

# THE INDONESIAN NATIONAL CARBON ACCOUNTING SYSTEM: Supporting Indonesia's emissions reporting requirements and MRV for REDD+

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Ministry of Environment and Forestry, Indonesia

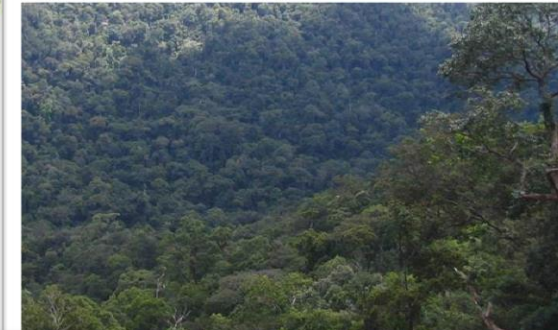


***The 3<sup>rd</sup> Annual Meeting of the Low Carbon Asia Research Network***

Bogor, 24-26 November 2014

# Outline

- INCAS – general information
- Why do we need INCAS?
- Key features
- System framework
- Land cover change analysis
- Forest biomass estimation
- Carbon modelling process
- Spatial allocation
- Progress to date
- Improvement plan – research needs



# Indonesian National Carbon Accounting System

- National level forest monitoring system – accounts for GHG emissions and removals from the entire land sector
- Systematic and consistent approach to generating credible forest management information
- Currently under development within the Ministry of Forestry and the National Space Agency
  - Supported by the Australian Government with financial contribution and technical assistance



# Why do we need INCAS?

- To better manage our forests, we first need to be able to accurately monitor our forests
- Track progress towards national emissions reduction target of 26 to 41 per cent below BAU by 2020
- Basis/input for national GHG inventories & UNFCCC reporting
- Inform the design of REDD+ architecture (e.g. REL and base year)
- Systematic data management to support domestic policy development, including sustainable management of forests, land-use planning and watershed management etc.
- Support detailed planning for high value areas for rehabilitation and reforestation efforts



INCAS



credible



M R V



Emissions  
Reduction  
Target

A map of Indonesia is shown in the top right corner of the slide, rendered in a light green color against a darker green background. The map shows the archipelago's main islands and surrounding waters.

## INCAS Key Features



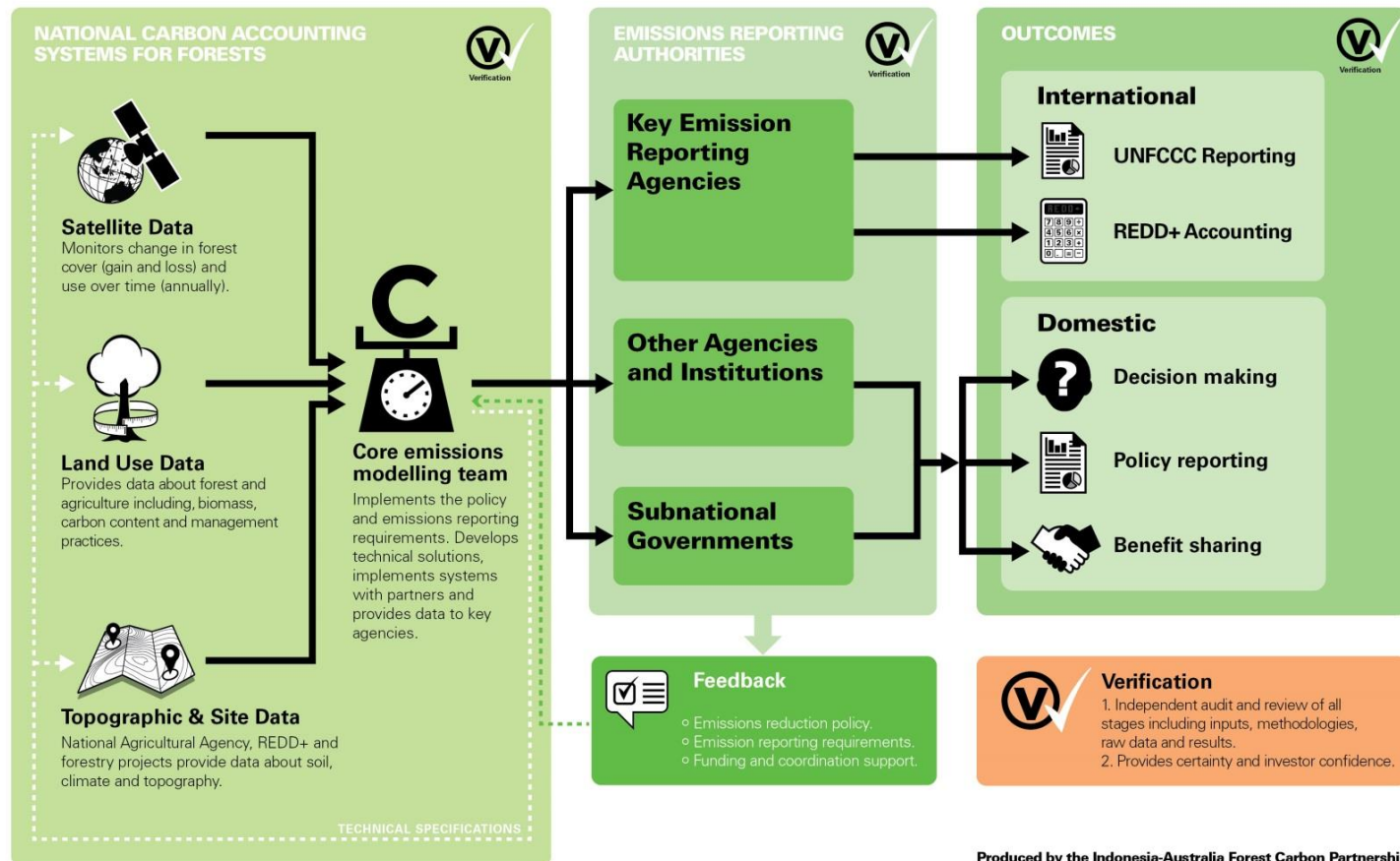
- Model based approach
- Best available data
- TACCC principles
  - *Transparency*
  - *Accuracy*
  - *Comparability*
  - *Consistency*
  - *Completeness*
- Flexible
- Forecasting and historical estimation, ongoing annual monitoring
- Continuous improvement



# INCAS framework

## FOREST CARBON

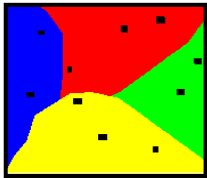
Measurement, Reporting & Verification (MRV)



# INCAS Modules

## A Biomass Classification

Classification of forests into groups (biomass classes) that have common characteristics



## B Land Cover Change Analysis

Annual time-series defining areas of:

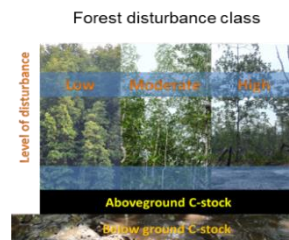
- Deforestation (permanent loss of forest cover)
- Degradation (forest clearance and regeneration or partial removal)



## C Forest Disturbance Class Analysis

Mapping forest disturbance classes

- Minimal disturbance
- Moderate disturbance
- Heavy disturbance



E

Carbon Accounting and Reporting Model (ICARM)

## D Carbon Stock Estimation

Carbon stock estimates for each biomass class (incl. growth/loss rate):

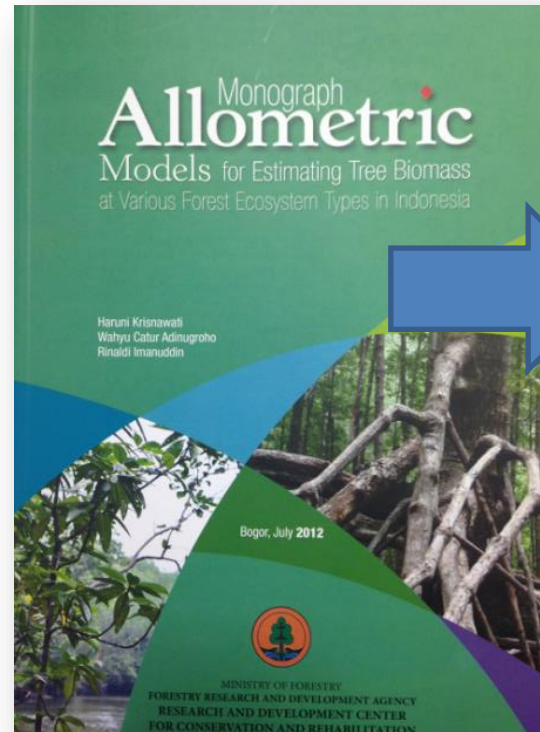
- Aboveground biomass
- Belowground biomass
- Litter
- Debris
- Soil



5-C pools

# INCAS – forest biomass estimation

- Assessment of biomass by forest type and condition, including the growth following the disturbance and management events
- Develop methods to account for forest carbon stock and changes
- Consider all carbon pools including aboveground biomass, belowground biomass, litter, woody debris, and soil organic matter



Estimation of Forest Biomass  
for Quantifying CO<sub>2</sub> Emissions  
in Central Kalimantan:  
*A comprehensive approach in determining  
forest carbon emission factors*

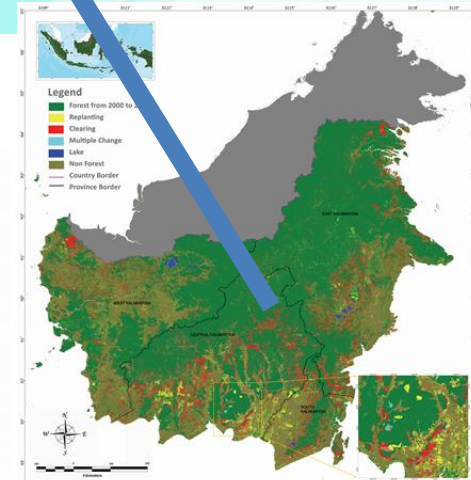
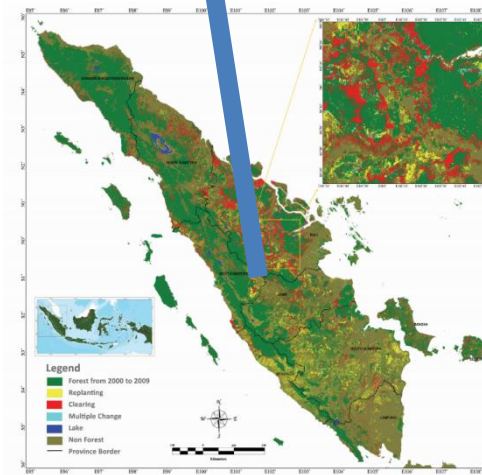


Ministry of Forestry  
Forestry Research and Development Agency  
Research and Development Center for Conservation and Rehabilitation

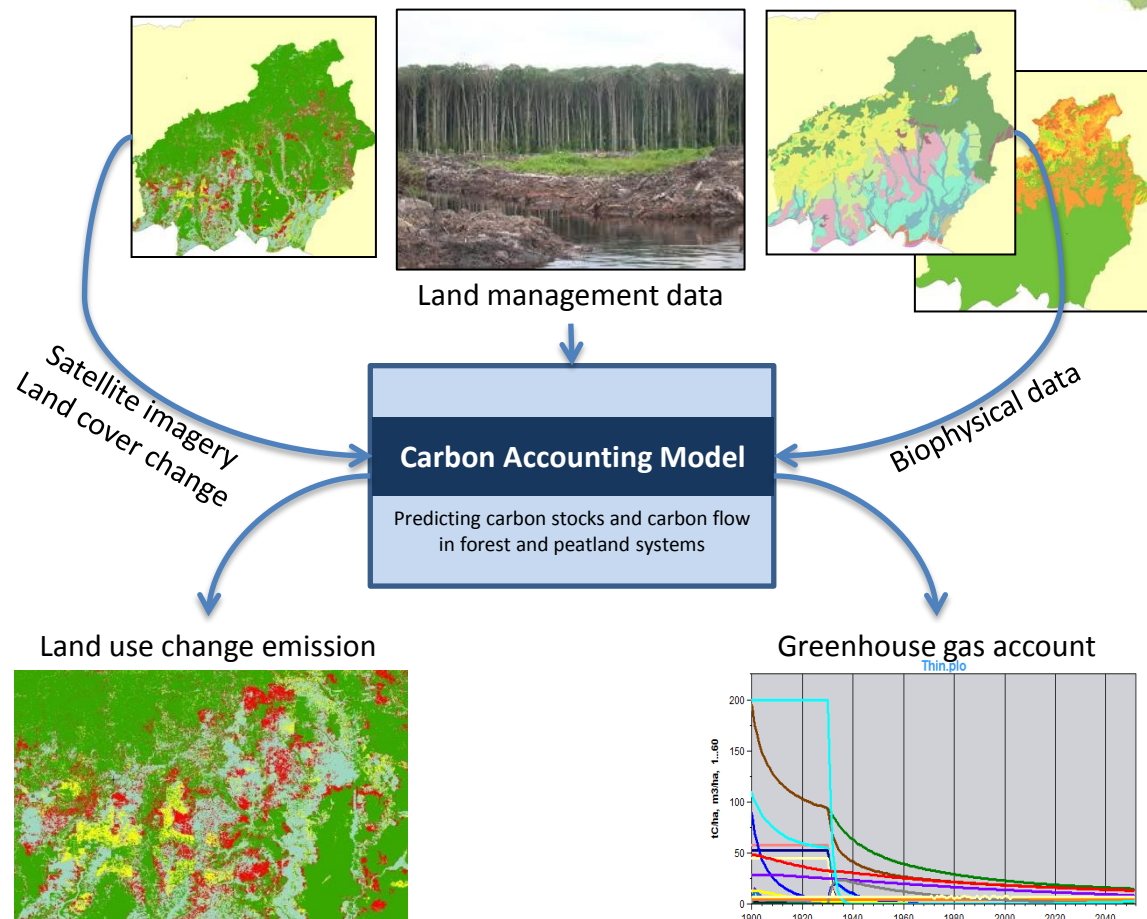


# INCAS – land cover change analysis

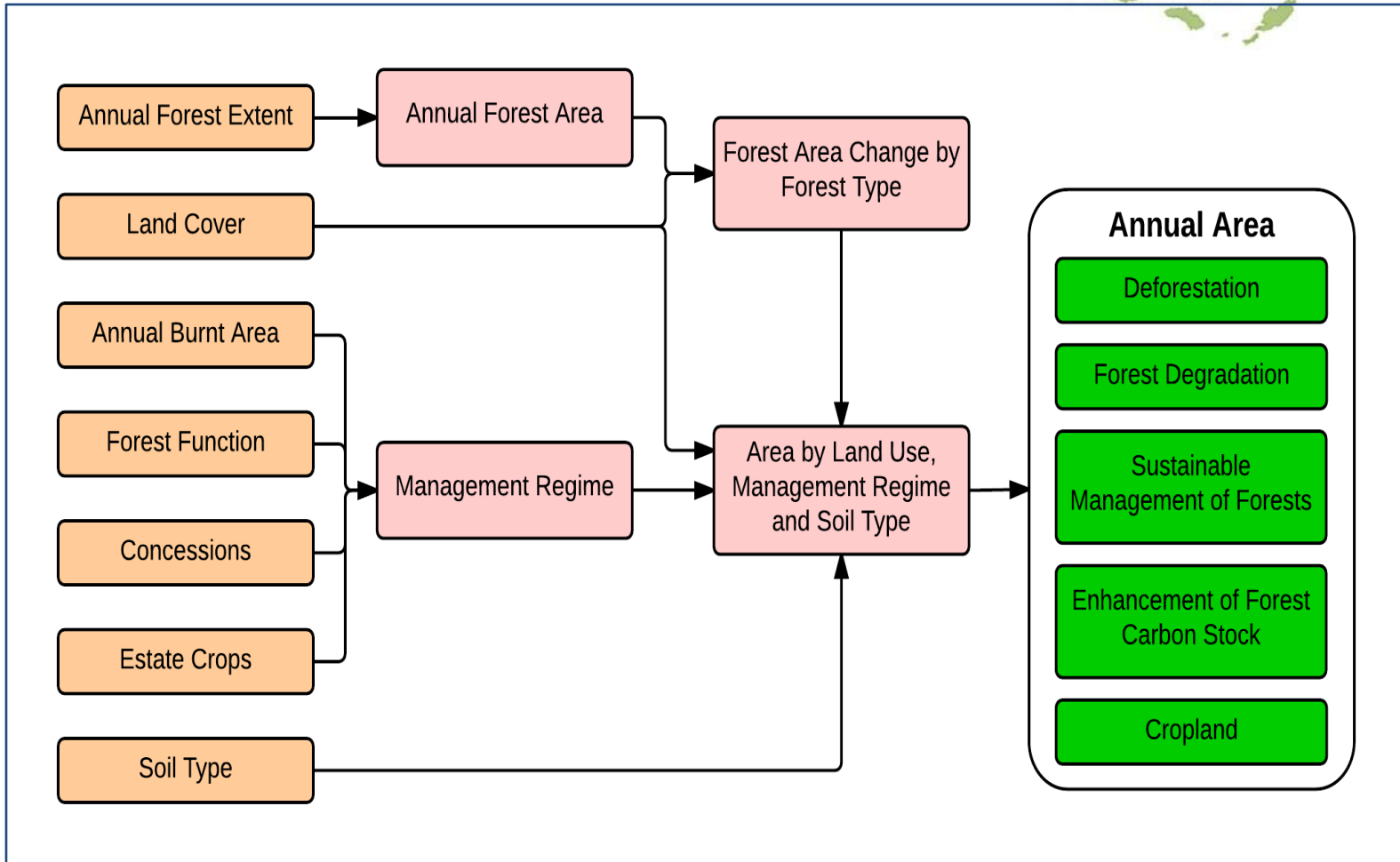
- National annual assessment of forest cover loss and gain
- Showing forest cover change annually on 25m grid across the whole country
- Time-series consistent
- Ground truthing from local experts
- Based on methodology developed by Australia, adapted to Indonesia's unique biophysical conditions



# INCAS – carbon modeling



# Spatial allocation of area subject to change



# INCAS progress to date

- INCAS has been trialed over Central Kalimantan pilot province
- National system well-advanced, due for completion by early next year
- National forest cover change assessment complete for the period 2000-2012 annually
- National estimate of forest biomass by forest type developed
- Sustainable human capacity to develop and continue to operate the system

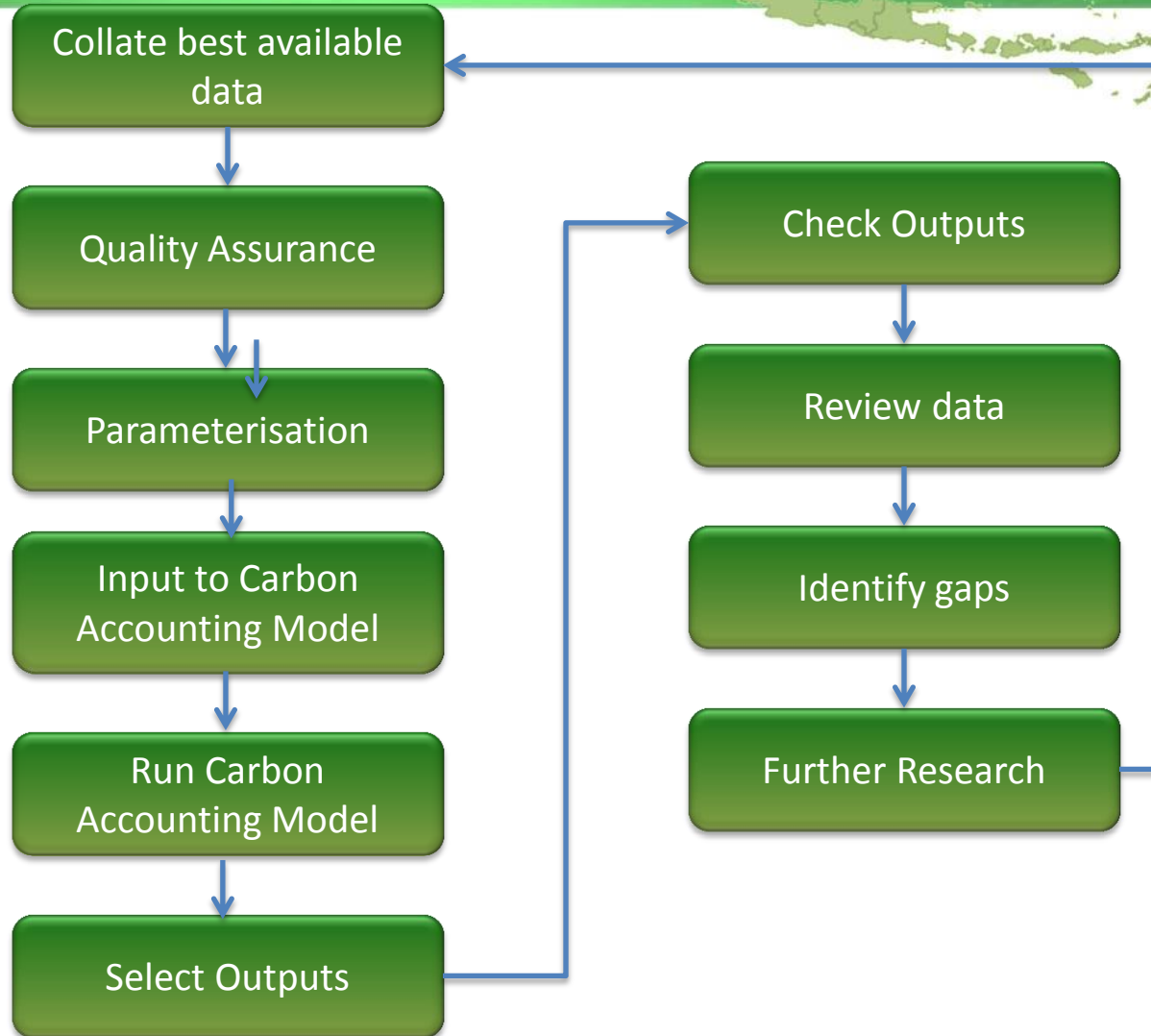


# Continuous improvement

Coverage	Interim Report (Dec, 2013)	Updated Report Nov, 2014)
Activities	Deforestation Peat biological oxidation	Deforestation, Forest Degradation, SMF, Enhancement of C-stock; peat biological oxidation and peat fire
Estimates	Emissions only	Emissions and removals (net)
Carbon pools	AGB, BGB, litter, woody debris	AGB, BGB, litter, woody debris, soils (mineral soil and organic soil)
Gases	CO <sub>2</sub>	CO <sub>2</sub> ; CO; CH <sub>4</sub> ; N <sub>2</sub> O, NO <sub>x</sub>
Period	Annual 2000-2008	Annual 2000-2011
Method	<b>Broad assumptions</b> Simple spatial analysis (2000-2009) Simple emission calculation	<b>Activity specific assumptions</b> Time series spatial analysis (2000-2012) Event driven models



# Modelling – Data flow



# Improvement plan - research needs



- Mapping of fires - burnt area analysis to develop greater spatial accuracy of historical fire areas and fire intensity



- Forest degradation vs SMF - definition, threshold, method to differentiate the impact of fire, logging and other land/forest management practices – short-term or long-term??)



- Improved emission estimates for peat - relationships between management events, peatland condition and the impact of repeated fires





# Thank You

