

The effect of Indonesia's moratorium on deforestation clusters

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October 4, 2012

Abstract

Tropical deforestation accounts for roughly 10% of annual carbon emissions, more than the combined emissions from road, rail, air, and marine transportation, worldwide. Any viable effort to mitigate climate change will have to address tropical deforestation. This paper assesses the impact of Indonesia's 2011 moratorium on new deforestation in Indonesian Borneo. The results suggest that, relative to Malaysian Borneo, the moratorium shifted the spatial distribution of deforestation, rather than reducing the overall rate, as intended. The proportion of new clearing activity that took place on the periphery of pre-existing clusters significantly increased with the phased enactment of the moratorium. The overall effect was a significant *increase* in the overall deforestation rate. We model this event through a spatial dynamic programming problem, noting that cleared land is an input in the production of agricultural products. The results are significant in determining the efficacy of the moratorium, since it is likely that the long-term rate of deforestation may be a better metric of success — as long as the two-year limit is extended.

Tables and figures

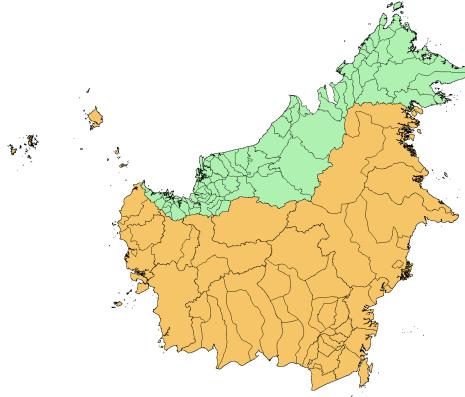


Figure 1: Sample area, Malaysia in green and Indonesia in orange. Borders indicate subprovinces.

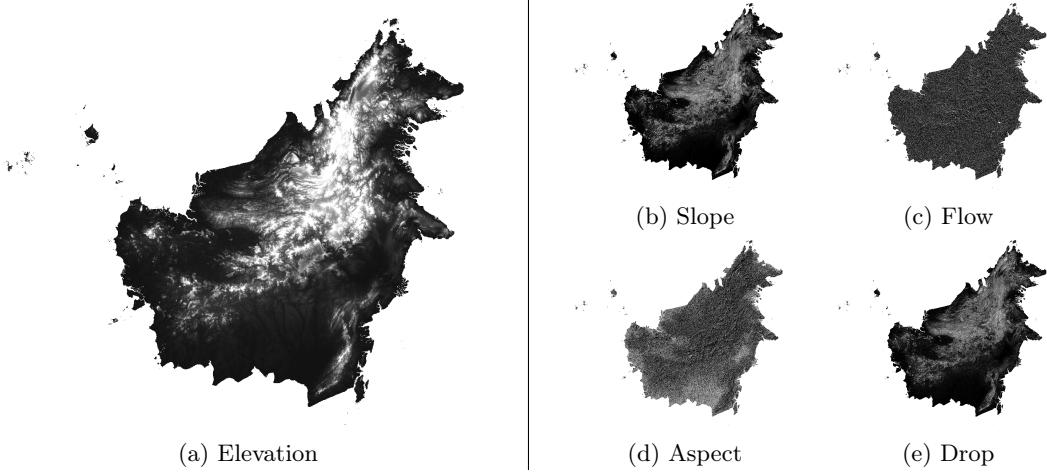
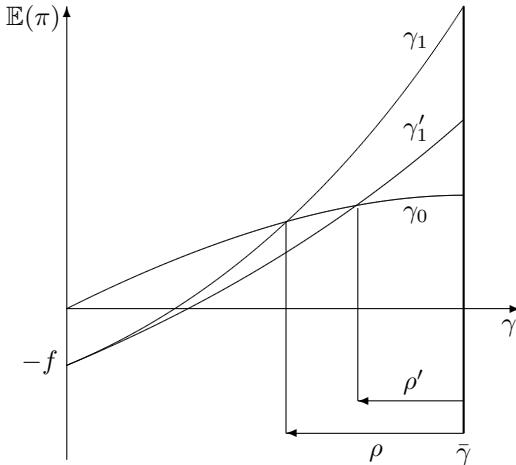


Figure 2: Map of the digital elevation model (left) with derived data sets (right) indicating slope, hydrology, and terrain roughness, 90m resolution.

Figure 3: Illustration



References

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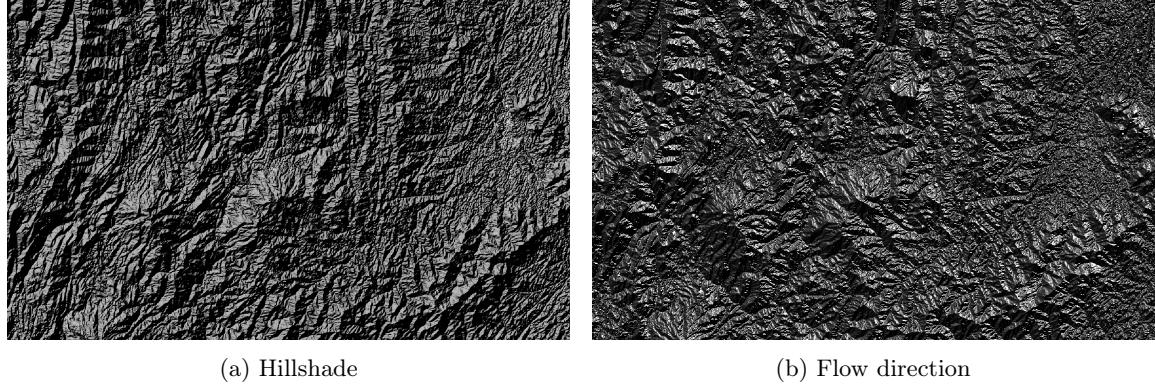


Figure 4: Detailed images of two derived data sets for the same area.

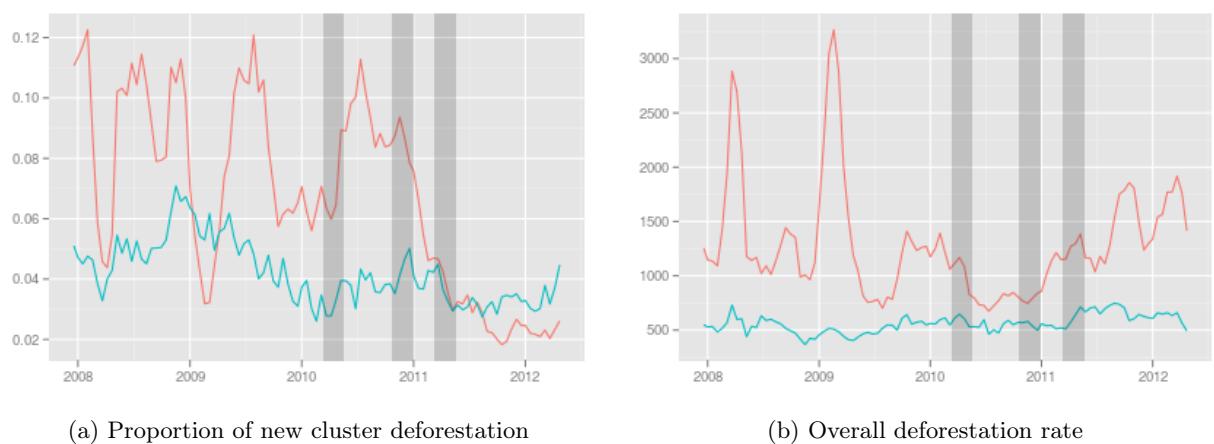


Figure 5: Time series for Malaysia baseline (blue) and Indonesia (red); grey areas indicate the three phases of the moratorium, allowing for uncertainty in the deforestation data.

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Table 1: Proportion of deforestation from new clusters

	(1)	(2)	(3)
(Intercept)	0.04552*** (0.00192)	0.06408*** (0.00536)	0.06506*** (0.00746)
cntry	0.03790*** (0.00271)	0.03790*** (0.00263)	0.02947*** (0.01055)
post	-0.01117*** (0.00346)	0.00047 (0.00460)	-0.01334 (0.04075)
cntry:post	-0.04021*** (0.00489)	-0.04021*** (0.00475)	0.11524** (0.05763)
pd		-0.00530*** (0.00144)	-0.00558*** (0.00207)
pd:cntry			0.00241 (0.00292)
pd:post			0.00253 (0.00732)
pd:cntry:post			-0.02822*** (0.01035)
R ²	0.64452	0.66756	0.68762
Adj. R ²	0.63913	0.66081	0.67635
Num. obs.	202	202	202

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$