

Guyana Degradation Monitoring Overview

September 3rd, 2014

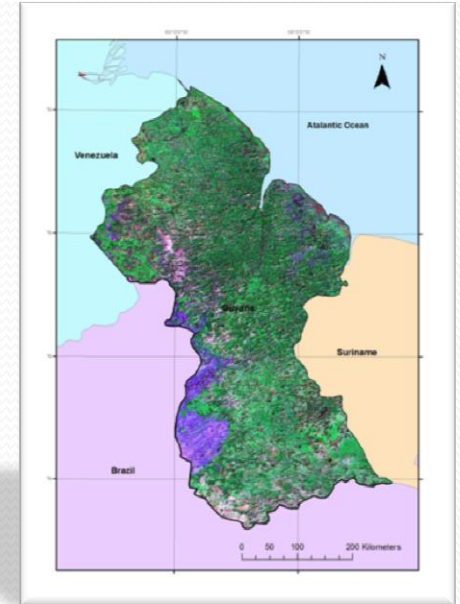


Maria Paul
Towana Smartt



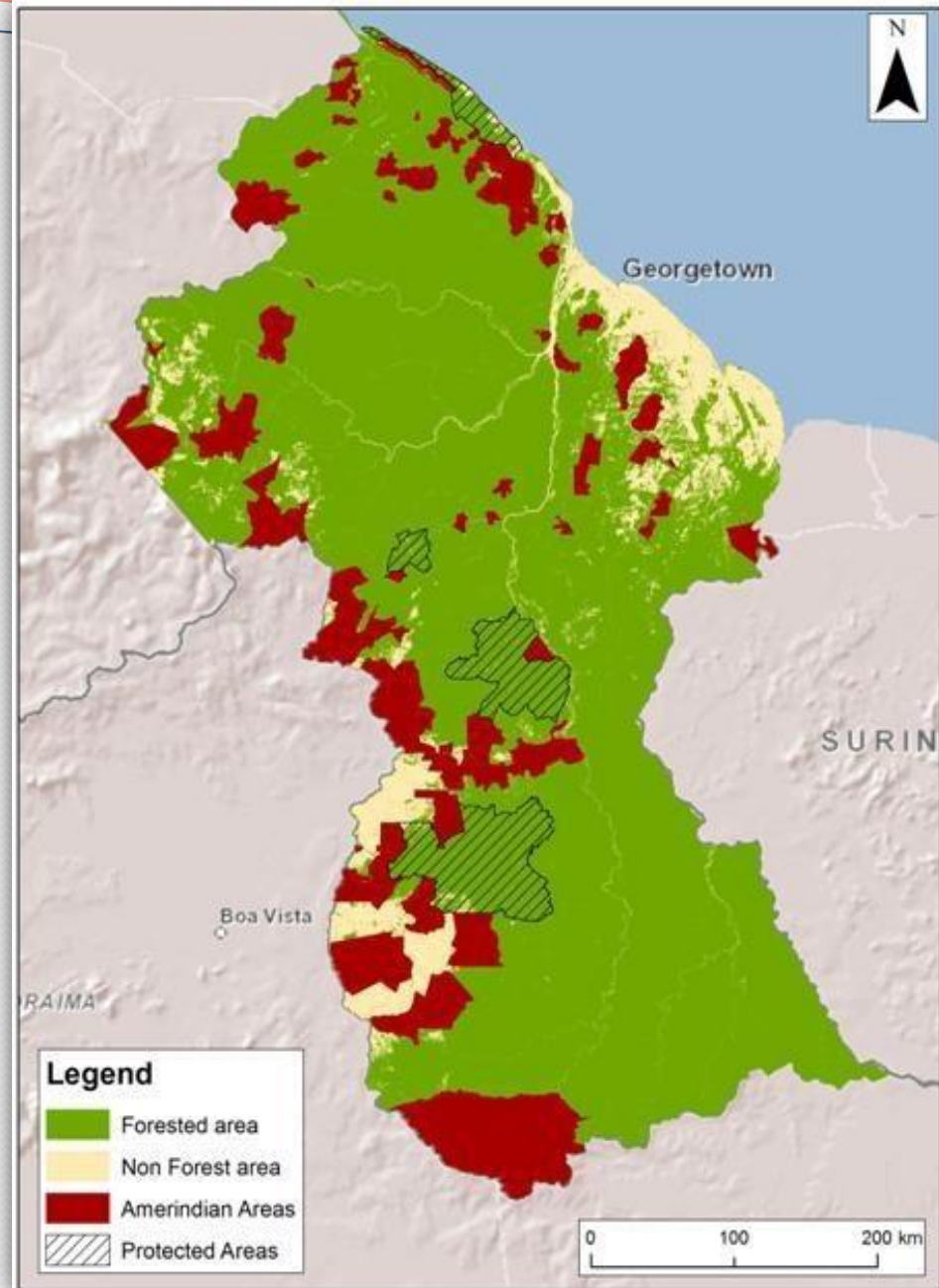
Outline

- Country Profile
- Reporting to Donor country
- Overview of main datasets processing
- Sources of forest cover change
- Approach to mapping the changes.



Country Profile

- The total land area of Guyana is ~214 000 square km.
- Total land area divided by forest and non-forest based on 2009 Benchmark Map.
- Developing country, low population (aprx. 756, 000) with 90 % living on the coast.
- Largely forested (18.3 million ha), mostly inaccessible. Flat coastal plain
- Hinterland region significant reservoir for biodiversity and contributor to forestry/mining sector

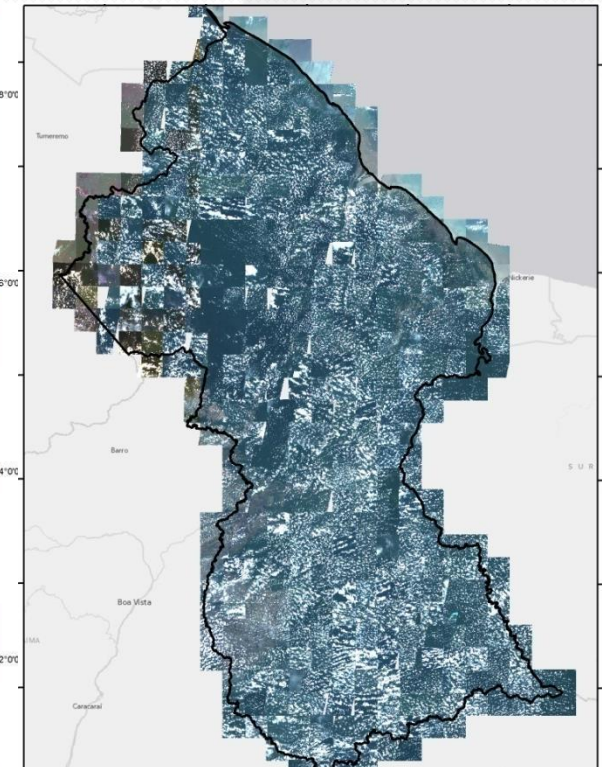
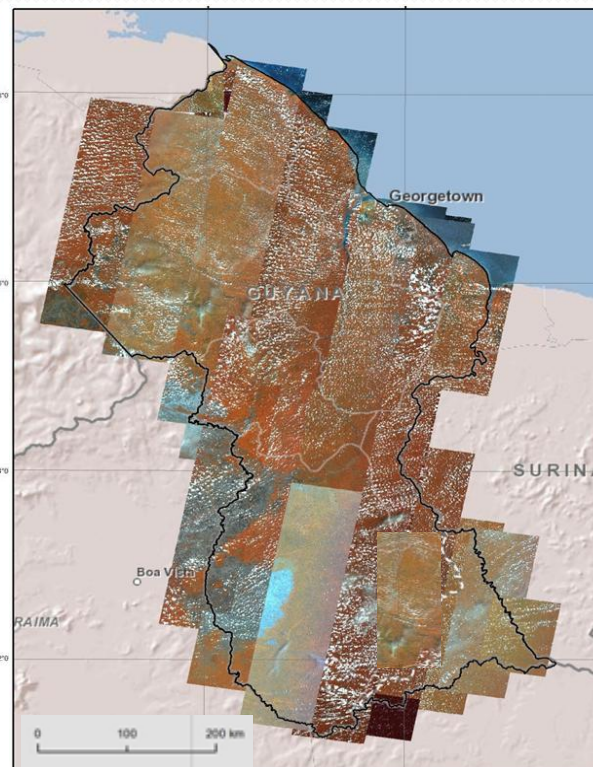
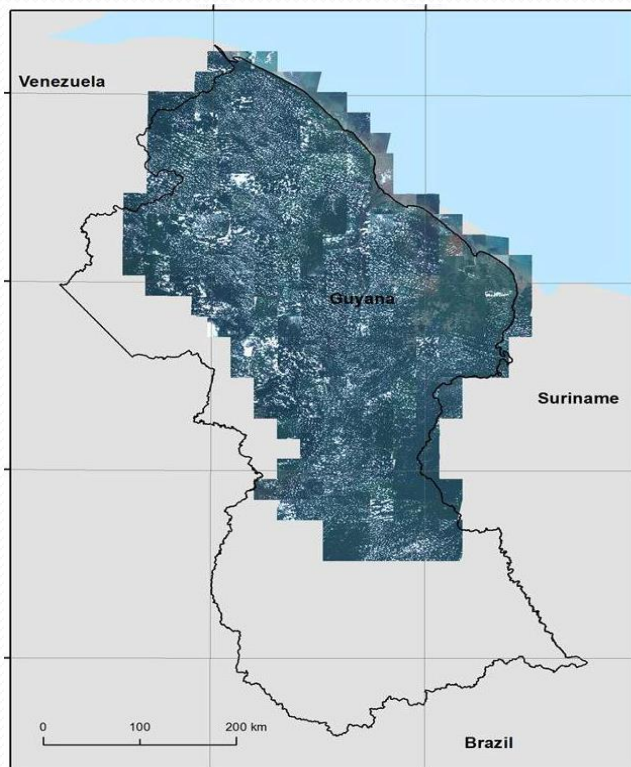
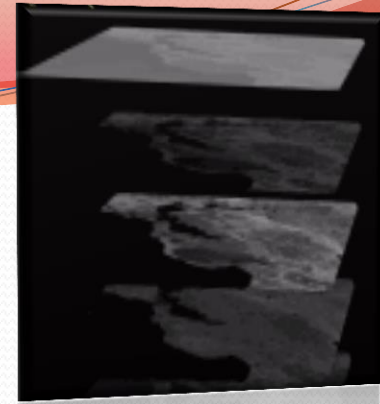


Reporting

- Historic assessment for the period 1990 to Sept 2009.
- First assessment
 - 1st October, 2009 – 30th September, 2010 (11 months)
- Second assessment
 - 1st October 2010 to 31st December 2011 (15 months)
- Third annual assessment
 - January 1st, 2012 to 31st December 2012 (12 months)
- Fourth annual assessment (**in progress**)
 - January 1st, 2013 to 31st December 2013 (12 months)
- Fifth Annual assessment
 - January 1st 2014 to 31st December 2014 (12 months)

RapidEye Imagery

- Primary monitoring data source: 5m res
- Multiple scenes over same footprint area.
- Came into effect in Year 2 (2011) after requirement to start reporting on degradation.

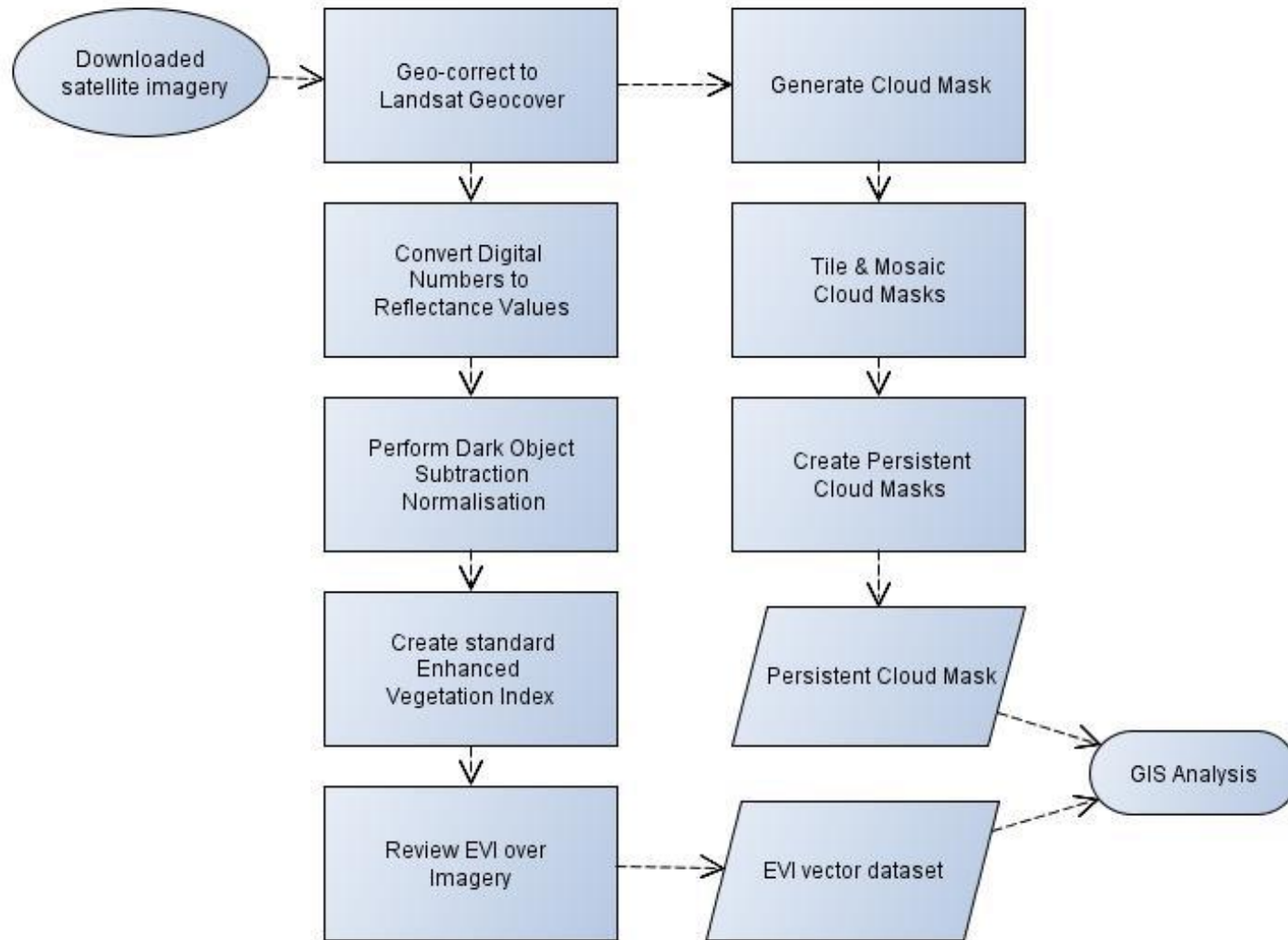


Year 2 Acquisition Area

Year 3 Full Coverage

Year 4 Full Coverage

Image Processing Steps



Definitions and Parameters

- **Forest**

Forest >30% crown cover and > 5 m in height or ability to reach 5 m at maturity, over 1 ha.

- **Deforestation**

Conversion from forest cover to non-forest cover.

- **Degradation / enhancement**

Loss or increase of growing stock between two periods of time but still considered forest.

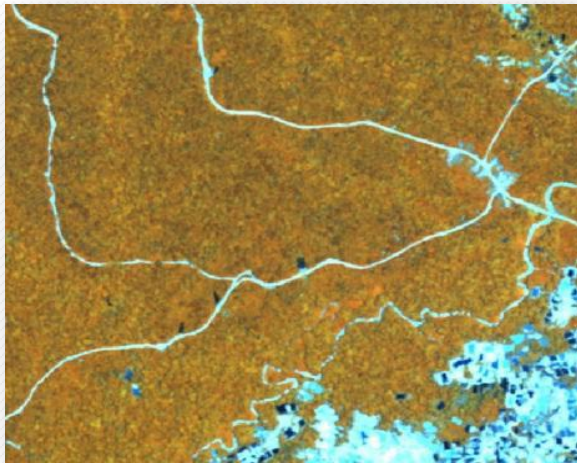
- **Change**

Transition to another land use as a result of an assigned driver.

Sources of forest cover change

Drivers of Deforestation

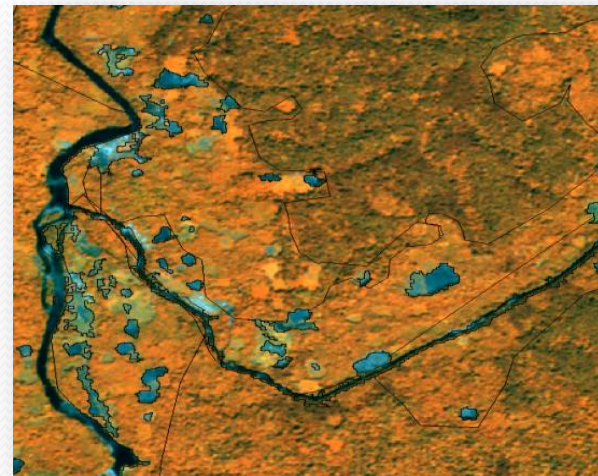
- Mining
- Infrastructure
- Agriculture Conversion
- Fire



Mining and infrastructure

Drivers of Forest Degradation

- Mining
- Infrastructure
- Fire
- Shifting Agriculture
- Forest harvest



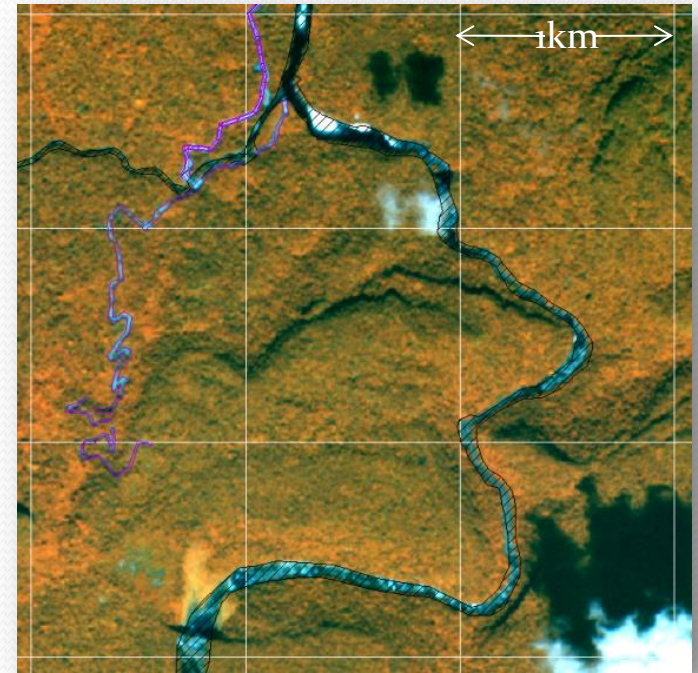
Shifting Agriculture

Approach

- The approach used by Guyana is IPCC Approach 3
- Requires observation of land use and land class data which are spatially explicit.
- Data Sources:
 - Primary data source: Rapideye (5m)
 - Secondary data source: Landsat 8(30m)

Monitoring Approach

- Systematic review of each 1km grid within 24 km tile.
- Use of previous mapping, imagery and Enhanced Vegetation Index (EVI).
- Observance of spectral signatures, location and geometry of change event.
- Editing of EVI vector output by mapping analyst.
- Use of reference data.



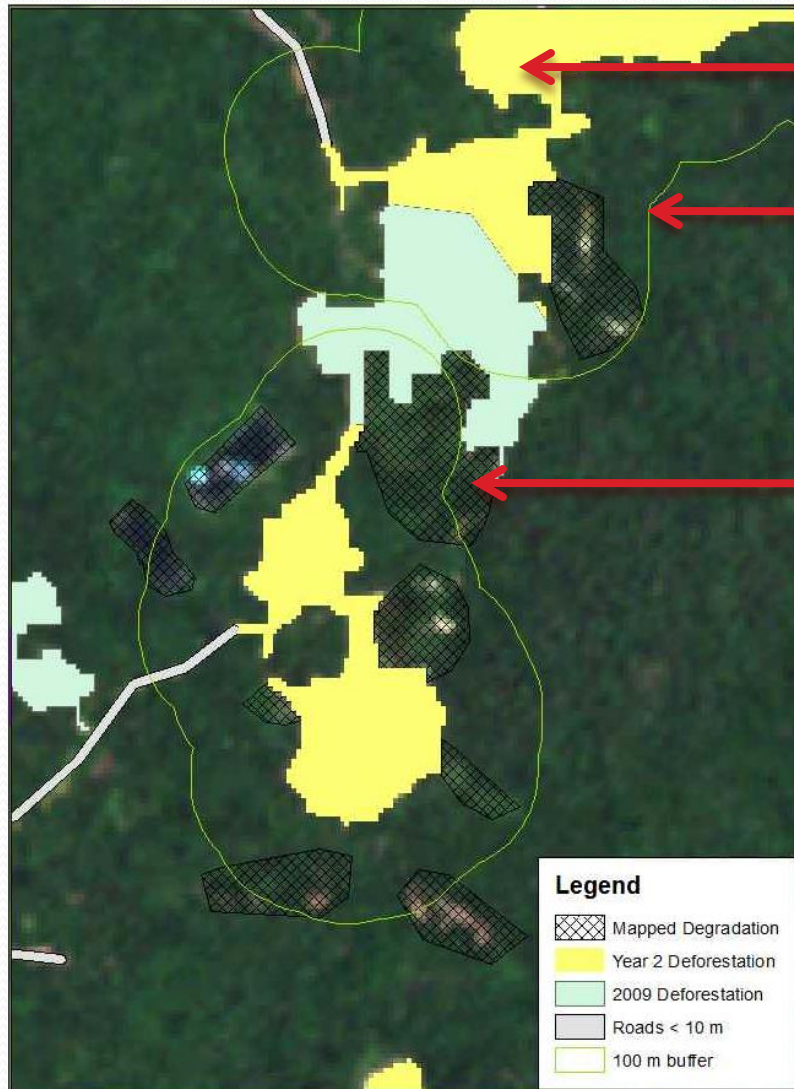
Inputs

- Hardware
- Software
 - ArcGis- remote sensing & spatial analysis
 - ENVI- image processing
 - Post Gris SQL

Inputs

- **Eight (8) staff**
- **Staff qualification-** first degree graduates:
 - Forestry (1)
 - Environmental sciences (3)
 - Biology (4)
- **Staff positions:**
 - GIS Remote Sensing Analysts(4)
 - GIS Analyst (1)
 - Data analyst (1)
 - Forest Resources Information Officers (2)

Mapping Forest Degradation

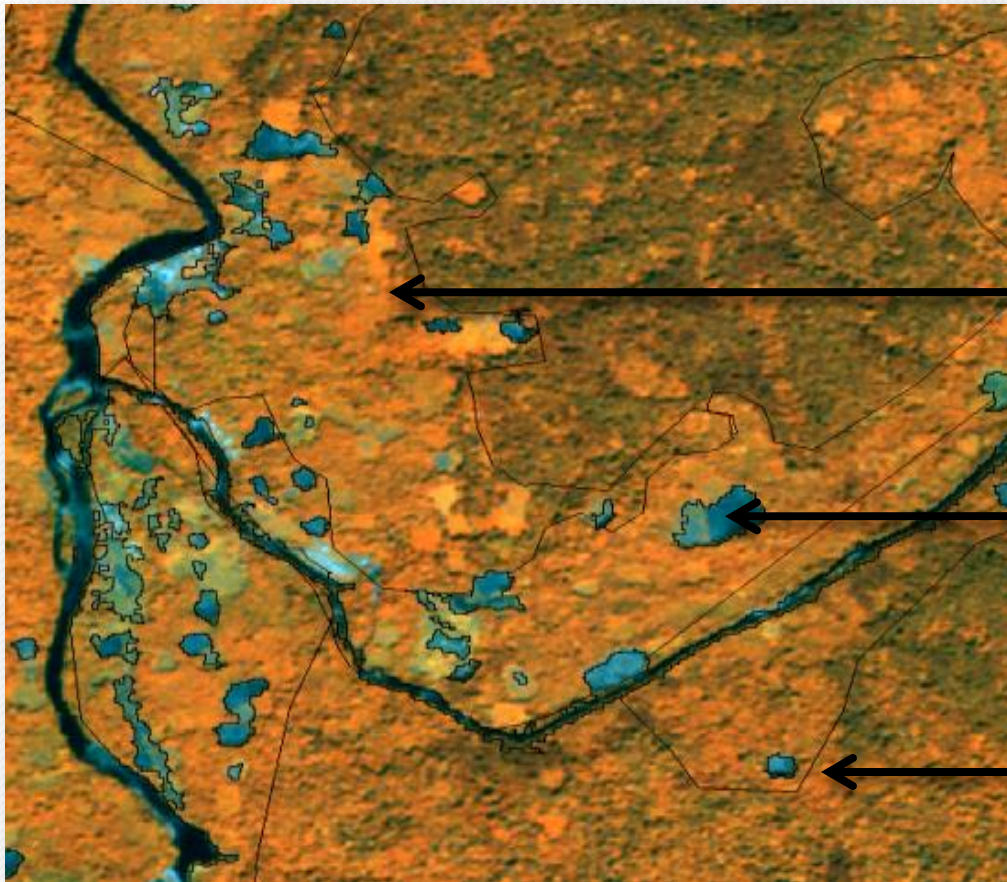


New deforestation event

100 m buffer

Entire degradation event is mapped manually as seen from the imagery even though it extends beyond 100 m buffer.

Mapping Shifting Agriculture



Historical rotational
Shifting Agriculture

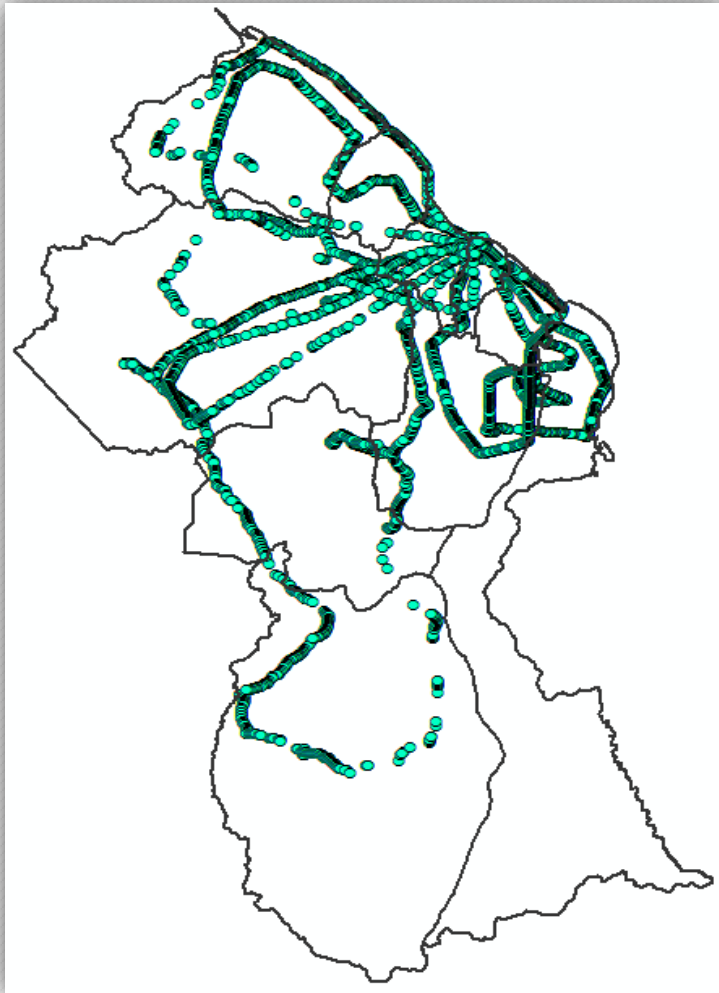
New rotational
Shifting Agriculture

Pioneer
Shifting Agriculture

Carbon Stock -Logging

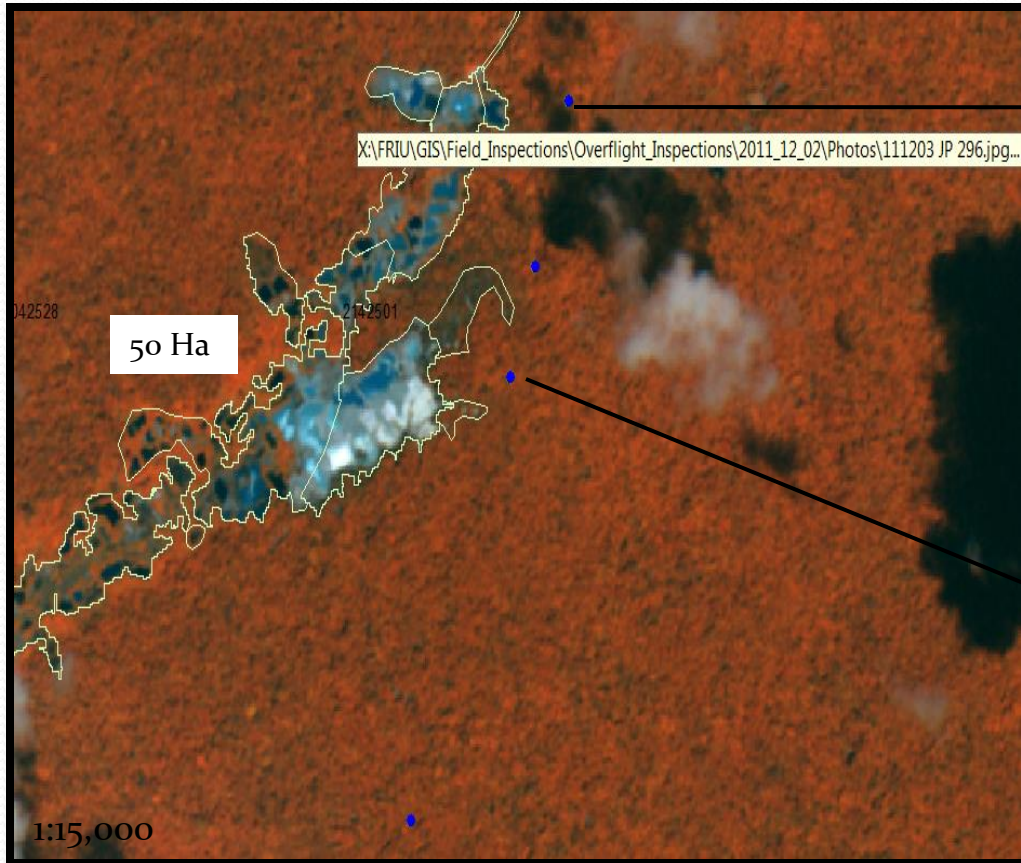
- Gain/Loss method is used. Selective forest harvest is not reported spatially.
 1. Forest inventory to assess what stock is there.
 2. Any harvested volume is then subtracted from the inventory volume.
 3. Also incidental damage and skids & other infrastructure are subtracted.

Oblique Aerial Photopoints



Extensive database of oblique
aerial photography

Aerial Photo Points



Data uses

- Forest area assessment data then forms the activity data for carbon assessment.
- GIS data used in forest management and the allocation of new forest concessions.
- Helps to inform decision making based on activities occurring on the ground.
- Areas that do not meet the forest criteria are being sub-classified based on IPCC non-forest categories.
- Used in conjunction with other agency data from within the natural resource ministry for cross-sectional analyses.

Thank You

