Reviewing burning embers from the 3 IPCC special reports in a homogenous framework

Philippe Marbaix[a], Zinta Zommers[b], Alexandre Magnan[c] and Jean-Pascal van Ypersele[a]

"Burning embers" are iconic diagrams developed in IPCC reports and other literature to illustrate risks from climate change, using a range of colours from white (no observed risk increase attributed to climate change) to purple (very high risk). The first burning embers were developed in 2001 and took the form of five integrative "Reasons for concern" to illustrate an expert elicitation-based global assessment of risks and impacts [1]. The recent IPCC Special Reports (SRs) on 1.5°C, Oceans/Cryosphere and Land developed "burning embers" for specific risks, for example to food security, from wildfire, or to coastal systems. Together, these burning embers cover a broad range of systems and sectors, providing a global picture of climate risks across latitudes and systems [2].

In this contribution, we continue efforts to bring all the "embers" from the IPCC special reports together in a consistent way, to examine the risks assessed across systems on a common basis. While the intrinsic nature of risk to different systems makes it difficult to define fully standardized (comparable) risk levels, a common understanding of burning ember diagrams has developed over time. Nevertheless, finding a proxy to describe climate hazards remains one of the outstanding challenges. Hazards are of diverse nature but need to be expressed with a common metric, such as global mean surface temperature change (GMST). For ocean ecosystems, in particular, this implies identifying a correspondence between GMST and sea surface temperature, which is not uniform across the globe and increases on average at a slower pace than temperature over land. We take advantage of the availability of the three SRs as well as the new climate observations and projections in the AR6 WG1 to further harmonise the presentation of the ensemble of ember diagrams. Building on this refinement, we revisit the messages that emerge from a joint presentation of this broad set of risks: do systems at higher risk, or showing larger increases in risks at a given level, share some common properties such as limits to adaptation?

[1] Zommers et al. 2020, https://doi.org/10/gg985p

[2] Magnan et al. 2021, https://doi.org/10/gm28qp

Affiliations:
(a) Université catholique de Louvain (Earth and Life Institute), Louvain-la-Neuve, Belgium
(b) United Nations Office for the Coordination of Humanitarian Affairs, United Nations Headquaters, New York, NY, USA
(c) Institute for Sustainable Development and International Relations (IDDRI-Sciences Po), Paris, France