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Mapping forest cover change and its relationship with protected areas and mining concessions in all forested aimags

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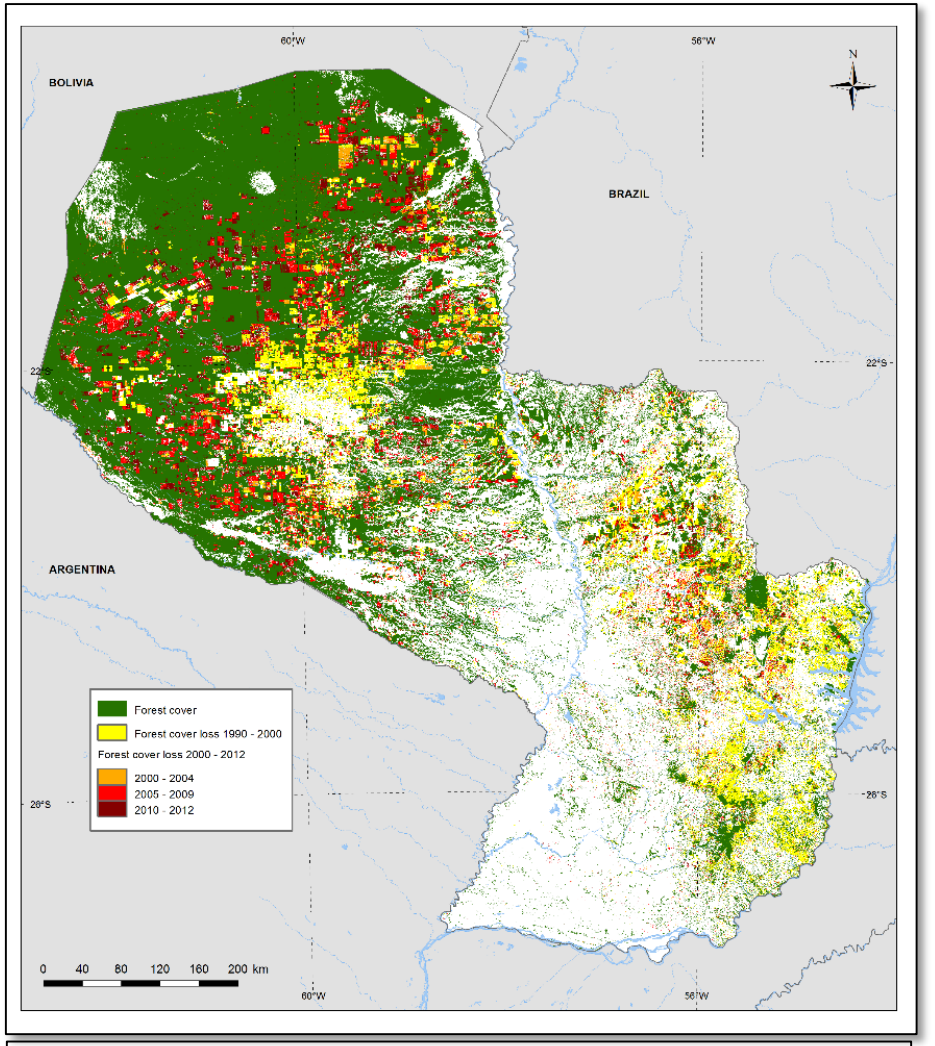
DATASETS

- Landsat-derived forest cover maps from 2000 and 2009
- Hansen data forest loss 2000 - 2014
- Distribution of protected areas in all forested aimags.
- Distribution of mining areas in all forested aimags
- Administrative boundaries and context data



Forest cover loss in Paraguay from 1990 to 2012

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High-Resolution Global Maps of 21st-Century Forest Cover Change

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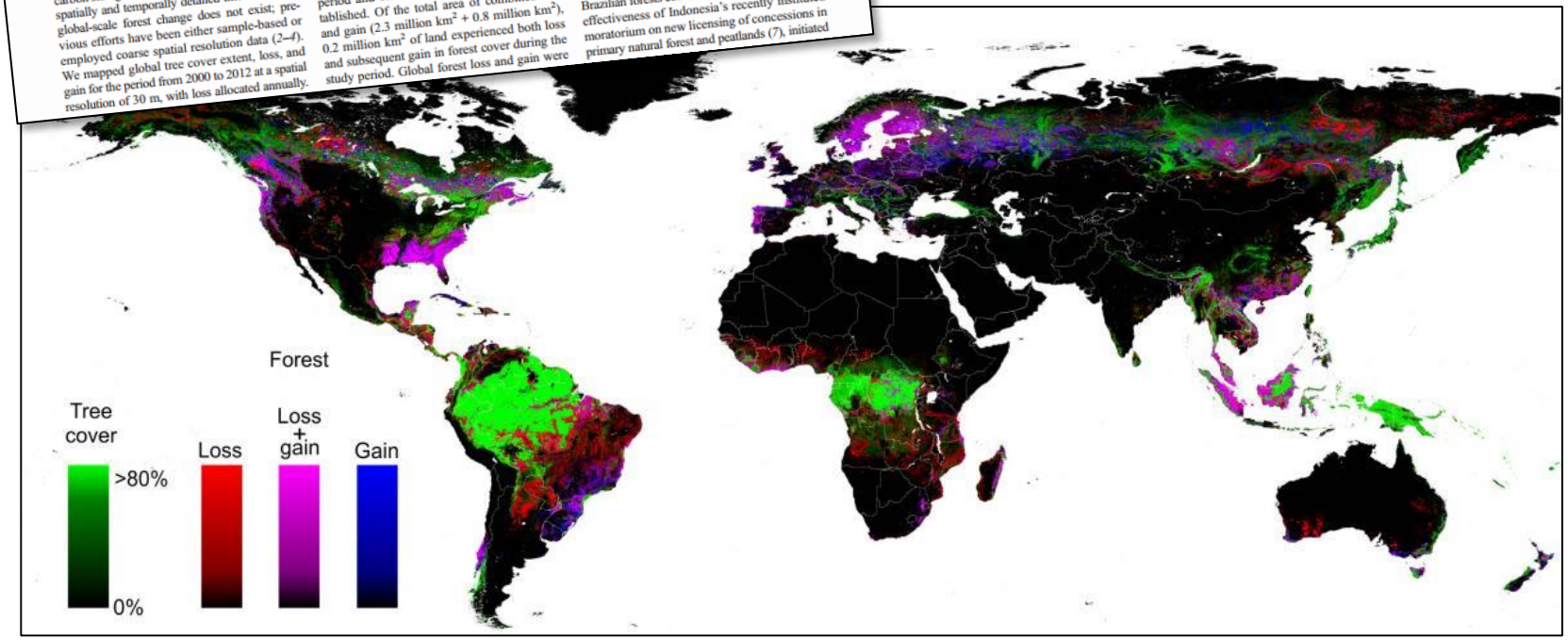
Quantification of global forest change has been lacking despite the recognized importance of forest ecosystem services. In this study, Earth observation satellite data were used to map global forest loss (2.3 million square kilometers) and gain (0.8 million square kilometers) from 2000 to 2012 at a spatial resolution of 30 meters. The tropics were the only climate domain to exhibit a trend, with forest loss increasing by 2101 square kilometers per year. Brazil's well-documented reduction in deforestation was offset by increasing forest loss in Indonesia, Malaysia, Paraguay, Bolivia, Zambia, Angola, and elsewhere. Intensive forestry practiced within subtropical forests resulted in the highest rates of forest change globally. Boreal forest loss due largely to fire and forestry was second to that in the tropics in absolute and proportional terms. These results depict a globally consistent and locally relevant record of forest change.

Changes in forest cover affect the delivery of important ecosystem services, including biodiversity richness, climate regulation, carbon storage, and water supplies (*1*). However, spatially and temporally detailed information on global-scale forest change does not exist; previous efforts have been either sample-based or employed coarse spatial resolution data (*2*–*4*). We mapped global tree cover extent, loss, and gain for the period from 2000 to 2012 at a spatial resolution of 30 m, with loss allocated annually. plete removal of tree cover canopy at the Landsat pixel scale. Forest gain was defined as the inverse of loss, or the establishment of tree canopy from a nonforest state. A total of 2.3 million km^2 of forest were lost due to disturbance over the study period and 0.8 million km^2 of new forest established. Of the total area of combined loss and gain (2.3 million km^2 + 0.8 million km^2), 0.2 million km^2 of land experienced both loss and subsequent gain in forest cover during the study period. Global forest loss and gain were dynamics in the Chaco woodlands of Argentina, Paraguay (Fig. 2A), and Bolivia. Eurasian rainforests (Fig. 2B) and dense tropical dry forests of Africa and Eurasia also had high rates of loss.

Recently reported reductions in Brazilian rainforest clearing over the past decade (*5*) were confirmed, as annual forest loss decreased on average 1318 km^2/year. However, increased annual loss of Eurasian tropical rainforest (1392 km^2/year), African tropical moist deciduous forest (536 km^2/year), South American dry tropical forest (459 km^2/year), and Eurasian tropical moist deciduous (221 km^2/year) and dry (123 km^2/year) forests more than offset the slowing of Brazilian deforestation. Of all countries globally, Brazil exhibited the largest decline in annual forest loss, with a high of over 40,000 km^2/year in 2003 to 2004 and a low of under 20,000 km^2/year in 2010 to 2011. Of all countries globally, Indonesia exhibited the largest increase in forest loss (1021 km^2/year), with a low of under 10,000 km^2/year from 2000 through 2003 and a high of over 20,000 km^2/year in 2011 to 2012. The converging rates of forest disturbance of Indonesia and Brazil are shown in Fig. 3. Although the short-term decline of Brazilian deforestation is well documented, changing legal frameworks governing Brazilian forests could reverse this trend (*6*). The effectiveness of Indonesia's recently instituted moratorium on new licensing of concessions in primary natural forest and peatlands (*7*), initiated

- Changes in forest cover at 30 m resolution globally
- More than 650,000 images analyzed
- Use it with caution!



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STEPS

- 2 Groups:
  - Mongolian forest cover maps
  - Hansen deforestation dataset
- Add distribution of protected areas in all forested aimags
- Add distribution of mining areas in all forested aimags
- Create final layout adding administrative boundaries context data