# Artificial Intelligence in the polycrisis: fueling or fighting flames?

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## Main text

Rapid changes in the Anthropocene have profoundly reshaped the Earth's biosphere (Nyström et al., 2019). Consequently, the idea of 'crisis' has shifted—from discrete, localized events to persistent, interconnected states of disruption, often described globally as the 'polycrisis' (Morin and Kern, 1993; Lawrence et al., 2024). Artificial intelligence (AI) is increasingly entangled with this condition, both through its material and ecological impacts (Galaz, 2025) and its influence on information flows and social interactions (Bak-Coleman et al., 2021). Yet no systematic framework currently captures how AI interacts with, and potentially fuels, the polycrisis. Here, we uncover key tensions between AI and the polycrisis, focusing on the Anthropocene Traps framework (Søgaard Jørgensen et al., 2023)—a recent effort to describe the structural, self-reinforcing processes of growth, technological escalation, accelerating change, and hyperconnectivity that drive 14 trajectories representative of the polycrisis.

**Table 1. Anthropocene Traps and key tensions with artificial intelligence (AI).** Adapted from Søgaard Jørgensen et al. (2023). This overview is not intended to be exhaustive but illustrates major intersections between AI and the Anthropocene Traps.

| | **Anthropocene Trap** | **Description** | **Key tensions with AI** |
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| 1 | Simplification | Increasing specialization produces simplified sub-systems that are vulnerable to shocks. | AI can enhance the assessment of supply chain vulnerabilities (Mittal & Panchal, 2023) but may deepen fragility by depending on infrastructures controlled by few actors (Verdegem, 2022). AI proliferation also raises risks of cyberattacks (Yamin et al., 2021) and may lead to simplified and less resilient ecosystems in e.g., agriculture and forestry (Galaz et al., 2021). |
| 2 | Growth-for-growth | Institutional lock-ins drive pursuit of growth at the cost of well-being. | AI reinforces growth paradigms by intensifying competition (Lowitzsch & Magalhães, 2024), consolidating tech monopolies (Galaz, 2025), and driving data commodification (Verdegem, 2022). |
| 3 | Overshoot | Continued material growth leads to overshoot of Earth system tipping points. | AI may boost energy efficiency (IEA, 2025), yet efficiency gains risk rebound effects. Overall, AI expansion is projected to increase global energy demand, emissions, water use, and mineral extraction (de Vries, 2023). |
| 4 | Division | Unstable selection for global human cooperation increases risk of international conflict. | While AI can foster cooperation (Tessler et al., 2024), it also intensifies geopolitical risks through technological asymmetries (Garcia, 2024), regulatory tensions (Roumate, 2024), and electoral interference (Wack et al., 2025). |
| 5 | Contagion | Global connectivity increases the risk of large-scale contagion of infectious diseases | AI can help predict protein structures with medical benefits (Schauperl & Denny, 2022) but also risks worsening health inequities due to biased data with systemic underrepresentation (O'Connor & Liu, 2023), and weakening patient-clinician relationships (Li & Gilbert, 2024). |

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| 6 | Infrastructure lock-in | Complex material infrastructure becomes maladaptive, e.g. owing to sunk costs. | AI strengthens technological lock-ins by amplifying network effects in digital platforms (Arthur, 1996), making dominant technologies harder to displace. While AI can monitor fossil infrastructure impacts (Szramowiat-Sala et al., 2024), it can also be used for accelerating the development of extractive infrastructures, for instance by increasing the identification of oil and gas reservoirs, and their recovery (Wang et al., 2024). |
| 7 | Chemical pollution | Capacity to produce complex or persistent compounds that can cause long-term harm to humans and ecosystems. | AI can accelerate chemical design, but it could also be misused to create toxic or persistent compounds (Urbina et al., 2022). AI relies on mining materials and contributes to toxic e-waste. |
| 8 | Existential technology | Technological arms-races drive the evolution of existential technology, such as weapons of mass destruction. | AI elevates risks in nuclear warfare (Johnson, 2020), biotechnology (Urbina et al., 2022), bioweapons (Hurst & Bobier, 2025), and cyber-attacks (Yamin et al., 2021). |
| 9 | Technological autonomy | Reliance on automation can backfire if systems become misaligned to human needs. | While AI can support creative processes, it may also diminish the collective diversity of novel content (Doshi & Hauser, 2024) and negatively correlate with critical thinking abilities (Gerlich, 2025). Moreover, the black-box nature of AI can lead to unintended consequences, such as biased algorithms (Langenkamp et al., 2020) or flawed medical diagnoses (Norori et al., 2021), when operating without transparency. |
| 10 | Dis- and mis-information | Digitalization can amplify the spread of mis- and disinformation e.g. destabilizing democracies. | AI can counter conspiracy beliefs in controlled environments (Costello et al., 2024) and detect fake news (Dhiman et al., 2024) but also mass-produce misinformation, destabilizing democratic processes, eroding trust in democratic institutions, and driving polarization (Rodilosso, 2024; Spitale et al., 2024). |
| 11 | Short-termism | Favour of short-term over long-term benefits reinforces other traps and promotes conflict. | AI prioritizes short-term gains, such as economic growth, efficiency, and productivity, over long-term societal benefits like sustainability and fairness (Meitei et al., 2023). |
| 12 | Overconsumption | Separation of production and consumption facilitates overconsumption. | AI-driven targeting can be used to foster more sustainable consumption patterns (Hermann, 2022). Yet, it may shape behaviors in ways that reduce agency, power, and control, while also fueling consumerism (Patel, 2021). |
| 13 | Biosphere disconnect | Separation of human settlements and | AI can support ecological research (Rafik et al., 2025) but predominantly drives screen-centric |

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| | | ecosystems reduces awareness about their benefits. | lifestyles and surveillance capitalism (Zuboff, 2023). |
| 14 | Local social capital loss | Digitalization can lead to loss of local social capital through reduced interaction and echo chambers. | Proliferation of AI-generated content increases risks of careless speech, defined as “subtle inaccuracies, oversimplifications or biased responses that are passed off as truth in a confident tone”, and ultimately affecting social capital (Wachter et al., 2024). AI adoption can also negatively affect workers’ mental health by increasing workloads and altering job skill requirements, potentially inducing stress and depressive symptoms (Jin et al., 2024). |

In our initial survey of how AI interacts with the polycrisis, exemplified by the 14 Anthropocene Traps, we found initial support of dual effects for 10 out of 14 traps, but with a stronger emphasis on negative effects (i.e., AI reinforcing the traps). For the remaining four traps, initial research tends to highlight mainly negative effects. Mechanisms that enable responses to the polycrisis primarily involve enhancing information gathering and the efficiency of key processes. In contrast, those that reinforce or exacerbate the polycrisis tend to be more varied in nature. On the environmental impact side of AI, they include the cumulative environmental impacts and novel waste products, and lifestyles that increase the disconnect with nature. On the social side, they include reinforcing biases and power asymmetries and loss of human agency and interaction. On the material side they include malign uses of enhanced technological capacities and increased dependency on complex infrastructures vulnerable to multiple risks.

The ambivalence of tensions reflects not merely divergent applications of AI, but the extent to which AI is embedded within the broader social-ecological systems that fuel the polycrisis. Technology is not inherently neutral; its development and deployment are shaped by institutions, economic incentives, and societal norms—many of which are closely aligned with traps such as growth-for-growth, infrastructure lock-in, and short-termism. Supporting more constructive roles for AI in the polycrisis will require moving beyond technical fixes toward approaches that can engage multiple Anthropocene Traps and their reinforcing feedbacks simultaneously. This includes research efforts that explore how adaptive and transformative resilience capacities can counteract trap dynamics (Søgaard Jørgensen et al., 2025), as well as political reforms that are explicitly informed by the Anthropocene Traps framework—recognizing, for instance, how policy inertia, narrow metrics, and fragmented institutions may themselves reinforce the very feedbacks AI is expected to help resolve.

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**Declaration of AI use**

We have used AI-assisted technologies (ChatGPT-4o model) for spell checking, and as inspiration for rewording individual sentences. After using these tools, the authors reviewed and edited the content as needed, and take full responsibility for the content of the publication.