



Forest cover extent and loss in Democratic Republic of the Congo

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2000 - 2010



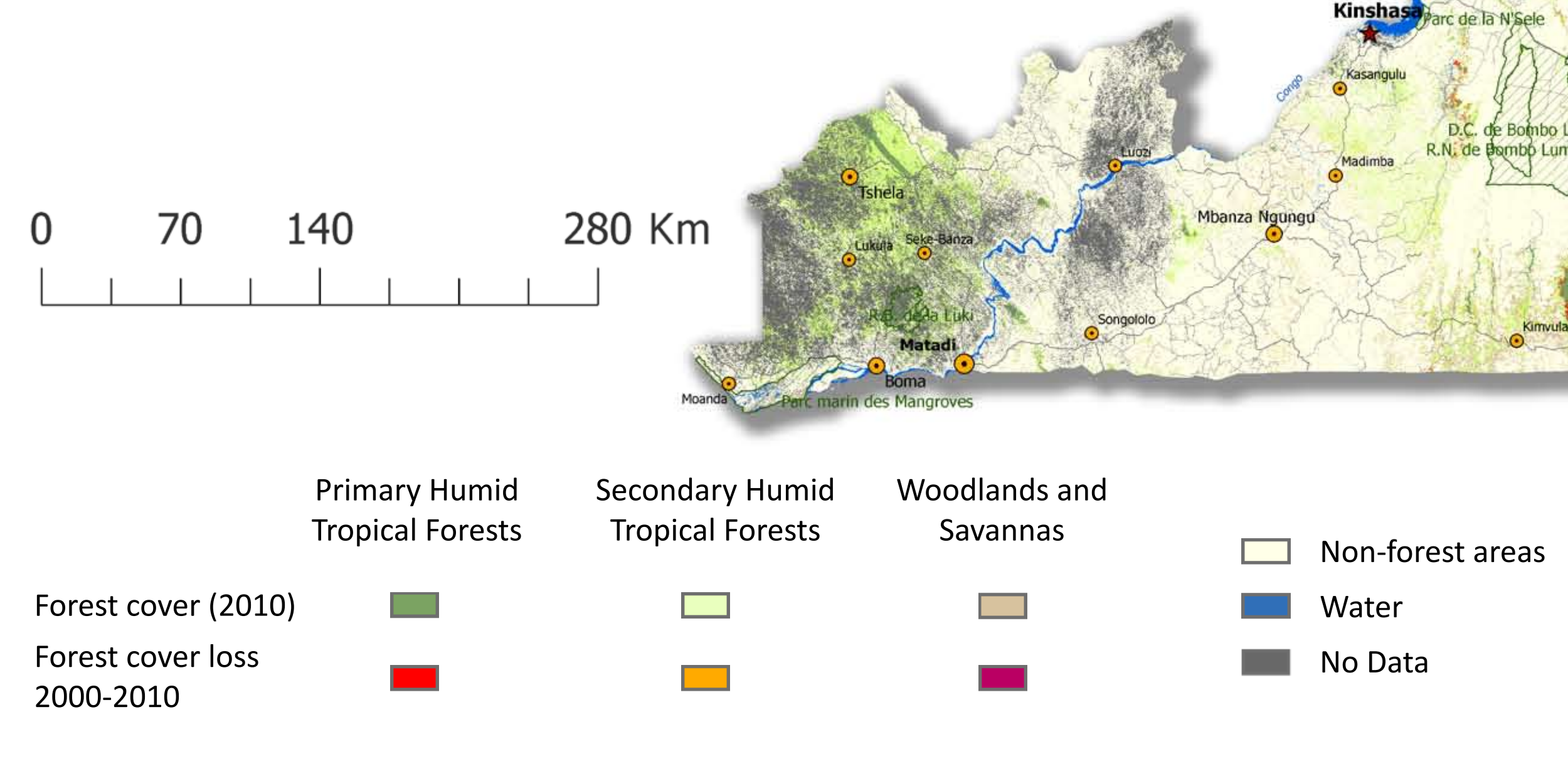
An exhaustive mining of the Landsat ETM+ archive was performed to map forest cover extent and loss for the Democratic Republic of Congo from 2000 to 2010. A total of 8,881 ETM+ images were processed to make the final map product. The method is an evolution of the approach of Hansen et al. (2008), where data from the MODIS are used to pre-process Landsat time-series images which are in turn used to characterize forest cover extent and loss. Forest was defined as 30% or greater canopy cover for trees of 5 meters or more in height. All such assemblages that were converted to non-forest are quantified and labeled as forest cover loss. Forest cover and loss were divided into three categories, primary forest, secondary forest and woodlands. Primary forest cover is defined as mature forest with greater than 60% canopy cover. Secondary forest is defined as regrown forest with greater than 60% canopy cover. Woodland is defined as forest cover with greater than 30% and less than or equal to 60% canopy cover.

The map was prepared by the Observatoire Satellital des Forêts d'Afrique Centrale (OSFAC) team at South Dakota State University. OSFAC was launched as part of the Global Observations of Forest Cover and Land Dynamics (GOF-CGLD) network for Central Africa under the Global Terrestrial Observing System (GTOS). Its primary objective is to support the management of natural resources and promote sustainable development by producing reliable land cover products, distributing satellite data, building capacity and providing technical assistance to implementing partners. The work was done in collaboration with the University of Maryland and the World Resources Institute, with support from the NASA Land Use Land Cover Change Program and the United States Agency for International Development (USAID) through the Central African Regional Program for the Environment (CARPE).

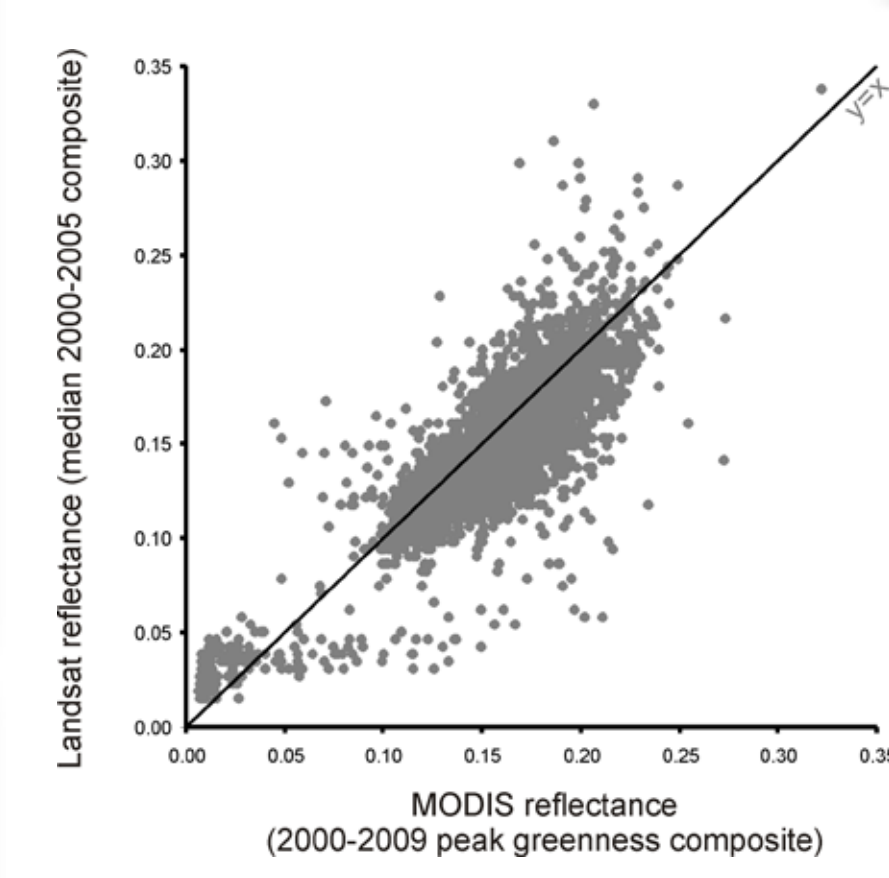
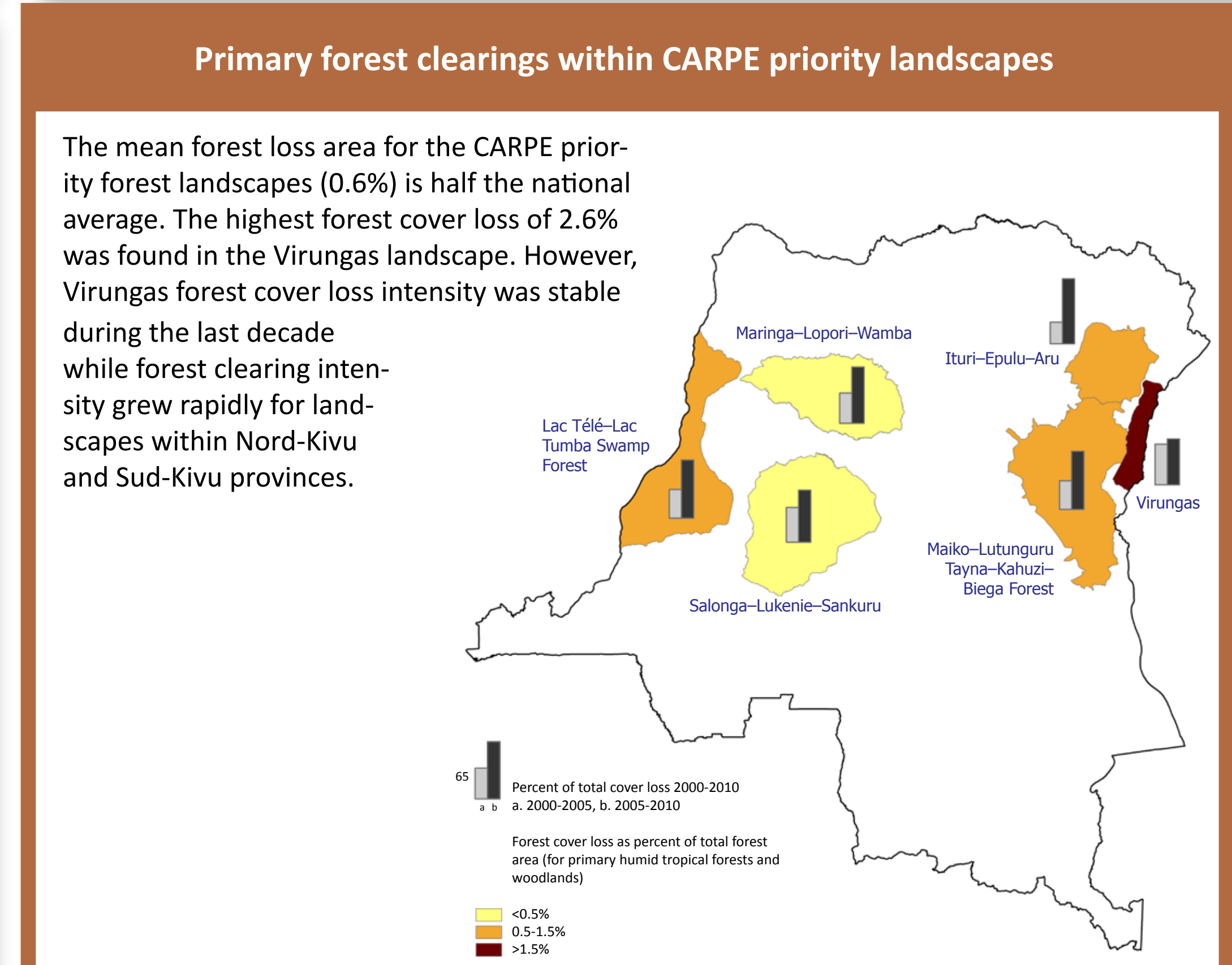
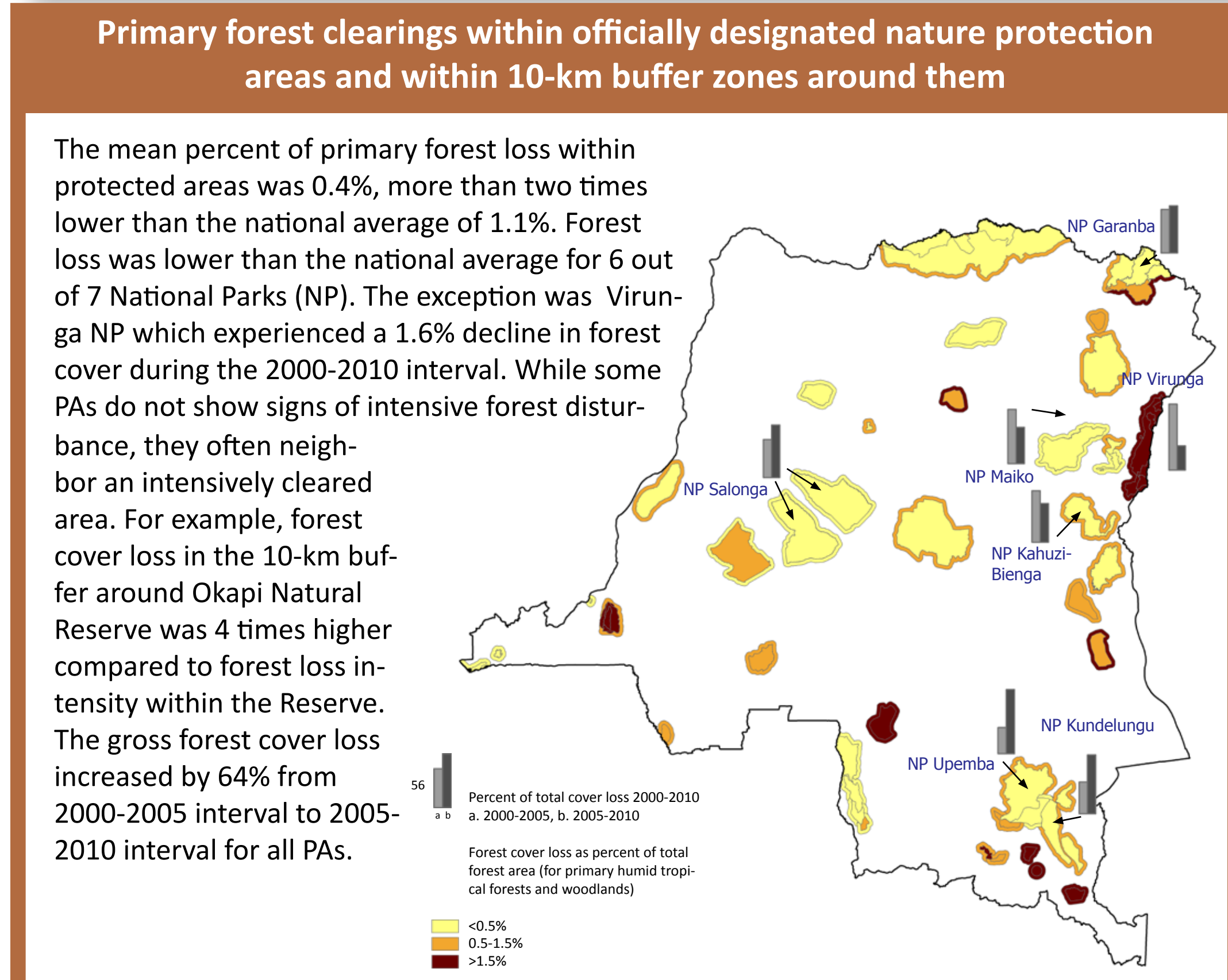
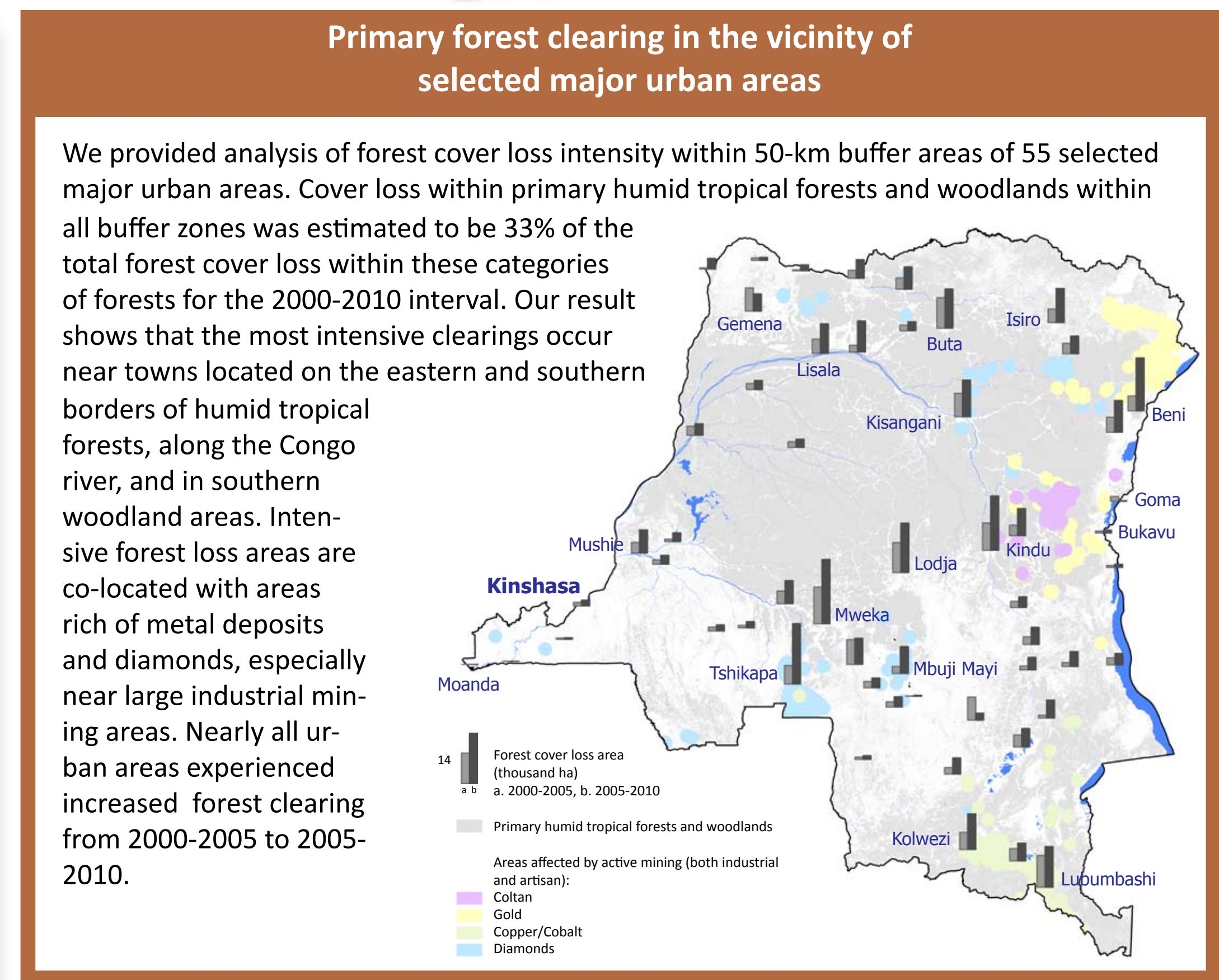
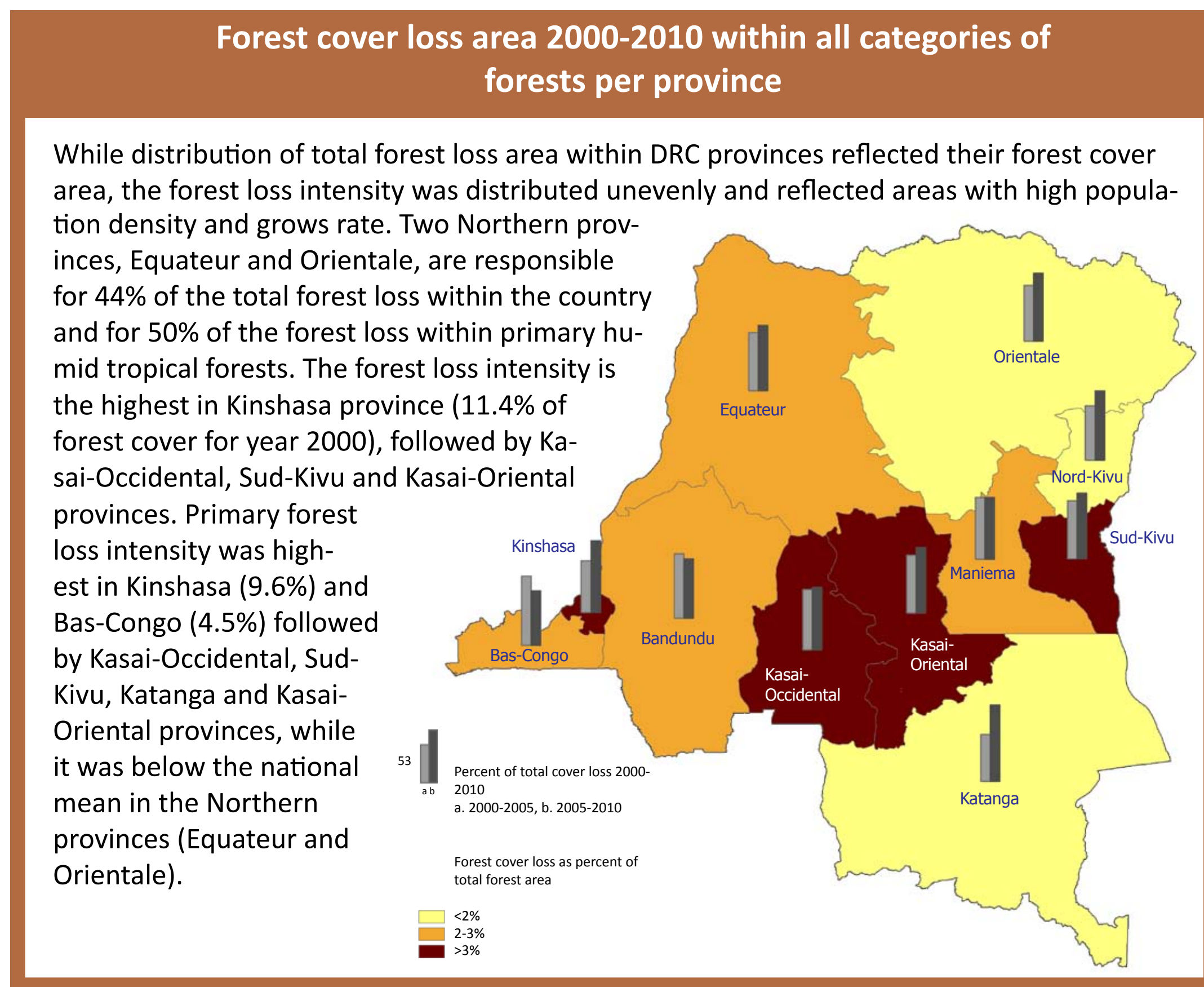
Forest cover extent and loss, 2000-2010

Our forest cover and change analysis was performed for the entire area of the DRC, with 99.6% of the country area covered with cloud-free Landsat observations. The total forest cover for the DRC was estimated to be 159,529.2 thousand hectares (kha). Primary humid tropical forests occupy 66% of total forest extent, secondary humid tropical forests 11%, and woodlands 23%. Our forest cover estimates are close to that provided by the Congo Basin Forest Partnership (2009) for the year 2008 (155,500 kha) as well as that of the FAO FRA for the year 2000 (157,249 kha; FAO, 2010).

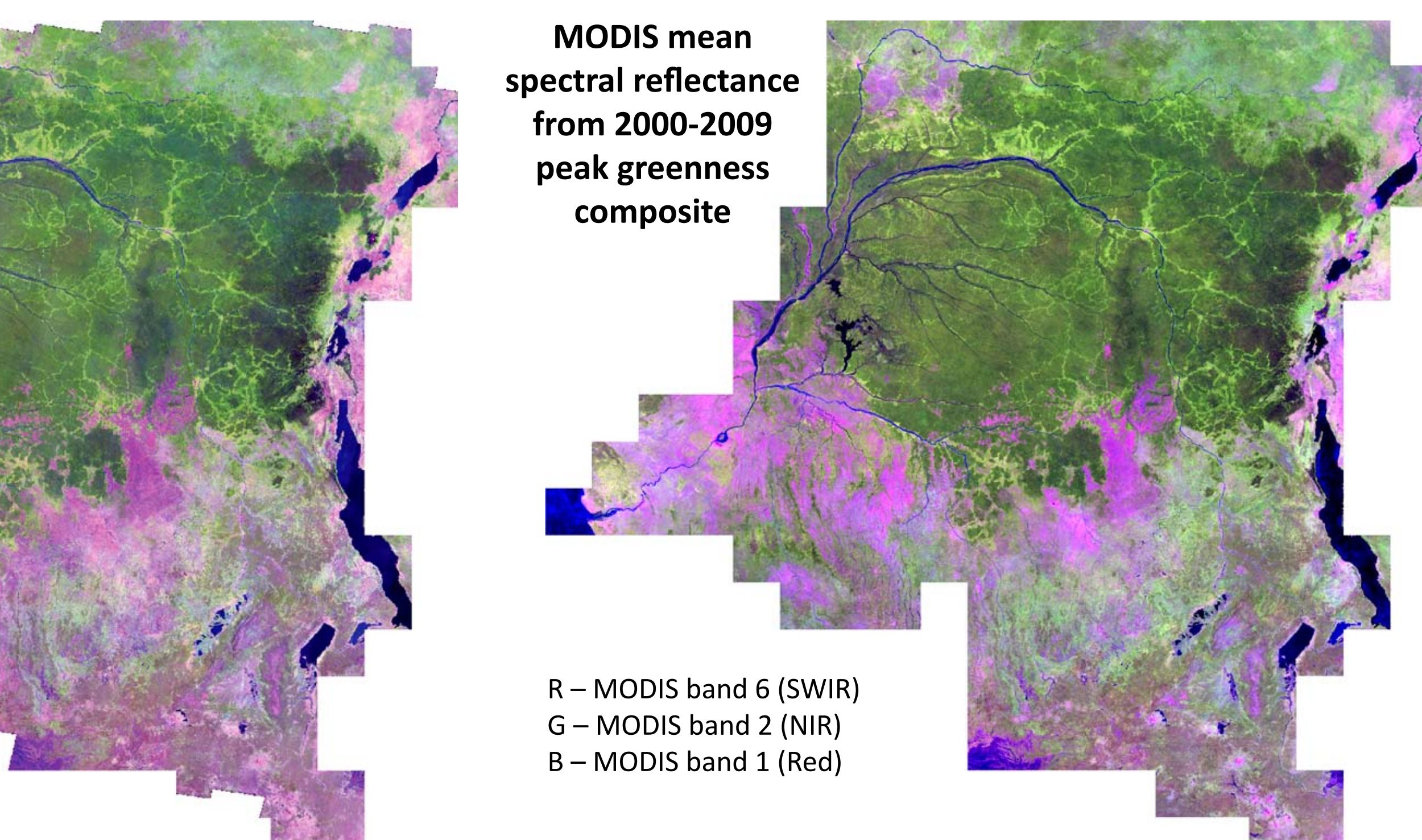
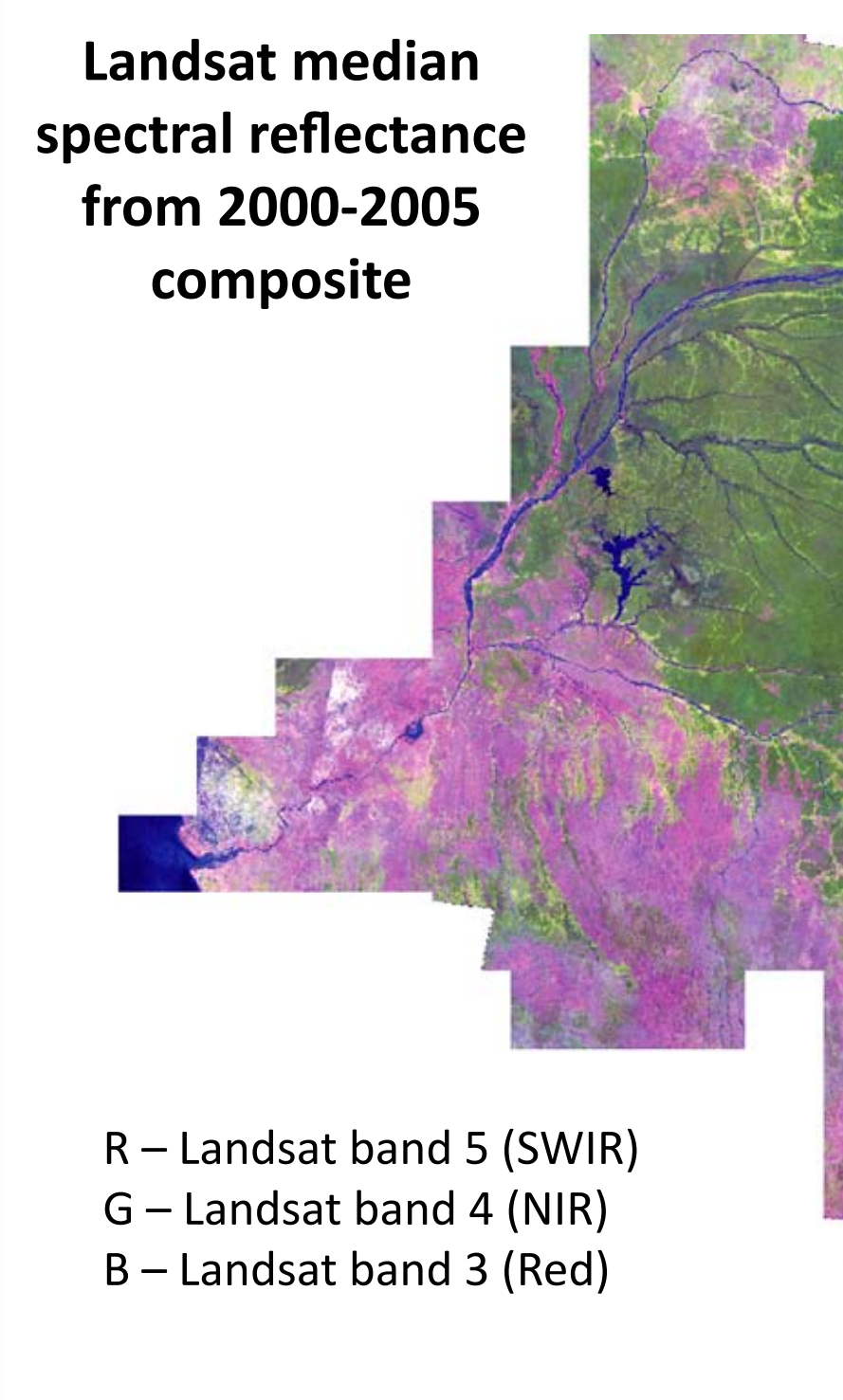
The area of gross forest cover loss from 2000 to 2010 was estimated to be 3,711.8 kha, or 2.3% of total forest cover area for year 2000. Of total forest loss, 57% occurred within secondary humid forests, 29% within primary humid forests, and 14% within woodlands. The percent of forest loss per forest type was different, with the highest rate of forest loss in secondary humid tropical forests (11.6%) and the lowest in primary humid tropical forests (1.0%). Total gross forest cover loss area increased by 13.8% from 2000-2005 to 2005-2010 interval. The greatest increase was detected within primary humid tropical forests, where forest area loss increased by almost a factor of two (by 91.1%). The average annual gross forest loss for the 2000-2010 interval was 371.2 kha/year (0.23% of forest cover for year 2000). Our total forest cover loss estimates are 16% higher compared to FAO (2010) estimates of 311 kha/year.



Forest clearing, 2000-2010, within the Northern part of Virunga National Park. Virunga NP remained one of the most threatened natural protection areas in the country, with the largest patch of contiguous deforestation near Beni and along new road extensions in the northern part of the Park.



Landsat vs. MODIS SWIR 1628-1652 nm band spectral reflectance. Landsat reflectance represents median MODIS-based calibrated reflectance value from all cloud-free observations for 2000 to 2005. MODIS reflectance represents mean TOC reflectance value for 6 16-day intervals with the highest NDVI. The 16-day interval values were collected from the least cloud contaminated observations from 2000 to 2009.



Reference data layers source: Interactive Forest Atlas for Democratic Republic of Congo, World Resources Institute, 2010