Priorizatization analysis of riparian forest corridors in the Brazilian National Forest Inventory

Maria Augusta Doetzer Rosot[1], Jéssica Caroline Maran[2], Marilice Cordeiro Garrastazú[1], Yeda Maria Malheiros de Oliveira[1], Luziane Franciscon[1], Nicola Clerici[3], Peter Vogt[4], Naissa Batista da Luz[5], Joberto Veloso de Freitas[6]
[1]Embrapa Florestas, Colombo, Brasil; [2]FAO, Curitiba, Brasil; [3]Universidad del Rosario, Bogotá, Colombia; [4]Joint Research Centre, Ispra, Italy; [5]Universidadey Federal de Uberlandia, Uberlandia, Brasil; [6]Serviço Florestal Brasileiro, Brasilia, Brasil (augusta.rosot@embrapa.br; jess.maran@gmail.com; marilice.garrastazu@embrapa.br; yeda.oliveira@embrapa.br; luziane.franciscon@embrapa.br; nicola.clerici@urosario.edu.co; peter.vogt@ec.europa.eu; naissa@gmail.com; joberto.freitas@florestal.gov.br)

The landscape component in the Brazilian National Forest Inventory (NFI-BR) evaluates habitat quality and spatial structure in national Landscape Sample Units (LSUs), established in a grid of 40 x 40 km. The analysis includes indices for riparian environments as a measure of their structural connectivity as forest corridors, the degree of human pressure acting on them and the extension of protected areas within those zones. LULC maps of twenty LSUs in Southern Brazil were used as pilot samples to conduct a Morphological Spatial Pattern Analysis (MSPA) and derive the following indices: Structural Corridors Index (SCc), showing the proportion of *core* and *bridge* MSPA categories within the riparian zone; the Structural Corridors under Pressure Index (CPc), to identify areas where structural corridors are subject to anthropogenic influences; and the Structural Corridors under Pressure Protection Index (UCPc), identifying corridor areas under anthropogenic pressure but with little or no legal protection. These indices were converted into ranking scores to prioritize riparian areas for conservation and landscape restoration. Three of the 20 pilot LSUs exhibited standardized values of UCPc, close to 1, thus indicating a critical conservation status for these areas.

Forest disturbances in the Brazilian Amazon: large-scale monitoring based on cloud-computed remote sensing analysis

René Beuchle[1], Yosio Edemir Shimabukuro[2], Andreas Johannes Langner[1], Peter Vogt[1], Silvia Carboni[3], Klara Janouskova[4], Thais Almeida Lima[5], Frédéric Achard[1]
[1]European Commission, Joint Research Centre (JRC), Ispra, Italy; [2]Brazilian National Institute for Space Research (INPE), São José dos Campos (SP), Brazil; [3]GFT ITALIA Srl., Milan, Italy; [4]ARHS Developments S.A., Luxembourg, Luxembourg; [5]University of British Columbia, Forest Sciences Centre, Vancouver, Canada (rene.beuchle@ec.europa.eu; yosio.shimabukuro@inpe.br; andreas-johannes.langner@ec.europa.eu; peter.vogt@ec.europa.eu; silvia.carboni@ext.ec.europa.eu; klara.janouskova@ext.ec.europa.eu; tha.almeida.lima@gmail.com; frederic.achard@ec.europa.eu)

The disturbances of forest cover by processes like selective logging and forest fires are very common in tropical forest. These disturbances heavily affect forest functionalities, lead to a decrease of forest biomass and contribute to greenhouse gas emissions. However, the quantification of the disturbance extend remains a challenging task because disturbed forest areas do not consist in a long-term conversion to another land use, but often undergo fast regrowth and thus are easily detectable only for a limited amount of time. We have applied a novel approach based on the ΔrNBR index, which maps the loss of forest canopy on a yearly basis by a multi-image analysis with cloud computing on Google Earth Engine. We have analysed 12 years of forest disturbances (2000-2011) over large area of interest (ca; 414,000 km^2), defined by the intersection of the Mato Grosso State border and the Brazilian Amazon biome. We assessed the logging and fire intensity by applying a grid of 300 m × 300 m spatial resolution over the mapped disturbance pixels. In 2016, more than 220,000 km^2 (53,3%) were covered by forest within the area of interest, thereof more than 38,000 km^2 (17,3%) were disturbed by selective logging within the 12 years analysed, ranging from 1,819 km^2 (2009) to 6,984 km^2 (2005). The burned forest added up to 18,711 km^2 (8,4%) during this period, the smallest forest area burned in 2001 (68 km^2) the larges area in 2007 (10,258 km^2).

Five decades of boreal forest disturbance in Ontario, Canada

Tarmo Remmel[1], Marc Ouellette[2]
[1]York University, Toronto, Canada; [2]Ontario Forest Research Institute, Sault Ste. Marie, Canada (remmelt@yorku.ca; marc.ouellette@ontario.ca)

The boreal forest biome in Ontario encompasses approximately 76 M ha across seven eco-regions that are defined by geo-climatic variability and gradients within the province. Located within this biome is the Area of Undertaking (AOU), a zone of highly regulated and monitored extractive forest activities that delineates our area of interest. There exits great concern over the state of the forests within the AOU, with a desire to understand the disturbances affecting them, their recovery, and any resultant dynamic patterns in space and time given the integrated ecological, financial, and physical processes involved. Just the sheer area involved has enormous implications on the economy, environmental quality, carbon sequestration, and recreation; these underscore the need to consistently collect and summarize information in the context of improving management activities and decision making surrounding this resource. We have produced a consistently processed dataset, at 120 m spatial resolution (1.44 ha), of annual disturbances (harvesting and fire) for the entire AOU from 1972-2018 and developed a workflow for annually updating this database. All base data comes from Landsat imagery (MSS, TM, ETM+, OLI) and are cross-referenced with supporting documentation and datasets to produce confidence attributes for each mapped location. Our spatio-temporal dataset provides a consistent means for assessing spatial patterns, fragmentation rates, impacts of management decisions, climate change trends, and various ecological states and implications through nearly 5 decades.

Forests and trees in national adaptation plans (NAPs)

Alexandre Meybeck[1], Vincent Gitz[1], Julia Wolf[2]
[1]CIFOR, Bogor, Indonesia; [2]FAO, Rome, Italy (a.meybeck@cgiar.org; v.gitz@cgiar.org; julia.wolf@fao.org)

The national adaptation plan (NAP) process was established under the UNFCCC in 2010. Least developed and other developing countries prepare (NAPs) that identify and address medium- and long-term adaptation needs. Some developed countries have prepared similar documents. The objective of this presentation is to give some preliminary insights on how forests and trees are considered in the NAPs. It will successively consider the way forests and trees are integrated in the process, the measures aimed at the adaptation of forests and trees and how they are used for the adaptation of other sectors. Most NAPs are organized by sectors, with forests and trees being often included in the biodiversity sector, with significant exceptions like for Chile where planted forests are part of the sylvoagropastoral sector. The main risks identified for forests and trees in the NAPs are increased climate variability, increased heat and drought, increased risk of extreme events, salinity in coastal areas, forest fires, pests and invasive species. The main measures promoted are sustainable forest management, biodiversity conservation, monitoring and risk management systems, conservation and sustainable management of genetic resources and to anticipate future changes. In almost all sectors figure measures that promote forests and trees as an adaptation mean, for a great variety of purposes that can be gathered in three main groups: natural resources management, agriculture, and protection of cities; however often omitting the consequences for forestry and the necessary enabling environment. This analysis leads to some important conclusions, with consequences for both research and policy making.