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Cutting the Brazilian Bush
Analyzing Deforestion in the Brazilian Amazon
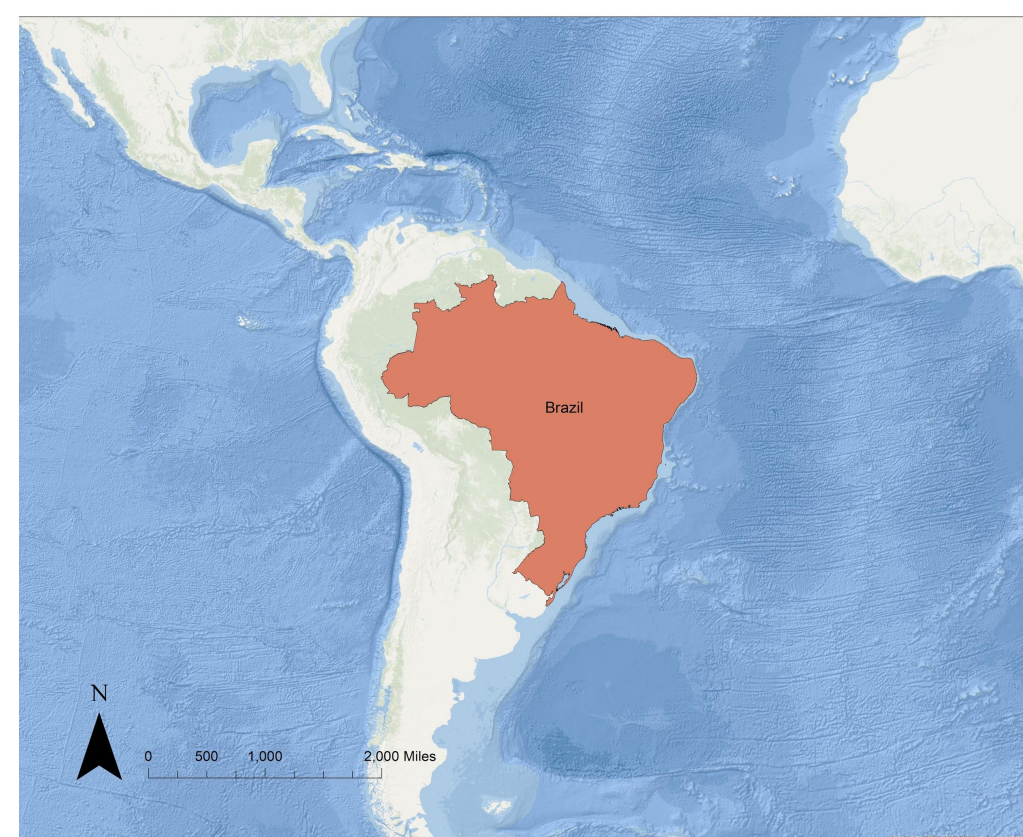
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Introduction

Last year, Brazil elected Jair Bolsonaro as their president. During his campaign, he pledged to rollback protection of the Amazon rainforest and to exploit it for timber and transform the land into cattle and soybean farms. Much of the rainforest that he is planning on cutting down is on land owned and protected by indigenous people. Included in campaign promises were vows to remove the rights of indigenous people. With rainforest protections reduced and right for the indigenous people guarding gone, irreparable damage could be done to the rainforest. This project aims to highlight the areas of the rainforest most at risk and where the most harm could be done. A vulnerability analysis will be done using factors such as proximity to roads, above ground biomass, and whether or not there is a indigenous population in the area.

Methodology

Since only Brazil was being considered, all shapefiles and rasters were clipped to be only in Brazil. A buffer was made using euclidean distance from roads in the Amazon. This was turned into a raster with a value of 2 for areas within 10 km of a road and a value of 2 for areas within 30 km of a road. Then, each area of Brazil was given a rating from 0 to 3 based on how much above ground biomass was present. Finally, using the raster calculator, a vulnerability index was made using the formula ("Intact Forest" * ("Road Buffer" + "Biomass" + (-"Indigenous Population")). Areas with an indigenous population got a negative score since they protect the part of the forest they live in. This led to a vulnerability scale of 0 - 5 being created.
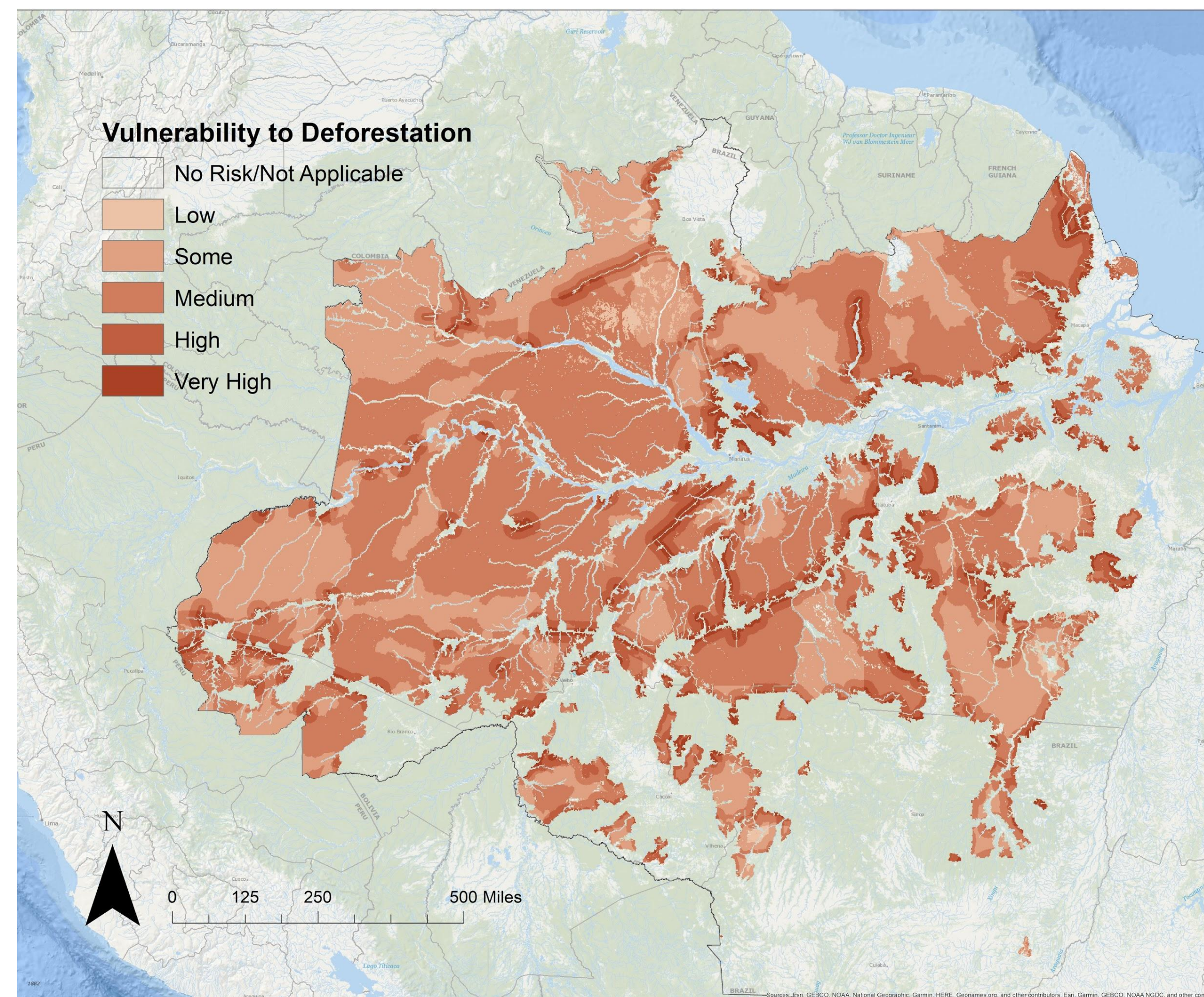

Fig. 1. An analysis showing the vulnerability of different parts of the Amazon Rainforest with darker areas indicating increased vulnerability.
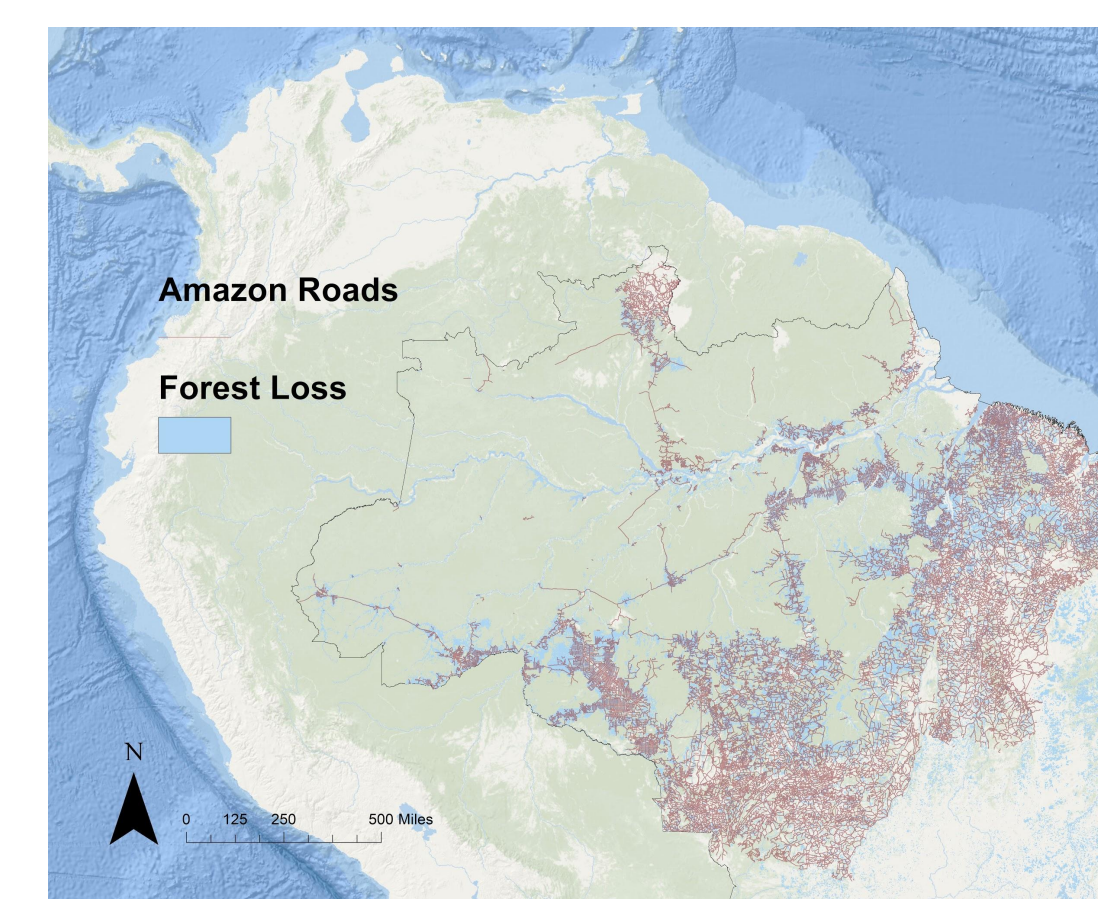
Results

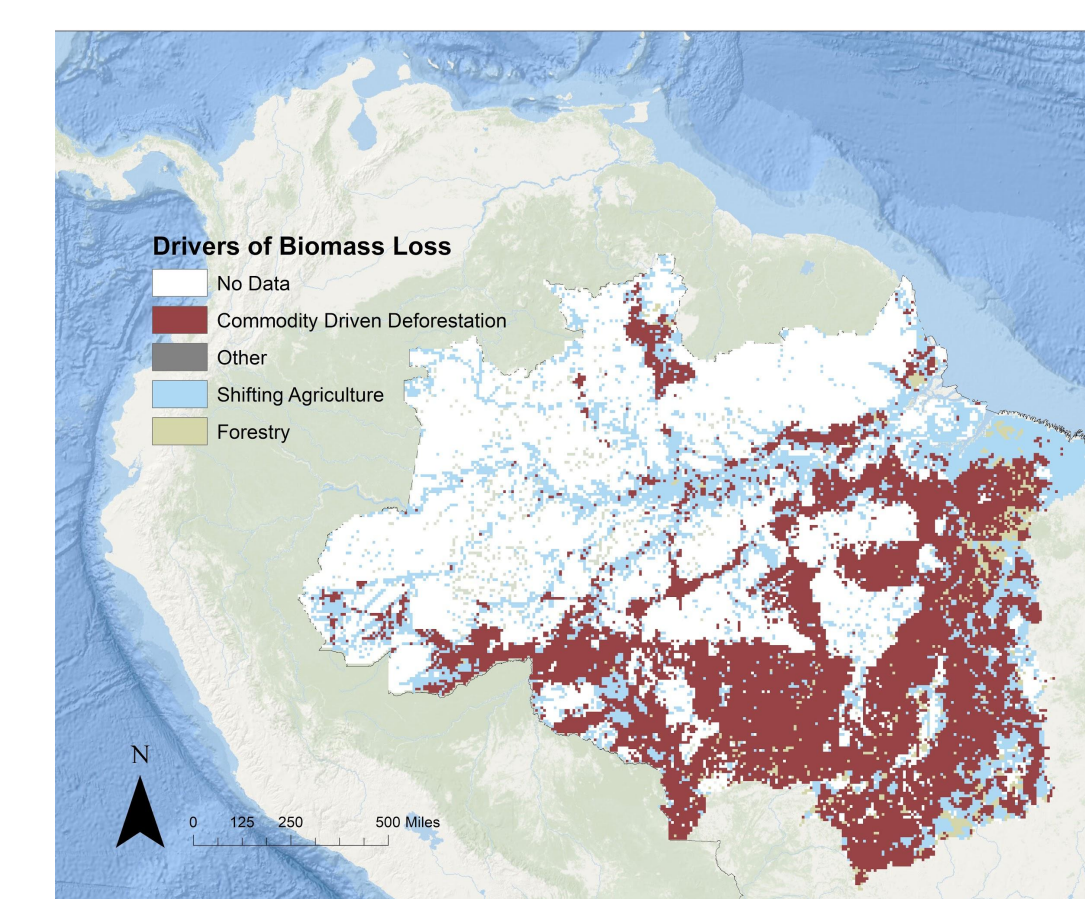Fig. 3. A map showing the overlap of roads and forest loss in the Brazilian Amazon

Fig. 2. A map showing the different reasons for deforestation in the Brazilian Amazon.

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Conclusions

As expected, the areas nearest to the roads had the highest vulnerability rating. This is as it should be since it is easiest to access to areas of the forest when the road infrastructure is already there. This can be seen in Fig. 3 as the densest areas of forest loss is where there are roads next to the forest. Something that did not play as big of a role was above ground biomass. The Amazon is so dense that almost all of it had the 3 on the 0 -3 scale for carbon storage. This just further stresses the importance of preserving the Amazon since it stores so much carbon.

As shown in Fig. 2, almost all of the biomass loss in the Amazon is due to either agriculture or commodity driven reasons. This is inline with Bolsonaro's reasons for expanding deforestation. He thinks of the Amazon as a wasted resource. It wants to use to to expand the Brazilian economy via agriculture and cattle.

Many assumptions were made in the creation of this analysis. One was that only intact forest landscapes were at risk. This excludes parts of the forest the are currently being deforested as well as areas affected from human activity. Another is that indigenous people make a noticeable difference in protecting the forest. This my not be true of all indigenous populations or for the entire territory in which they live in the rainforest.

Sources

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