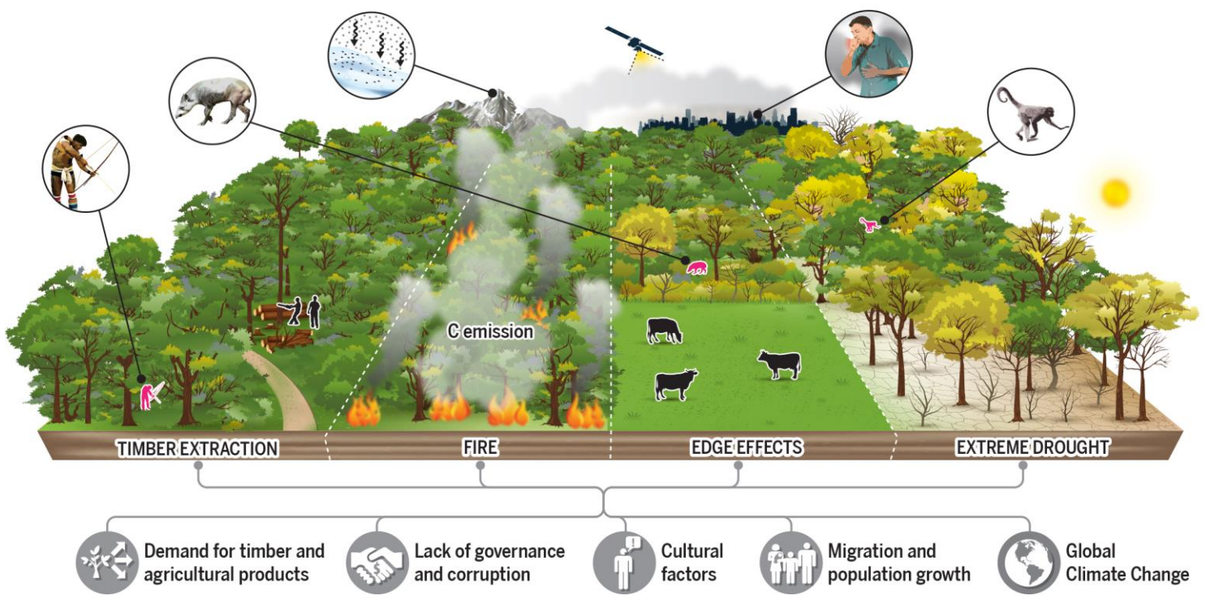
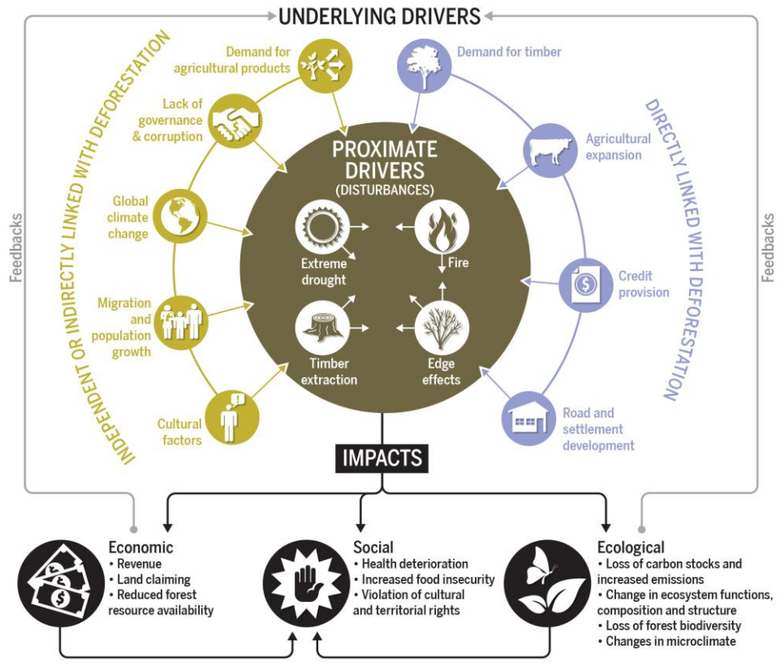
Halting Amazon deforestation may not stop forest degradation

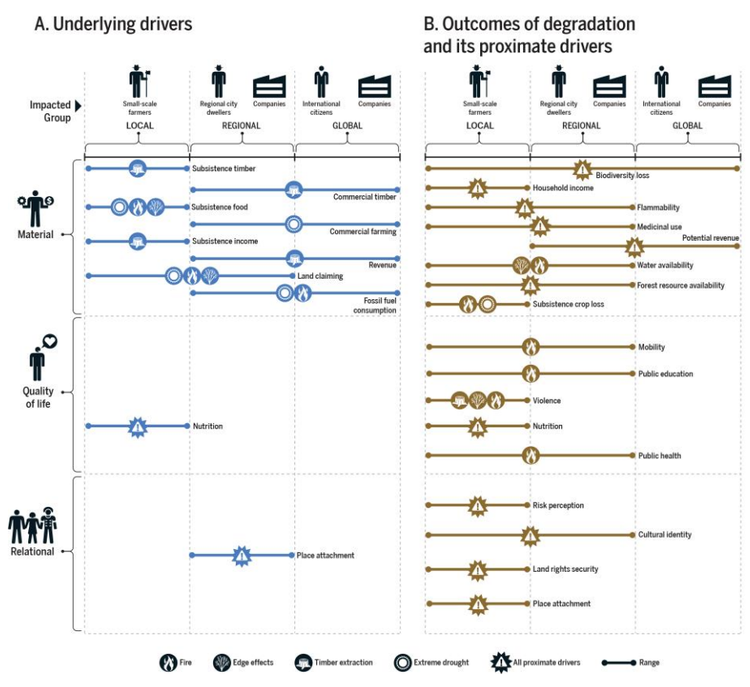
OVERVIEW OF TROPICAL FOREST DEGRADATION PROCESSES IN THE AMAZON



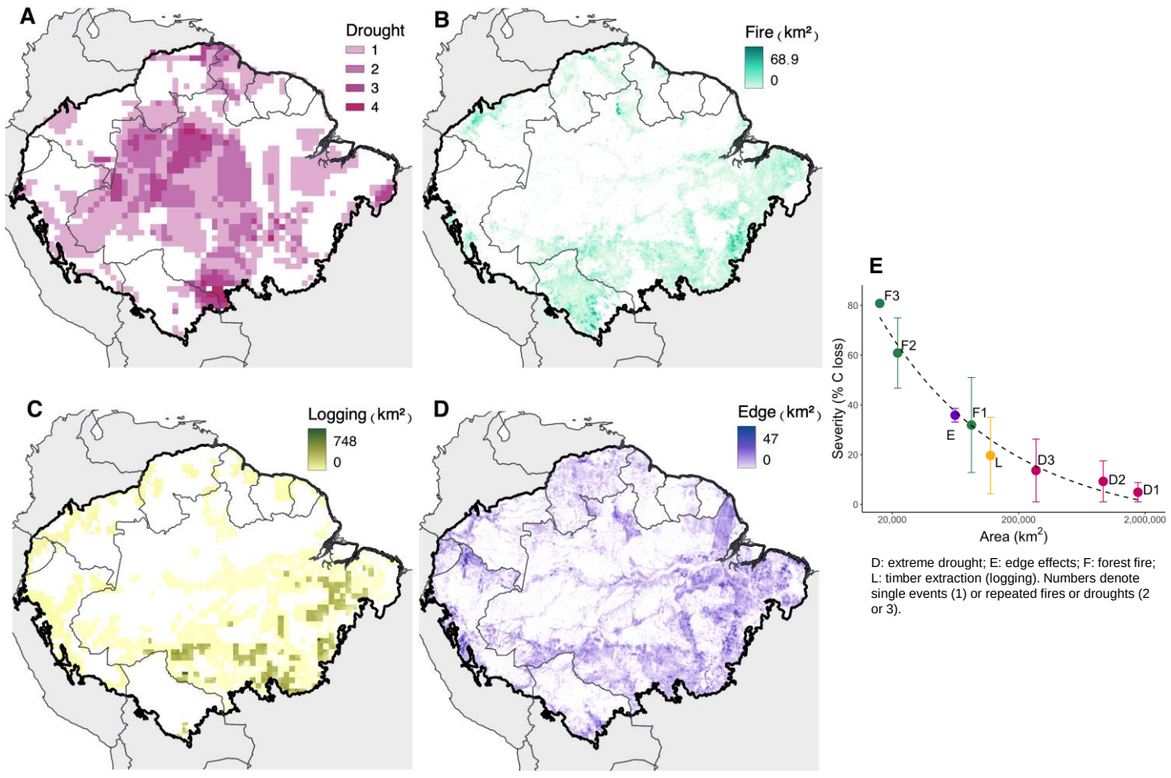
DEGRADATION DRIVERS



SOCIOECONOMIC IMPACTS

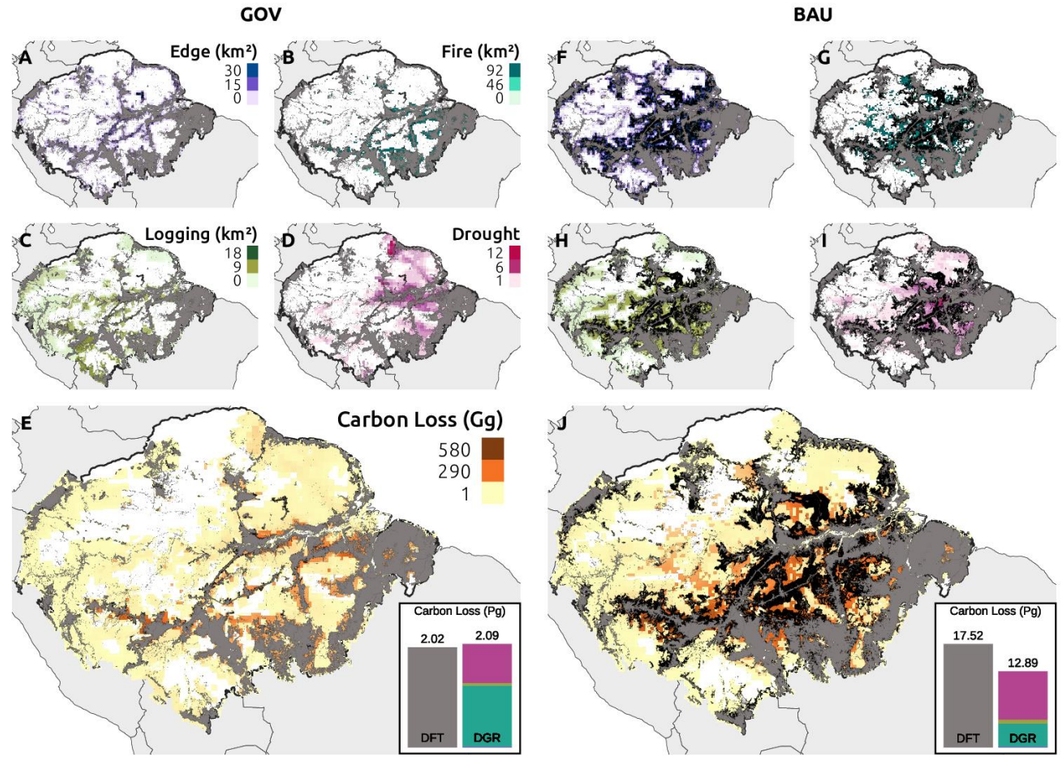


CURRENT (2001-2018) OBSERVATIONS



D: extreme drought; E: edge effects; F: forest fire; L: timber extraction (logging). Numbers denote single events (1) or repeated fires or droughts (2 or 3).

FIRST-ORDER 2050 MODEL PROJECTIONS



- Spatial extent of the 4 main drivers of forest degradation (A-D) and estimated carbon loss (E). Earth observation datasets used for this analysis include: (A) CRU 4.0 (Harris et al., 2020), (B) Collection 6 MODIS burned area (Giglio et al., 2018), (C) Land-Use Harmonization 2 dataset (Hurtt et al., 2020), (D) MapBiomas derived from Landsat (Souza et al., 2020).
- **0.36 x106 km^2 (5.5%) of the Amazon forest is under some form of degradation, which corresponds to 112% of the total area deforested in the same period. Adding data on extreme droughts increases the estimate of total degraded area to 2.5 x106 km^2, or 38% of the remaining Amazonian forests.**

- Combining previously published projections of the individual main disturbances that cause degradation, we projected potential future patterns of degradation of the Amazon forest and their effects on carbon stocks under two alternative deforestation scenarios: “governance” (GOV) and “business-as-usual” (BAU) and compared it to deforestation projections using the model SimAmazonia (Soares-Filho et al., 2006).
- **Projections indicate that degradation will remain a dominant source of carbon emissions independent of deforestation rates.**

RECOMMENDATIONS

- Curbing degradation will require interventions that go beyond policies focused on deforestation, like operationalizing the monitoring of the different types of disturbances and refining the REDD+ framework.
- As spaceborne LiDAR technology becomes increasingly cost-effective, the combination of its ability to detail canopy structure with optical imagery is a promising avenue for operationalizing the monitoring of disturbances linked to degradation.

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Reference: David M. Lapola*, Patricia Pinho, Jos Barlow, Luiz. E. O. C. Aragão, Erika Berenguer, Rachel Carmenta, Hannah M. Liddy, Hugo Seixas, Camila V. J. Silva, Celso H. L. Silva-Junior, et al., The drivers and impacts of Amazon forest degradation. *In review.*

No photo