LAND-USE CHANGE
Forest Cover: The Jamaican Scenario
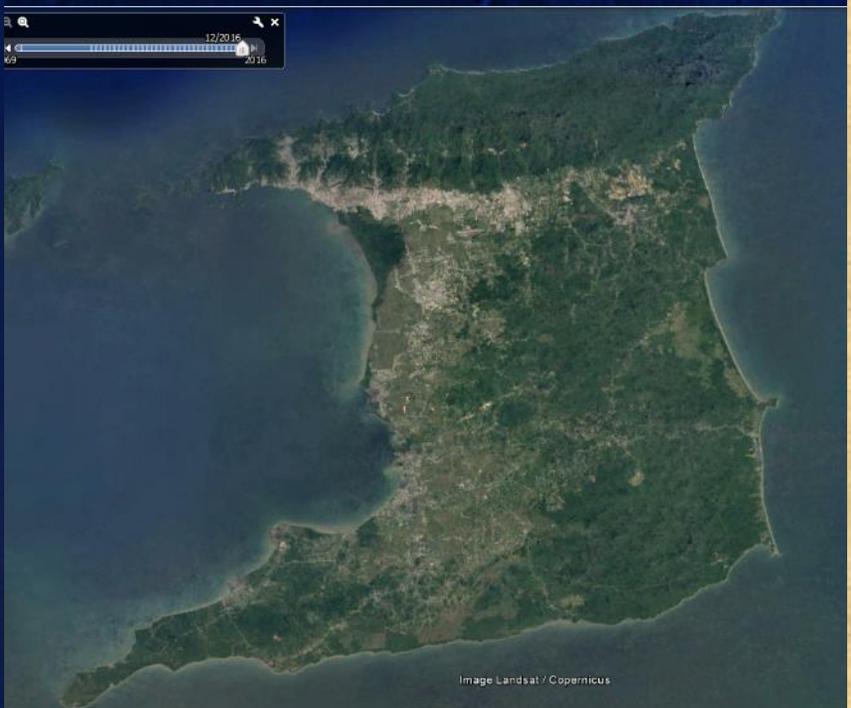
Forest Forum
TREES & SUSTAINABLE CITIES

March 2018

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Senior Director – FS & TS Division

First Impression

Importance of knowing the figures

- For Management and Accountability purposes

- International obligations

- Monitoring (reference/bench mark)

- Public Awareness and Education

- *Part and parcel of our national accounting system*

- Asset – to be traded in different forms

- Research and development

- For the creating of linkages to other sectors

The figures- how are they derived?

CONDUCT FIELD VERIFICATION & UPDATE DATASET

CONDUCT IN HOUSE CLEANING AND VERIFICATION

CONDUCT SUPERVISED CLASSIFICATION ANALYSIS USING FEATURE ANALYST

SELECT CLASS SIGNATURES USING 1998 LANDUSE

MOSAIC AND CLIP IMAGES

1. Stages of Analysis

Quality of data

Image Quality – Cloud and shadow Free (<5%)

High resolution (<1m), multispectral IKONOS imagery)

Archival and new

More on the methodology…

Supervised Classification using ESRI compatible Imaging software – _Feature Analyst_

- Utilizes spectral and spatial information to rapidly collect feature data from satellite & aerial imagery
- Perform object-specific change detection
- Improve feature data using a variety of post-processing and advanced-editing tools
- Develop Automated Feature Extraction (AFE) models that contain all of the information required to automatically process additional datasets

Trained interpreters - Makes sense from the classification, verifies and validates the findings
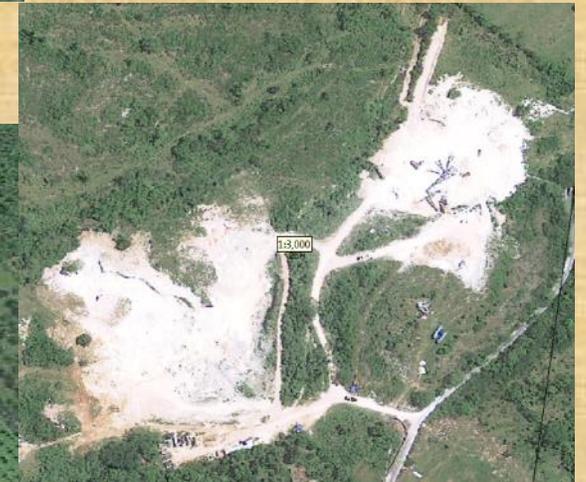Detects misclassifications
Reduces the occurrence of unknown classification
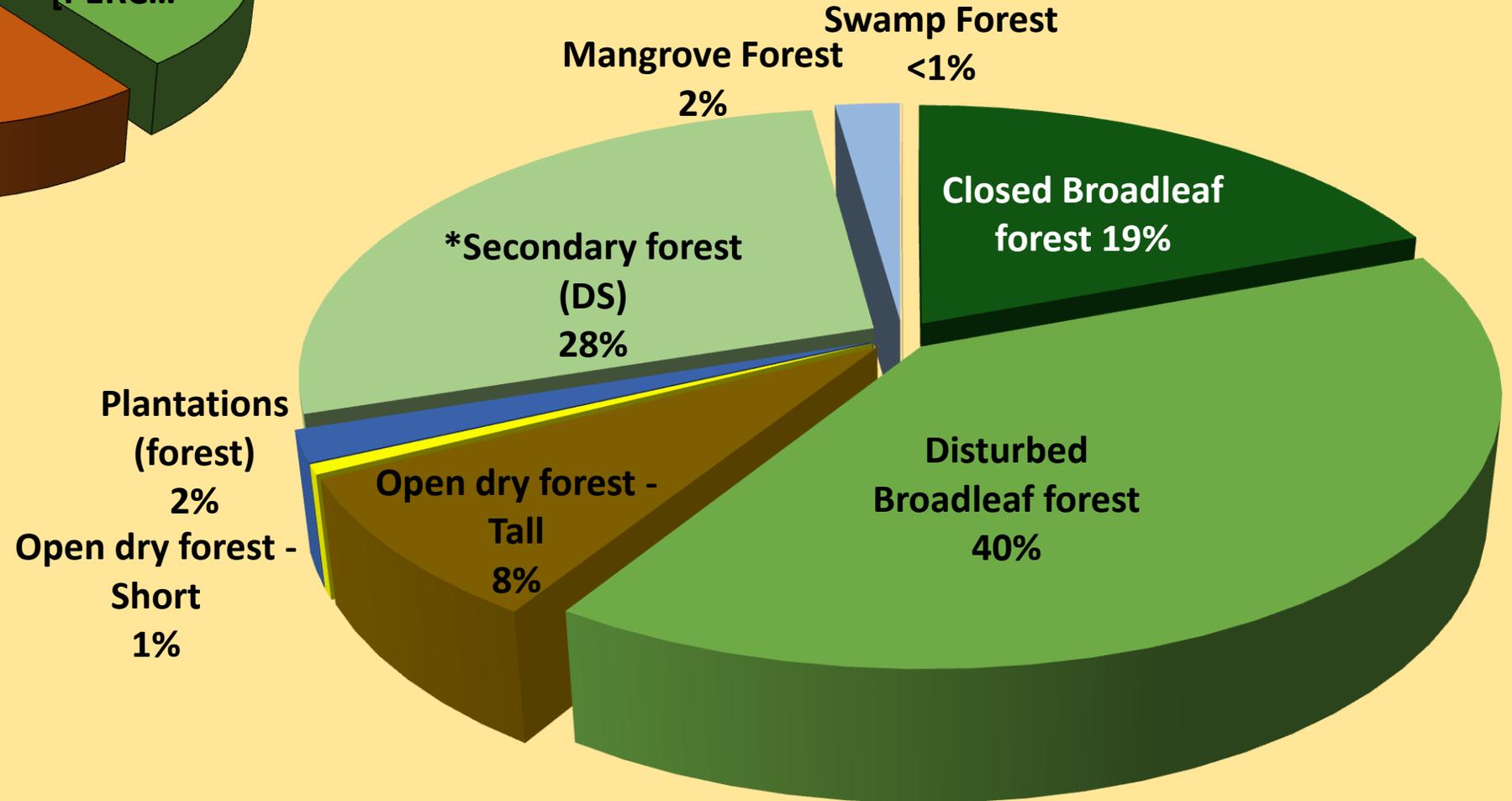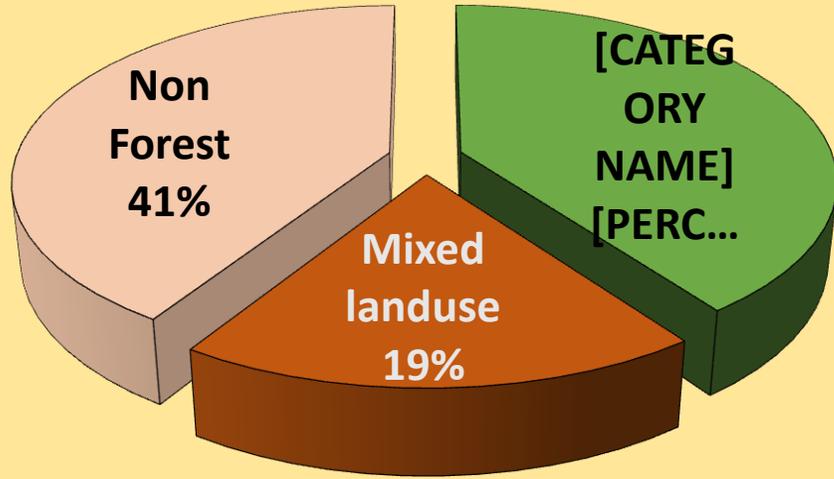
Time
Costs

Signature Identification

Bamboo

Bamboo and Fields

Bamboo and Secondary Forest

Bare Rock

Bauxite Extraction

Bauxite Extraction and Secondary Forest

Buildings and other infrastructures

Closed broadleaved forest (Primary Forest)

Disturbed broadleaved forest (Secondary Forest)

Fields and Secondary Forest

Fields or Secondary Forest/**Pine Plantation**

Fields: Herbaceous crops, fallow, cultivated vegetables

Herbaceous Wetland

Mangrove Forest

Open dry forest - Short (Shrubland/Bushland)

Open dry forest - Tall (Woodland/Savanna)

Plantation: Tree crops, shrub crops, sugar cane, banana

Secondary Forest and Fields

Swamp Forest

Water Body

Hardwood Plantation

21 Class Classification

FINDINGS

Non Forest 41%

Mixed landuse 19%

[CATEGORY NAME] [PERC...]

Mangrove Forest 2%

Swamp Forest <1%

*Secondary forest (DS) 28%

Closed Broadleaf forest 19%

Plantations (forest) 2%

Open dry forest - Short 1%

Open dry forest - Tall 8%

Disturbed Broadleaf forest 40%
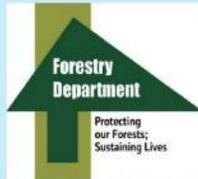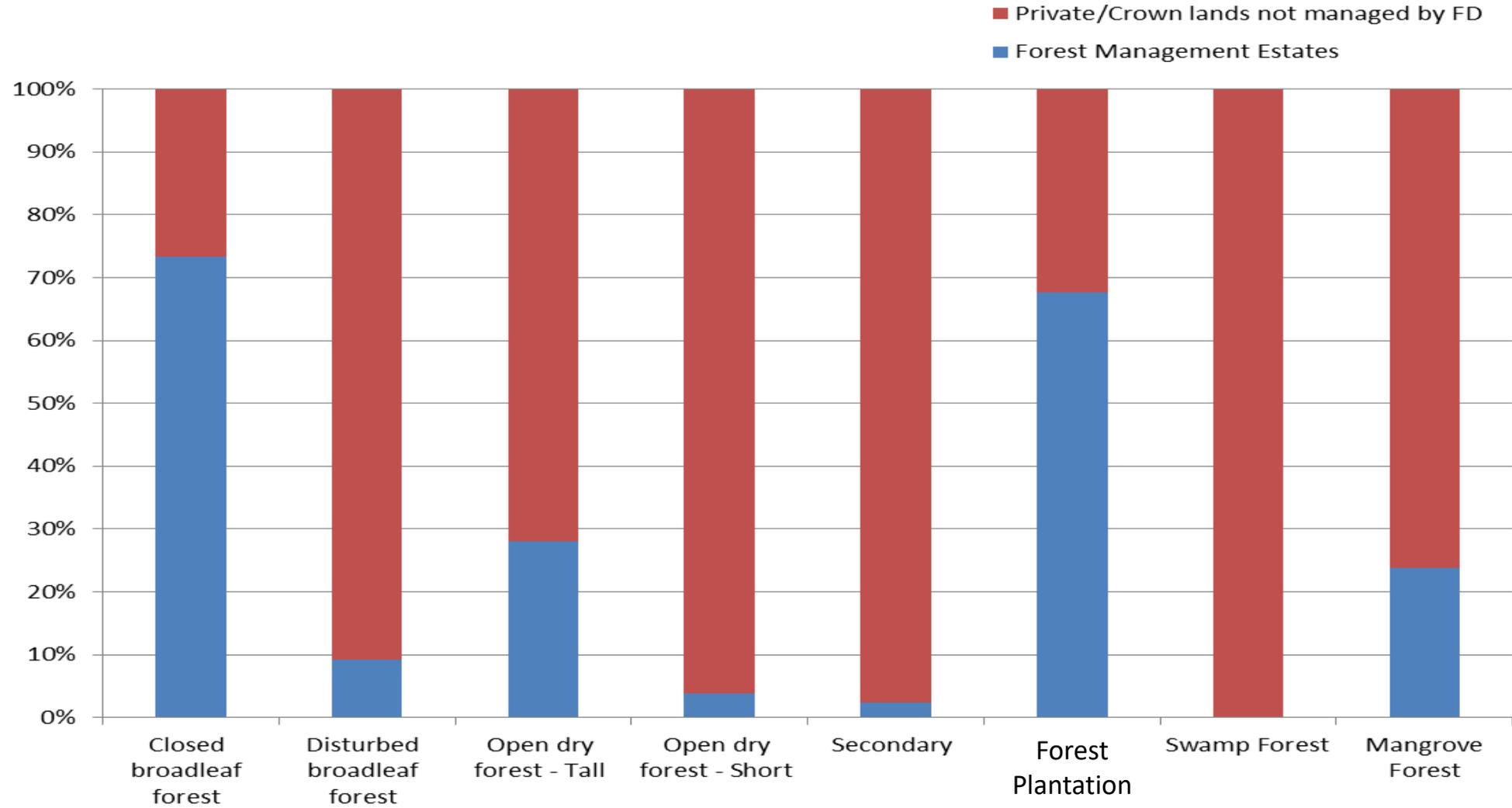
FOREST COVER OF JAMAICA
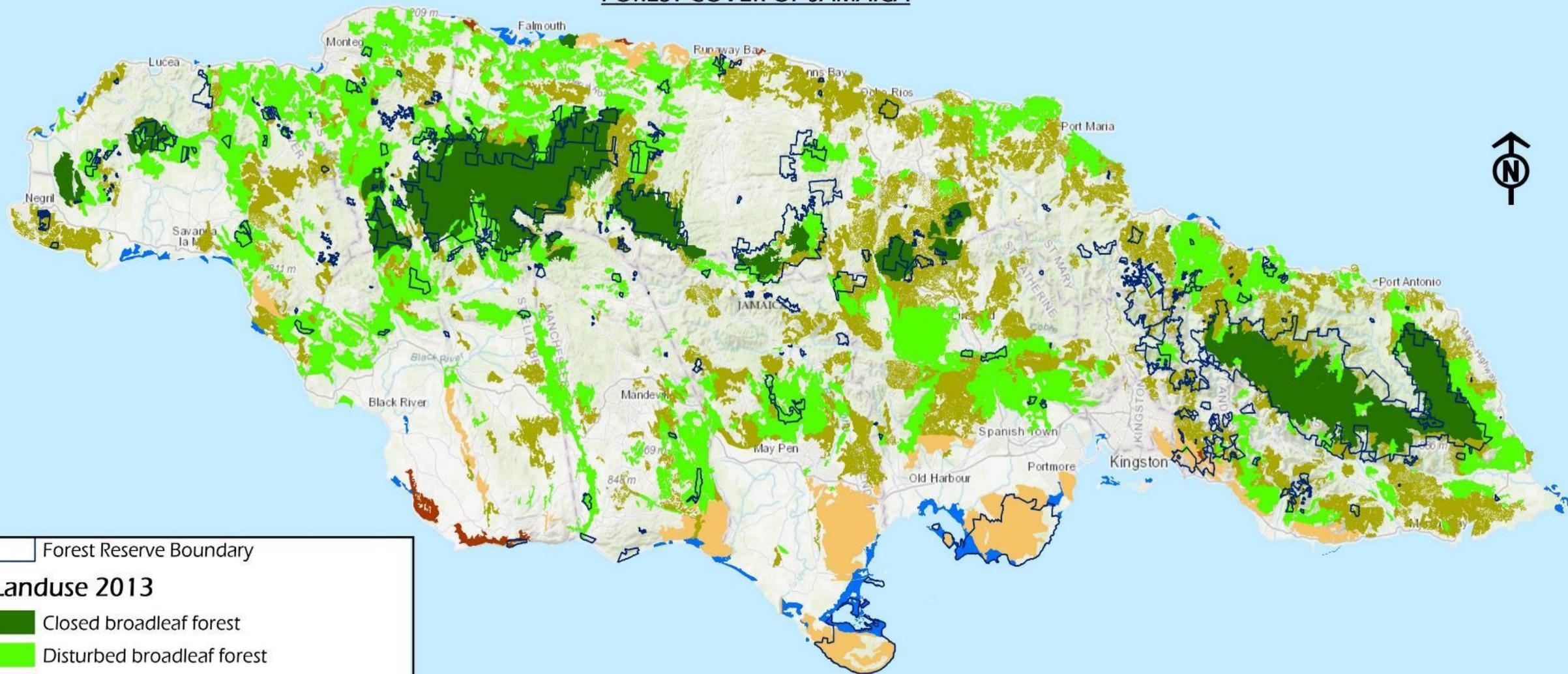
Forest Reserve Boundary

Landuse 2013

- Closed broadleaf forest
- Disturbed broadleaf forest
- Mangrove Forest
- Open dry forest - Short
- Open dry forest - Tall (Woodland/Savanna)
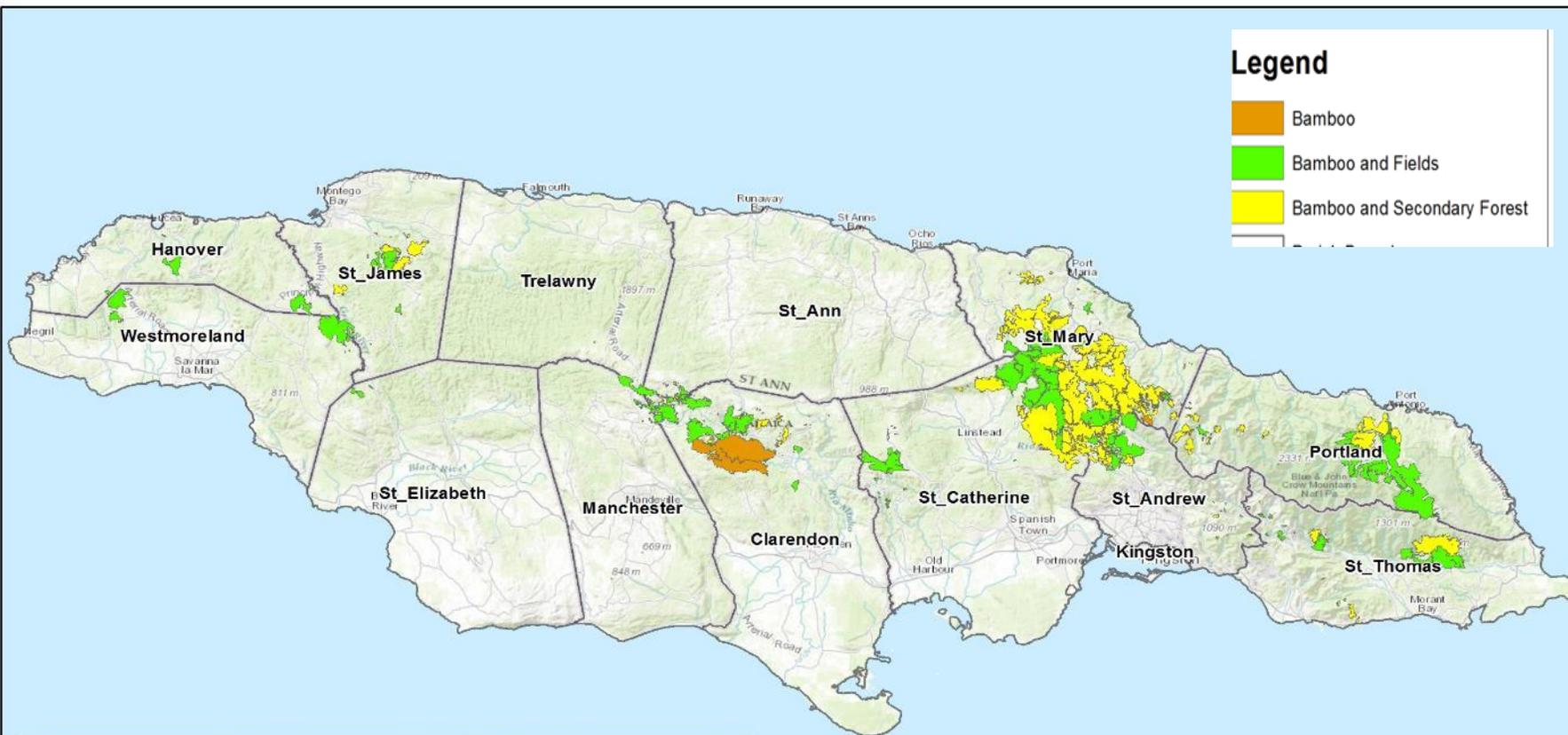- Secondary Forest
- Swamp Forest

Forestry Department
Protecting our Forests; Sustaining Lives

Percentage of forest cover (2013) by management status (Public vs Private)

Bamboo
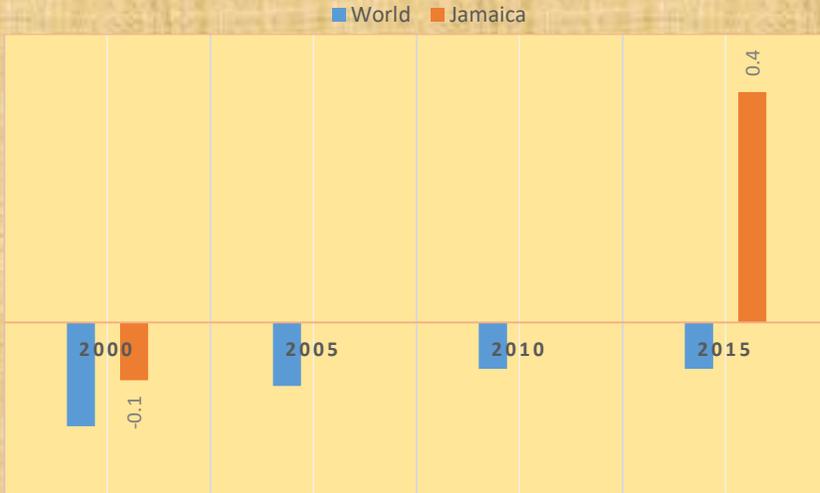# (Bambusa vulgaris)

Legend

🟫	Bamboo
🟩	Bamboo and Fields
🟨	Bamboo and Secondary Forest

Parish	Bamboo	Bamboo & Fields	Bamboo & Secondary Forest
Hanover		991.13	
St James		2575.29	117.85
Trelawny		180.87	4.22
St Ann		286.43	60.65
St Mary	186.61	4182.03	15609.58
Portland		6846.79	2688.10
St Thomas		2169.49	1938.05
Kingston & Standrew		2511.91	2090.59
St Catherine		5251.23	5872.89
Clarendon	4480.80	3570.77	433.74
Manchester		382.63	1.03
St Elizabeth		136.23	
Westmoreland		1857.16	
Total	4667.409	30941.96	28816.70

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

ANNUAL NET % CHANGE IN FORES COVER

World   Jamaica

0.4

2000   2005   2010   2015

-0.1
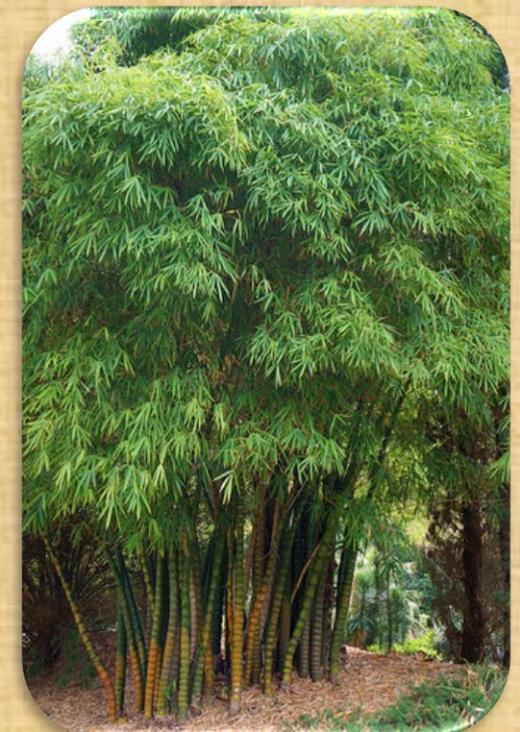
JAMAICA
Net Annual Gain in Forest Cover
= 0.4%

Jamaica compared to the top 10 countries reporting the greatest annual net gain in forest area, 2010–2015

Country	Value
USA	0.1
Australia	0.2
India	0.3
Jamaica	0.4
France	0.7
China	0.8
Gabon	0.9
Viet Nam	0.9
Lao	1
Chile	1.8
Phillipines	3.3

0   0.5   1   1.5   2   2.5   3   3.5

Comparison 1998 vs. 2013

CLOSED BROADLEAF FOREST (1998 VS 2013) AND
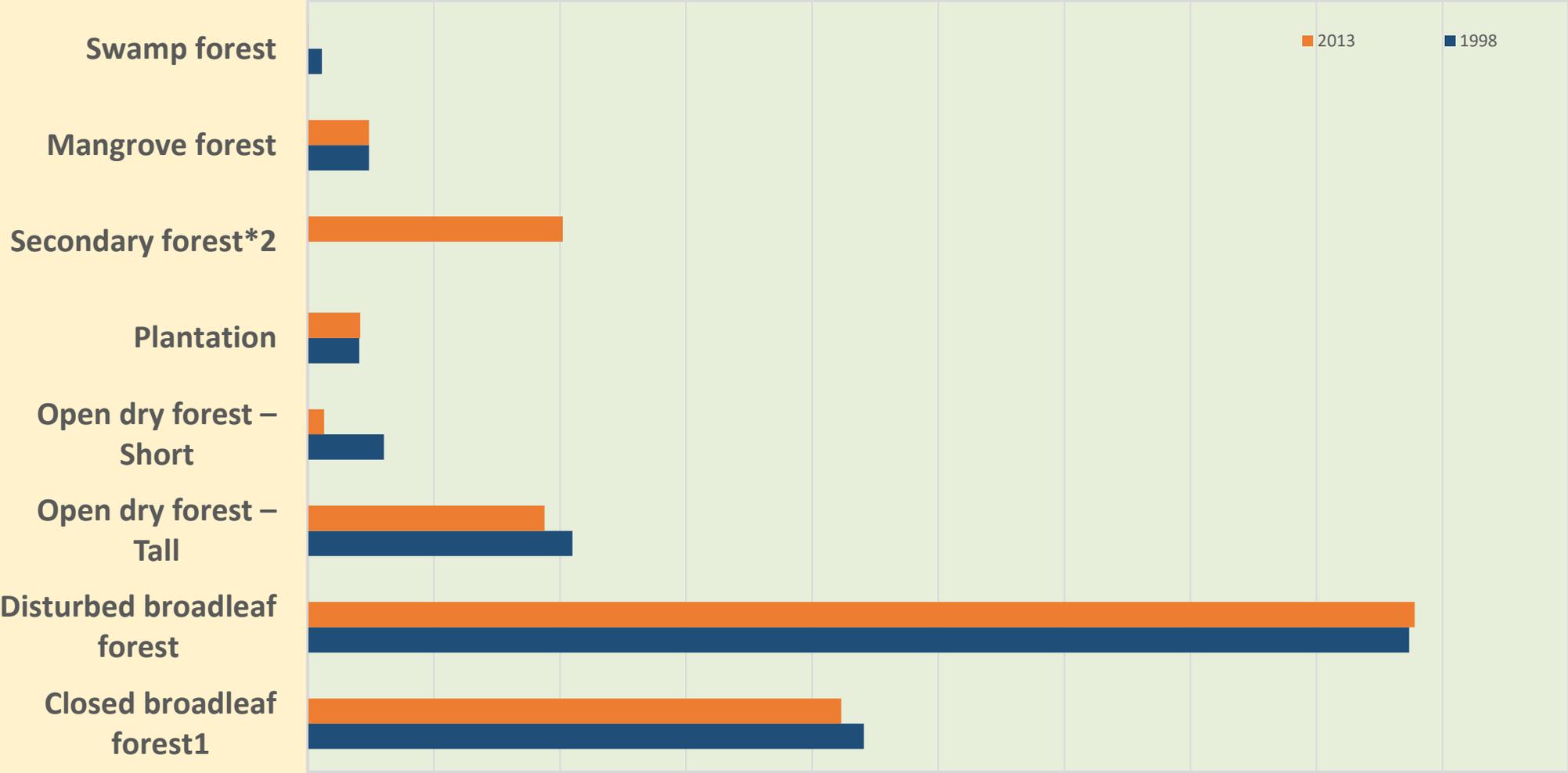
The Big Picture:
Degradation instead of Deforestation

Closed Broadleaf Forest (4.01% or ~ 3600 ha reduction) - Significant losses to:
- Disturbed Broadleaf forest
- Secondary Forest
- Field and secondary forest.

Swamp forest (95% or ~ 2100 ha reduction) - Significant losses to:
- Fields of herbaceous crops, fallow, cultivated vegetables etc.
- Herbaceous wetland
- Buildings and other infrastructures

Short Open Dry Forest (78% or ~ 9500 ha reduction) : **Significant losses to**:
- Tall open dry Forest
- Bare land

The Big Picture:
# Degradation instead of Deforestation

Tall Open Dry Forest (11% or ~ 4400 ha reduction): Significant losses to:

- Secondary Forest
- Bare Rock
- Buildings and other infrastructures

Secondary Forest: Present in 1998 but due to the coarseness of the data, a significant portion of this type was classified in the mixed land-use category. Real gains to secondary forest was from –

- Fields (cultivations) - i.e. fields of herbaceous crops, fallows, vegetables etc.)
- Crop plantations of tree and shrub crops, sugar cane, banana etc. and
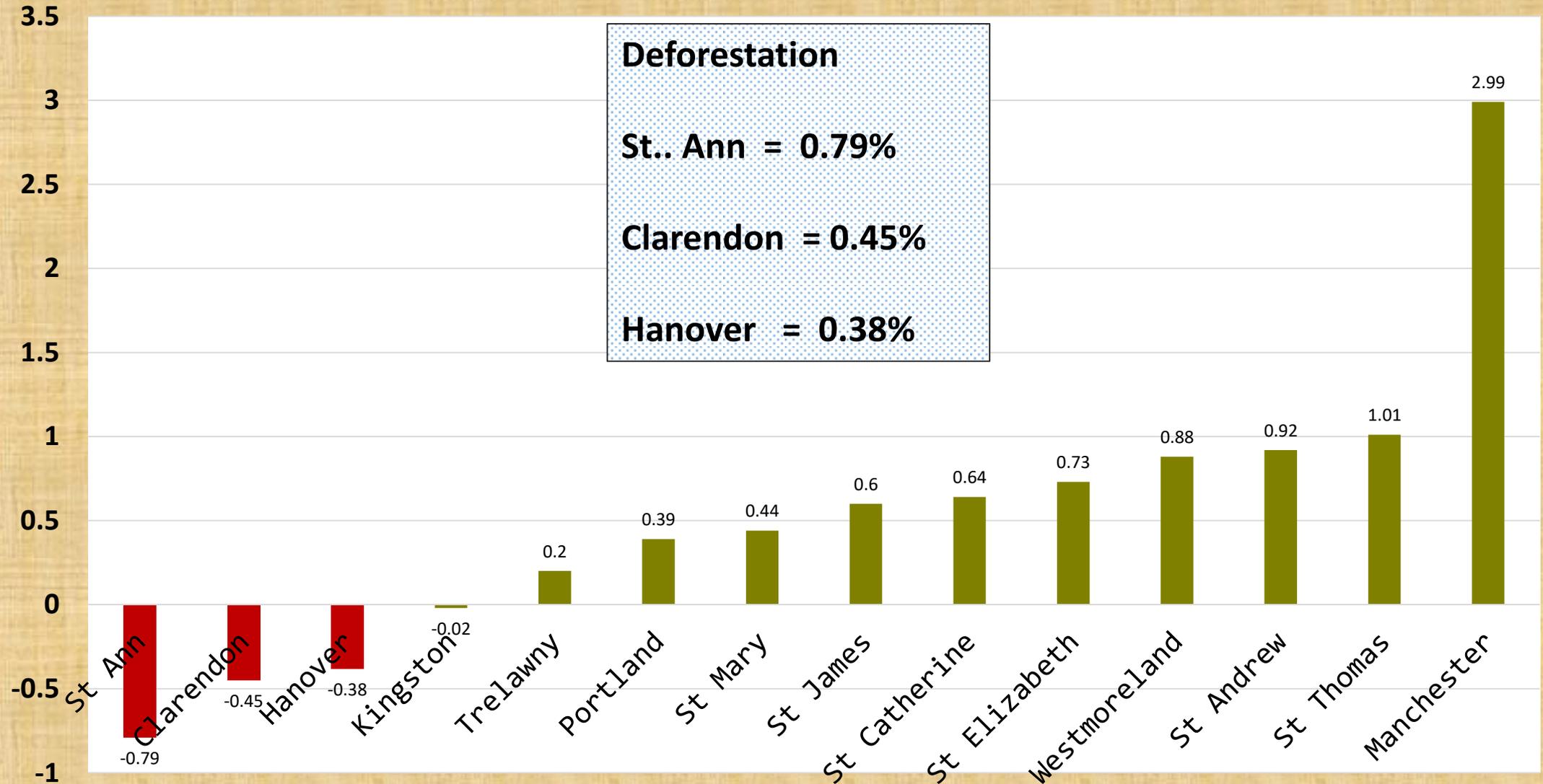- Areas of bauxite extraction

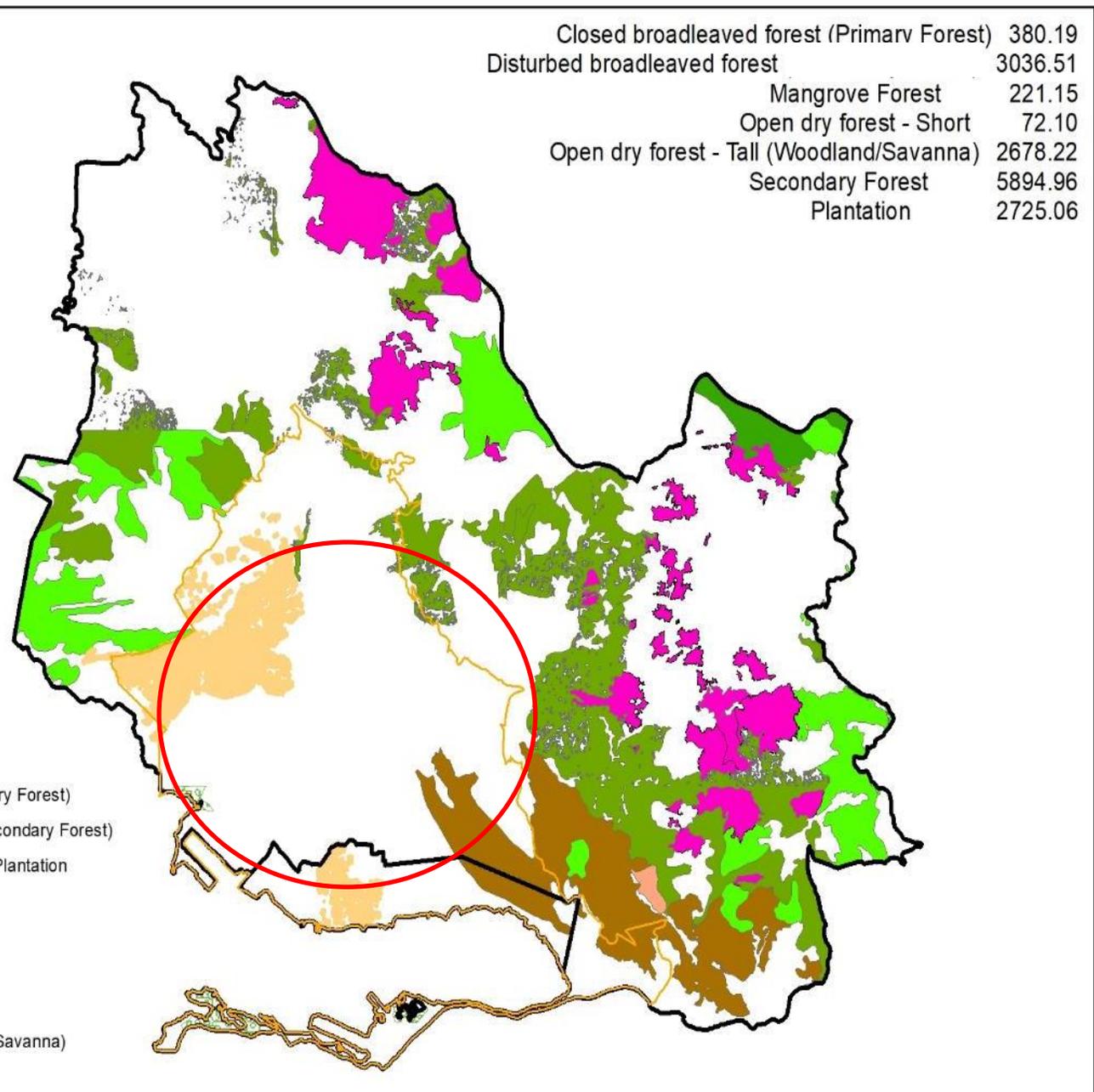**Current (2013) Forest Cover across parishes (ha)**
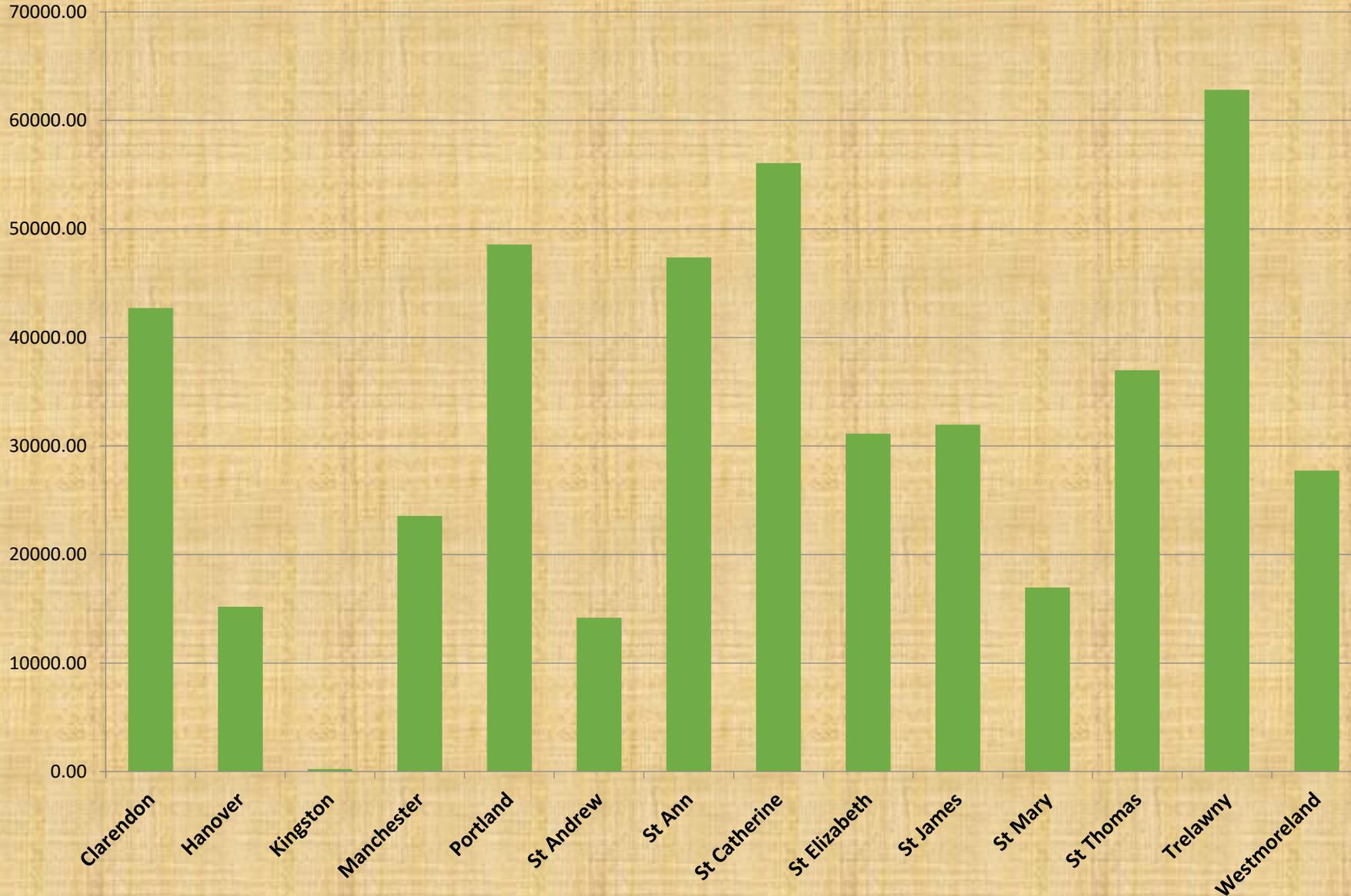
Top 5 Parishes

Trelawny
St Catherine
Portland
St Ann
Clarendon

Annual net change in forest cover by parish (2013)

Deforestation

St.. Ann = 0.79%

Clarendon = 0.45%

Hanover = 0.38%

Parish	Value
St Ann	-0.79
Clarendon	-0.45
Hanover	-0.38
Kingston	-0.02
Trelawny	0.2
Portland	0.39
St Mary	0.44
St James	0.6
St Catherine	0.64
St Elizabeth	0.73
Westmoreland	0.88
St Andrew	0.92
St Thomas	1.01
Manchester	2.99

KSA Forest Cover

Closed broadleaved forest (Primary Forest) 380.19
Disturbed broadleaved forest 3036.51
Mangrove Forest 221.15
Open dry forest - Short 72.10
Open dry forest - Tall (Woodland/Savanna) 2678.22
Secondary Forest 5894.96
Plantation 2725.06

Trees outside Forest - KMA

Legend
KMA
Parish KSA
Urban Forest

Landuse/cover
Closed broadleaved forest (Primary Forest)
Disturbed broadleaved forest (Secondary Forest)
Fields or Secondary Forest/Pine Plantation
Hardwood Plantation: Euculytus
Hardwood Plantation: Mixed
Mangrove Forest
Open dry forest - Short
Open dry forest - Tall (Woodland/Savanna)
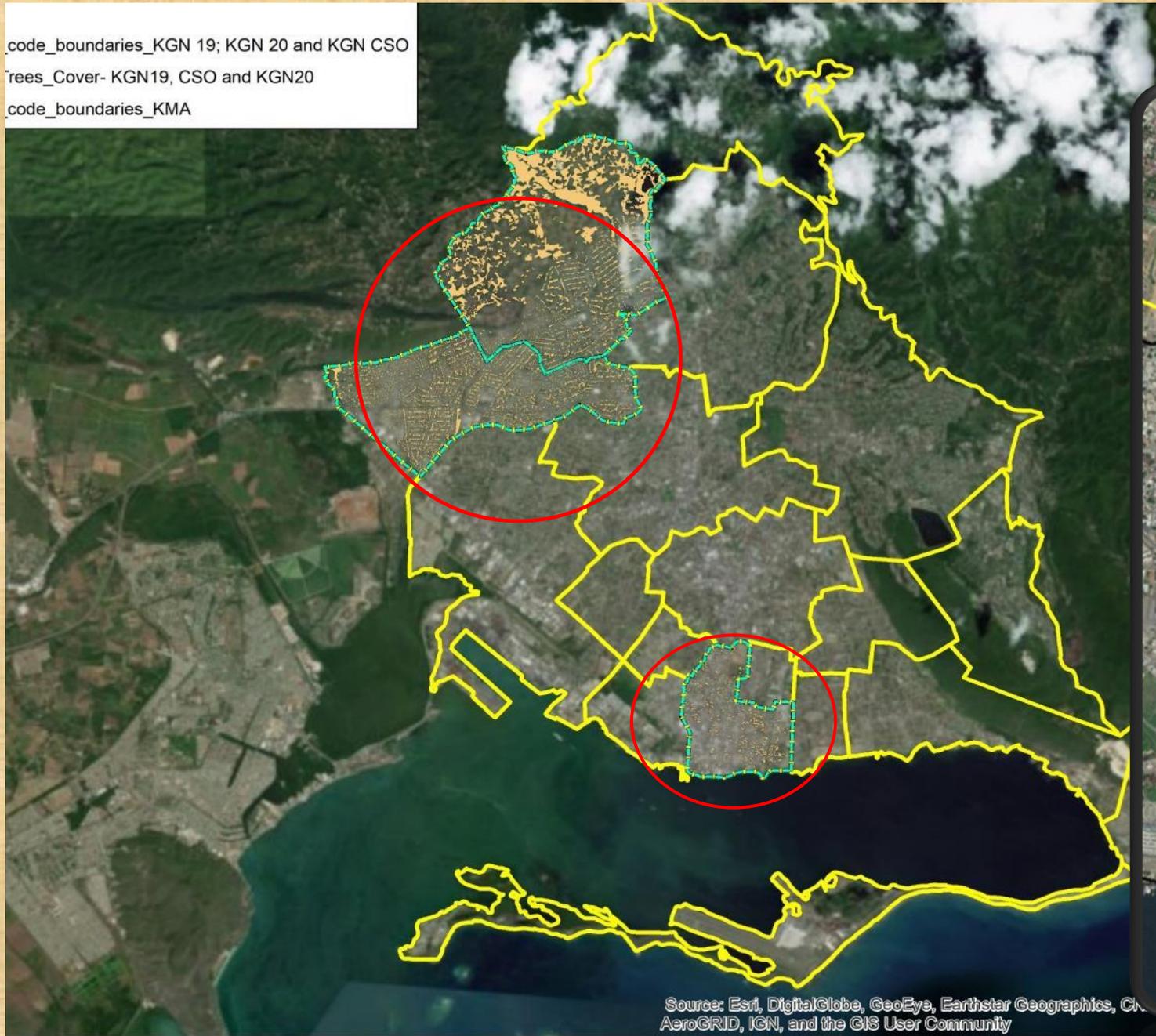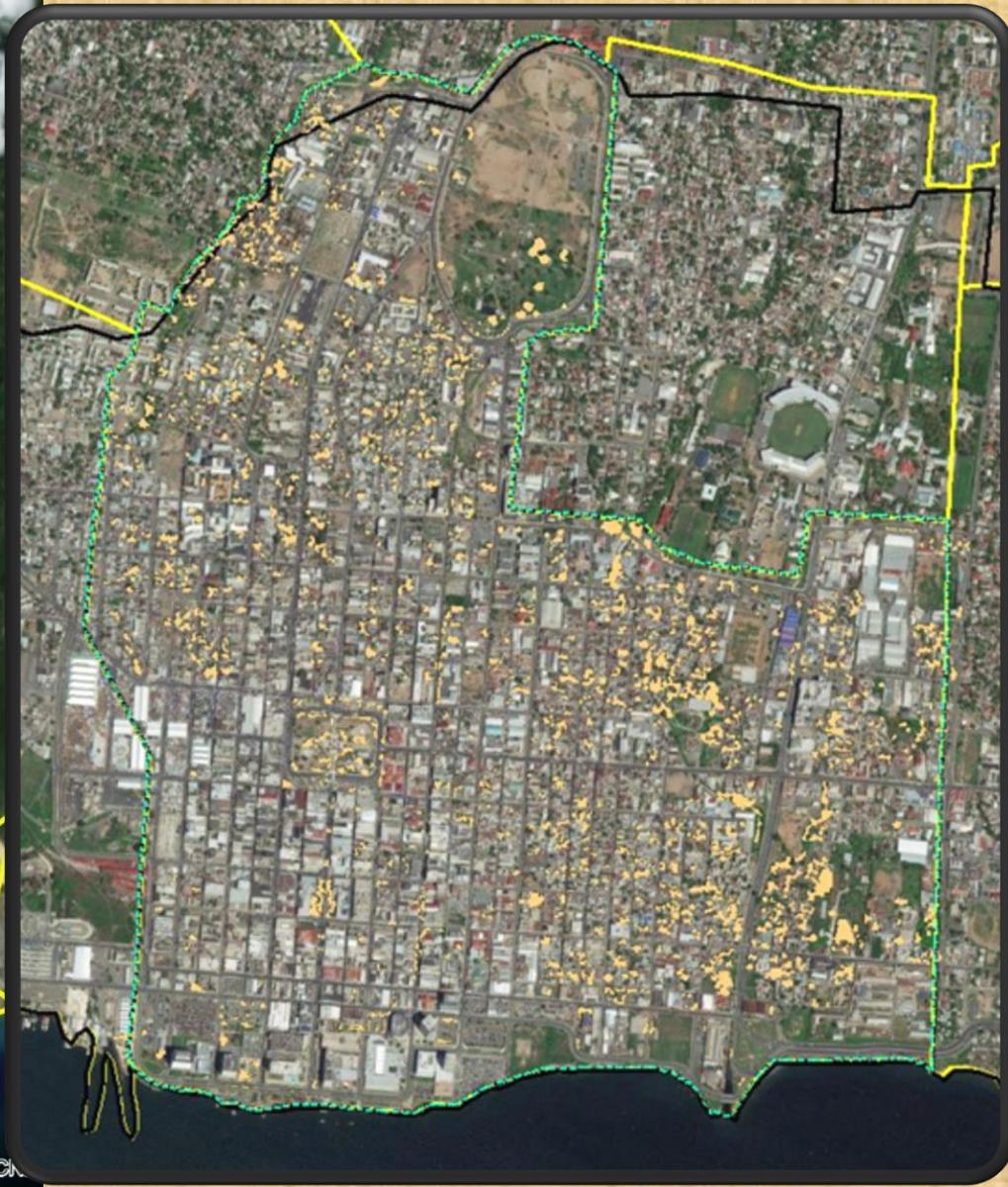Secondary Forest

City coverage Kingston
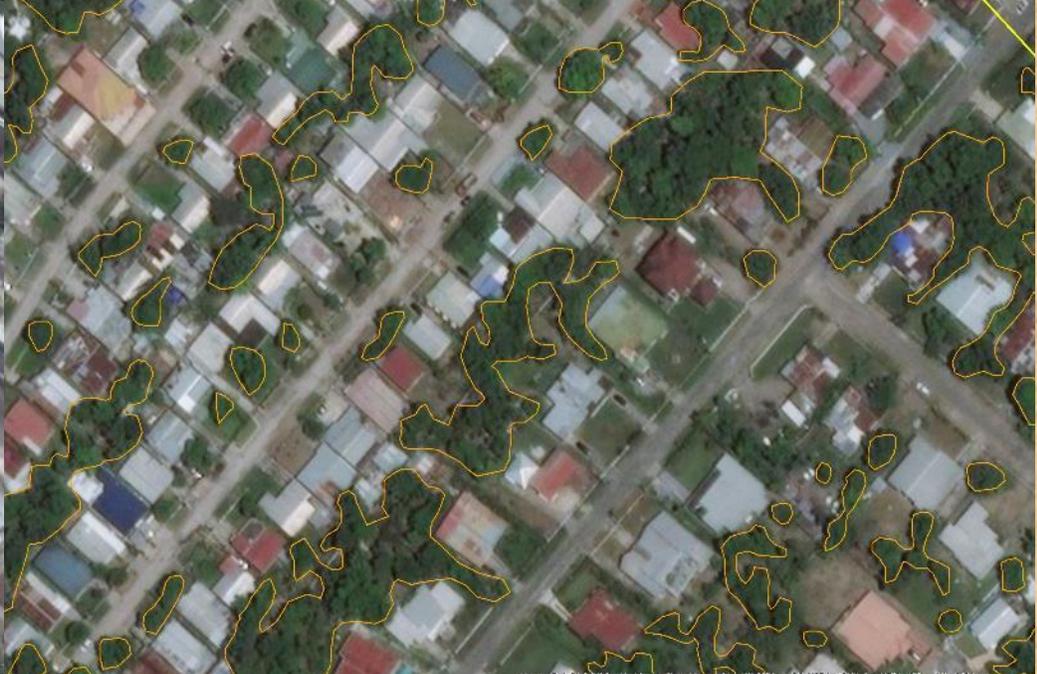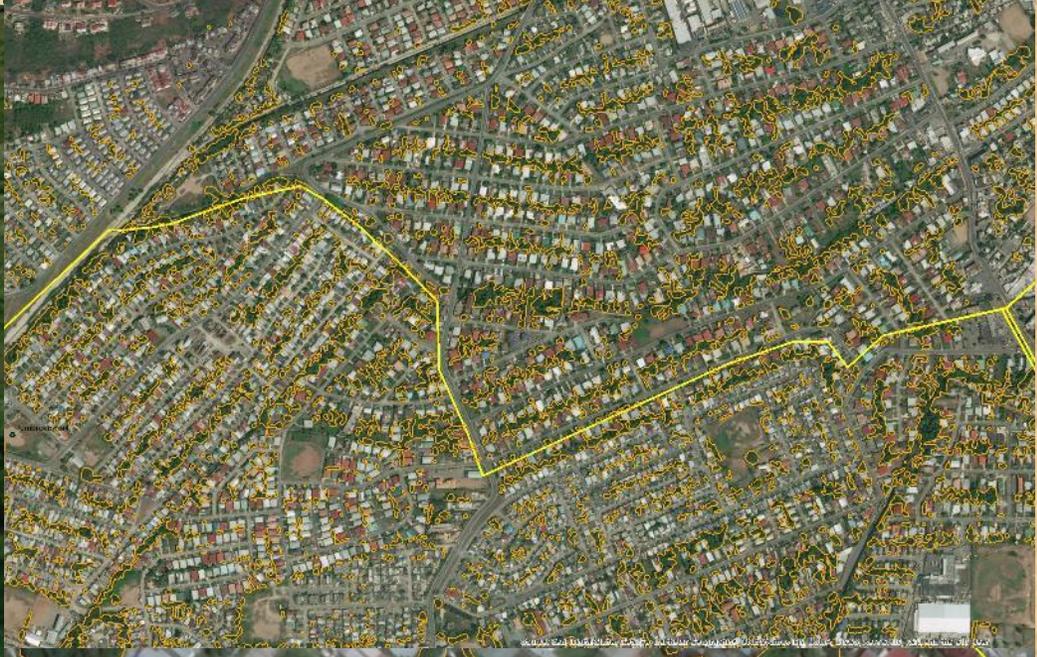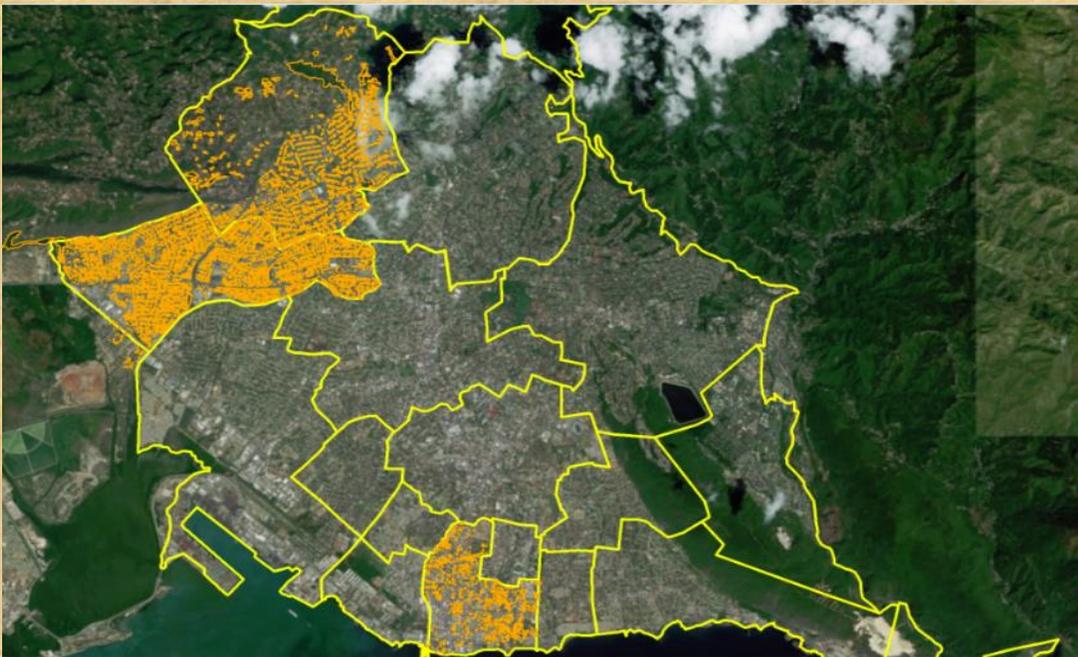
_code_boundaries_KGN 19; KGN 20 and KGN CSO

Trees_Cover- KGN19, CSO and KGN20

_code_boundaries_KMA

Kingston CSO

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CN AeroGRID, IGN, and the GIS User Community

Kingston 19 and 20

Tree coverage -Kingston

Area of KMA ha	13217.00
KGN CSO Area	351 ha
KGN CSO Urban Trees Cover	21.25 ha (6%)
KGN 19 Area	1234 ha
KGN 19 Urban Trees Cover	419.4 ha (34%)
KGN 20 Area	791 ha
KGN 20 Urban Trees Cover	97.90 ha (12%)

Forestry Department - Protecting our eco-Legacy

- **Forest Policy for Jamaica** (2017) – promoting "No net loss" of forest cover

- **National Forest Management and Conservation Plan** (2016- 2026) to address SFM in the face of climate change

  - Protection and conservation of vulnerable forest types
  - Implementation of REDD+
  - Collaborative management
  - Sustainable forest utilisation
  - Forest education and awareness

- **Amendment of Forest Legislation**

- **Public Private Partnership Programmes** (Declaration of private forests, Adopt-a Hillside, PFP)

Cockpit Country Core, Protected Area and Landuse

Proposed Protection

CBL = 43198.73 ha (51%)

DBL = 12760.38 ha (7.3%)

Secondary forest = 5001.16 ha

Your role:-

- Partner with the Agency in planting and protecting forests (trees)
- Assist in building awareness of the benefits of sustaining and protecting our forest cover
- Declare your private forest for protection
- Adopt and Adapt Sustainable livelihoods
- Promote forest values and valuation

- Any others ?....share with us !

FUNDING was made possible under the EU- CCA & DRR Project (2013)

FD GIS TEAM

FD FIELD TEAMS

Ali Morgan

Water Resources Authority

National Spatial Data Management Division

Other members of the Forestry Department Team

Thank you!

Closed Broad Leaf forest
A heritage - left as our legacy an
enduring spirit of respect