Werning, S., 2021. "Ecomodding. Understanding and Communicating the Climate Crisis by Co-Creating Commercial Video Games."
communication +1, vol 8, iss 1,
DOI: 10.7275/1nsh-tg46

Ecomodding. Understanding and Communicating the Climate Crisis by Co-Creating Commercial Video Games

Stefan Werning, Utrecht University, s.werning@uu.nl

This article explores how the climate crisis and specifically the underlying "crisis of the imagination" (Bendor 2018, 132) exacerbate the entrenchment of environmental communication, and how modifying commercial video games (ecomodding) can facilitate the use of games as effective communication infrastructures to address this issue. Environmental communication challenges are well-studied, but remain difficult to tackle in practice. Timothy Morton summarizes these challenges by defining climate change and related phenomena as "hyperobjects" (Morton 2013), which appear tangible but are always only partially knowable and communicable. In recent years, games have been increasingly regarded as a potential solution to these problems (e.g. Chang 2013); as games provide agency to players, they can be specifically effective as "tools to communicate about climate (change) uncertainty" (van Pelt et al. 2015). More recently, though, the promises of ecogames are offset against more critical questions. For example, (Asplund 2020) addresses "credibility aspects in research-based gaming", and researchers become more aware of the inequities of "discursive gaming" (Voorhees 2012) like the carbon footprint of contemporary gaming technology and the disproportionate influence of larger publishers and platform owners. To address this issue, the article develops a comparative perspective on "ecocritical" (Bohunicky 2017) modifications of commercial games (ecomods) as an ongoing discursive process. Ecomods for two major game franchises *The Sims* and *Civilization* are analyzed as communicative acts over time, quoting, re-phrasing or outright challenging the procedural rhetoric of the original games. The definition of eco games as boundary objects (van Pelt et al. 2015) is thereby adapted to the characteristic multiplicity and redundancy of ecomods. This perspective acknowledges how modding can affect the games as communication infrastructure, e.g. considering that both franchises recently 'responded' with official expansions including environmental themes, Civilization VI: Gathering Storm (2019) and The Sims 4: Eco Lifestyle (2020). To conclude, the article briefly reports on an exploratory workshop, in which students applied ecomodding techniques to repurpose Epic Games'

Fortnite (2017-) as a platform for academic communication on the climate crisis. Due to the game's immense popularity, climate researchers and activists have tentatively used Fortnite, e.g. via the 'ClimateFortnite' channel , where players can "find climate researchers and others discussing global warming while they play" (Boykoff 2019, 22), or a 2019 WWF ad campaign . These approaches, however, are characteristically relegated to small existing 'niches' within the "ecology of communication" (Altheide 2019) surrounding the game because they cannot modify or otherwise appropriate its contents. The workshop outlines how ecomodding not only constitutes a uniquely productive site for societal debate, but may also hold potential for augmenting academic communication on the climate crisis.

Keywords: ecomodding, discursive games, climate crisis, procedural rhetoric

Introduction

The global climate crisis and the systemic economic injustice fueling it arguably constitute the defining challenge of our time; yet, while the Climate Crisis Coalition, founded in 2004,[1] already visibly institutionalized the crisis label, the term itself only began to gradually permeate public discourse in 2019 in response to several concerted reframing attempts.[2] This article explores how the climate crisis and the underlying "crisis of the imagination"[3] exacerbate the entrenchment of environmental communication and how modifying commercial video games (ecomodding) can facilitate a more effective and equitable use of (digital) games as communication infrastructures to address these issues. For that purpose, a comparative analysis of "ecocritical"[4] modifications of commercial games (ecomods) is conducted, which conceptualizes these modifications as part of an ongoing discursive process across several commercially successful video game franchises. To conclude, the article briefly reports on an exploratory workshop, in which students actively applied ecomodding techniques to repurpose Epic Games' *Fortnite* (2017-), and formulates corresponding practical considerations as well as opportunities for further research on how to harness ecomodding as an alternative mode of academic climate crisis communication.

The distinct challenges of environmental communication are well-studied, but remain difficult to tackle in practice. These traditionally include, among others, a disproportionate emphasis on conflict narratives rather than alternative mythologies predicated on principles like circularity or stewardship.[5] Moreover, the highly complex interactions between ecosystems and human intervention require the capacity to think in extreme spatial and temporal categories, which transcend lived experience, defy patterns of direct causality, and call for adopting non-anthropocentric perspectives. Timothy Morton summarizes some of these claims by

---

[1] See https://www.climatecrisiscoalition.org/about_us.html.

[2] For an overview of these developments, cf. e.g. https://www.eenews.net/stories/1060718493 and, as an example, the corresponding glossary proposed by *The Guardian* in 2019 at https://www.theguardian.com/environment/2019/oct/16/guardian-language-changes-climate-environment.

[3] Roy Bendor, *Interactive Media for Sustainability* (Cham: Palgrave Macmillan, 2018), 132.

[4] Kyle Matthew Bohunicky, "Ecomods: An Ecocritical Approach to Game Modification," *Ecozon@: European Journal of Literature, Culture and Environment* 8, no. 2 (2017): 72–87, https://ebuah.uah.es/dspace/handle/10017/31327.

[5] Corinne Donly, "Toward the Eco-Narrative: Rethinking the Role of Conflict in Storytelling," *Humanities* 6, no. 2 (April 10, 2017), https://doi.org/10.3390/h6020017.

defining climate change and related phenomena as "hyperobjects,"[6] which only appear object-like and tangible, but are always only partially knowable and communicable.

Furthermore, the ongoing diversification and platformization of online communication channels contributes to a fragmentation of climate change communication across "blogs, reader comments, social media status updates, and a multitude of other online platforms."[7] Many of these smaller, less regulated channels afford "homophily"[8] and, thereby, contribute to the increasing bifurcation of public and political discourse, solidifying existing "psychological barriers."[9] As a consequence, effectively communicating the climate crisis requires identifying and "unify[ing] diverse audiences rather than contribut[ing] to polarization" (187).

Finally, climate crisis communication is routinely critiqued for focusing on identifying problems rather than outlining sustainable futures and actionable agendas;[10] accordingly, Bendor argues that the climate crisis is exacerbated by an underlying "crisis of the imagination, or more accurately, crises of our social, economic, and political imaginaries" (132), i.e. a lack of readily available and consensual future scenarios. This phenomenon often leads to political apathy, manifesting itself e.g. in "public skepticism about the political system's amenability to change" (130) or in businesses as well as individuals "letting short-term goals dictate their long-term strategies" (131). In contrast, "rekindl[ing] our imagination" might reverse that process and allow us to "[re]discover our power to act" (132).

Bendor argues that "interactive media can help" (135) with that process, but, even though several of his case studies like Tamiko Thiel's interactive installation *Gardens of the Anthropocene* (2016) clearly exhibit playfulness by way of their "speculative design" (158), he notably does not explicitly include digital games. Therefore, the well-researched potential of (digital) games to communicate the climate crisis will be briefly summarized and juxtaposed with some of their much less-discussed systemic constraints below. On this foundation, the following analysis will

---

[6] Timothy Morton, *Hyperobjects* (Minneapolis: University of Minnesota Press, 2013).

[7] Nelya Koteyko, Brigitte Nerlich, and Iina Hellsten, "Editorial: Climate Change Communication and the Internet: Challenges and Opportunities for Research," *Environmental Communication* (Routledge, April 3, 2015), 149, https://doi.org/10.1080/17524032.2015.1029297.

[8] Wendy Hui Kyong Chun, "Queerying Homophily," in *Pattern Discrimination*, ed. Clemens Apprich et al. (Minneapolis & London: University of Minnesota Press, 2018), 59–98.

[9] Ezra M. Markowitz and Meaghan L. Guckian, "Climate Change Communication: Challenges, Insights, and Opportunities," in *Psychology and Climate Change. Human Perceptions, Impacts, and Responses*, ed. Susan Clayton and Christie Manning (Cambridge, MA: Academic Press, 2018), 35–63.

[10] See e.g. Bendor, *Interactive Media for Sustainability*.

determine how ecomodding, in comparison, might help offset some of (eco)games' power imbalances and contribute to sustainable collective imaginaries.

Opportunities and Limitations of Ecogames

In recent years, digital games have been increasingly acknowledged as a potential solution to the difficulties of effective climate communication[11] summarized above. For example, in 2017 Abraham and Jayemanne[12] identified a relative "dearth of clifi games" (85), i.e. games that explicitly address motifs of climate fiction, and suggested to more broadly consider how human-environment relations are portrayed in games that do not explicitly engage in environmental communication. Following the early definition of Holzbaur[13], whose work exemplifies how contemporary "ecogames" are rooted in analogue planning games (972), the term ecogames will be used as a collective term below, even though any label like that belies the complexity of game forms addressing the climate crisis, which e.g. includes implicitly ecological popular board games like *Spirit Island* (2017) but also playful interactive data visualizations like *Seeing CO2.*[14]

As games offer players agency, albeit usually in the symbolic context of a virtual world, they can be specifically effective as "tools to communicate about climate (change) uncertainty."[15] The various uncertainties produced by the climate crisis due to both "natural climate variability [and] the uncertainty of human induced change" (44) are well understood, but trying to rationalize them is qualitatively different from making them experienceable. For example, the game *Stop Disasters!* (2018), commissioned by the UN Office for Disaster Risk Reduction,[16] radically simplifies the consequences of climate crisis-induced natural disasters (and policies to mitigate their effects on vulnerable communities), but makes the frustration of e.g. having to pull resources from one area to protect another palpable on an affective level. However,

[11] e.g. Alenda Chang, "Playing Nature: The Virtual Ecology of Game Environments" (University of California, Berkeley, 2013), https://escholarship.org/uc/item/9ch2w332.

[12] Benjamin Abraham and Darshana Jayemanne, "Where Are All the Climate Change Games? Locating Digital Games' Response to Climate Change," *Transformations* 30, no. 1 (2017): 74–94, https://opus.lib.uts.edu.au/handle/10453/121664.

[13] Ulrich D. Holzbaur, "EcoGames – Simulation Games and Sustainable Development," in *Sustainability in the Information Society*, ed. Lorenz M. Hilty and Paul W. Gilgen (Marburg: Metropolis Verlag, 2001), 971–78.

[14] See e.g. https://flowingdata.com/2021/03/11/seeing-co2-is-a-playable-data-visualization/.

[15] S. C. van Pelt et al., "Communicating Climate (Change) Uncertainties: Simulation Games as Boundary Objects," *Environmental Science and Policy* 45 (January 1, 2015): 41–52, https://doi.org/10.1016/j.envsci.2014.09.004.

[16] See https://www.stopdisastersgame.org/.

games not only allow players to re-enact how uncertainties are "difficult for decision makers to interpret and make sense of because they are ambiguous and unconnected to their existing frames of reference" (43), but they can also ideally convey the confidence of being able to repeatedly engage with them within the safety of the game's scenarios.

As ecogames attract more scholarly attention, the focus has been widened to include analogue games as well. For example, Friedersdorff et al.[17] continue the ecocritical tradition of research on environmental cinema by investigating and taxonomizing the representation of plants in modern board games. The authors argue, seemingly paradoxically, that board games may help mitigate "plant blindness[, defined as] the inability to appreciate plants in one's own environment [as well as in] their relationship to human affairs" (292). In that sense, plant blindness is related to the broader notion of nature deficit disorder, a controversial idea formulated by Richard Louv, which describes that especially younger generations increasingly lack embodied experience with nature, potentially resulting in a lack of motivation to preserve it.[18] More recently, Makai[19] pursued a similar approach by comparing how principles of science communication on climate change are translated into "playful mechanisms" (77) in four recently published board games.

However, recent scholarship has also begun to juxtapose the promises of ecogames with more critical questions. For example, Dobrin and Morey[20] argue that understanding mediations of nature (in games) requires "understanding the creation and production of those mediations, right down to the algorithms, circuit boards, and power sources that drive mediating technologies" (2). Indeed, while ecogames can alert and inform audiences about the climate crisis that might otherwise be less receptive towards these arguments, their benefits need to be assessed e.g. in the context of the massive ecological footprint of especially new gaming technologies like cloud gaming

---

[17] Jessica C. A. Friedersdorff et al., "From Treetops to Tabletops: A Preliminary Investigation of How Plants Are Represented in Popular Modern Board Games," *PLANTS, PEOPLE, PLANET* 1, no. 3 (July 2019): 290–300, https://doi.org/10.1002/ppp3.10057.

[18] The term has been critically re-assessed more recently in relation to representations of nature in digital games; see e.g. Robert Fletcher, "Gaming Conservation: Nature 2.0 Confronts Nature-Deficit Disorder," *Geoforum* 79 (February 2017): 153–62, https://doi.org/10.1016/j.geoforum.2016.02.009.

[19] Péter Kristóf Makai, "Climate Change on Cardboard: Ecological Eurogames," *Paradoxa* 31 (2020): 77–104, https://paradoxa.com/downloads/climate-change-on-cardboard-ecological-eurogames-77-104-download/.

[20] Sidney I. Dobrin and Sean Morey, eds., *Mediating Nature: The Role of Technology in Ecological Literacy* (London: Routledge, 2019).

and the escalating energy requirements of producing the "tiny chips" that current game consoles are comprised of.[21]

Focusing more on the playing experience, Asplund[22] recently addressed "credibility aspects in research-based gaming" through focus group tests of a custom game about "climate change maladaptation" (5). While credibility in this case study was primarily assessed based on the internal consistency of the game's claims as well as their congruence with the player's domain knowledge, another important category Asplund identifies, but does not elaborate on as much, is the "frame articulators" (12). In the focus group, this refers to how players perceive the "information sources for the game content," but the term also draws attention to the still often overlooked inequities of "discursive gaming,"[23] e.g. due to the disproportionate influence of larger publishers and platform owners.

For example, the highly acclaimed *Never Alone* (2014) was developed by the "first indigenous-owned video game company" Upper One Games, a company created by the "Cook Inlet Tribal Council"[24] to popularize the traditional lore of the Iñupiat people and their relationship with nature. However, as the game is sold on Steam as well as the numerous platform-specific digital stores operated by companies like Google, Apple or Sony, it is routinely interpreted as one among many 'entertainment products' and assessed according to these criteria. At the same time, the game challenges the industry logic of awards and similar accolades, e.g. winning the British Academy Award for Best Debut Game award in 2014 against purely entertainment-oriented contenders like *Shovel Knight* or *Hitman GO*,[25] which raises questions of comparability. This clash between cultural expression and industry logic becomes specifically apparent in the genre label "world games," which the publisher strategically coined for the game.[26] The label arguably aims to carve out a niche for similar content, driven by indigenous communities and designers, within the commercial games industry. At the same time, semantically evoking the "heavily-

[21] See e.g. https://www.wired.com/story/xbox-playstation-cloud-gaming-environment-nightmare/.

[22] Therese Asplund, "Credibility Aspects of Research-Based Gaming in Science Communication-the Case of The Maladaptation Game," *Journal of Science Communication* 19, no. 1 (January 13, 2020), https://doi.org/10.22323/2.19010201.

[23] Gerald Voorhees, "Discursive Games and Gamic Discourses," *Communication +1* 1, no. 1 (2012): 1–21.

[24] Jacqueline Land, "Indigenous Video Games," in *Race and Media: Critical Approaches*, ed. Lori Kido Lopez (New York, NY: New York University Press, 2020), 95.

[25] See e.g. http://awards.bafta.org/award/2015/games/debut-game.

[26] For an overview of the concept as well as the rhetoric used to establish it, see the official website at http://neveralonegame.com/world-games-inclusive-development/.

critiqued musical genre of World Music,"[27] which in the 1990s promoted discourses of "musical discovery [...] underpinned by inherently colonial perspectives" (178), is a characteristically ambivalent decision that exposes the inadequacies of the contemporary mainstream video game industry to fully support games as a medium of (eco)critical communication. Systemic issues like these compromise the potential of games as a form of communicating the climate crisis; the analysis below explores how ecomodding may tests these boundaries and explore alternative approaches by using video games that clearly fit industry logic as a vehicle as well as a resource to offer new communicative options.

Mapping Ecomodding as (Eco-)Critical Discourse

From an academic perspective, Bohunicky[28] was among the first and (still) few authors to acknowledge the importance of modding for environmental communication, coining the term "ecomods" (80) and situating the phenomenon in the tradition of "ecocriticism" (73). This implies focusing on representations of nature and human-nature relationships in ecomods as texts. On the basis of several modifications for Bethesda Softworks' *The Elder Scrolls V: Skyrim*, Bohunicky argues that ecomods offer a more nuanced rendering of natural phenomena, e.g. adding "birds and flocks" (81) as well as "realistic weather" (82), but also functionally elevating game environments from mere "background scenery" (72). In the conclusion, modding is characterized as "a nuanced and complicated ecological activity" that "allow[s] players to imagine alternatives to worlds established on the consumption and destruction of natural environments" (85), yet this broader context of ecomodding is not systematically addressed.

For that purpose, ecomods will be conceptualized as part of an ongoing discursive process rather than primarily as self-contained texts or paratextual extensions of the original games, following the work of Werning[29] on how mods for the *Civilization* game franchise have been discursively (de)legitimizing the gradually evolving framing of religion within the games' procedural rhetoric since *Civilization IV*. The term procedural rhetoric hereby refers to how games – both digital and

---

[27] Gavin Carfoot, "Musical Discovery, Colonialism, and the Possibilities of Intercultural Communication through Music," *Popular Communication* 14, no. 3 (July 2, 2016): 181, https://doi.org/10.1080/15405702.2016.1193184.

[28] Bohunicky, "Ecomods: An Ecocritical Approach to Game Modification."

[29] Stefan Werning, "Modding as a Strategy to (de-)Legitimize Representations of Religion in the Civilization Franchise," in *Participatory Digital Cultures and Contemporary Discourses of (De)Legitimization*, ed. Andrew S. Ross and Damian J. Rivers (New York & London: Routledge, 2018), 307–25.

analogue – convey meaning and rhetorical import through rules rather than narrative or theme:[30] for example, only the latest expansion in the *Civilization* franchise implemented a victory condition called Diplomacy that, among other factors, takes into account steps towards sustainable governance, thereby emphasizing that 'victory' on a civilizational level can and should be redefined in cooperative terms. Understanding ecomodding as a discursive process combines the assumptions of Voorhees' "discursive games," which hold that games "are not simply catalysts for the conversations that emerge around them" but actively communicate "by taking up contemporary issues, both allegorically and directly,"[31] with the notion of "discursive design,"[32] referring to a design approach in which "ideas of psychological, sociological, and ideological import are embodied and engendered through artifacts" (24).

This more conceptual rather than object-oriented definition also acknowledges existing co-creative work with analogue games that can and should be included to understand ecomodding as a form of communication. Using the term "critical modification," Loring-Albright[33] describes how changing and adding the rules of *Settlers of Catan* (1995) can expose and overcome the popular board game's alleged "frontier myth." The author likens his approach to the "type of re-writing [that] is commonplace in reaction to non-game fictional texts," for example "fanfic and fan movies." In a more formal educational context, Chappin et al.[34] explored how a custom extension, "developed in cooperation with the original developers of *Settlers of Catan*" (558), can facilitate learning about sustainability e.g. through "finite resources" or "learning from disasters" (560). Similarly, Mattlin[35] shows how modifying the Cold-War board game *Diplomacy* (1954/59) by adding "team play, a dedicated peace mediator team, altered win rules and a post-game debriefing discussion on different cultures of anarchy" (735) can enable educators to "show[…] that the game logic

---

[30] With regard to games, the term is often attributed to Ian Bogost; see Ian Bogost, *Persuasive Games: The Expressive Power of Videogames* (Cambridge, MA: MIT Press, 2007). However, it can easily be adapted to other types of interactive systems like hyperfiction or mobile apps.

[31] Voorhees, "Discursive Games and Gamic Discourses," 6.

[32] Bruce M. Tharp and Stephanie M. Tharp, *Discursive Design. Critical, Speculative, and Alternative Things* (Cambridge, MA: MIT Press, 2018).

[33] Greg Loring-Albright, "The First Nations of Catan: Practices in Critical Modification," *Analogue Game Studies* 2, no. 7 (2015), http://analoggamestudies.org/2015/11/the-first-nations-of-catan-practices-in-critical-modification/.

[34] Emile J.L. Chappin, Xanna Bijvoet, and Alexander Oei, "Teaching Sustainability to a Broad Audience through an Entertainment Game – The Effect of Catan: Oil Springs," *Journal of Cleaner Production* 156 (July 10, 2017): 556–68, https://doi.org/10.1016/j.jclepro.2017.04.069.

[35] Mikael Mattlin, "Adapting the DIPLOMACY Board Game Concept for 21st Century International Relations Teaching," *Simulation and Gaming* 49, no. 6 (December 1, 2018): 735–50, https://doi.org/10.1177/1046878118788905.

approximating offensive realism is only one possibility and that by altering the goals and dynamic different logics may emerge" (741), thereby shifting the focus from identifying the problem to imagining potential alternatives. These studies can be understood in terms of ecomodding, yet they all focus on one contingent modification rather than the communicative process itself. In contrast, based on her aforementioned case study, Asplund[36] noticed that players respond to the maladaptation game not only verbally but also with a co-creative mindset, e.g. expressing the "desire to combine several actions" or even "want[ing] to add an in-game design feature to address the suggested maladaptive outcome" (8). That is, they arguably formulate a response through the 'language' of the game's design, which usually remains hypothetical but, in the case of ecomodding, can be formalized, implemented and experienced through play.

Seven Principles of Mod-Based Communication

To explore this process and outline a more long-term perspective on ecomodding, the analysis below interprets and compares ecomods for two major game franchises – *The Sims* and *Civilization* – as communicative acts occurring over time, quoting, re-phrasing or outright challenging the procedural rhetoric of the original games.

The first game in the iconic *Sims* series launched in 2000, and allowed players to simulate the everyday life of a customizable household; rather than providing clear-cut goals and challenges, games in the series requires players to satisfy the various needs of their virtual characters but foregrounds experimentation and self-expression, e.g. in terms of 'designing' their home, hobbies or social life. Thus, it reflects a micro perspective on sustainability, similar to that of an individual household. In comparison, the *Civilization* series, which started in 1991, simulates an entire culture over the course of several millennia. Its defining feature is an expansive "tech tree," i.e. a system of interdependent upgrades that allow players to develop their own civilization in vastly different ways, e.g. focusing on exploration, trade, military might or cultural achievements. Ecomods for the latest *Civilization* games thus take up a complementary macro perspective on sustainability and focus on systemic aspects like e.g. the (over)exploitation of natural resources.

[36] Asplund, "Credibility Aspects of Research-Based Gaming in Science Communication-the Case of The Maladaptation Game."

Figure 1 - Cover art of *Civilization VI: Gathering Storm* and *The Sims 4: Eco Lifestyle*.

The analysis adapts the definition of eco games as boundary objects[37] and applies it to the characteristic multiplicity and redundancy of ecomods. The seven subsections below each focus on a different characteristic of how ecomodding contributes to communicating the climate crisis and how it can affect the communication infrastructure of the original games, considering e.g. that both franchises relatively recently 'responded' with official expansions including environmental themes, *Civilization VI: Gathering Storm* (2019) and *The Sims 4: Eco Lifestyle* (2020). On a practical note, individual mods will be referenced by their name in square brackets (in the case of very long titles, a short version is used instead); the corresponding hyperlinks as well as other metadata are available via a work-in-progress Google Sheet at https://tinyurl.com/ecomods.

[37] van Pelt et al., "Communicating Climate (Change) Uncertainties: Simulation Games as Boundary Objects."

1) Expanding the Original Game's Procedural Rhetoric

According to Lakoff,[38] in environmental communication and beyond, "one cannot avoid framing" (72), as frames are systems of meaning-making "include[ing] semantic roles, relations between roles, and relations to other frames" (71) that can be activated by "a single word" (72), which makes them essential in today's contested attention economies. This definition originally applies to verbal rhetoric but can be easily adapted to games as well. For example, capitalism is commonly framed as a vicious cycle, i.e. a feedback loop almost impossible to break out of, which escalates over time as those benefitting from it are usually least likely to suffer its negative consequences. The iconic board game *Monopoly* 'translates' this frame into the cyclical layout of its game board, which becomes increasingly perilous to traverse for those lagging behind with each iteration. Lakoff argues that, in regards to climate change, a "constant effort to build up the background frames needed to understand the crisis" (74) is imperative. That is, environmental frames need to be continuously re-activated to avoid "hypocognition" (77), a paralyzing lack of actionable frames directly contributing to the crisis of the imagination identified by Bendor.[39]

In games and corresponding ecomods, frames are repeated every time a rule applies. It is important to note that procedural frames work differently, sometimes more subtly, than words because we are less adept at decoding procedural rhetoric than verbal statements. As a consequence, simple procedural 'statements' – e.g. the fact that players in *Gathering Storm* will initially "be powering [their] most advanced buildings by burning carbon-based resources like Coal and Oil"[40] – may appear less blatant and reductionist than e.g. if put into words. For example, the *Civilization* mod [Global Warming Congress] adds a resolution called "Greenhouse Gas Regulation," which inevitably adds "+1 Happiness per City." This would be very blatant to verbalize, but in the context of the game the happiness increase has further gameplay repercussions which add nuance to the message. In his analysis of the *Civilization* franchise, Galloway argues that playing the game actually means "playing the code," [41] i.e. "becoming intimate with a massive, multipartite global algorithm" (35) that governs the game's procedural representation of systems like scientific progress, social and political organization, religion and – most recently – environmental and

---

[38] George Lakoff, "Why It Matters How We Frame the Environment," *Environmental Communication* 4, no. 1 (2010): 70–81.

[39] Bendor, *Interactive Media for Sustainability*.

[40] See https://civilization.fandom.com/wiki/Civilization_VI:_Gathering_Storm.

[41] Alexander Galloway, "Playing the Code: Allegories of Control in Civilization," *Radical Philosophy* 128 (2004): 33, https://www.radicalphilosophy.com/wp-content/files_mf/rp128_article3_playingthecode_galloway.pdf.

ecological factors. Following this interpretation, ecomodding not only means understanding the "allegorithm" (35), i.e. the meaning built into the game's system, but tentatively re-writing it. In that regard, the practice merges the logic of environmental communication and algorithmic thinking as will be expounded below.

2) Re-Framing the Game-as-Model

Both games investigated in this article, explicitly or implicitly, rhetorically position themselves towards issues relevant within the context of environmental communication. For example, Bianchi[42] argues that "*The Sims 3* reimagines neighbourhoods as ecological spaces that link rather than divorce civilisation from nature" (214). Players routinely engage with these framings, not least since adopting these perspectives is often key to an effective and successful playstyle, which can fosters "simulation resignation,"[43] i.e. "the blind acceptance of the limited results of a [game-as-]simulation" (107) and one of the most prominent consequences of the current consumer centricity of games as an industry and as a mode of climate crisis communication. Thus, players respond to "what the system chooses to include and exclude," which are subjective choices often deliberately veiled behind the opaqueness of the game as a digital object. Yet, especially with so-called 'serious' games, players often "refuse[…] to interrogate the implications of that subjectivity" (107).

Ecomods can offer an outlet for "speaking back," i.e. they can be meaningfully interpreted as an equivalent of speech acts, which quote earlier utterances (by implementing existing game rules or components) and respond to them, either affirmatively (e.g. by extending these rules) or critically (by removing/changing the rules or by implementing alternative solutions). In that regard, they perform similarly to "image-acts,"[44] defined as a "visual equivalent of speech-acts" (355), in visual communication. For example, *The Sims* launched the *Eco Lifestyle* expansion in June 2020, which elaborated on several themes previously explored in community-created mods. However, the actual implementation of features like neighborhoods having different levels of eco-friendliness or the unrealistic and unconditional effectiveness

---

[42] Melissa Bianchi, "Rhetoric and Recapture: Theorising Digital Game Ecologies through EA's The Sims Series," *Green Letters* 18, no. 3 (September 2, 2014): 209–20, https://doi.org/10.1080/14688417.2014.963881.

[43] Ian Bogost, *Unit Operations. An Approach to Videogame Criticism* (Cambridge, MA: MIT Press, 2008), 106/107.

[44] Derek Hook and Vlad Petre Glaveanu, "Image Analysis: An Interactive Approach to Compositional Elements," *Qualitative Research in Psychology* 10, no. 4 (2013): 358, https://doi.org/10.1080/14780887.2012.674175.

of windmills and solar panels were – as summarized e.g. by *The Sims* youtubers[45] – not engaging and framed sustainable lifestyles as an easy choice rather than a continuous challenge.

Similarly, the *Civilization* mod [Renewable Energy Complexity] explicitly defines renewable energy as the "final stage" in the *Gathering Storm* expansion, but critiques its simplistic focus on the production side as well as the overall inefficiency of renewables. In the mod, renewable energy still "starts out weak but is unlocked earlier and can generate more power than before with new technologies and the right placement," i.e. by emphasizing the scalability of renewables the mod engages, according to Aristotelian rhetoric, in deliberative discourse with an orientation towards the future. The mod uses a 3D model of a battery power station that had been in the game files but does not appear in the original *Gathering Storm* expansion, repurposing it as part of an attempt to make renewable energy more "engaging and rewarding" to use; that is, rather than pure efficiency, the game-specific criterion of meaningful choices is evoked to justify the adoption of renewable energy in the mod.

In [Climate Balance - Complete Pack], which includes the aforementioned mod, creator JNR argues that "climate change is no longer something that happens quickly and goes by without notable damages."[46] A similar example from *The Sims* is the [Save the Environment Driving Eco-Friendly Cars], a mod which explicitly positions itself as elaborating on the eco-friendly personality trait for in-game characters (or: sims) introduced in the second expansion pack for *The Sims 3* called *Ambitions* (2010). In that expansion, the trait complemented other additions that allowed sims to pursue more extravagant careers, i.e. it was framed in a rather neoliberal manner, as a facet of self-optimization. The mod inadvertently continues this neoliberal framing, by interacting with branded hybrid cars introduced into the game through collaborations with Toyota and Renault,[47] increasing the mood of sims with the eco-friendly trait when driving these cars (as opposed to a negative impact upon driving regular cars). It should be noted that the hybrid cars in *The Sims* are the only case of corporate ecomodding encountered so far, likely due to the fact that the game has a long history of partnering with mainstream brands like H&M or IKEA, which usually led to official content updates, and only recently publicly involve external modders for a collaboration with Gucci. While these have never touched

[45] See e.g. the short overview by Carl's Sim Guides at https://www.youtube.com/watch?v=kC2fda9koyc&t=22m28s.
[46] See https://steamcommunity.com/sharedfiles/filedetails/?id=1667883116.
[47] See e.g. https://thesimssocial.fandom.com/wiki/Toyota_Prius_Plug-in_Hybrid.

upon societally relevant issues so far, the official Toyota/Renault content[48] makes it plausible to assume that, just as companies increasingly intervene in societal discourses on social media platforms,[49] similar interventions (often critically referred to as greenwashing) can and will become more frequent in ecomodding in the future.

Regardless of individual processes of meaning-making, though, Bendor's (2018) focus on social imaginaries reminds us that the affordance of modding games has an empowering effect in itself because it exposes the inequity built into traditional ecogame-based communication, and outlines – albeit not always delivers – a viable alternative, allowing for adding multiple, potentially conflicting interpretations to the game as the 'authoritative' argument by design. Indeed, simpler types of mods – e.g. scripting mods like [Save the Environment Driving Eco-Friendly Cars] – explicitly encourage players to customize them, e.g. "to tune this mod" to add "custom cars" or simply to crowdsource the localization process.

3) Keeping Emerging Eco-Narratives Contingent

Our current overreliance on a small set of highly conventionalized eco-narratives makes these tropes appear particularly authoritative,[50] i.e. alternative crisis narratives that are less predicated on conflict and less absolute in their claims to the truth are needed. Ecomods also (re)produce eco-narratives. For example, by emphasizing the gradually increasing efficiency of renewable energy sources, the above-mentioned mod [Renewable Energy Complexity] affords a spectrum of stories, in which these technologies rise from marginalized novelties to pillars of a civilization's survival. Yet, the multiplicity of ecomods inherently foregrounds the contingency of any particular framing, i.e. because game mods are often modular and can be easily reconfigured and recombined, they inherently remind players of the contingent nature of the game-as-argument. For example, the author of [Renewable Energy Complexity] explicitly "recommend[s] supplementing this mod with more tweaks to climate change so that switching to renewable energy later in the game actually becomes a necessity of survival," as well as pairing the mod with other tweaks, optionally offered as a bundle.[51]

---

[48] See http://uoem.com/forums/threads/the-sims-3-renault-toyota-electric-vehicle-pack-and-ev-eco-set.20193/.

[49] Thomas P. Lyon and A. Wren Montgomery, "Tweetjacked: The Impact of Social Media on Corporate Greenwash," *Journal of Business Ethics* 118, no. 4 (December 22, 2013): 747–57, https://doi.org/10.1007/s10551-013-1958-x.

[50] Donly, "Toward the Eco-Narrative: Rethinking the Role of Conflict in Storytelling."

[51] See https://steamcommunity.com/sharedfiles/filedetails/?id=1667883116.

Recurring types of mods like eco-friendly buildings in *The Sims*,[52] which may even be interpreted as micro-genres because they function as cognitive schemas both in the creation and interpretation of mods-as-texts, are comparable to the interactive applications Bendor (2018) discusses as a means of tackling the crisis of the imagination. For example, the "Swedish online interactive exhibition *Life 2053* [...] provides visitors a glimpse of 'sustainable life in a major Swedish city in 2053'" (135). By creating eco-friendly building mods, players of *The Sims* similarly engage in "discursive design."[53] Yet, unlike *Life 2053*, their designs are inherently contingent, challenging other players' imaginations through radical propositions and even inconsistencies. For instance, [Eco-Logical Apartments with urban gardens] furnishes each unit in an urban apartment building with their "own interior vegetable garden." The fact that any mod can lead to a variety of emerging played outcomes adds another element of contingency to their claims. Under the conditions of ecomodding, the shape of a game is always in flux, i.e. its procedural rhetoric is by definition tentative and visibly dependent on external conditions. This mindset is valuable to apply to communicating the climate crisis as a whole, to question the assumptions behind arguments that appear without alternative.

4) Extrapolating from 'Static' Rules to 'Dynamic' Scenarios

In any ludic context, players learn to extrapolate from the proposed "procedures,"[54] i.e. usually immutable game rules. This capacity in itself addresses a key issue in environmental crisis communication, i.e. inferring future developments from currently observable circumstances and thinking in larger timeframes.[55]

Consider e.g. a comment on [Global Warming Congress], which half-jokingly suggests players "drive the world into a [sic] artificial Ice Age and eliminate other civs by freezing them to death as your civ goes underground to reemerge once the earth has rewarmed." While this is not a realistic scenario, neither in reality nor in the game, it touches upon the profound entanglement of social and environmental justice in climate crisis communication. Mod creators explicitly anticipate players' capacity to extrapolate; e.g. the creator of [Iceless Greenland] explains that "although inner and outer seas are usually separated by numerous hexes, there are some choke points that

---

[52] See e.g. https://modthesims.info/browse/all/143/?showType=1&tag=eco-friendly.

[53] Tharp and Tharp, *Discursive Design. Critical, Speculative, and Alternative Things*.

[54] Werning, "Modding as a Strategy to (de-)Legitimize Representations of Religion in the Civilization Franchise," 312.

[55] Laura op de Beke, "Anthropocene Temporality in Gaia Games," *KronoScope* (Brill Academic Publishers, November 16, 2020), https://doi.org/10.1163/15685241-12341470.

are only two or three hexes large: sound strategic positions," implying that players are able to infer potential game outcomes from the immutable topography of the mod's map. This capacity similarly applies to parsing new developments exacerbating the climate crisis as they are currently communicated, e.g. the decision to make water a tradable commodity on Wall Street in late 2020.[56] The long-term ramifications of these developments might be difficult to fathom, but they become more plausible if understood as additional "rules of play."

Indeed, many mod creators, like the creator of [Amelia's Fish Camp], emphasize that they "thoroughly tested everything out," i.e. exploring the interactive potential of the immutable rules and content they create can be considered an integral part of the "DIY ethos"[57] that characterizes ecomodding as a critical practice. In that regard, ecomodding illustrates Schulzke's claim that (video)games can operate as "executable thought experiments"[58] par excellence. Particularly the plethora of eco-friendly houses among *The Sims* mods are static user-generated objects that afford role play, i.e. acting out how it might feel to live in such a home, even if financial or other constraints make that impossible in real life. For example, [The Green way of Life], "an eco-friendly house for an eco-friendly couple or single Sim, located in the desert," is a static object, but the evocative description alludes to an embodied experience of the place (e.g. "a large raised pool to cool down if the shadow left your terrace") and provides a fictional backstory for decorative objects (e.g. "The leather on seatings [stemming] from animals which have died naturally"). The creator of [The Alora] similarly describes their content as "a tiny modern home, that's right not house — home," playfully underscoring the personal connection to the object, mediated through their sims inhabiting it. This pattern is supported by the fact that the costs of houses and lots in The Sims mods are usually explicitly stated. For example, [The Alora] creator "unghie" concedes that the house "may seem a bit expensive," but that "after a week or so, you'll start to realise that the solar panels and wind turbine seem to make a really big difference in your bills," i.e. the game allows for experiencing these "rules of play" – which similarly apply in real life – in an accelerated and iterative manner.

---

[56] See e.g. https://earth.org/water-trade/.

[57] Matt Ratto and Megan Boler, eds., *DIY Citizenship: Critical Making and Social Media* (Cambridge, MA: MIT Press, 2014), 23.

[58] Marcus Schulzke, "Simulating Philosophy: Interpreting Video Games as Executable Thought Experiments," *Philosophy and Technology* 27, no. 2 (June 26, 2014): 251–65, https://doi.org/10.1007/s13347-013-0102-2.

5) Harnessing Game Logic as a Frame of Reference for Environmental Communication

As commercial games like The Sims receive significantly more playtime than self-branded "serious games,"[59] mod creators and players internalize how to use "game logic," i.e. the internal consistency of the rule system, as a frame of reference to evaluate claims about the climate crisis. Unlike many other forms of online communication, this often leads to a more self-reflexive style of argumentation using shared knowledge about the game's rule system as a well-defined conceptual framework. Consider e.g. a comment on the world map mod [The Last Ice Age]: "I get historical accuracy and all but for playability maybe clearing the path would be better, #canalmod." The player argues that the lack of a Suez canal in the map, while accurate, "makes Egypt far harder" to play. Some players even refer to specific LUA code used in mod-making; e.g. a commenter on [Renewable Energy] suggests to "use Building_LockedBuildingClasses to mutually exclude wind farms and nuclear plants from being used together." In [Renewable Energy Complexity], the author states that checking of a geothermal power plant to be built "'next to [a] volcano' was not possible", so that they instead "chose Volcanic Soil as the next best option." That is, the gameplay system, despite its flexibility, might resist the creator's original intentions, thereby inspiring different ways of thinking about the subject matter. This implies that ecomods as communicative acts are usually productive, i.e. they inherently propose an alternative solution because simply rejecting an existing mod-as-argument is impossible by design; the closest equivalent may be exaggerating a mod's core rules to emphasize their flawed internal coherence.

6) Prioritizing the Modularity and Compatibility of (Procedural) Arguments

Ecomods and, by extension, the arguments they formulate are inherently modular and (re)combinable. For example, the creator of [Global Warming] urges players to "consider adding Global Warming Resolutions, a World Congress addition" to add further nuance to the mod's systems. The "global warming events" in [Global Warming] itself are expressed by identifying and repurposing existing rules and components in the main game, e.g. tiles gaining or losing resources, losing specific improvements (due to events like flooding) or cities losing population (e.g. in the event of a hurricane). This modular approach to rhetoric, using existing arguments as building blocks for new utterances, is characteristically different from established

[59] For an overview of *The Sims* statistics, cf. e.g. the 20th anniversary post at https://www.ea.com/games/the-sims/the-sims-4/news/the-sims-20th-birthday.

characteristics of crisis communication like "bifurcation or a radical system fluctuation"[60] or even "emergent self-organization" (332) as a corrective principle. It not only applies to elements of a game but also to connections between games with related procedural rhetoric. For example, a comment on [Global Warming Congress] suggests that "back in the days of *Alpha Centauri*, there was a resoution to lauch [sic] solar shade; which would cause global cooling and the lowering of sea levels" and "might make a good resolution as well." Thus, functionally similar games are, ideally, considered as complementary discourses in regards to the climate crisis; consequently, users often actively suggest adding interoperability between related mods to formalize these connections. For example, a player of the *Sims 3* mod adding eco-friendly cars suggests including the newly added custom Tesla Model S car to the list of supported vehicles,[61] This aspect adds to the inherent contingency of arguments indicated above, because depending on the configuration of ecomods installed, a game offers different options. For example, the mod [Decommissioned Power Plants] only allows for destroying outdated power plants running on coal, oil or uranium, while the more comprehensive [Renewable Energy Complexity] by the same creator "offers a completely carbon-neutral option for power plants."

A comment on [Earth After Climate Change] states that the "amazing map [...] makes you wonder how else the world would be affected by climate change (other than sea level)." This remark suggests that the challenge to fully explore the recombinability of modular game features, which constitutes a dominant appeal for ecomodders, contributes to bricolage thinking in a broader sense. Louridas defines bricolage as "the creation of structure out of events."[62] While this bottom-up approach was traditionally considered "in contrast to the scientific process" (5), Louridas uses the bricolage metaphor of design to highlight commonalities between scientific thinking and design thinking, positing "that science and design follow the same mode of work, but [...] apply it in different contexts" (16). Thus, with modding-as-design becoming an increasingly widespread practice, this suggests that its bricolage logic will also be applied to other areas of public discourse. For that purpose, ecomods, much like simulation games in general,[63] function as boundary objects. Like e.g. maps, a prototypical example of boundary objects, they provide an "operating space between

---

[60] Matthew W. Seeger, "Chaos and Crisis: Propositions for a General Theory of Crisis Communication," *Public Relations Review* 28, no. 5 (October 1, 2002): 331, https://doi.org/10.1016/s0363-8111(02)00168-6.

[61] See https://modthesims.info/download.php?t=416172&c=1&goto=newpost.

[62] Panagiotis Louridas, "Design as Bricolage: Anthropology Meets Design Thinking," *Design Studies* 20, no. 6 (November 1999): 5, https://doi.org/10.1016/S0142-694X(98)00044-1.

[63] van Pelt et al., "Communicating Climate (Change) Uncertainties: Simulation Games as Boundary Objects."

different 'social worlds' in which actors come together and share interpretations without the need for consensus" (43), i.e. depending on their personal and professional backgrounds, players will respond to different aspects of the mod despite playing the same game. However, Susan Leigh Star, one of the early proponents of boundary objects, emphasizes that, apart from their "interpretive flexibility,"[64] it is important to consider the material "form" (604) of boundary objects, including e.g. "textbooks, performances [or] computer operating systems" (604), as well as their "scale/granularity" (602) to avoid inflationary and, thus, meaningless use of the concept. Especially in terms of these last two, often overlooked categories, ecomods offer more variability, as they can e.g. be used in conjunction with other mods or merged as well as disassembled into larger or smaller components.

7) The Reification of Environmental Frames

Above, the importance of framing and specifically the challenge of continuously re-activating pertinent frames in environmental communication to maintain societal momentum were posited.[65] As "all thinking and talking involves 'framing'" (71-2), not only individual procedures but entire ecomods can activate and occasionally challenge existing frames. For example, [Amelia's Fish Camp], a mod for *The Sims 2*, evokes the contentious frame of "sustainable tourism"[66] by creating a resort based on circular economy principles that would enable tourists to "feel good about [their] vacation destination." However, as ecomods are easily shareable and modifiable as digital objects, they can contribute to the reification of specific frames, turning them into a thing with a fixed spectrum of possible connotations. Gregory Simon[67] addresses the problems of reification in environmental discourse and policy-making, e.g. when "fuzzy and investigative ecological boundaries" are formalized and codified via natural resource management policies. Ecomods can incur the same risk, e.g. reifying scientific data as in the case of [Antarctica 2050], a mod derived from a scientific map of the Antarctic bedrock topography. Other ecomods exaggerate the iconicity of

---

[64] Susan Leigh Star, "This Is Not a Boundary Object: Reflections on the Origin of a Concept," *Science, Technology, & Human Values* 35, no. 5 (September 10, 2010): 602, https://doi.org/10.1177/0162243910377624.

[65] Lakoff, "Why It Matters How We Frame the Environment."

[66] For a disambiguation of the term, see e.g. https://medium.com/colandian/whats-the-difference-between-green-tourism-ecotourism-and-sustainable-tourism-af4d0a4d8db8.

[67] Gregory L. Simon, "The 100th Meridian, Ecological Boundaries, and the Problem of Reification," *Society and Natural Resources* 24, no. 1 (December 2010): 95–101, https://doi.org/10.1080/08941920903284374.

prominently discussed near-future scenarios like [Iceless Greenland][68] or even accelerate the reification of frames initiated in other media contexts like [Al Gore's Antarctica], extrapolating on Al Gore's references to the transformation of the Earth's geographical poles in *An Inconvenient Truth* (2006).

Outlook

The seven principles identified above provide a framework for assessing ecomodding as a potential responses to the challenge of communicating the climate crisis but also to the shortcomings of ecogames as communicative infrastructures. Understanding ecomods as discursive utterances is an important first step, but as modding tools become even easier to use, they also afford new media modalities for communicating scholarly arguments. How this could work will be briefly outlined with reference to an exploratory workshop conducted at Utrecht University, in which students used the Creative mode of Epicgames' battle royale game *Fortnite* to introduce sustainability concerns into the game. *Fortnite* has been used as a platform for political communication, most notably in the context of Joe Biden's 2020 presidential campaign.[69] Moreover, due to the game's immense popularity, climate researchers and activists have tentatively used *Fortnite*, e.g. via the 'ClimateFortnite' channel,[70] where players can "find climate researchers and others discussing global warming while they play,"[71] or a 2019 WWF ad campaign.[72] Moreover, Marlatt[73] has pointed out the game's educational potential, emphasizing the "complex literacy practices of Fortnite" (7) and "the Fortnite community of practice [as] an ideal literate environment from which educators can scaffold academic content for learners" (8). These approaches, however, are characteristically relegated to existing niches in the "ecology of communication"[74] surrounding the game because they cannot modify or otherwise appropriate its contents.

---

[68] As an example of this motif in popular scientific discourse, see e.g. https://www.bbc.com/news/av/science-environment-42346009.

[69] See e.g. https://www.polygon.com/2020/11/2/21545771/joe-biden-fortnite-campaign-creative-map.

[70] See e.g. https://thisspaceshipearth.org/2018/11/climatefortnite-climate-scientists-playing-fortnite-on-twitch/.

[71] Maxwell Boykoff, "Digital Cultures and Climate Change: 'Here and Now,'" *Journal of Environmental Media* 1, no. 1 (December 10, 2019): 22, https://doi.org/10.1386/jem_00003_1.

[72] See e.g. https://adage.com/creativity/work/wwf-france-no-build-challenge/2163206.

[73] Rick Marlatt, "Capitalizing on the Craze of Fortnite: Toward a Conceptual Framework for Understanding How Gamers Construct Communities of Practice," *Journal of Education* 200, no. 1 (January 17, 2020): 3–11, https://doi.org/10.1177/0022057419864531.

[74] David L. Altheide, *An Ecology of Communication. Cultural Formats of Control* (Abingdon and New York: Routledge, 2019).

Contemplating potential modifications, students started by challenging the rather non-reflective engagement with the theme of flooding in Chapter 2, Season 3, which was called "Splashdown" and launched in June 2020. While submerging large parts of the game's map under water afforded new gameplay elements, the "Waterworld-style floating city area"[75] appeared particularly tone-deaf juxtaposed with increasingly frequency of flood disasters world-wide. One popular design approach thus involved using a workaround to include "swimmable water"[76] and implementing a more realistic flooded city that presents rising water levels as an actual, unfairly severe threat rather than a fun diversion. Another group used a tutorial on how to create tower defense maps in Fortnite Creative,[77] designing a map using the desert terrain and props with a small green island at the center that players needed to defend from the game's zombie-like enemies, which were reinterpreted as a symbolic manifestation of predatory capitalism. Other groups e.g. re-interpreted the game's iconic chug jug as a water resources, causing players to continuously loose health; as weapons were not implemented in the mod, players had to rely on and share the water to stay alive. Rather than formulating complex independent arguments, these mods effectively re-framed the game's own iconography. Whether they will succeed in defamiliarizing the game's environments and procedures as well as in reaching audiences otherwise inaccessible to environmental communication will have to be determined by publicly sharing the maps in a next step. These examples outline how ecomods may intervene in critical conversations about the climate crisis. Based on in-class exercises using the authoring tool *Twine*, Saklofske and Wilson[78] propose that game-making can augment academic communication and ideally facilitate new forms of "open social scholarship" (2). More specifically, the authors argue that game-making can "defamiliarize[…] and repoliticize[…] the forms and functions of communication and scholarly work" (2). Compared to traditional academic articles, game prototypes convey insights by "constellating ideas, and anticipating narrative networks and multiple pathways through such ideas" (4). These claims similarly apply to the Fortnite workshop outlined above. Accordingly, instead of establishing and defending a central hypothesis, the mods "spatialize a text, recreating a textual source into an inhabitable and navigable location" (5).

---

[75] See e.g. https://www.theverge.com/2020/6/17/21292876/fortnite-chapter-2-season-3-splashdown-launched-trailer-battle-pass.

[76] See https://www.youtube.com/watch?v=PTmiqdPmoxY.

[77] See https://www.youtube.com/watch?v=rwYYqpuvTvw.

[78] Rebecca Wilson and Jon Saklofske, "Playful Lenses: Using Twine to Facilitate Open Social Scholarship through Game-Based Inquiry, Research, and Scholarly Communication," *Knowledge Creation, Dissemination, and Preservation Studies* 3, no. 1 (February 27, 2019), https://doi.org/10.5334/kula.11.

Figure 2 - An early version of a 'flooded city' mod in the *Fortnite Creative* mode

To conclude, conceptualizing ecomodding as a discursive process points to how modifying commercial games can help address some of the shortcomings of ecogames as a medium for climate communication. Yet, as a "cultural public sphere,"[79] ecomodding is still in an aspirational stage. For example, while [The Sims 4 Eco Kitchen Stuff][80] received more than 140k views (as of July 2021), most ecomods for *The Sims 4* only accumulate a few thousand views, i.e. are limited to a minuscule subsection of the entire player base. Unsurprisingly, some of the arguments offered by ecomods – e.g. about the viability of a resort like [Amelia's Fish Farm] – may appear idealistic or underdeveloped. To refine these ideas, both mod creators and players are gradually developing "procedural literacy."[81] Given how Bendor considers the "unfinishedness"[82] of interactive media their characteristic strength in response to the crisis of the imagination, though, these inconsistencies should not be regarded purely as deficits, but they raise important questions and, most importantly, invite critical, co-creative responses. The affordance for creative action – more than just playing games – can

[79] Jean E. Burgess, Marcus Foth, and Helen G. Klaebe, "Everyday Creativity as Civic Engagement: A Cultural Citizenship View of New Media," in *Communications Policy & Research Forum* (Sydney, Australia: QUT ePrints, 2006), https://eprints.qut.edu.au/5056/.

[80] See. https://modthesims.info/d/646477/the-sims-4-eco-kitchen-stuff-custom-stuff-pack-updated-01-06-21.html.

[81] Michael Mateas, "Procedural Literacy: Educating the New Media Practitioner," *On the Horizon* 13, no. 2 (2005): 101, https://doi.org/10.1108/10748120510608133.

[82] Bendor, *Interactive Media for Sustainability*, 148.

foster a sense of empowerment as modders discover the "synthesizing capacity of the imagination."[83] On that account, ecomodding shows how games can facilitate a more equitable means of communicating the climate crisis but, among countless entertainment-oriented modifications,[84] individual ecomods still often only reach a small, albeit dedicated audience. Thus, it will likely require a concerted effort between the traditional games industry and this more decentralized, networked form of cultural production to make their benefits available at scale.

Finally, this article focuses on how ecomodding alters the distribution of agency with ecogames and the games industry but, given the available scope, had to mostly ignore the power balance within ecomodding as a sociotechnical system. For example, Sihvonen[85] emphasizes that, "in addition to numerous player-created tools, there are also official editors" made available by *The Sims* developer Maxis. Depending on the design preferences of these modding tools, the spectrum of expression may be implicitly or explicitly constrained, e.g. streamlined to facilitate producing fun and balanced experiences, thereby prefiguring mod-based forms of expression. Moreover, distribution and monetization tools constitute important gatekeepers that determine overall visibility as well as which type of content receives attention,[86] making them important aspects to consider for further research.

---

[83] Bendor, *Interactive Media for Sustainability*, 145.

[84] An selection of officially endorsed popular Civilization V mods consequently emphasizes usability, UI improvements and gameplay variability; see https://civilization.com/de-DE/civilization-5/news/entries/five-great-mods-for-civ-v/.

[85] Tanja Sihvonen, *Players Unleashed!: Modding the Sims and the Culture of Gaming* (Amsterdam: Amsterdam University Press, 2011), 13, https://doi.org/10.1177/009430611243819000.

[86] For example, to share Fortnite maps, modders need to receive a creator code from Epicgames and abide by the corresponding terms and conditions; see https://www.epicgames.com/fortnite/en-US/news/fortnite-creative-creator-content-rules-and-guidelines.

Bibliography

Abraham, Benjamin, and Darshana Jayemanne. "Where Are All the Climate Change Games? Locating Digital Games' Response to Climate Change." Transformations 30, no. 1 (2017): 74–94. https://opus.lib.uts.edu.au/handle/10453/121664.

Altheide, David L. *An Ecology of Communication. Cultural Formats of Control*. Abingdon and New York: Routledge, 2019.

Asplund, Therese. "Credibility Aspects of Research-Based Gaming in Science Communication-the Case of The Maladaptation Game." *Journal of Science Communication* 19, no. 1 (January 13, 2020). https://doi.org/10.22323/2.19010201.

Beke, Laura op de. "Anthropocene Temporality in Gaia Games." *KronoScope*. Brill Academic Publishers, November 16, 2020. https://doi.org/10.1163/15685241-12341470.

Bendor, Roy. *Interactive Media for Sustainability*. Cham: Palgrave Macmillan, 2018.

Bianchi, Melissa. "Rhetoric and Recapture: Theorising Digital Game Ecologies through EA's The Sims Series." *Green Letters* 18, no. 3 (September 2, 2014): 209–20. https://doi.org/10.1080/14688417.2014.963881.

Bogost, Ian. *Persuasive Games: The Expressive Power of Videogames*. Cambridge, MA: MIT Press, 2007.

Bogost, Ian. *Unit Operations. An Approach to Videogame Criticism*. Cambridge, MA: MIT Press, 2008.

Bohunicky, Kyle Matthew. "Ecomods: An Ecocritical Approach to Game Modification." *Ecozon@: European Journal of Literature, Culture and Environment* 8, no. 2 (2017): 72–87. https://ebuah.uah.es/dspace/handle/10017/31327.

Boykoff, Maxwell. "Digital Cultures and Climate Change: 'Here and Now.'" *Journal of Environmental Media* 1, no. 1 (December 10, 2019): 21–25. https://doi.org/10.1386/jem_00003_1.

Burgess, Jean E., Marcus Foth, and Helen G. Klaebe. "Everyday Creativity as Civic Engagement: A Cultural Citizenship View of New Media." In *Communications Policy & Research Forum*. Sydney, Australia: QUT ePrints, 2006.

https://eprints.qut.edu.au/5056/.

Carfoot, Gavin. "Musical Discovery, Colonialism, and the Possibilities of Intercultural Communication through Music." *Popular Communication* 14, no. 3 (July 2, 2016): 178–86. https://doi.org/10.1080/15405702.2016.1193184.

Chang, Alenda. "Playing Nature: The Virtual Ecology of Game Environments." University of California, Berkeley, 2013. https://escholarship.org/uc/item/9ch2w332.

Chappin, Emile J.L., Xanna Bijvoet, and Alexander Oei. "Teaching Sustainability to a Broad Audience through an Entertainment Game – The Effect of Catan: Oil Springs." *Journal of Cleaner Production* 156 (July 10, 2017): 556–68. https://doi.org/10.1016/j.jclepro.2017.04.069.

Chun, Wendy Hui Kyong. "Queerying Homophily." In *Pattern Discrimination*, edited by Clemens Apprich, Wendy Hui Kyong Chun, Florian Cramer, and Hito Steyerl, 59–98. Minneapolis & London: University of Minnesota Press, 2018.

Dobrin, Sidney I., and Sean Morey, eds. *Mediating Nature: The Role of Technology in Ecological Literacy*. London: Routledge, 2019.

Donly, Corinne. "Toward the Eco-Narrative: Rethinking the Role of Conflict in Storytelling." *Humanities* 6, no. 2 (April 2017). https://doi.org/10.3390/h6020017.

Fletcher, Robert. "Gaming Conservation: Nature 2.0 Confronts Nature-Deficit Disorder." *Geoforum* 79 (February 2017): 153–62. https://doi.org/10.1016/j.geoforum.2016.02.009.

Friedersdorff, Jessica C. A., Benjamin J. Thomas, Hannah R. Hay, Brodie A. Freeth-Thomas, and Christopher J. Creevey. "From Treetops to Tabletops: A Preliminary Investigation of How Plants Are Represented in Popular Modern Board Games." *PLANTS, PEOPLE, PLANET* 1, no. 3 (July 2019): 290–300. https://doi.org/10.1002/ppp3.10057.

Galloway, Alexander. "Playing the Code: Allegories of Control in Civilization." *Radical Philosophy* 128 (2004): 33–40. https://www.radicalphilosophy.com/wp-content/files_mf/rp128_article3_playingthecode_galloway.pdf.

Holzbaur, Ulrich D. "EcoGames – Simulation Games and Sustainable Development." In *Sustainability in the Information Society*, edited by Lorenz M. Hilty and Paul W.

Gilgen, 971–78. Marburg: Metropolis Verlag, 2001.

Hook, Derek, and Vlad Petre Glaveanu. "Image Analysis: An Interactive Approach to Compositional Elements." *Qualitative Research in Psychology* 10, no. 4 (2013): 355–68. https://doi.org/10.1080/14780887.2012.674175.

Koteyko, Nelya, Brigitte Nerlich, and Iina Hellsten. "Editorial: Climate Change Communication and the Internet: Challenges and Opportunities for Research." *Environmental Communication*. Routledge, April 3, 2015. https://doi.org/10.1080/17524032.2015.1029297.

Lakoff, George. "Why It Matters How We Frame the Environment." *Environmental Communication* 4, no. 1 (2010): 70–81.

Land, Jacqueline. "Indigenous Video Games." In *Race and Media: Critical Approaches*, edited by Lori Kido Lopez, 92–100. New York, NY: New York University Press, 2020.

Leigh Star, Susan. "This Is Not a Boundary Object: Reflections on the Origin of a Concept." *Science, Technology, & Human Values* 35, no. 5 (September 10, 2010): 601–17. https://doi.org/10.1177/0162243910377624.

Loring-Albright, Greg. "The First Nations of Catan: Practices in Critical Modification." *Analogue Game Studies* 2, no. 7 (2015). http://analoggamestudies.org/2015/11/the-first-nations-of-catan-practices-in-critical-modification/.

Louridas, Panagiotis. "Design as Bricolage: Anthropology Meets Design Thinking." *Design Studies* 20, no. 6 (November 1999): 517–35. https://doi.org/10.1016/S0142-694X(98)00044-1.

Lyon, Thomas P., and A. Wren Montgomery. "Tweetjacked: The Impact of Social Media on Corporate Greenwash." *Journal of Business Ethics* 118, no. 4 (December 22, 2013): 747–57. https://doi.org/10.1007/s10551-013-1958-x.

Makai, Péter Kristóf. "Climate Change on Cardboard: Ecological Eurogames." *Paradoxa* 31 (2020): 77–104. https://paradoxa.com/downloads/climate-change-on-cardboard-ecological-eurogames-77-104-download/.

Markowitz, Ezra M., and Meaghan L. Guckian. "Climate Change Communication: Challenges, Insights, and Opportunities." In *Psychology and Climate Change. Human*

Perceptions, Impacts, and Responses, edited by Susan Clayton and Christie Manning, 35–63. Cambridge, MA: Academic Press, 2018.

Marlatt, Rick. "Capitalizing on the Craze of Fortnite: Toward a Conceptual Framework for Understanding How Gamers Construct Communities of Practice." *Journal of Education* 200, no. 1 (January 17, 2020): 3–11. https://doi.org/10.1177/0022057419864531.

Mateas, Michael. "Procedural Literacy: Educating the New Media Practitioner." *On the Horizon* 13, no. 2 (2005): 101–11. https://doi.org/10.1108/10748120510608133.

Mattlin, Mikael. "Adapting the DIPLOMACY Board Game Concept for 21st Century International Relations Teaching." *Simulation and Gaming* 49, no. 6 (December 1, 2018): 735–50. https://doi.org/10.1177/1046878118788905.

Morton, Timothy. *Hyperobjects*. Minneapolis: University of Minnesota Press, 2013.

Pelt, S. C. van, Marjolijn Haasnoot, Bas Arts, Fulco Ludwig, Rob Swart, and Robbert Biesbroek. "Communicating Climate (Change) Uncertainties: Simulation Games as Boundary Objects." *Environmental Science and Policy* 45 (January 1, 2015): 41–52. https://doi.org/10.1016/j.envsci.2014.09.004.

Ratto, Matt, and Megan Boler, eds. *DIY Citizenship: Critical Making and Social Media*. Cambridge, MA: MIT Press, 2014.

Schulzke, Marcus. "Simulating Philosophy: Interpreting Video Games as Executable Thought Experiments." *Philosophy and Technology* 27, no. 2 (June 26, 2014): 251–65. https://doi.org/10.1007/s13347-013-0102-2.

Seeger, Matthew W. "Chaos and Crisis: Propositions for a General Theory of Crisis Communication." *Public Relations Review* 28, no. 5 (October 1, 2002): 329–37. https://doi.org/10.1016/s0363-8111(02)00168-6.

Sihvonen, Tanja. *Players Unleashed!: Modding the Sims and the Culture of Gaming*. Amsterdam: Amsterdam University Press, 2011. https://doi.org/10.1177/0094306112438190000.

Simon, Gregory L. "The 100th Meridian, Ecological Boundaries, and the Problem of Reification." *Society and Natural Resources* 24, no. 1 (December 2010): 95–101. https://doi.org/10.1080/08941920903284374.

Tharp, Bruce M., and Stephanie M. Tharp. *Discursive Design. Critical, Speculative, and Alternative Things*. Cambridge, MA: MIT Press, 2018.

Voorhees, Gerald. "Discursive Games and Gamic Discourses." *Communication +1* 1, no. 1 (2012): 1–21.

Werning, Stefan. "Modding as a Strategy to (de-)Legitimize Representations of Religion in the Civilization Franchise." In *Participatory Digital Cultures and Contemporary Discourses of (De)Legitimization*, edited by Andrew S. Ross and Damian J. Rivers, 307–25. New York & London: Routledge, 2018.

Wilson, Rebecca, and Jon Saklofske. "Playful Lenses: Using Twine to Facilitate Open Social Scholarship through Game-Based Inquiry, Research, and Scholarly Communication." *Knowledge Creation, Dissemination, and Preservation Studies* 3, no. 1 (February 27, 2019). https://doi.org/10.5334/kula.11.