. In *Policy & Practice: A Development Education Review*, by Stephen McCloskey. Centre for Global Education. <https://www.developmenteducationreview.com/sites/default/files/Full%20Issue%2029%20final-1.pdf#page=155>.
- McKenna, Tarquam, Donna Moodie, and Pat Onesta, eds. 2021. *Indigenous Knowledges: Privileging Our Voices. Critical New Literacies: The Praxis of English Language Teaching and Learning (PELT)*, volume 11. Leiden; Boston: Brill Sense.
- Meadows, Dennis L., Linda Booth Sweeney, and Gillian Martin-Mehers. 2016. *The Climate Change Playbook: 22 Systems Thinking Games for More Effective Communication About Climate Change*. White River Junction, Vermont: Chelsea Green Publishing.
- Meeker, Joseph W. 1997. *The Comedy of Survival: Literary Ecology and a Play Ethic*. Tucson: University of Arizona Press.
- Meyer, Kris De, Emily Coren, Mark McCaffrey, and Cheryl Slean. 2020. 'Transforming the Stories We Tell About

- Climate Change: From 'issue' to 'action'. *Environmental Research Letters* 16 (1): 015002. <https://doi.org/10.1088/1748-9326/abcd5a>.
- Middleton, Jo, Jackie Cassell, Vojtech Novotny, Gavin Colthart, Mika Peck, James Fairhead, Stephen L. Walker, et al. 2017. 'Surfaces: An Interdisciplinary Project to Understand and Enhance Health in the Vulnerable Rainforests of Papua New Guinea'.
- Mika, Jason Paul, Kiri Dell, Christine Elers, Mohan Dutta, and Qing Tong. 2022. 'Indigenous Environmental Defenders in Aotearoa New Zealand: Ihumātao and Ōroua River'. *AlterNative: An International Journal of Indigenous Peoples* 18 (2): 277–89. <https://doi.org/10.1177/11771801221083164>.
- Miller, Matthew. 2019. 'Environmental Personhood and Standing for Nature: Examining the Colorado River Case', 24.
- Mitchell, Timothy. 2013. *Carbon Democracy: Political Power in the Age of Oil*. London: Verso.
- Montoya, José M., Ian Donohue, and Stuart L. Pimm. 2018. 'Planetary Boundaries for Biodiversity: Implausible Science, Pernicious Policies'. *Trends in Ecology & Evolution* 33 (2): 71–73. <https://doi.org/10.1016/j.tree.2017.10.004>.
- Moore, Jason W. 2017. 'The Capitalocene, Part I: On the Nature and Origins of Our Ecological Crisis'. *The Journal of Peasant Studies* 44 (3): 594–630. <https://doi.org/10.1080/03066150.2016.1235036>.
- Morton, Timothy. 2010. *The Ecological Thought*. Cambridge (Mass.) London: Harvard University Press.
- Moscoso, Paola, Mika Peck, and Alice Eldridge. 2018. 'Systematic Literature Review on the Association Between Soundscape and Ecological/Human Wellbeing'.
- Mythen, Gabe. 2021. 'The Critical Theory of World Risk Society: A Retrospective Analysis'. *Risk Analysis* 41 (3): 533–43. <https://doi.org/10.1111/risa.13159>.
- Newell, Peter, Shilpi Srivastava, Lars Otto Naess, Gerardo A. Torres Contreras, and Roz Price. 2021. 'Toward Transformative Climate Justice: An Emerging Research Agenda'. *WIREs Climate Change* 12 (6): e733. <https://doi.org/10.1002/wcc.733>.
- Nilsson, Annika E., and Miyase Christensen. 2019. *Arctic Geopolitics, Media and Power*. Routledge Geopolitics Series. Routledge. <https://doi.org/10.4324/9780429199646>.
- Nishime, LeiLani, and Kim D. Hester Williams, eds. 2018. *Racial Ecologies*. Seattle: University of Washington Press.
- Nonhuman Rights Project. n.d. 'Frequently Asked Questions'. Nonhuman Rights Project. Accessed 10 June 2022. <https://www.nonhumanrights.org/frequently-asked-questions/>.
- O'Donnell, Erin, Anne Poelina, Alessandro Pelizzon, and Cristy Clark. 2020. 'Stop Burying the Lede: The Essential Role of Indigenous Law(s) in Creating Rights of Nature'. *Transnational Environmental Law* 9 (3): 403–27. <https://doi.org/10.1017/S2047102520000242>.
- Oates, Lori Lee. 2021. 'Climate Change Is Colonialism'. *Text. NiCHE* (blog). World. 13 December 2021. <https://niche-canada.org/2021/12/13/climate-change-is-colonialism/>
- Odum, Eugene P., and Eugene P. Odum. 1997. *Ecology: A Bridge Between Science and Society*. Sunderland, Mass: Sinauer Associates.
- O'Gorman, Emily, Thom van Dooren, Ursula Münster, Joni Adamson, Christof Mauch, Sverker Sörlin, Marco Armiero, et al. 2019. 'Teaching the Environmental Humanities: International Perspectives and Practices'. *Environmental Humanities* 11 (2): 427–60. <https://doi.org/10.1215/22011919-7754545>.
- Ojea, Elena, Maria L. Loureiro, Maria Alló, and Melina Barrio. 2016. 'Ecosystem Services and REDD: Estimating

- the Benefits of Non-Carbon Services in Worldwide Forests'. *World Development* 78 (February): 246–61. <https://doi.org/10.1016/j.worlddev.2015.10.002>.
- ONS. 2019. 'UK Natural Capital – Office for National Statistics'. 2019. <https://www.ons.gov.uk/economy/environmentalaccounts/bulletins/uknaturalcapital/urbanaccounts>.
- Owusu-Kwarteng, Louise. 2019. "Livin and Learnin", Tellin' Stories, Challengin' Narratives: Critical Reflections on Engaging Students from Marginalised Groups in Academic Research Activities.' *Compass: Journal of Learning and Teaching* 12 (1). <https://doi.org/10.21100/compass.v12i1.951>.
- Parenti, Christian, and Jason W. Moore, eds. 2016. *Anthropocene or Capitalocene? Nature, History, and the Crisis of Capitalism*. Kairos. Oakland, CA: PM Press.
- Pascoe, Bruce. 2018. *Dark Emu: Aboriginal Australia and the Birth of Agriculture*.
- Pellow, David N. 2016. 'Toward a Critical Environmental Justice Studies: Black Lives Matter as an Environmental Justice Challenge-Corrigendum'. *Du Bois Review: Social Science Research on Race* 13 (2): 425–425. <https://doi.org/10.1017/S1742058X16000175>.
- . 2018. *What Is Critical Environmental Justice?* Cambridge, UK; Medford, MA, USA: Polity Press.
- Plumwood, Val. 2003. *Feminism and the Mastery of Nature*. Opening out Feminism for Today. London: Routledge.
- Porr, Martin, and Ella Vivian-Williams. 2021. 'The Tragedy of Bruce Pascoe's Dark Emu'. *Australian Archaeology* 87 (3): 300–304. <https://doi.org/10.1080/03122417.2021.1991378>.
- Raïgorodetskiĭ, Gleb. 2017. *The Archipelago of Hope: Wisdom and Resilience from the Edge of Climate Change*. New York: Pegasus Books.
- Ranta, Eija. 2018. *Vivir Bien as an Alternative to Neoliberal Globalization: Can Indigenous Terminologies Decolonize the State?* Rethinking Globalizations. London; New York: Routledge Taylor & Francis Group.
- Raworth, Kate. 2017. *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist*. London: Random House Business Books.
- Ray, Sarah Jaquette. 2020. *A Field Guide to Climate Anxiety: How to Keep Your Cool on a Warming Planet*. Berkeley: University of California Press. <https://doi.org/10.2307/j.ctvw1d67m>.
- Ray, Sarah Jaquette, Jay Sibara, and Stacy Alaimo. 2017. *Disability Studies and the Environmental Humanities: Toward an Eco-Crip Theory*. Lincoln: UNP – Nebraska. <https://doi.org/10.2307/j.ctt1p6jht5>.
- Reeves, Jade-Ann, and Timothy D. Peters. 2021. 'Responding to Anthropocentrism with Anthropocentrism: The Biopolitics of Environmental Personhood'. *Griffith Law Review* 30 (3): 474–504. <https://doi.org/10.1080/10383441.2022.2037882>.
- Reitsma, Lizette, Ann Light, Tariq Zaman, and Paul Rodgers. 2019. 'A Respectful Design Framework. Incorporating Indigenous Knowledge in the Design Process'. *The Design Journal* 22 (sup1): 1555–70. <https://doi.org/10.1080/14606925.2019.1594991>.
- Reynolds, Jesse L. 2019. *The Governance of Solar Geoengineering: Managing Climate Change in the Anthropocene*. Cambridge University Press.
- Rice, J.L. 2021. 'Against Climate Apartheid: Confronting the Persistent Legacies of Expendability for Climate Justice'. *Environment and Planning E: Nature and Space*. <https://doi.org/10.1177/2514848621999286>.
- Rockström, Johan, Katherine Richardson, and Will Steffen. 2017. 'A Fundamental Misrepresentation of the Planetary Boundaries Framework', 2017. <https://www.stockholmresilience.org/research/research-news/2017-11-20-a-fundamental-misrepresentation-of-the-planetary-boundaries-framework.html>.

- Rockström, Johan, Will Steffen, Kevin Noone, Åsa Persson, F. Stuart Chapin, Eric F. Lambin, Timothy M. Lenton, et al. 2009. 'A Safe Operating Space for Humanity'. *Nature* 461 (7263): 472–75. <https://doi.org/10.1038/461472a>.
- Rowhani, Pedram, Joanna Smallwood, Izabela Delabre, and Sophia Pinheiro Vergara. 2022. 'The Governmentality of Tropical Forests and Sustainable Food Systems, and Possibilities for Post-2020 Sustainability Governance'. *Journal of Environmental Policy and Planning*, May. <https://sro.sussex.ac.uk/id/eprint/106059/>.
- Rueda, O., J. M. Mogollón, A. Tukker, and L. Scherer. 2021. 'Negative-Emissions Technology Portfolios to Meet the 1.5 °C Target'. *Global Environmental Change* 67 (March): 102238. <https://doi.org/10.1016/j.gloenvcha.2021.102238>.
- Salamon, Author Margaret Klein. 2013. 'Best Metaphors for the Climate Crisis'. *The Climate Psychologist* (blog). 23 October 2013. <http://theclimatepsychologist.com/best-metaphors-for-the-climate-crisis/>.
- Salter, Colin, Anthony J. Nocella, and Judy K. C. Bentley, eds. 2014. *Animals and War: Confronting the Military-Animal Industrial Complex*. Critical Animal Studies, Theory, Pedagogy, and Methodology. Lanham, Maryland: Lexington Books.
- Sassen, Saskia. 2014. *Expulsions: Brutality and Complexity in the Global Economy*. Cambridge, Massachusetts: The Belknap Press of Harvard University Press.
- Satgar, Vishwas. 2018. *Climate Crisis: South African and Global Democratic Eco-Socialist Alternatives*. Democratic Marxism; Volume 3. Johannesburg: Wits University Press.
- Savoy, Lauret E. 2021. *Trace: Memory, History, Race, and the American Landscape*. Berkeley, California: Counterpoint Press.
- Scarpino, Philip, Helen Berry, Michel Meybeck, Kelly M Jason, and James Syvitski. 2017. *Rivers of the Anthropocene*. Oakland: University of California Press. <https://doi.org/10.1525/luminos.43>.
- Schmitz, Hubert, and Ian Scoones. 2015. 'Accelerating Sustainability: Why Political Economy Matters'. IDS Evidence Report IDS Evidence Report;152. IDS. <https://opendocs.ids.ac.uk/opendocs/handle/20.500.12413/7077>.
- Schröder, Patrick, Manisha Anantharaman, Kartika Anggraeni, and Timothy J. Foxon, eds. 2019. *The Circular Economy and the Global South: Sustainable Lifestyles and Green Industrial Development*. London: Routledge. <https://doi.org/10.4324/9780429434006>.
- Schwander, Hanna, and Tim Vlandas. 2020. 'The Left and Universal Basic Income: The Role of Ideology in Individual Support'. *Journal of International and Comparative Social Policy* 36 (3): 237–68. <https://doi.org/10.1017/ics.2020.25>.
- Scoones, Ian. 1995. *Living with Uncertainty: New Directions in Pastoral Development in Africa*. London: Intermediate Technology.
- . 2015. *Sustainable Livelihoods and Rural Development*. Agrarian Change & Peasant Studies 4. Rugby.
- . 2022a. 'A New Politics of Uncertainty: Towards Convivial Development in Africa'. In *African Futures*, 101–10. Brill.
- . 2022b. 'Livestock, Methane, and Climate Change: The Politics of Global Assessments'. *Wiley Interdisciplinary Reviews: Climate Change*, e790.
- Scoones, Ian, and Andy Stirling, eds. 2020a. *The Politics of Uncertainty: Challenges of Transformation*. Pathways to Sustainability. Abingdon, Oxon; New York, NY: Routledge.
- , eds. 2020b. 'Uncertainty and the Politics of Transformation'. In *The Politics of Uncertainty: Challenges of Transformation*. Pathways to Sustainability. Abingdon, Oxon; New York, NY: Routledge.

- Shiva, Vandana. 1997. *Biopiracy: The Plunder of Nature and Knowledge*. Boston, Mass: South End Press.
- . 2000. *Tomorrow's Biodiversity*. Prospects for Tomorrow. London: Thames & Hudson.
- . 2012. *Making Peace with the Earth: Beyond Resource, Land, and Food Wars*. New Delhi: Women Unlimited.
- . 2015a. *Earth Democracy: Justice, Sustainability, and Peace*. Berkeley, California: North Atlantic Books.
- . 2015b. *The Vandana Shiva Reader*. Culture of the Land. Lexington: The University Press of Kentucky.
- . 2016. *Stolen Harvest: The Hijacking of the Global Food Supply*. Lexington: University Press of Kentucky.
- Shukin, Nicole. 2009. *Animal Capital: Rendering Life in Biopolitical Times*. Posthumanities 6. Minneapolis: University of Minnesota Press.
- Siewers, Alfred Kentigern. 2013. *Re-Imagining Nature: Environmental Humanities and Ecosemiotics*. Lewisburg: The Rowman & Littlefield Publishing Group.
- Sini, Raffaella. 2022. *Temporary Gardens*. <https://www.taylorfrancis.com/books/9781315688770>.
- Solnick, Sam. 2017. *Poetry and the Anthropocene: Ecology, Biology and Technology in Contemporary British and Irish Poetry*. Routledge Environmental Humanities. London: Routledge, Taylor & Francis Group.
- Solnit, Rebecca. 2021. *Orwell's Roses*. New York: Viking.
- Song, Lisa. 2019. 'An (Even More) Inconvenient Truth: Why Carbon Credits For Forest Preservation May Be Worse Than Nothing'. *ProPublica*, 2019. <https://features.propublica.org/brazil-carbon-offsets/inconvenient-truth-carbon-credits-dont-work-deforestation-redd-acre-cambodia/>.
- Spahr, Juliana, and Joshua Clover. 2017. 'Gender Abolition and Ecotone War'. In *Anthropocene Feminism*, edited by Richard A. Grusin. 21st Century Studies. Minneapolis: University of Minnesota Press.
- Spark, Gareth B. 2014. 'Protecting Wild Animals from Unnecessary Suffering'. *Journal of Environmental Law* 26 (3): 473–94.
- Spirn, Anne Whiston. 1998. *The Language of Landscape*. New Haven: Yale U.P.
- Srnicke, Nick, and Alex Williams. 2015. *Inventing the Future: Postcapitalism and a World Without Work*. Brooklyn, NY: Verso Books.
- Stirling, Andy, and Arora Saurabh. 2021. 'Whither the Pluriverse? Degrowth and Coloniality'. Degrowth.Info (blog). 2021. degrowth.info/en/blog/whither-the-pluriverse-degrowth-and-coloniality.
- Stark, Hannah, and Jon Roffe. 2015. *Deleuze and the Non/Human*. Hampshire, England: Palgrave Macmillan.
- Stone, Christopher D. 2010. *Should Trees Have Standing? Law, Morality, and the Environment*. New York, N.Y: Oxford University Press.
- Suarez, Pablo, and Maarten K. van Aalst. 2017. 'Geoengineering: A Humanitarian Concern'. *Earth's Future* 5 (2): 183–95. <https://doi.org/10.1002/2016EF000464>.
- Sultana, Farhana, and Alex Loftus, eds. 2020. *Water Politics: Governance, Justice, and the Right to Water*. Earthscan Water Text. Abingdon, Oxon; New York, NY: Routledge.
- Surprise, Kevin. 2020. 'Geopolitical Ecology of Solar Geoengineering: From a "Logic of Multilateralism" to Logics of Militarization'. *Journal of Political Ecology* 27 (1): 213–35. <https://doi.org/10.2458/v27i1.23583>.
- Swilling, Mark. 2019. *The Age of Sustainability: Just Transitions in a Complex World*. Routledge Studies in Sustainable Development. Milton: Routledge. <https://doi.org/10.4324/9780429057823>.
- Sze, Julie. 2018. *Sustainability: Approaches to Environmental Justice and Social Power*. New York: University Press.
- Thomas, Cassidy, and Elhom Gosink. 2021. 'At the Intersection of Eco-Crises, Eco-Anxiety, and Political Turbulence:

- A Primer on 'Twenty-First Century Ecofascism'. *Perspectives on Global Development and Technology* 20 (1–2): 30–54. <https://doi.org/10.1163/15691497-12341581>.
- Thomas, Greg. 2020. 'Ian Hamilton Finlay, Albert Speer, and the Ideology of the Aesthetic at Little Sparta and Spandau'. *Journal of Lusophone Studies*, 29.
- Thomas, Robina, and Jacquie Green. 2020. 'A Way of Life: Indigenous Perspectives on Anti-Oppressive Living'. *First Peoples Child & Family Review* 3 (1): 91–104. <https://doi.org/10.7202/1069529ar>.
- Thompson, Kim-Ly, Trevor Lantz, and Natalie Ban. 2020. 'A Review of Indigenous Knowledge and Participation in Environmental Monitoring'. *Ecology and Society* 25 (2). <https://doi.org/10.5751/ES-11503-250210>.
- Tsing, Anna Lowenhaupt. 2015. *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins*. Princeton: University Press.
- Tuck, Eve, and K Wayne Yang. 2012. 'Decolonization Is Not a Metaphor'. *Decolonization: Indegeneity, Education & Society*, 40.
- Tuckey, Melissa, ed. 2018. *Ghost Fishing: An Eco-Justice Poetry Anthology*. Athens: The University of Georgia Press.
- Tyberg, Jamie. 2020. 'Unlearning: From Degrowth to Decolonization'. *RLS-NYC* (blog). 3 July 2020. <https://rosalux.nyc/degrowth-to-decolonization/>.
- Vakoch, Douglas A., ed. 2021. *Dystopias and Utopias on Earth and beyond: Feminist Ecocriticism of Science Fiction*. Routledge Studies in World Literatures and the Environment. New York, NY: Routledge.
- Vatomsky, Sonya. 2017. 'When Societies Put Animals on Trial'. *JSTOR Daily*. 13 September 2017. <https://daily.jstor.org/when-societies-put-animals-on-trial/>
- Vindal Odegaard, Cecilie. 2018. *Indigenous Life Projects and Extractivism: Ethnographies from South America*. New York, NY: Springer Science+Business Media.
- Vira, Bhaskar, Christoph Wildburger, and Stephanie Mansourian. 2015. *Forests and Food: Addressing Hunger and Nutrition Across Sustainable Landscapes*.
- Vlieghe, Joris, and Piotr Zamojski. 2019. 'Out of Love for Some-Thing: An Ontological Exploration of the Roots of Teaching with Arendt, Badiou and Scheler'. *Journal of Philosophy of Education* 53 (3): 518–30. <https://doi.org/10.1111/1467-9752.12375>.
- Waitoa, Joanne, and Kelly Dombroski. 2020. 'Working with Indigenous Methodologies: Kaupapa Māori Meets Diverse Economies'. In *The Handbook of Diverse Economies*, by J. Gibson-Graham and Kelly Dombroski, 502–10. Edward Elgar Publishing. <https://doi.org/10.4337/9781788119962.00069>.
- Wald, Sarah D., David J. Vazquez, Priscilla Solis Ybarra, Sarah Jaquette Ray, Laura Pulido, and Stacy Alaimo. 2019. *Latinx Environmentalisms: Place, Justice, and the Decolonial*. Temple University Press.
- Wallace, Molly. 2016. *Risk Criticism: Precautionary Reading in an Age of Environmental Uncertainty*. Ann Arbor: University of Michigan Press.
- Wahlund, Madeleine, and Teis Hansen. 2022. 'Exploring Alternative Economic Pathways: A Comparison of Foundational Economy and Doughnut Economics'. *Sustainability: Science, Practice and Policy* 18 (1): 171–86. <https://doi.org/10.1080/15487733.2022.2030280>.
- Walter, E. V. 1984. 'Nature on Trial: The Case of the Rooster That Laid an Egg'. In *Methodology, Metaphysics and the History of Science: In Memory of Benjamin Nelson*, edited by Robert S. Cohen and Marx W. Wartofsky, 295–321. Boston Studies in the Philosophy of Science. Dordrecht: Springer Netherlands. https://doi.org/10.1007/978-94-009-6331-3_13.

- Walton, Jo Lindsay, and Samantha Walton. 2018. 'Introduction to Green Letters: Crime Fiction and Ecology'. *Green Letters*. Taylor & Francis.
- Walton, Samantha. 2018. 'Studies in Green: Teaching Ecological Crime Fiction'. In *Teaching Crime Fiction*, edited by Charlotte Beyer, 115–30. Teaching the New English. Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-90608-9_8
- Wanner, Thomas. 2015. 'The New "Passive Revolution" of the Green Economy and Growth Discourse: Maintaining the "Sustainable Development" of Neoliberal Capitalism'. *New Political Economy* 20 (1): 21–41. <https://doi.org/10.1080/13563467.2013.866081>.
- Weber, Jana M., Constantin P. Lindenmeyer, Pietro Liò, and Alexei A. Lapkin. 2021. 'Teaching Sustainability as Complex Systems Approach: A Sustainable Development Goals Workshop'. *International Journal of Sustainability in Higher Education* 22 (8): 25–41. <https://doi.org/10.1108/IJSHE-06-2020-0209>.
- Weiss, Thomas G., and Rorden Wilkinson. 2019. *Rethinking Global Governance*. Polity Press. <http://politybooks.com/bookdetail/?isbn=9781509527236>.
- West, Simon, L. Jamila Haider, Sanna Stålhammar, and Stephen Woroniecki. 2020. 'A Relational Turn for Sustainability Science? Relational Thinking, Leverage Points and Transformations'. *Ecosystems and People* 16 (1): 304–25. <https://doi.org/10.1080/26395916.2020.1814417>.
- Wenzel, Jennifer. 2019. *The Disposition of Nature: Environmental Crisis and World Literature*. New York: Fordham University Press.
- Whyte, Kyle. 2020. 'Too Late for Indigenous Climate Justice: Ecological and Relational Tipping Points'. *WIREs Climate Change* 11 (1). <https://doi.org/10.1002/wcc.603>.
- Whyte, Kyle P. 2018. 'Indigenous Science (Fiction) for the Anthropocene: Ancestral Dystopias and Fantasies of Climate Change Crises'. *Environment and Planning E: Nature and Space* 1 (1–2): 224–42. <https://doi.org/10.1177/2514848618777621>.
- Whyte, Kyle Powys. 2020. 'Indigeneity in Geoengineering Discourses: Some Considerations'. In *The Ethics of "Geoengineering" the Global Climate*. Routledge.
- Whyte, Kyle Powys, Joseph P. Brewer, and Jay T. Johnson. 2016. 'Weaving Indigenous Science, Protocols and Sustainability Science'. *Sustainability Science* 11 (1): 25–32.
- Williams, Raymond. 1973. *The Country and the City*. London: Chatto and Windus.
- Wise, Steven M. 2000. *Rattling the Cage: Towards Legal Rights for Animals*. A Merloyd Lawrence Book. New York, NY: Perseus.
- Witz, Claude, and Martin Hlawon. 2014. 'On Racine's *The Litigants*'. *Oñati Socio-Legal Series* 4 (6). <https://papers.ssrn.com/abstract=2543495>.
- Wolford, Wendy. 2021. 'The Plantationocene: A Lusotropical Contribution to the Theory'. *Annals of the American Association of Geographers* 111 (6): 1622–39. <https://doi.org/10.1080/24694452.2020.1850231>.
- Wright, Shane Donald, and Len Norman Gillman. 2022. 'Replacing Current Nomenclature with Pre-Existing Indigenous Names in Algae, Fungi and Plants'. *TAXON* 71 (1): 6–10. <https://doi.org/10.1002/tax.12599>.
- Ybarra, Priscilla Solis. 2016. *Writing the Goodlife: Mexican American Literature and the Environment*. Tucson: The University of Arizona Press.
- Yunkaporta, Tyson, and Donna Moodie. 2021. 'Thought Ritual: An Indigenous Data Analysis Method for Research'.

In *Thought Ritual: An Indigenous Data Analysis Method for Research*, 87–96. Brill. https://doi.org/10.1163/9789004461642_006.

Zylinska, Joanna. 2014. *Minimal Ethics for the Anthropocene*. Critical Climate Change. Ann Arbor, Michigan: Open Humanities Press.