

Earth Syst. Dynam. Discuss., author comment AC5
<https://doi.org/10.5194/esd-2021-26-AC5>, 2021
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Reply on AC4

Oliver López-Corona et al.

Author comment on "ESD Ideas: planetary antifragility: a new dimension in the definition of the safe operating space for humanity" by Oliver López-Corona et al., Earth Syst. Dynam. Discuss., <https://doi.org/10.5194/esd-2021-26-AC5>, 2021

Additionally, it may be useful to clarify some concerns about the focus of the paper in the context of how an albedo measurement may or may not say something about PB.

We are not using albedo measurements per se, we are using fisher information which is a measure of the system stability and its capacity to respond to perturbation (Frieden et.al. 2007; Equihua et.al 2020) of the Albedo time series as a proxy of entropy production (Michaelian 2015). So we are not interested in specific mechanisms of interaction between albedo and any other Earth major biogeochemical process (including PB) but in a systemic measurement of the earth system antifragility.

Why are we using this approach?

Because it has proven to work on human systems.

One way of conceptualizing human health is a reductionist mechanistic approach in which the complexity of the organisms is reduced firstly into major systems: cardiovascular; digestive; excretory; endocrine; exocrine; immune and lymphatic; muscular; nervous; renal and Urinary; reproductive; respiratory; and skeletal system. Then track one by one all the mechanisms involved in each one of those systems. As in Physics, this method has had tremendous success, but can not explain for example some auto-immune diseases.

In recent years we have learned that some systemic signals encode health beyond a single mechanism or system. In that category, we found the fractal physiology approach to human health (Bassingthwaight et al. 2013), especially the analysis of heart R-R fluctuation time series analysis (see complementary references already given in other commentaries).

References

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