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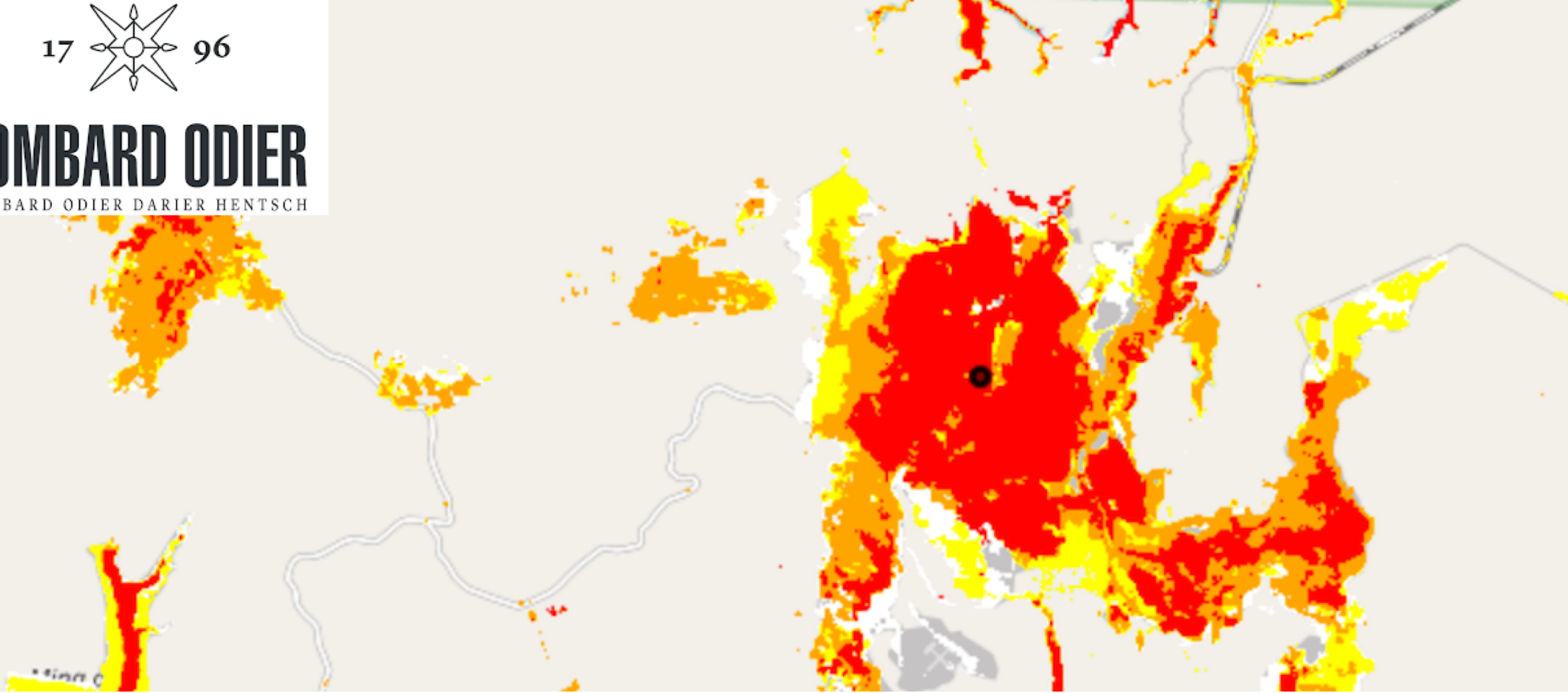
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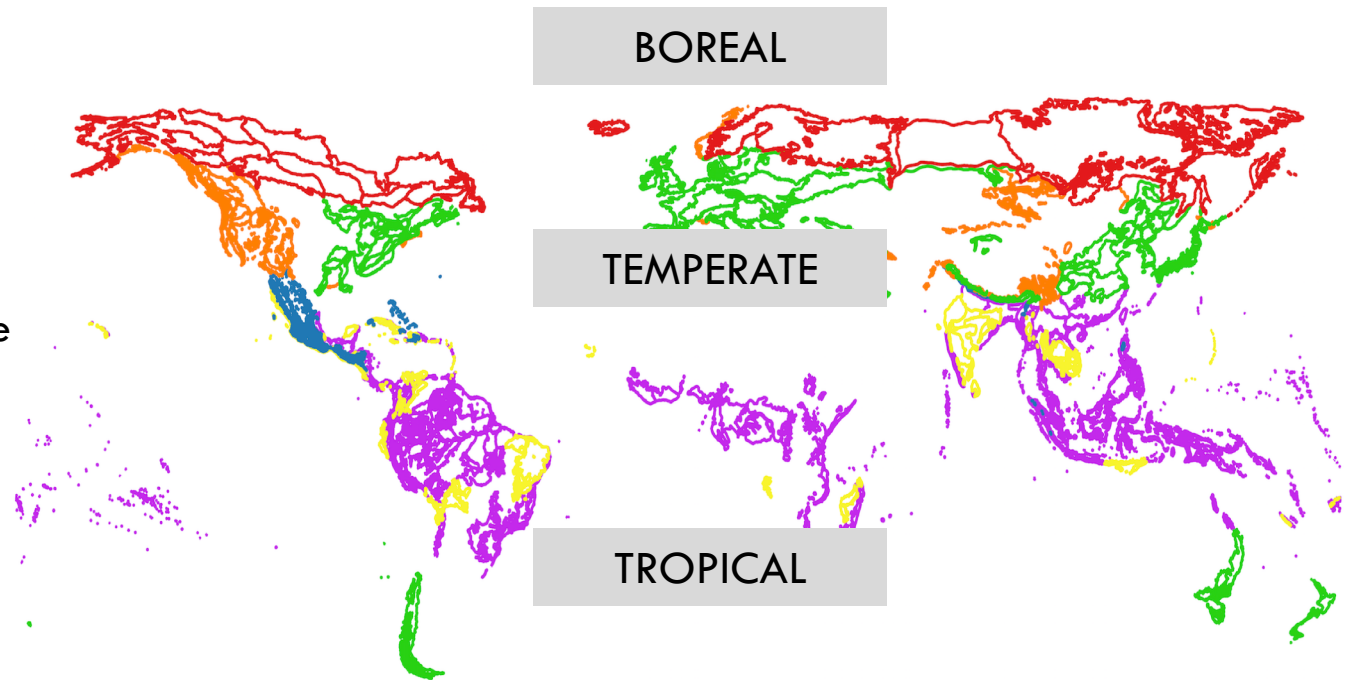


GLOBAL ATTRIBUTION OF MICROCLIMATE DYNAMICS TO INDUSTRIAL DEFORESTATION SITES USING TRS ML

Nataliya Tkachenko
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FORESTS WITHIN PLANETARY BOUNDARIES

- Three major forest biomes play major role in land surface-climate coupling than other biomes: tropical, temperate and boreal
- Of the forest biomes, tropical forests have substantial feedbacks to climate through changes in evapotranspiration when they are converted to non-forested systems
- Changes in the distribution of boreal forests affect the albedo of the land surface (regional energy exchange)
- The biome boundary of tropical and boreal forests is set the highest in the boundaries' framework: 85%
- The boundary for temperate forests has been proposed at 50% of potential forest cover, because their changes are estimated to have weaker impact on the global scale



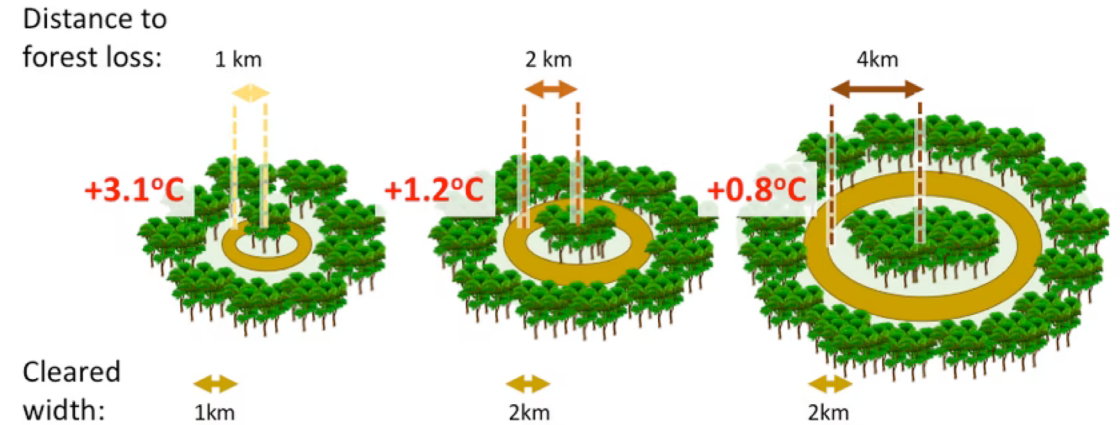


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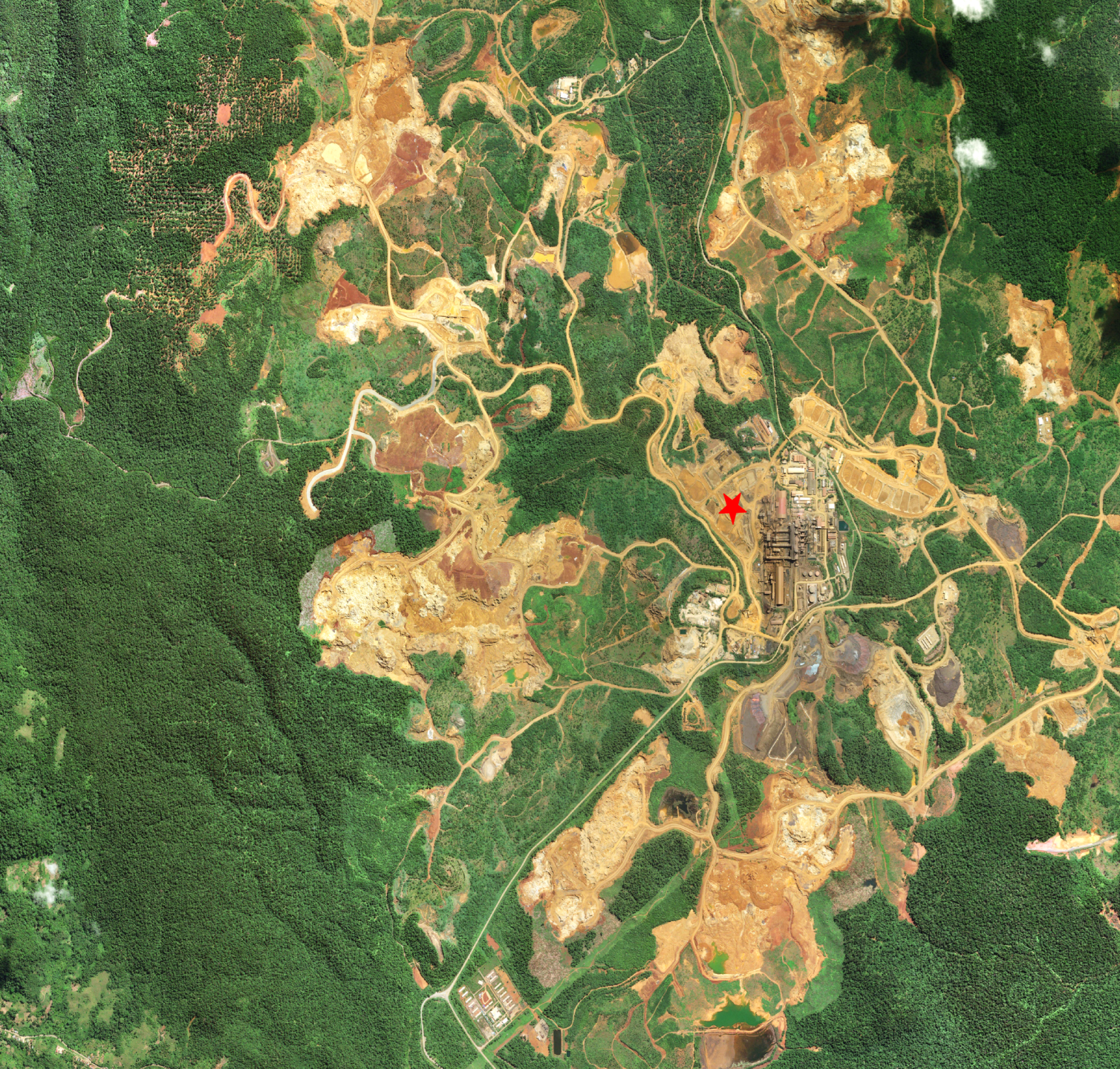
Deforestation can raise local temperatures by up to 4.5°C – and heat untouched areas 6km away

Sally Thompson, The University of Western Australia, Débora Corrêa, The University of Western Australia, John Duncan, The University of Western Australia, Octavia Crompton, Duke University

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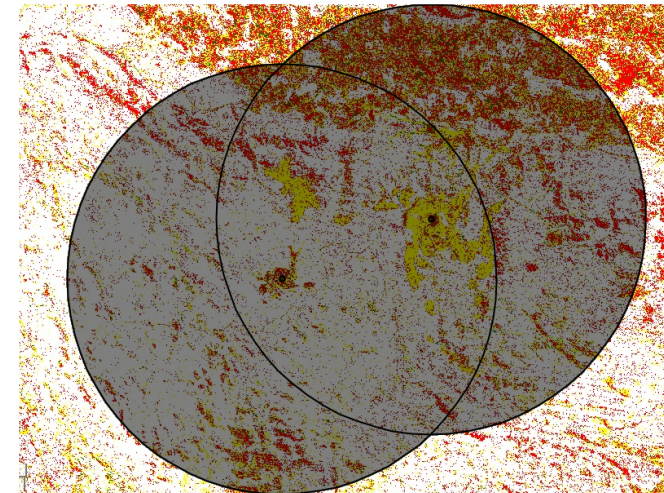
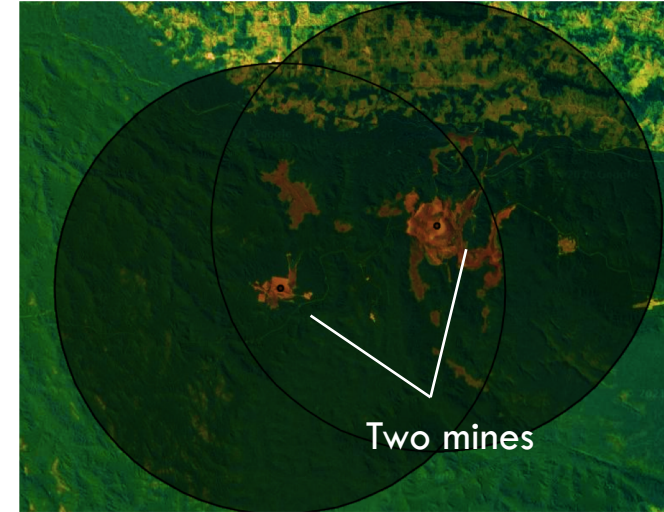
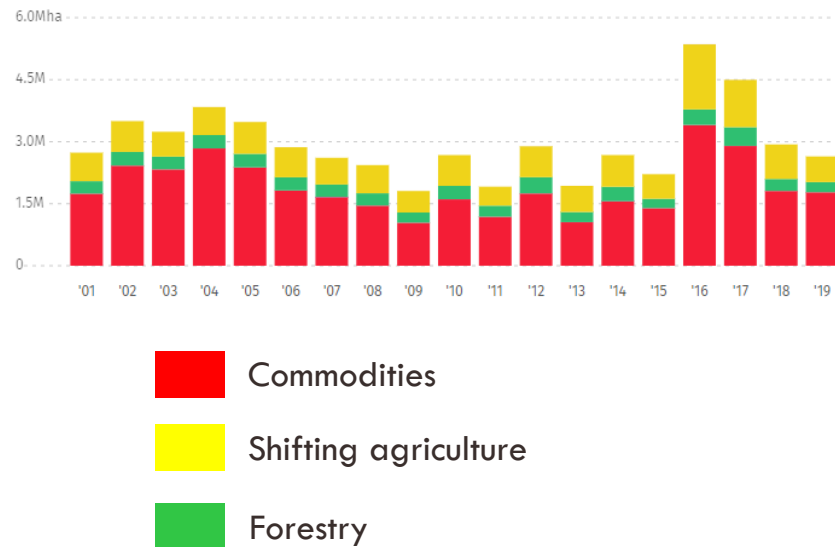
- **Forests cool the climate and losing them causes temperatures to rise**
- **Tested on hypothetical geometries**
- **WHAT IS THE ACTUAL INDUSTRIAL IMPACT ON THE PLANETARY SCALE?**



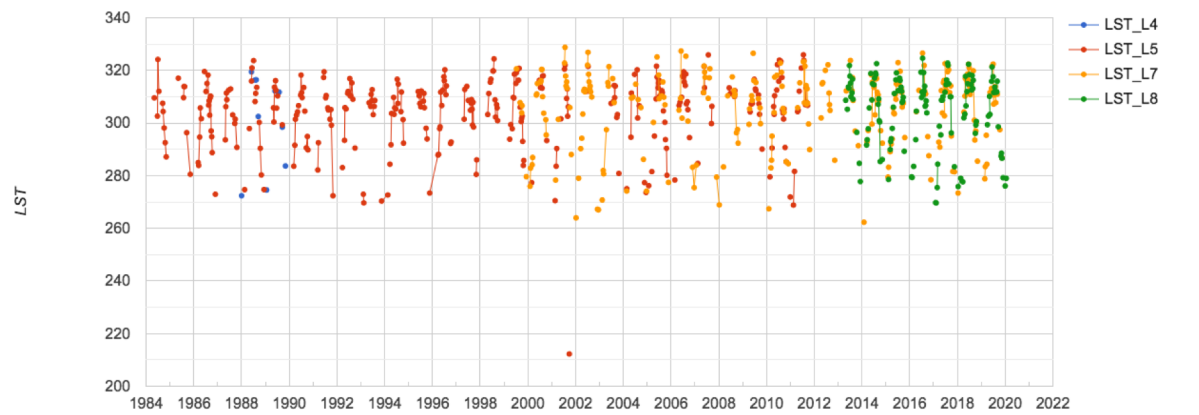
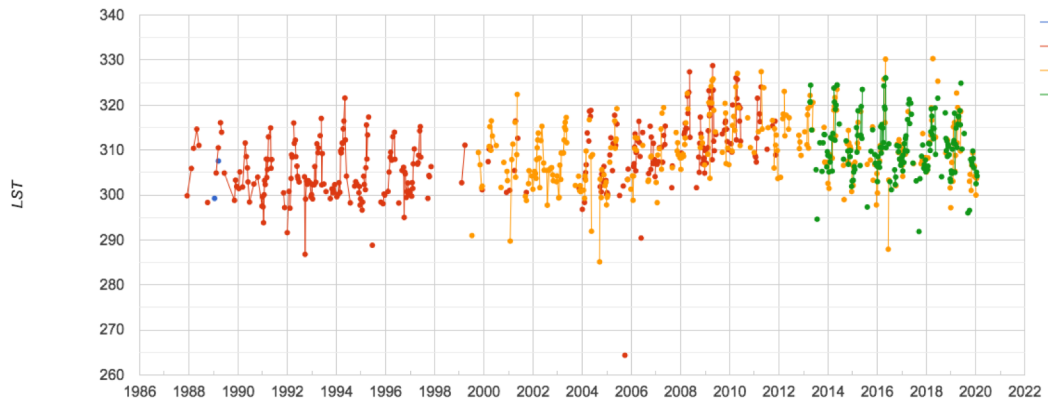
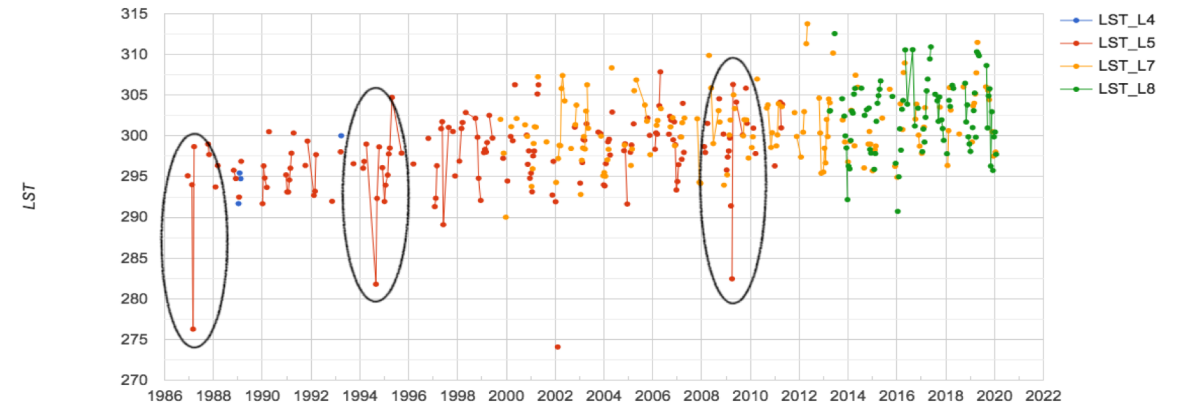
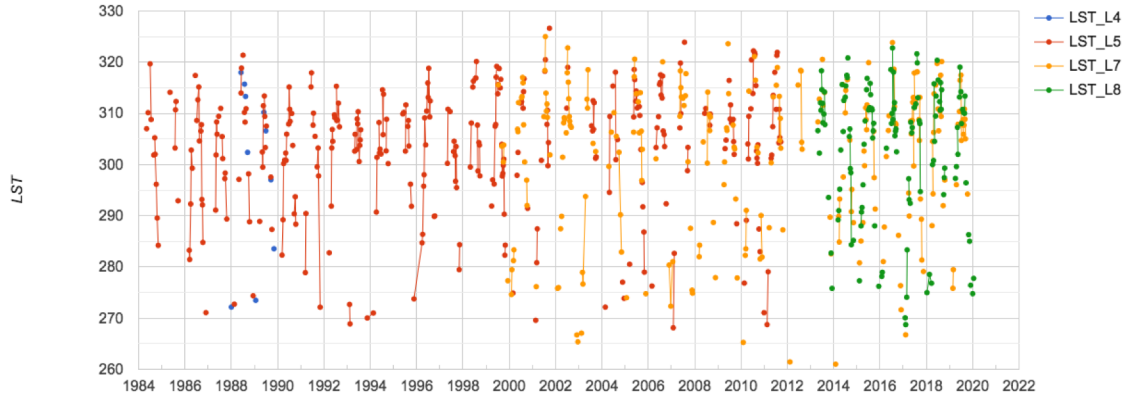
- (1) What area of forest loss each asset is responsible for (attribution)?
- (2) How the **volume** and **dynamics** of loss affect neighboring climate?

CASE STUDY

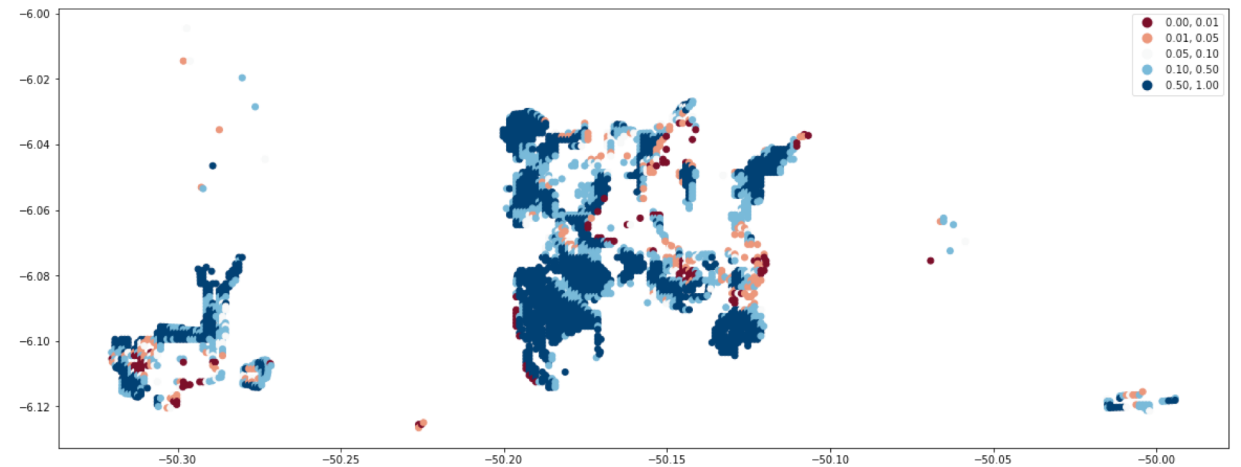
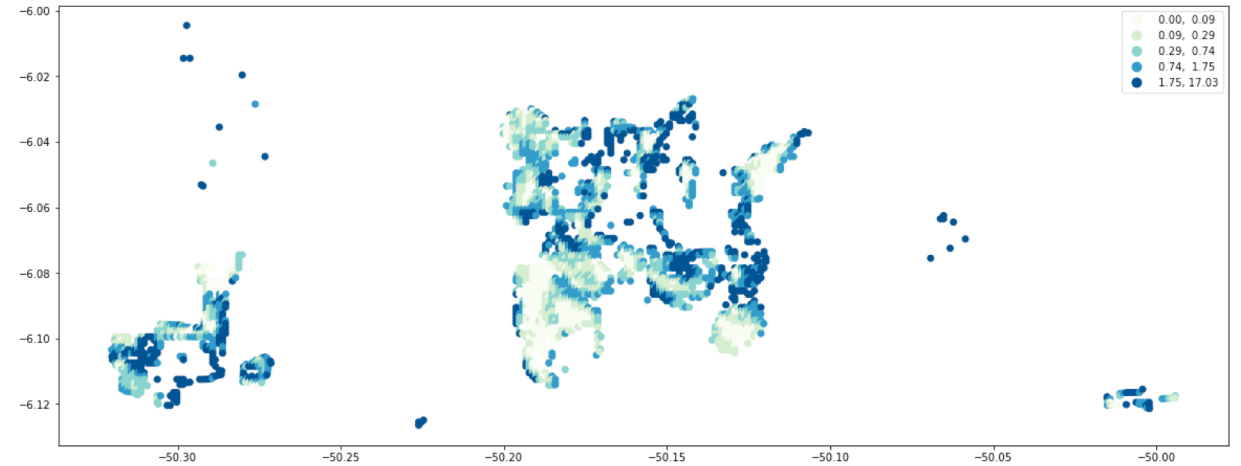
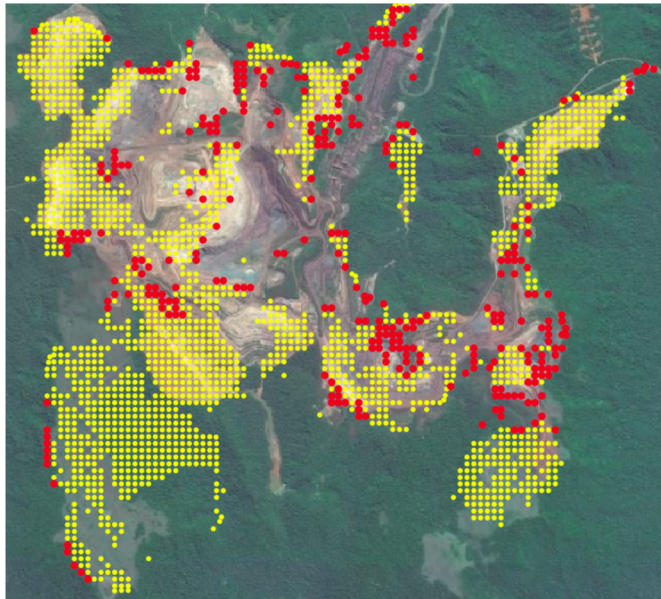
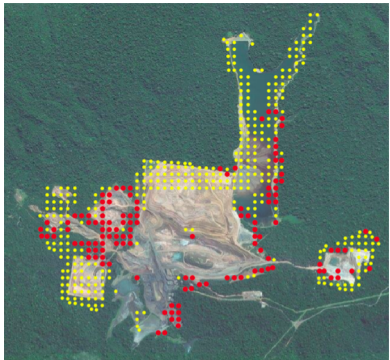
Annual tree cover loss by dominant driver in Brazil (2000-2019)



* Different institutions draw buffer, we wanted to estimate actual footprints



ATTRIBUTION SIGNIFICANCE



CONCLUSIONS

- Sequential change in microclimates is important as it enables source attribution
- Geospatial machine learning allows to develop statistical significance indicators of forest dynamics impact on the local climates
- Scalable, enables links establishment between industrial activity at the asset level and the local temperatures (climate litigation)