



# Belize's Journey to Result Based Payments

REDD+

Ministry of Sustainable Development, Climate Change & Disaster Risk Management

Edgar S. Correa,

# CONTENT

Belize Context

01

Belize Forest Department Structure

02

Permanent Sample Plots

03

Collection of AD Process

04

National Forest Results

05

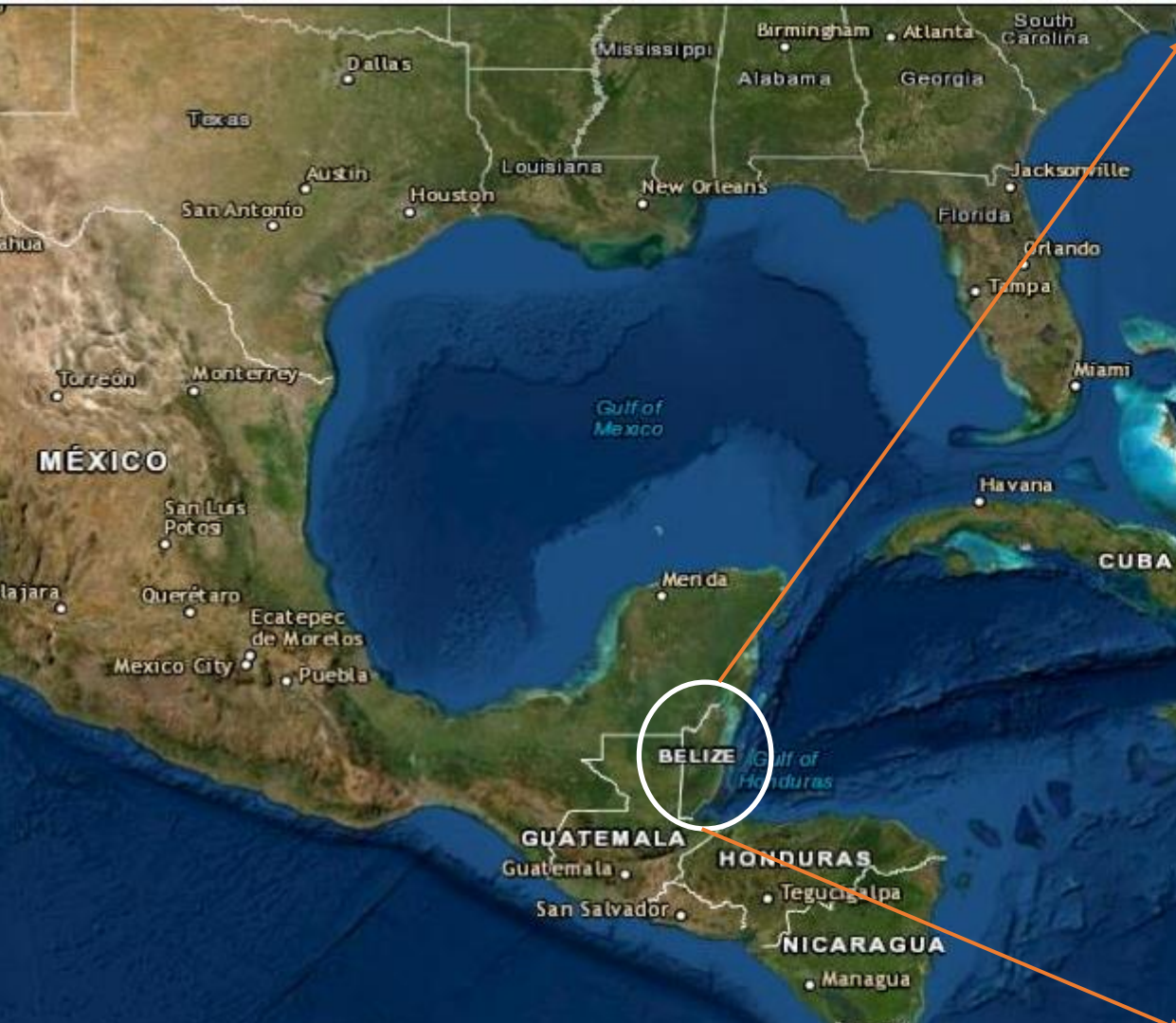
Forest Reference Emission Level Report / GHGs

06

Next Steps

07





- 8,867 mi<sup>2</sup> (22,151 km<sup>2</sup>)
- Natural Resource-Based Economy (agriculture and tourism)
- Population: 400,000 (2020 est)
- Growth rate: 2.3%
- 43% poverty
- English speaking

- 61.75 % forest cover (2018)
- 36% terrestrial area protected
- Main driver of Forest Loss:
  - Agriculture Expansion
  - Infrastructure Expansion
  - Unsustainable and Illegal Logging
  - Hurricanes, Pests and Wildfires
  - Average of 9712 ha (0.07%) of deforestation rate between 2000-2018

# BELIZE CONTEXT



# Background



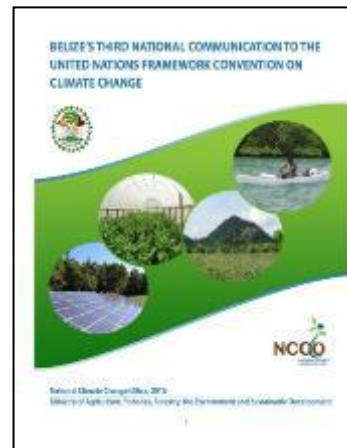
Under the **FNC/BUR Project**, Belize is in the process of submitting its 4<sup>th</sup> National Greenhouse Gas Inventory to the UNFCCC.

- Annex within the BUR (2019)
- Chapter within FNC- 5<sup>th</sup> GHG Inventory (2021)

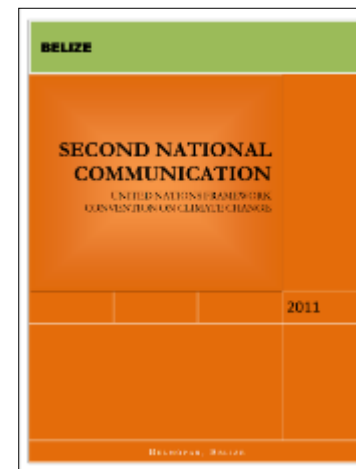
## What is the Greenhouse Gas (GHG) Inventory and why do we care?

- The GHG Inventory contains Belize's official reported greenhouse gas emission estimates
- Key Policy Building tool for understanding the origin and magnitude of Belize's emissions.
- Covers the six direct greenhouse gases under the Kyoto Protocol
  - Carbon dioxide (CO<sub>2</sub>)
  - Methane (CH<sub>4</sub>)
  - Nitrous oxide (N<sub>2</sub>O)
  - Hydrofluorocarbons (HFCs)
  - Perfluorocarbons (PFCs)
  - Sulphur hexafluoride (SF<sub>6</sub>)

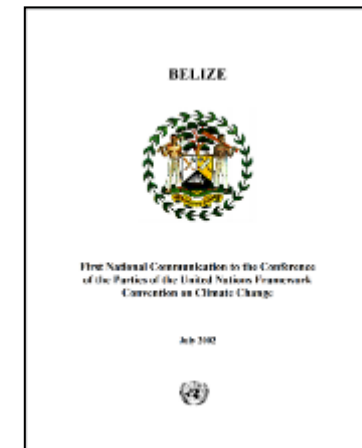
3



2



1

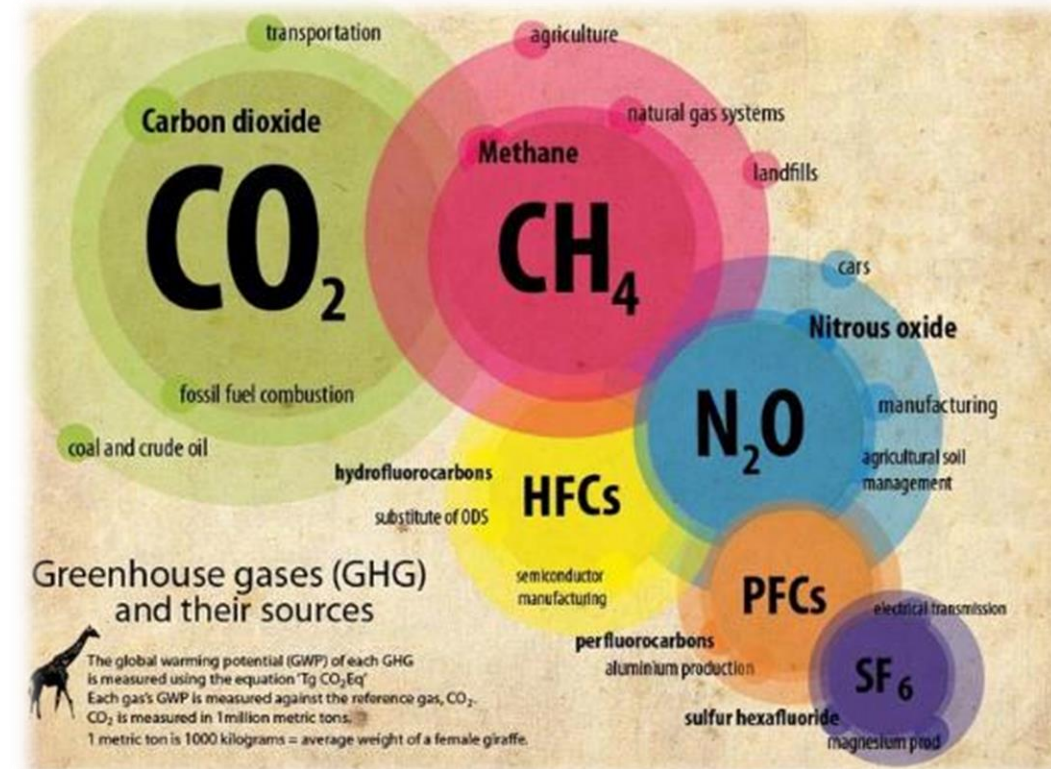


# What is a GHG Inventory? Cont.

- Estimates of all emissions and removals of greenhouse gases (GHG) from given sources or sinks from a defined region in a specific period of time.
- **Agriculture, Forestry (AFOLU), Energy, Industrial, Waste**

Here we are dealing with:

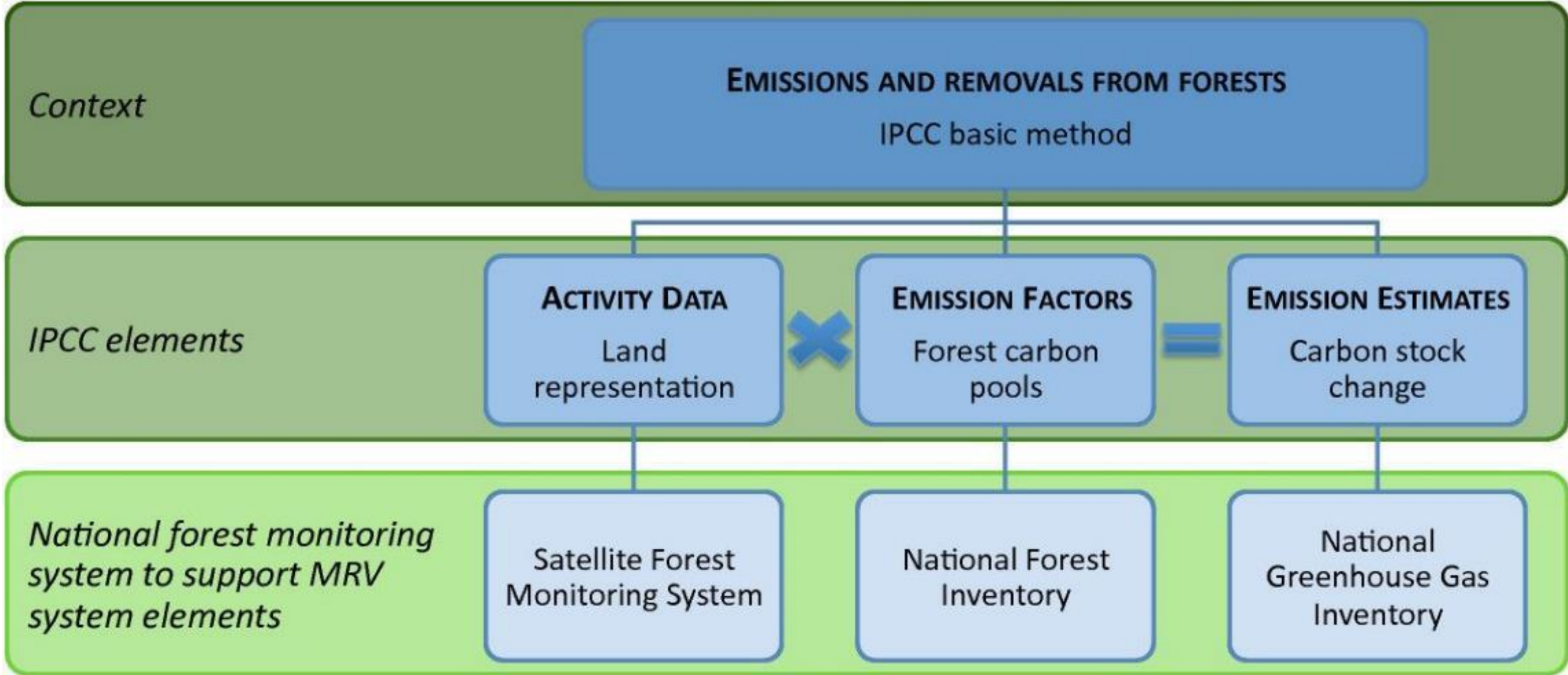
- – Greenhouse Gases
- – National Estimates
- – Annual Estimates



# UNFCCC reporting requirements

- All countries are required to report National Communications every 4 yrs, including a GHG inventory Biennial Update Reports to be submitted every 2 yrs, including a GHG inventory
- Those countries that voluntarily participate in REDD+ should present a RL consistent with their GHG inventory. REDD+ results should be consistent as well.
- Paris Agreement (specific rules under negotiation) require countries to report a GHG inventory and other information to understand progress of NDCs





# What is REDD+?

REDD+ is a framework created by the UNFCCC Conference of the Parties (COP) to guide mitigation activities in the forest sector that **reduces emissions from deforestation and forest degradation** and includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks.

REDD+  
Activities



1

Reducing  
Emissions  
from  
Deforestation



2

Reducing  
Emissions  
from Forest  
Degradation



3

Conservation  
of Forest  
Carbon Stocks



4

Sustainable  
Management  
of Forest



5

Enhancement  
of Forest  
Carbon Stocks



# PHASES OF REDD+



National Forest Monitoring System (NFMS)



Forest Reference Levels (FR(E)L)



Safeguards and Safeguards Information System (SIS)



National Strategies/Action Plans (NS/AP)

## PHASE 1

### Readiness

#### WARSAW FRAMEWORK

Development of national strategies, action plans and capacity building

## PHASE 2

### Implementation

Implementation of national strategies, action plans, deployment of NFMS, capacity building and results-based demonstration activities

## PHASE 3

### Payments for results

Results-based actions are fully measured, reported and verified

### REDD+ Enabling Environment

Governance (including policy and legal framework, tenure), stakeholder engagement (including indigenous groups) and gender

# REDD+

---

- It is the only emissions reduction program and standard included in the Paris Agreement.
- Creates financial value for the carbon stored in forests.
- Allows countries to obtain economic value for carbon reductions resulting from actions they take to reduce deforestation and preserve their forests.
- Offers incentives for developing countries to reduce emissions.
- It is the framework through which developed countries, the private sector, and consumers can engage rainforest countries with payments for actions to conserve and restore forest lands.
- This can take the form of direct payments from multi-lateral banks and inter-governmental organizations, such as Green Climate Fund, or can be in exchange for “carbon credits”.
- Now, businesses and individuals can also purchase carbon credits created from nationally issued, UNFCCC verified emissions reductions.

An aerial photograph of a vast, dense forest. The left side of the image is overlaid with a semi-transparent orange gradient. A thin white horizontal line is positioned above the text, and a white circle is located below it. The text 'MRV' is centered in a large, bold, black font.

# MRV

*Measuring, Reporting, Verification*

# Baseline and Results

---

- MRV is important within the context of the UNFCCC and Paris Agreement
- MRV includes data collection, analysis, reporting and validation
- Provide data for our national reporting commitments
- Fundamental to entering carbon market and results-based payments under REDD+
- A baseline assessment/Forest Reference Level was carried covering 15 years: 2000 to 2015
- Data for 2016 to 2018 were assessed against the Reference Level to determine Results





# REDD+ Belize

- (R-PP) was presented to the Participants Committee (PC) of the Forest Carbon Partnership Facility (FCPF) in July, 2013
- Subsequently, the World Bank signed a Country Participation Agreement with Belize in October 2014.
- Grant Agreement signed February 2017
- REDD+ Readiness Preparation Grant (P152415) to a total of US\$3.8 million



Ministry of Sustainable Development, Climate Change and Disaster Risk Management

The Belize Forest Department

Sustainable Forest Management

Wildlife Management

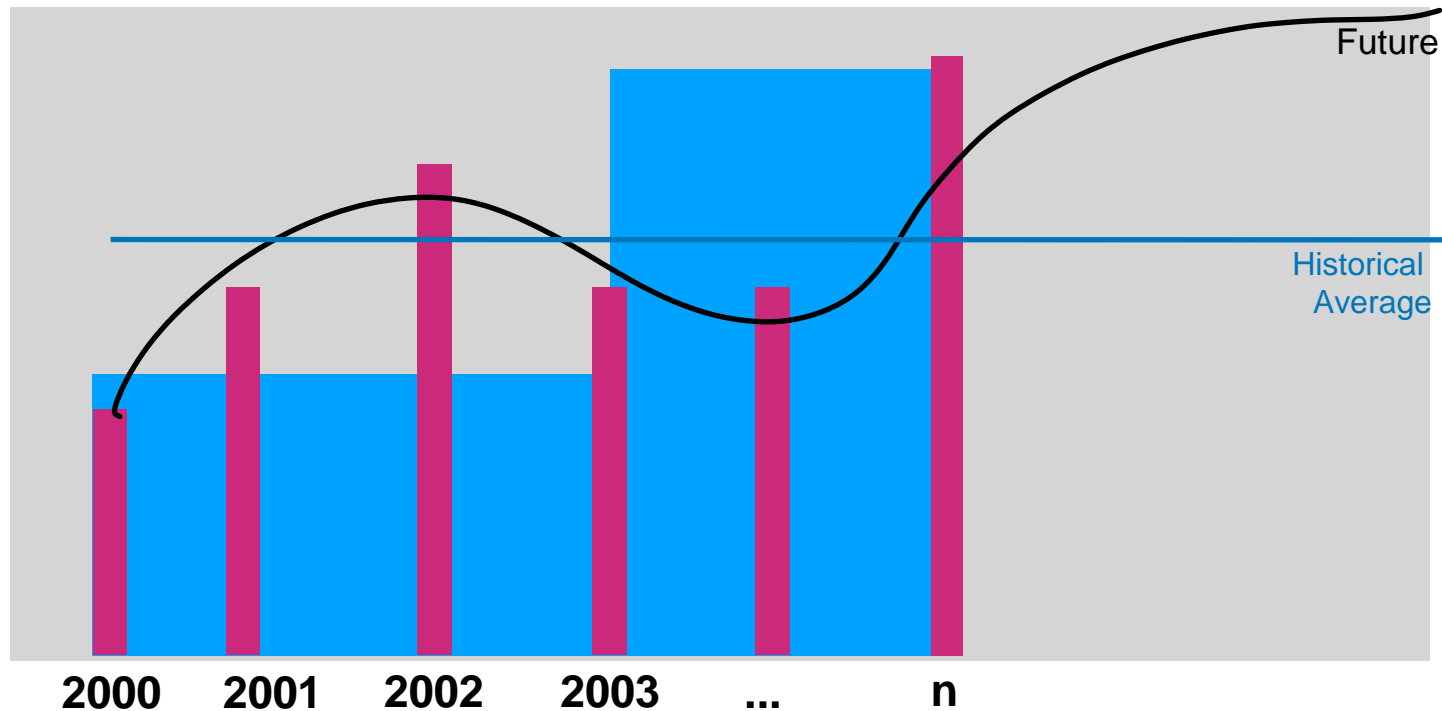
Protected Areas

Geospatial Monitoring Unit/MRV Program

# Land representation

And why the mapathon is so important?

- Evolution in methods and data
- Sporadic wall-to-wall mapping to annual sampling (Collect Earth + ICE)
- Improves understanding of the trend & supports better projections
- Better projections reduce uncertainty & increases credibility (markets)
- All results in improved trust + transparency



# Assessing Belize's Results?

Development of AFOLU  
Green House Gas Inventory  
Tool

## National Forest Information System

Monitoring of Forest  
Product Yields

Monitoring of Forest  
Increments

Monitoring of Forest  
Change

Monitoring Of Forest  
Disturbances

Land Use Change Assessment  
(2000 – 2018)

## Field Monitoring of Permanent Forest and Non- Forest Plots

National Forest Inventory – Emission Factor Estimate

## Collection of Activity Data and Quality Assurance

Collection of National Activity Data following IPCC Classes. Using high resolution imagery for visual interpretation classification in Collect Earth.

Generation of wall-to-wall landcover/land use maps using opensource satellite imagery, as a Quality Assurance Activity for Activity Data

Collection of GHG Emissions  
Through the Permanent  
Sample Plots Network

Information used to Present  
Result Based payment 2016-  
2018



# National Forest Monitoring System



# Two Main Activities

## Activity Data

- Land-use/Landcover Data

## National Inventory

- Permanent Sample Plots



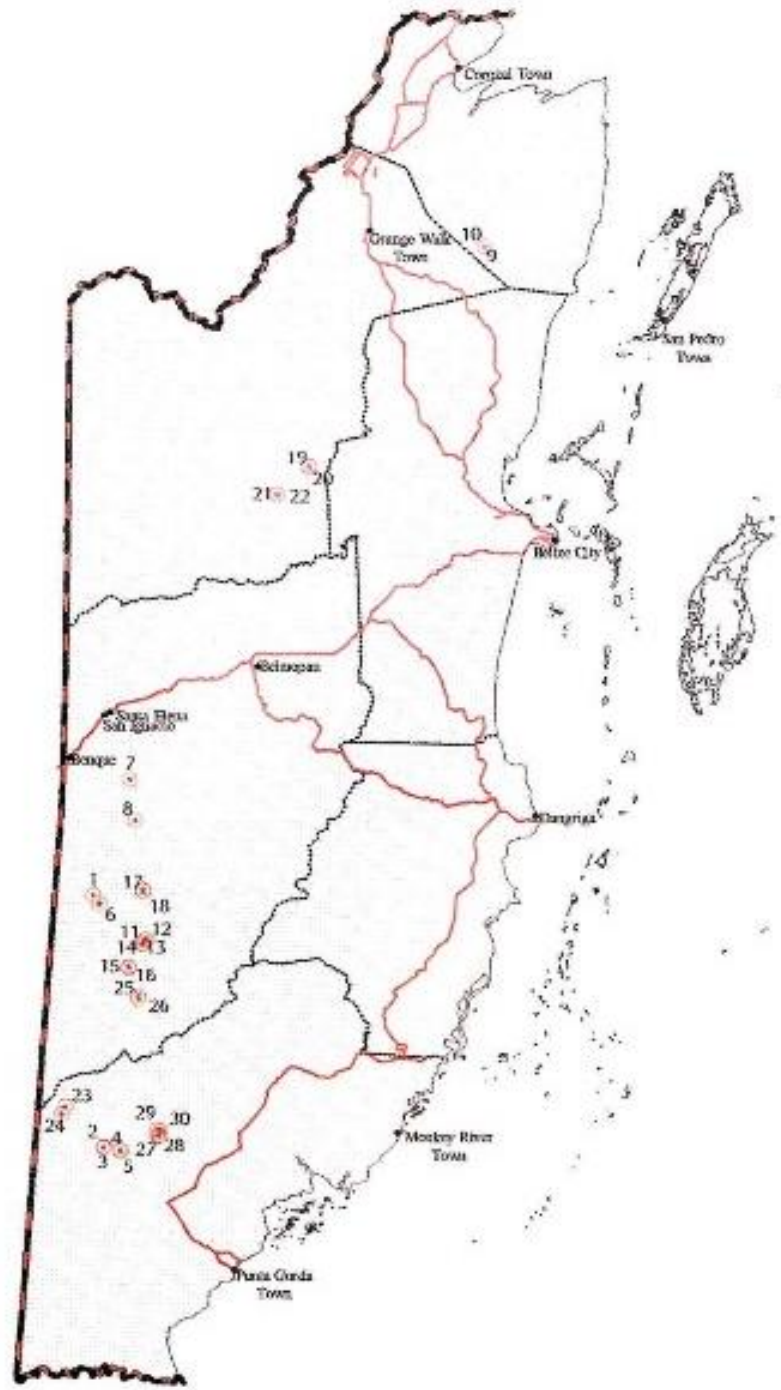
# Long-term Forest Monitoring in Belize: Permanent Sample Plots



# What are Permanent Sample Plots?

- PSPs are permanently demarcated areas of forest, typically of 1 ha each, which are periodically remeasured. They are maintained over years and provide estimates of changes in forest stocking and volume. This information is essential for the management of the forest.

# The Permanent Sample Plot Program in Belize



1992 – 1997

- 30 permanent sample plots established under the Forest Planning and Management project
- Samples many vegetation types
- Comprehensive dataset of tree stand & forest structure.

**Revival of network by Dr. Percival Cho**

Presently

- Total number of plots has increased to a total of 60 permanent sample plots established within the country with the aid of funding from various projects.

# Tree Census

Within the PSP standard measurements are made to allow comparison over time. Trees within a PSP are enumerated. The point of measurement for DBH of trees is marked to allow re-measurement at same point in the future.

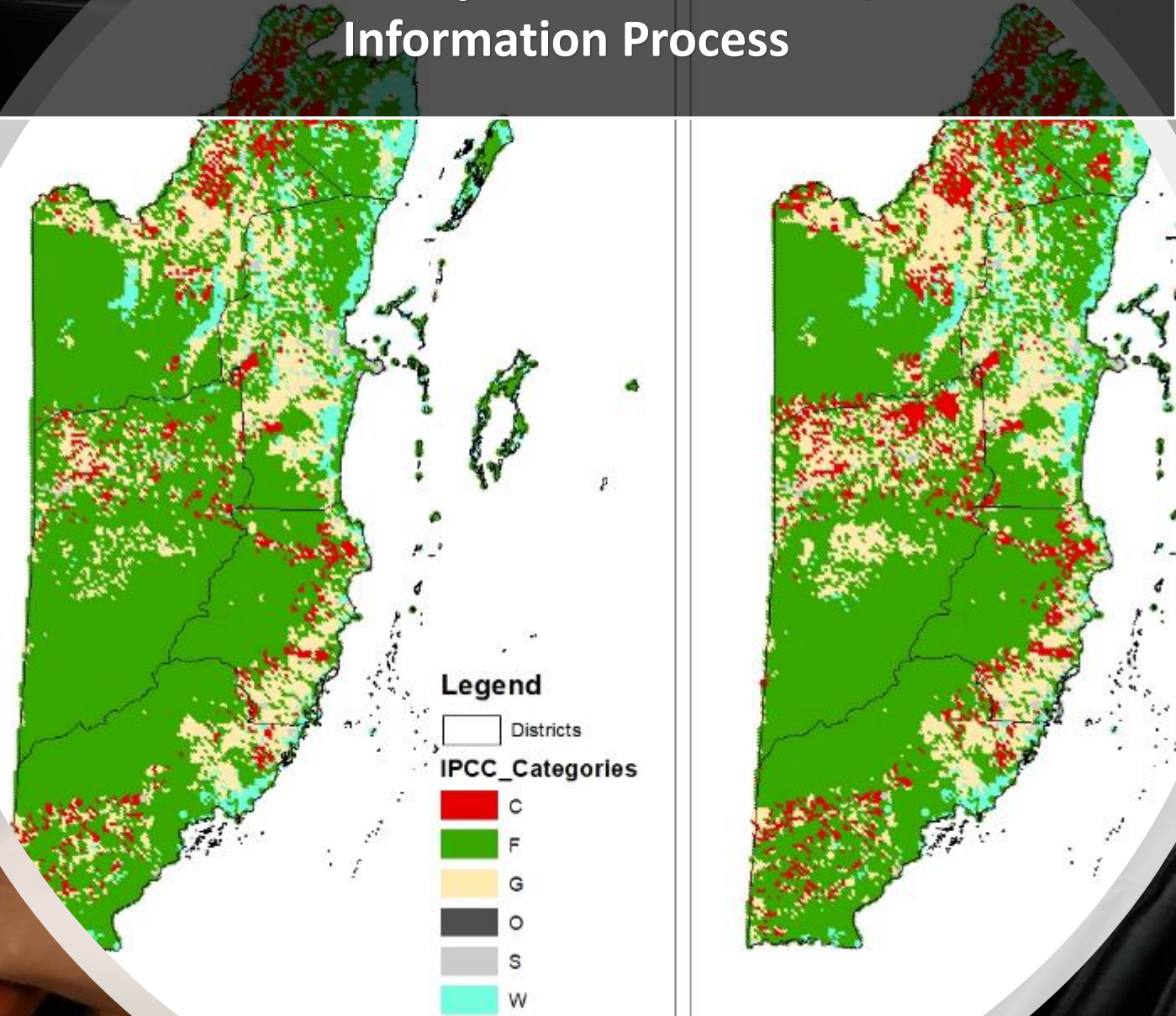
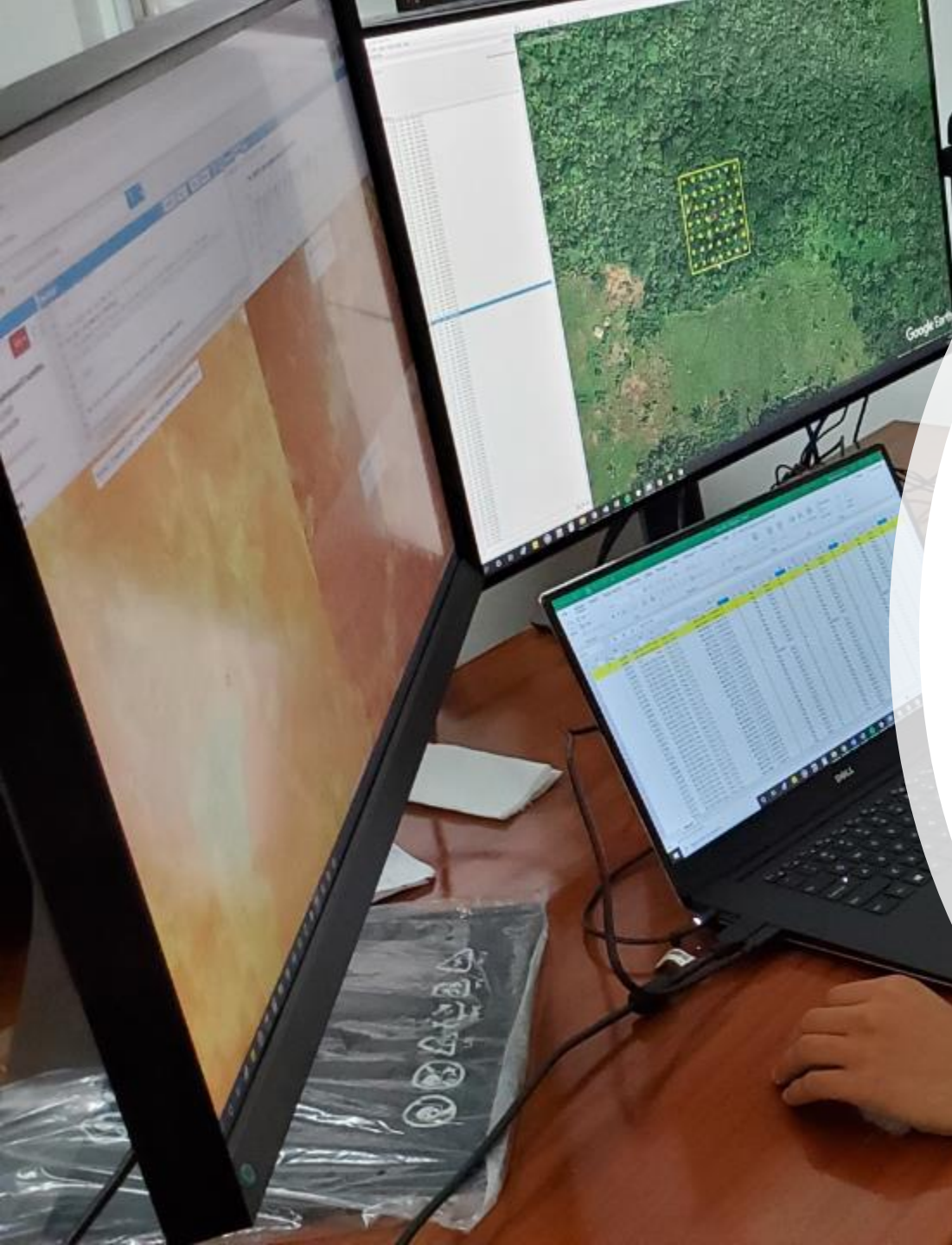
Data collected for the Tree Census:

- Height
- Diameter at Breast Height (DBH)
- Crown Health (Position & Form)
- Liana Load





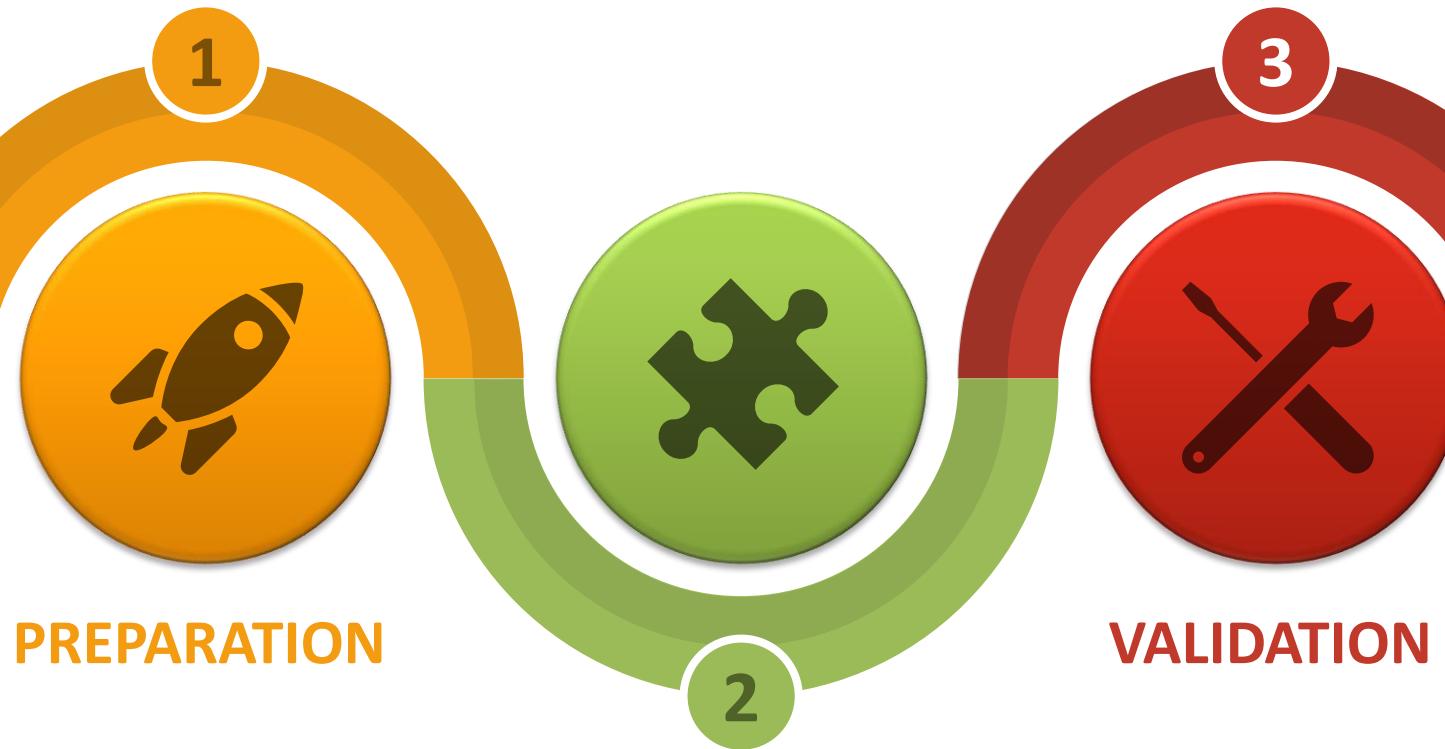
# Collection of Activity Data or Landuse/Landcover Information Process





# PROCESS DIAGRAM ACTIVITY DATA

## IMPLEMENTATION



# Collect Earth

Augmented Visual Interpretation for Land Monitoring

[Download last version](#)[Tutorials](#)[Case Study](#)

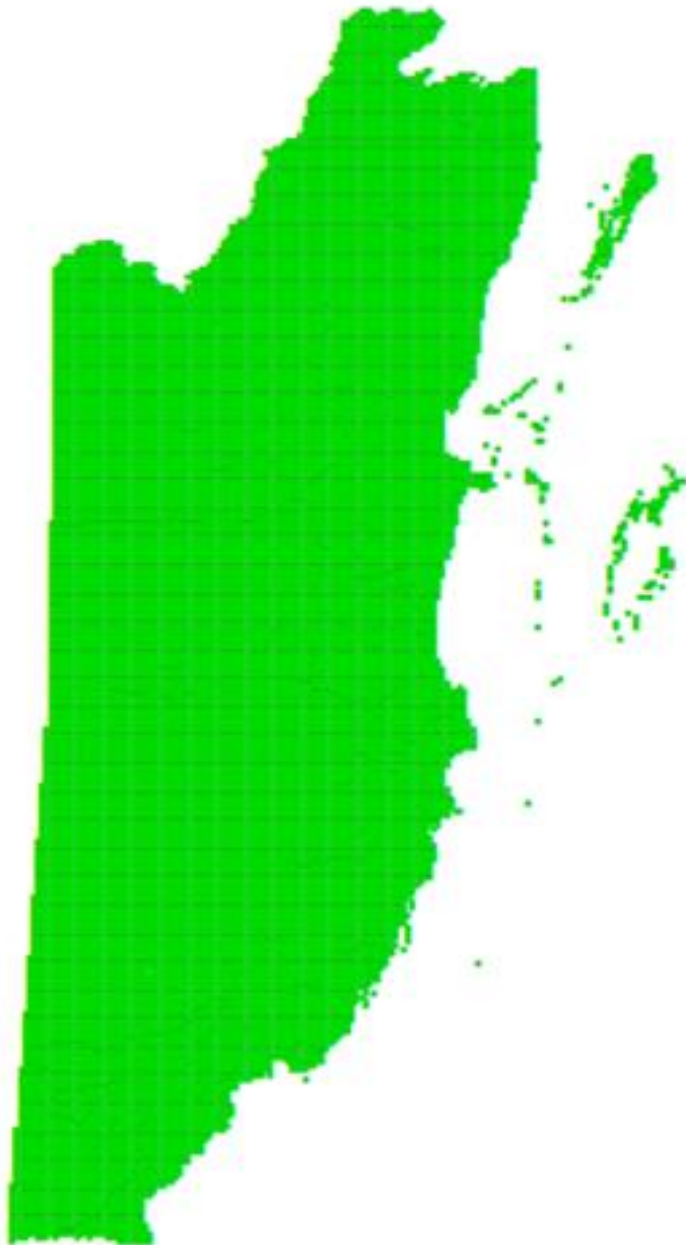
Tool that enables data collection through Google Earth. In conjunction w/t Bing Maps and Google Earth Engine.

- Support multi-phase National Forest Inventories
- Land Use, Land Use Change and Forestry (LULUCF) assessments
- Monitoring agricultural land and urban areas
- Validation of existing maps
- Collection of spatially explicit socio-economic data
- Quantifying deforestation, reforestation and desertification



# Belize Grid Design ( Collect Earth)

Grid Design Total to 21,991 plots ( Developed in GEE)



1km

Indian Creek

Categories	% Minimum
Forest	> 30
Cropland	> 20
Grassland	> 20
Wetland	> 20
Settlement	> 20
Other Land	> 80

Plot size is 0.5 ha  
49 points within each plot  
Each point represents 2%

© 2019 CNES / Airbus  
© 2018 Google  
© 2019 DigitalGlobe  
© 2019 CNES / Airbus

Google Earth

16 Q 314491.26 mE 1964195.30 m N elev 50'm eye alt 25.67 km

# Lit Review/ Discussion

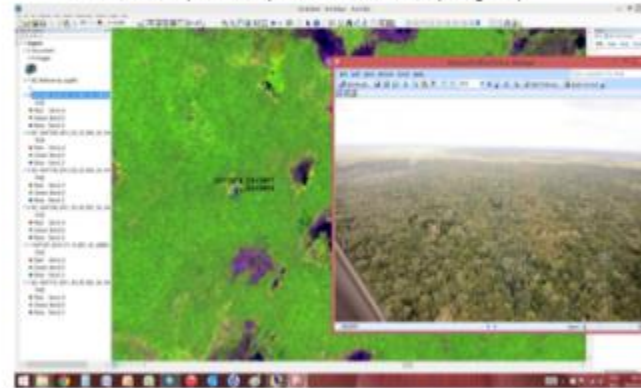
## FOREST COVER AND CHANGE IN BELIZE

### Contents

Classification system for the forest and land cover map of Belize 2012/2014 based on RapidEye imagery .....	3
<b>1. Forests</b> .....	4
1.1. Broad-leaf dominated semi-deciduous/semi-evergreen mature forest .....	4
1.2. Broad-leaf dominated semi-deciduous/semi-evergreen secondary forest .....	5
1.3. Cohune palm dominated semi-deciduous/semi-evergreen mature forest .....	6
1.4. Littoral forest .....	7
1.5. Tall mangroves .....	8
1.6. Riparian Forest .....	9
1.7. Mixed pine-broadleaf mature forest .....	10
1.8. Pine dominated evergreen mature forest .....	11
1.9. Pine dominated evergreen regeneration .....	12
1.10. Swamp forest .....	13
1.11. Bajo forests .....	14
1.12. Broadleaf mature plantations .....	15
<b>2. Shrubland</b> .....	16
2.1. Riparian shrubland vegetation .....	16
2.2. Shrub land (thicket) .....	17
2.3. Beach vegetation .....	18
2.4. Fern .....	19
2.5. Peat land .....	20
<b>3. Savannah</b> .....	21
3.1. Savannah with scattered pine trees .....	21
3.2. Savannah with scattered shrubs .....	22
3.3. Palmetto palm patches .....	23
3.4. Bare-savannah .....	24
<b>4. Marine Vegetation</b> .....	25
4.1. Marine vegetation .....	25
<b>5. Wetlands</b> .....	26
5.1. Wetland .....	26

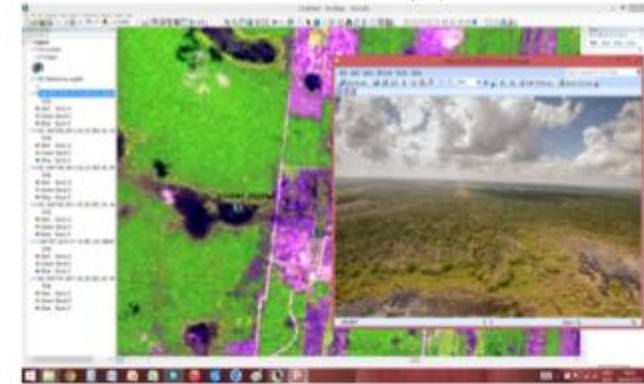
### 1. Forests

1.1. Broad-leaf dominated semi-deciduous/semi-evergreen mature forest. Includes all classes of mixed-species broadleaf forest on all types of soil at all elevations. The important defining characteristic here is a **closed canopy** that is dominated by a mix of broadleaf tree species and may have intermittent palms. The canopy will appear even, smooth or slightly textured on rapideye images. On the ground, forests in this category must be at least 5 metres tall and dominated by large broadleaf trees forming one main upper canopy. This class can be further separated by deciduousness/evergreeness post-classification by looking at whether the forest occurs over predominantly limestone areas (deciduous) versus santa rosa soils (evergreen).

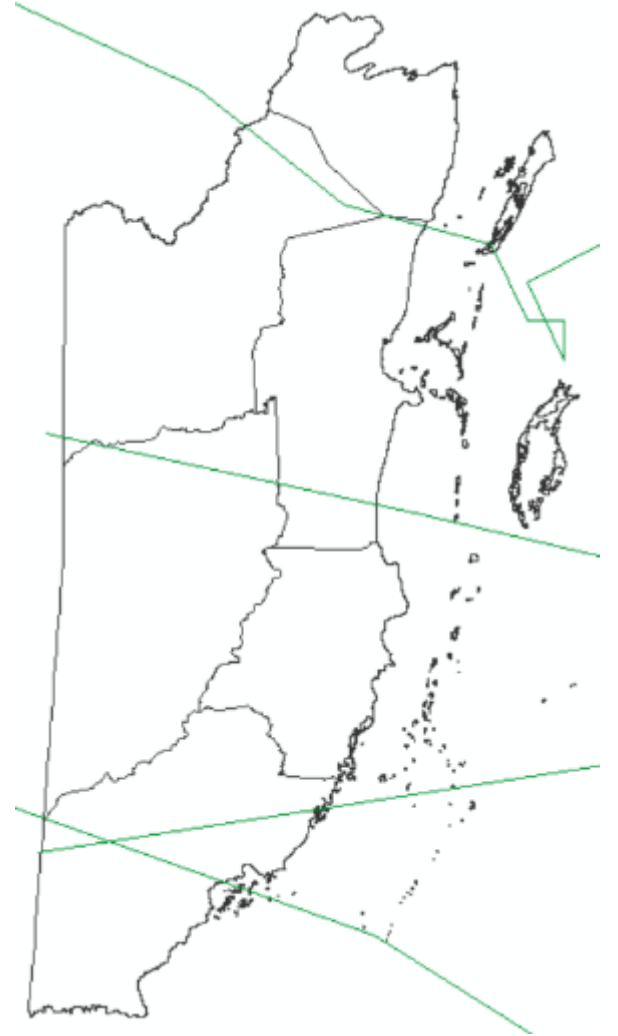
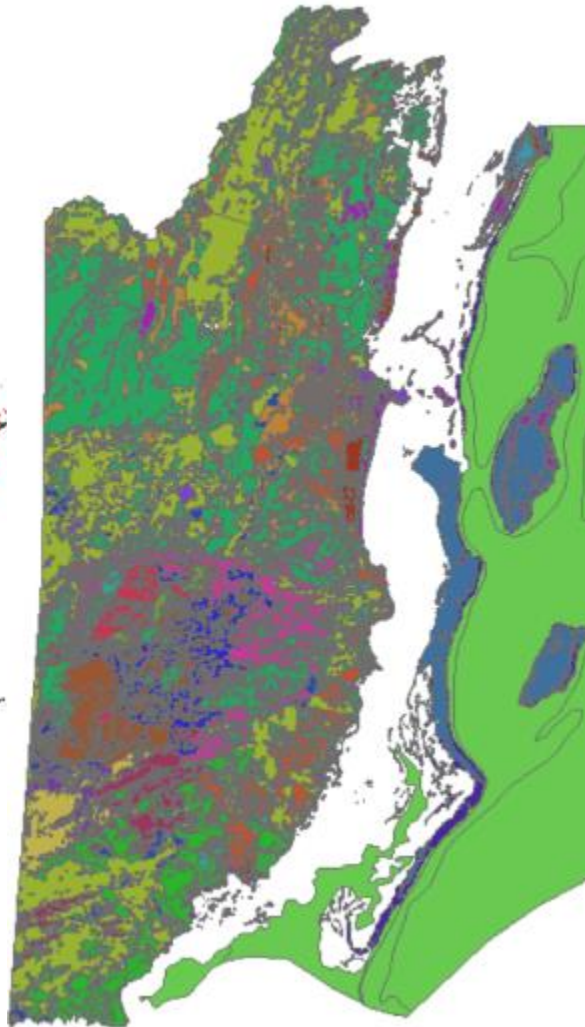
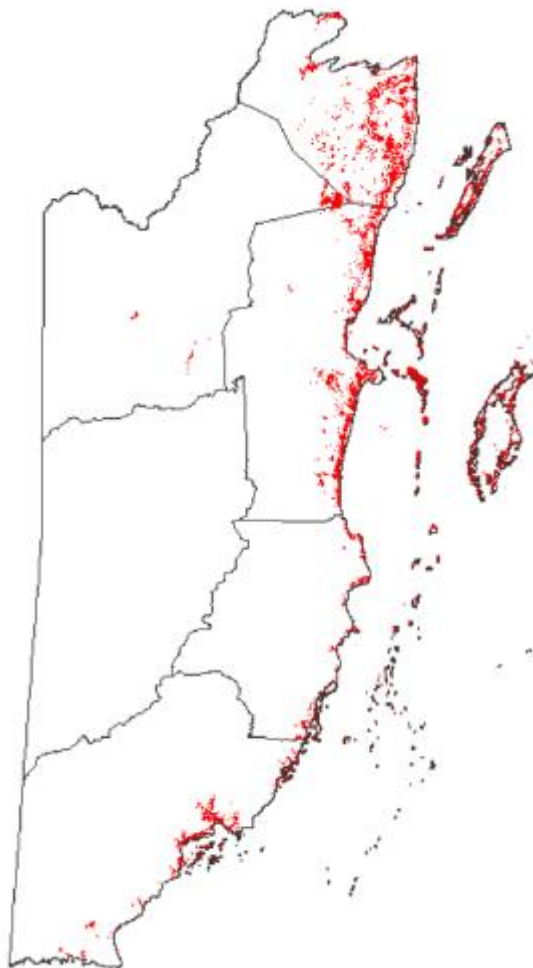
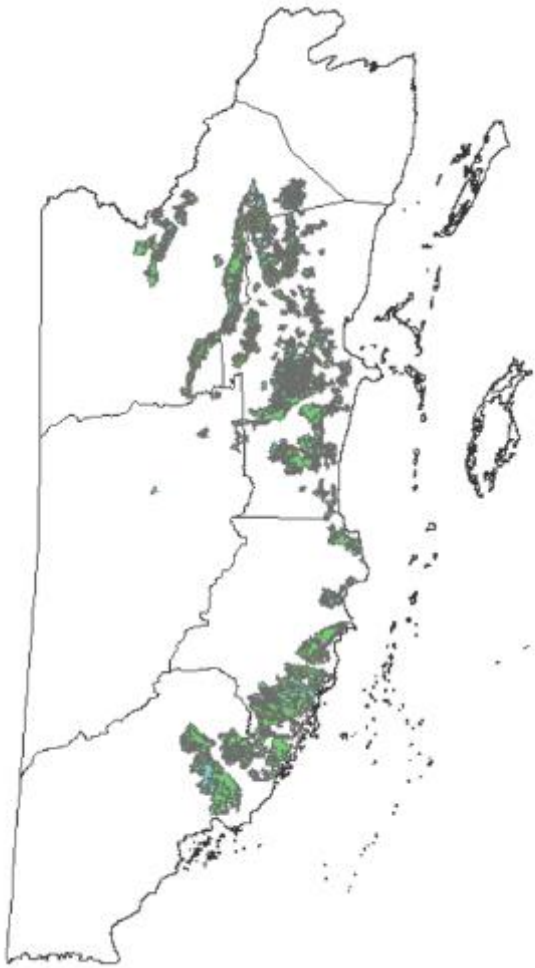


### 5. Wetlands

5.1. Wetland. Permanently or seasonally flooded areas, dominated by herbaceous/graminoids vegetation with or without limited tree cover. Example: marshes and areas with calabash (Crescentia cujete)



# Available Layers for Guidance





IPCC Classes	Sub-Classes		Specific Class
Forest	Mature Broad Leaf Forest	Regenerating Forest	Riparian
	Secondary Broad- Leaf		Swamp Forest
	Pine Forest		Riparian
	Mangrove		Swamp Forest
	Plantations		Mature
			Secondary
		Mangrove& Littoral	
		Dwarf mangrove	
		Teak	
		Other Plantations	
IPCC Class	Sub-Classes		Specific Classes
Grassland	Lowland Savannah		Savannah wt scattered trees
			Open-savannah
	Shurbland		
	Pasture		
	Ferns		
	Regerating grassland ( Shurbs & Bushes)		
IPCC Class	Sub-Classes		Specific Classes
Other lands	Bare Soil		Rocks
			Beaches
IPPC Class	Sub-Classes		Specific Classes
Cropland	Agriculture Intensive Farming		Corn
			Rice
			Sugar Cane
			Beans
			Bannana
			Coffee
			Citrus
			Coconut
			Shifting Agriculture
			Other crops
	Agriculture-swidden Farming		
	Fallow land		
IPCC Class	Sub-Classes		
Wetland	Wetland		
	Inland water Bodies		
IPCC Class	Sub-Classes		
Settlements	City		
	Town		
	Village		
	Road		
	Mining		
	Aquaculture		
	Other infrastructure		



## For Belize, The Forest Definition

Is a plot of land with an area of 0.5 hectares or more, with trees 5 meters or higher, and a canopy cover of 30% or higher. This definition also includes forest plantation. In addition, it includes an ecosystem that due to biotic conditions (terrain, soil type, rainfall, et cetera), the trees cannot grow higher than 5 meters.

Belize divided its 'forest category' into five subcategories/subdivisions. These are mature broad-leaf forest, secondary broad-leaf forest, pine forest, mangrove forest, forest plantation and regenerating forest (this is disturbed forest).



# Land-use 2000-2018 classification Mapaton







The vertical monitor in the center displays the Collect Earth website. At the top, there is a header with the text "Collect Earth" and "Augmented Visual Impairment for Land Monitoring". Below this is a section titled "What is Collect Earth?" which includes a list of features and a "Download Collect Earth" button. The website content is as follows:

### Collect Earth

Augmented Visual Impairment for Land Monitoring

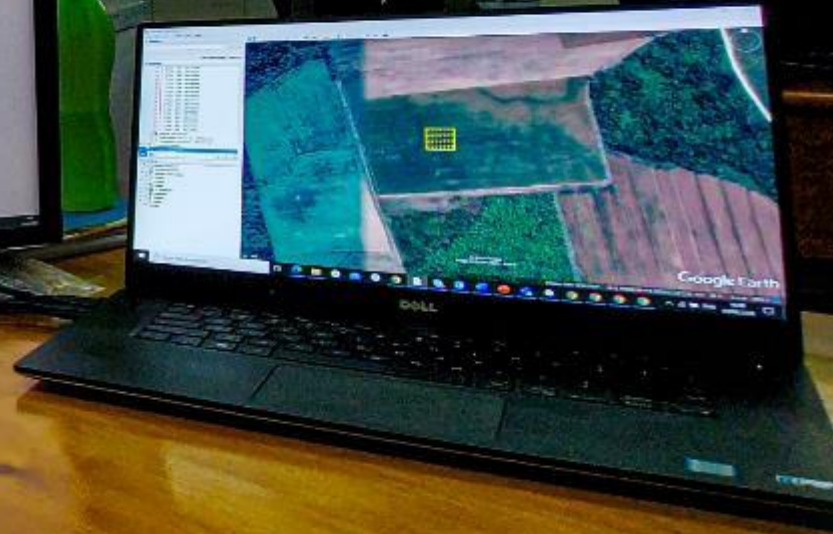
#### What is Collect Earth?

Collect Earth is a tool that provides users with a visual interface to collect data from Google Earth, Bing Maps, and Google Earth Pro. It is designed to be used by a wide range of users, from researchers to field workers.

- Supports various data collection methods
- Intuitive and easy-to-use interface
- Ability to collect data from multiple sources
- Supports various data formats
- Ability to export data to various formats

#### Download Collect Earth

Download Collect Earth



# Classification Process

Land Use 2018

Forest	Cropland
Shrubland	Settlement
Urbanland	Water
Ice/snow	

Land Use 2018 - Confidence

Yes No

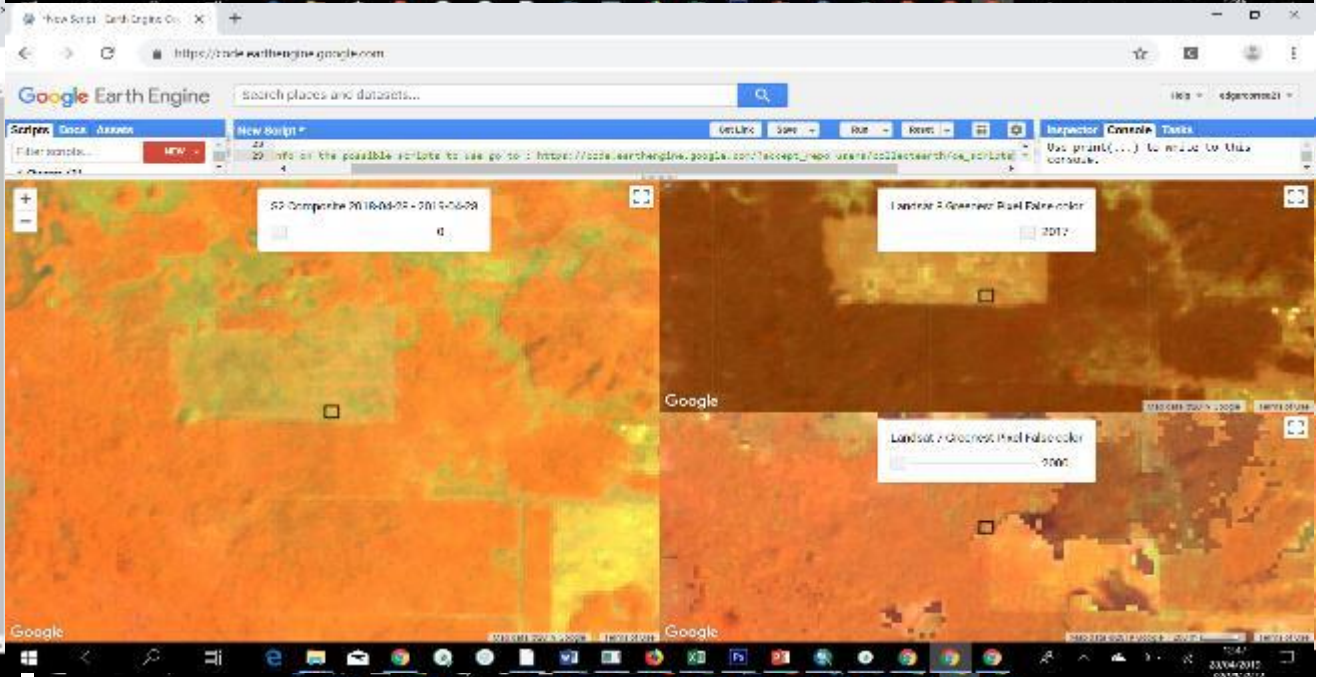
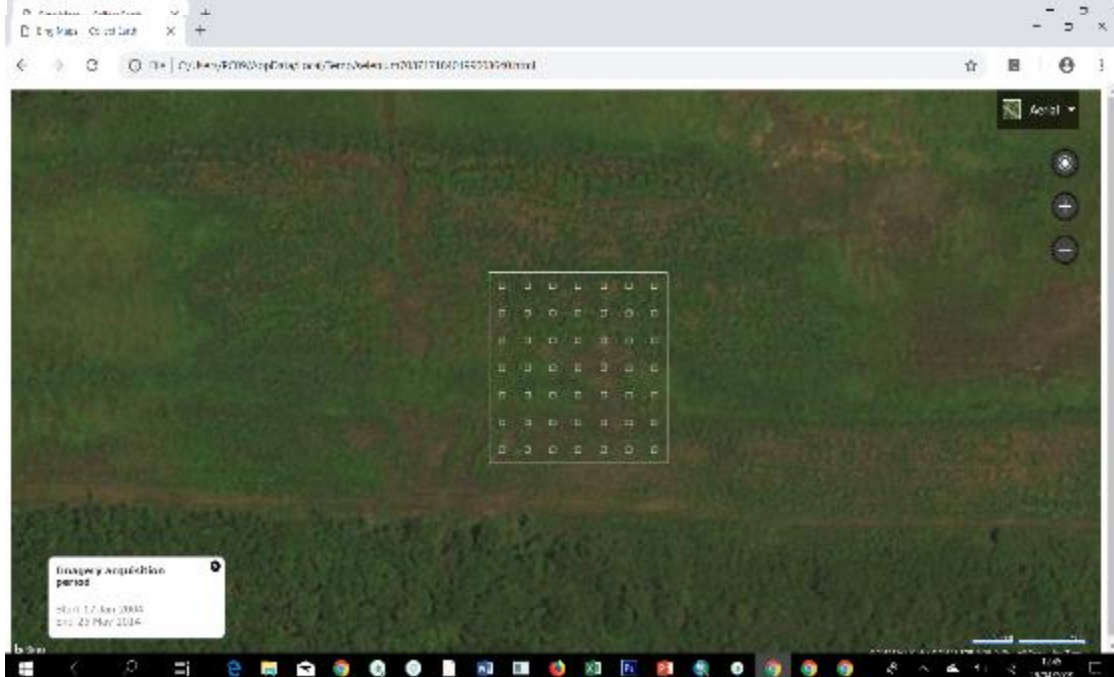
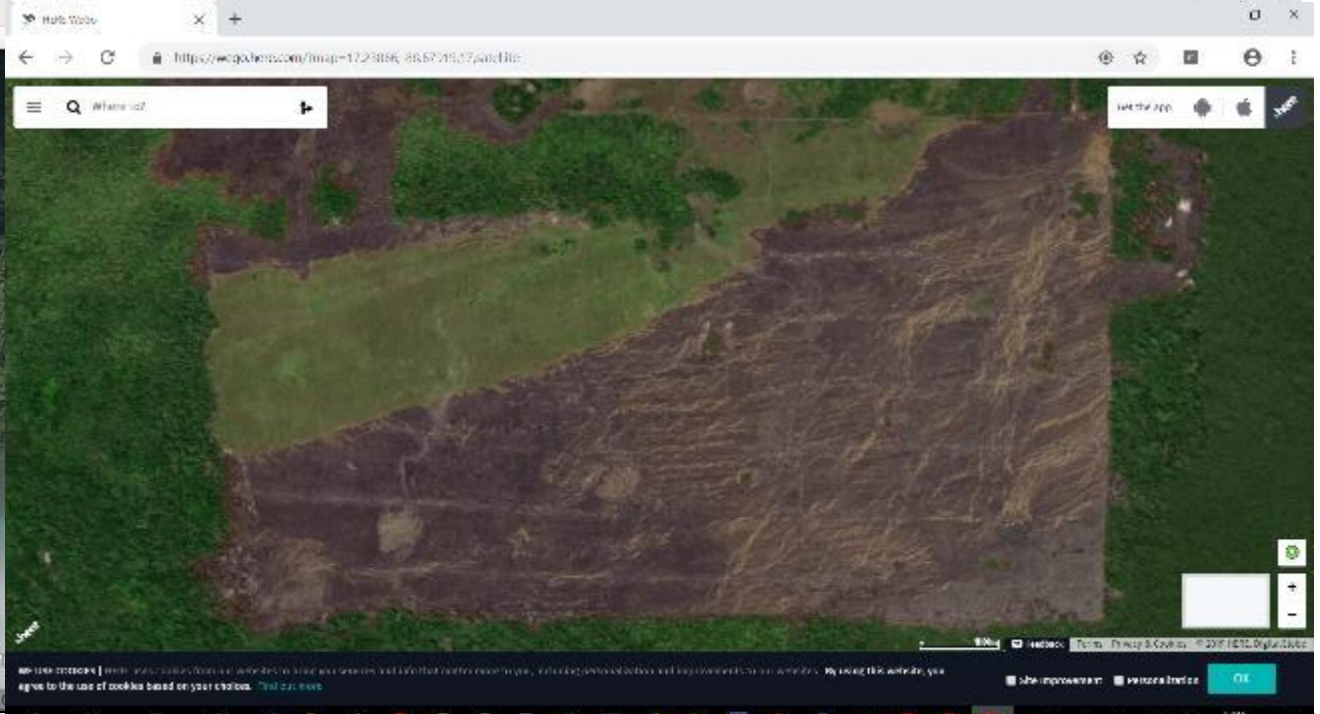
Land Use Change

C to C	C to F
C to S	S to C
W to C	S to F

Land Use Change - Confidence

Yes No

Next

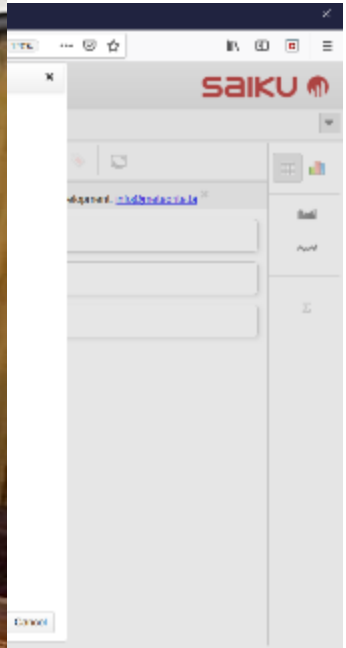




QA/QC during the Mapathon



# Validation



Plots with NO CONFIDENCE for LAND USE

Plots with NO CONFIDENCE for LAND USE

Plots where the LU change year was 2010

Plots that where there was a change in LU

Forest plots where the tree cover was < 30%

Intensive agriculture plots where the tree cover was < 30%

Mangrove plots that are located adjacent to water

Plots that are still not finished (in year 2010)

Plots with more than 30% crop cover

Plots with more than 30% tree cover

Plots with more than 30% of roads

Plots with more than 30% of Built-up

Plots with multiple land uses that are not

Plots with multiple land uses that are not

Plots where there is no land cover

Review plots inside protected areas

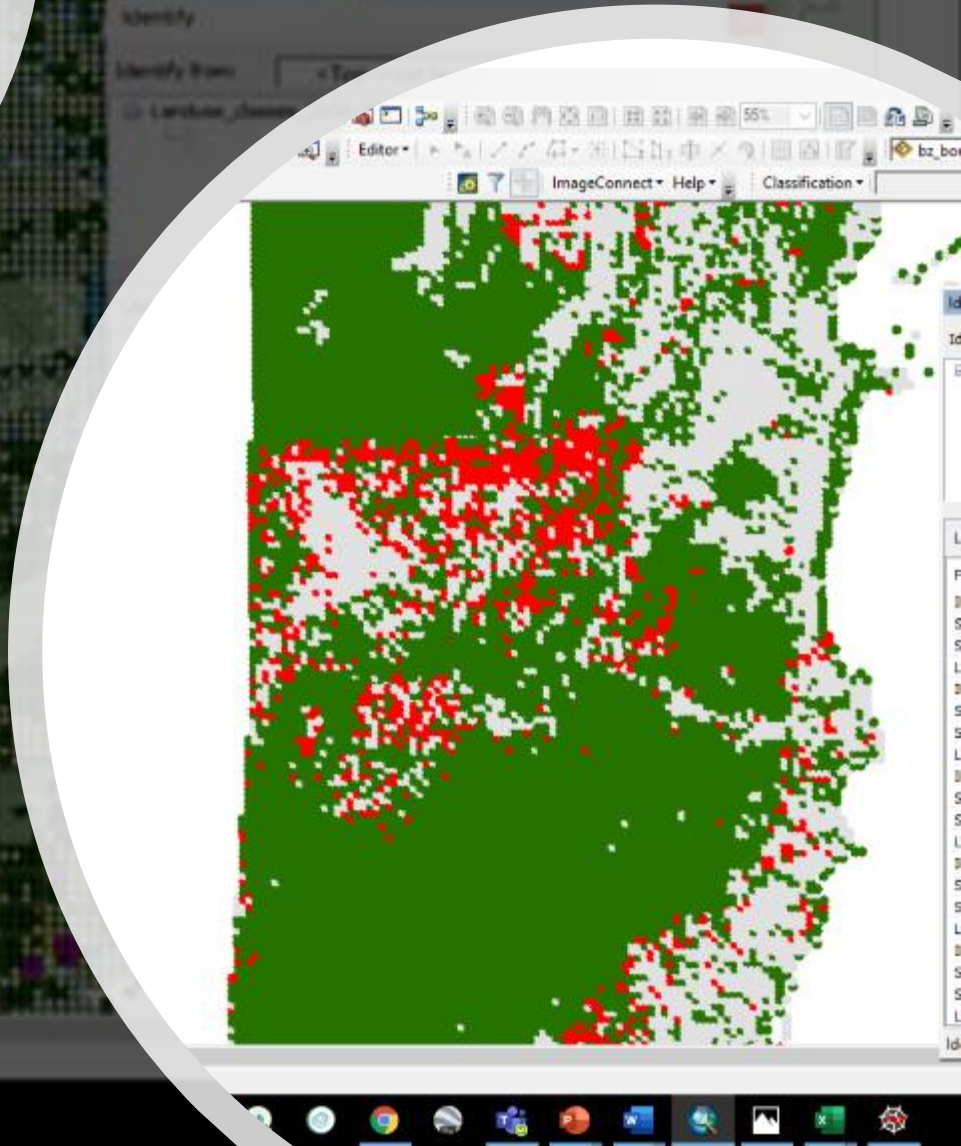
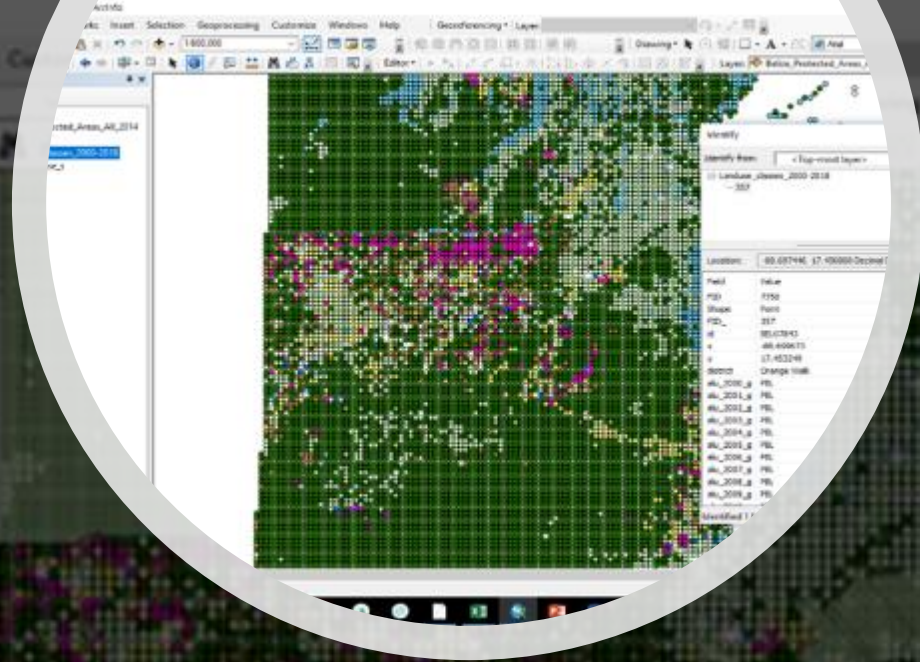
Review plots with one change where the change is

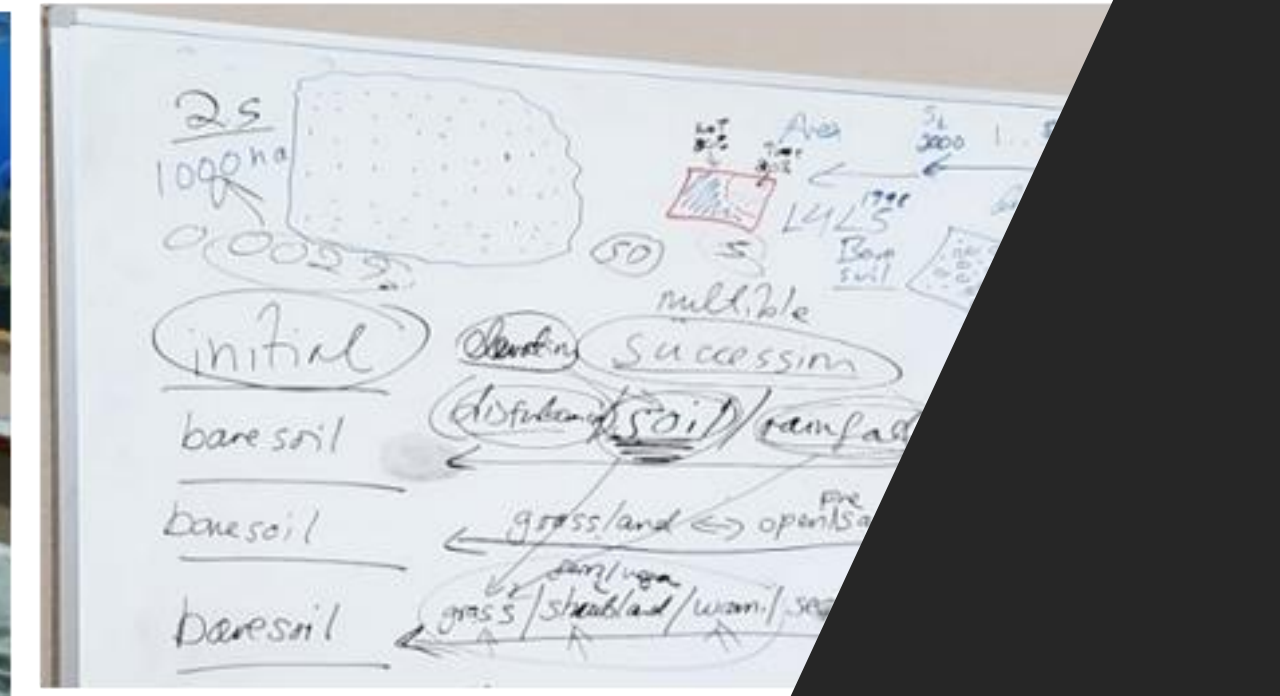
Review plots where there is a transition from

Review plots that have changed from Pine to shrubs or Lowland Savannah



# Importing of AD into Arc Map Platform









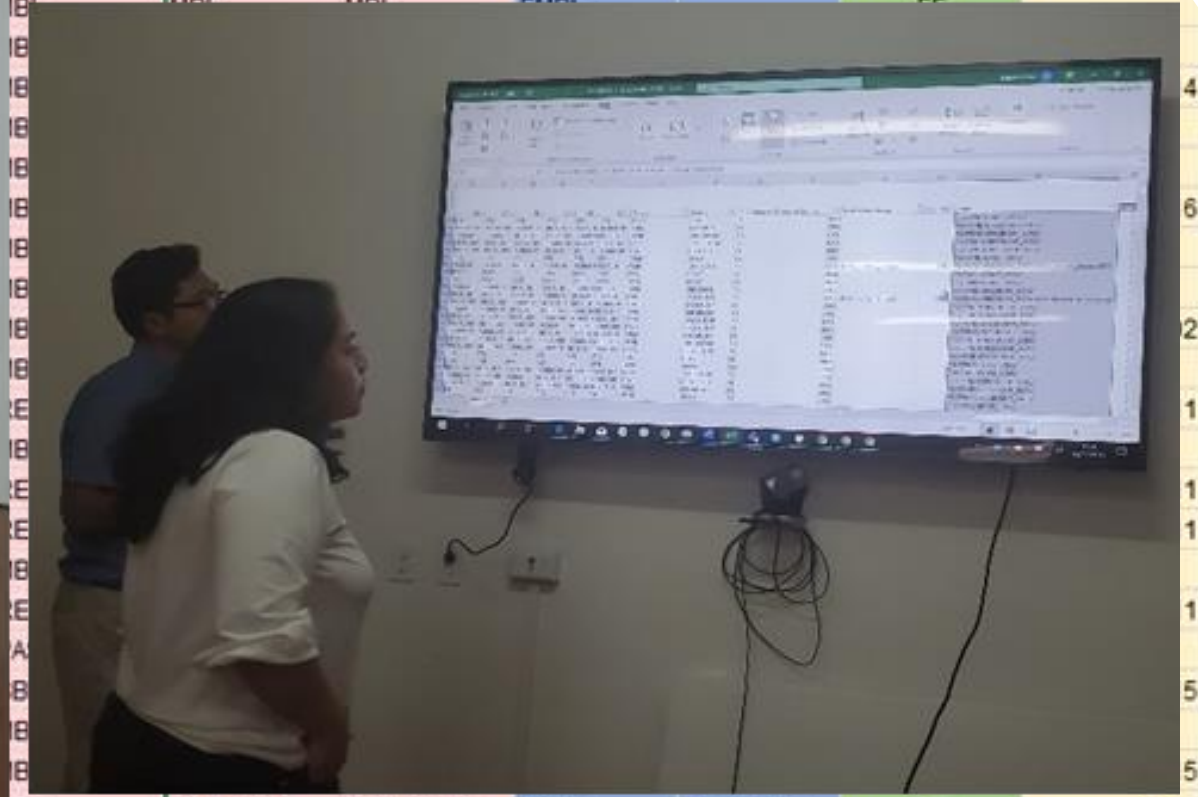
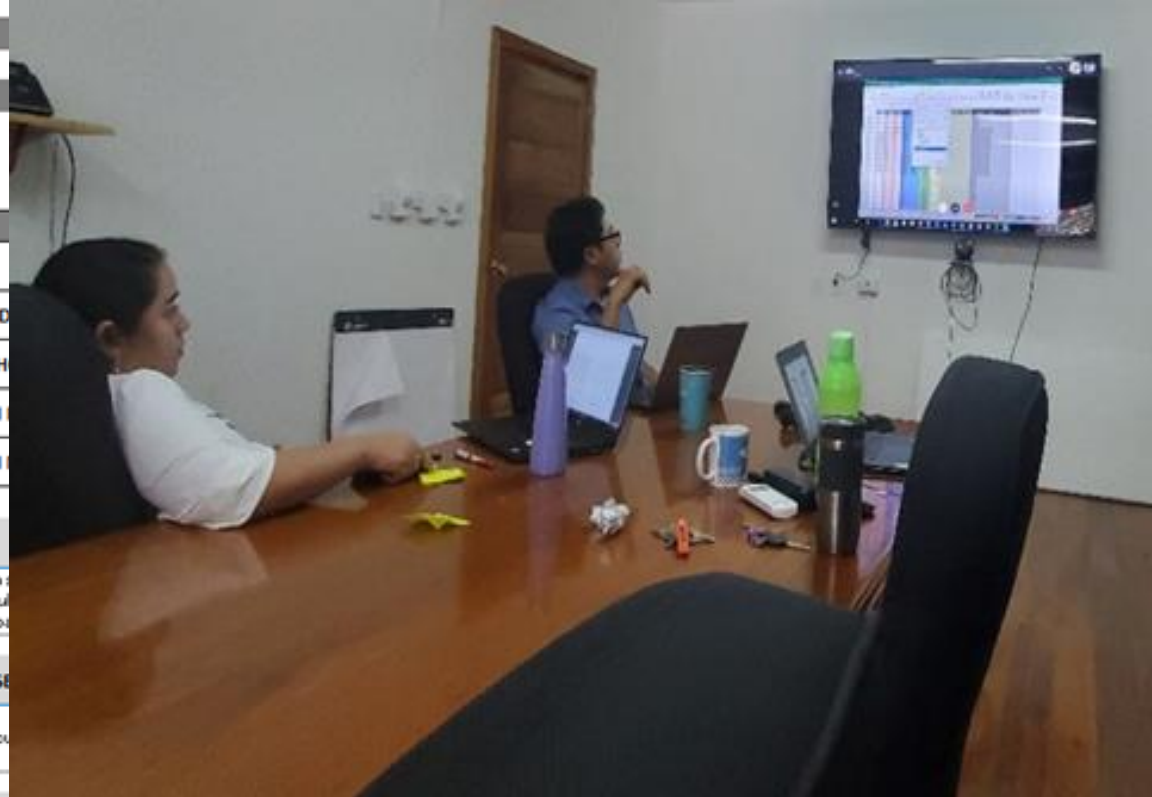


Belize

# Land Use, Land Use Change and Forestry Greenhouse gas (GHG) Inventory

## and REDD+ Reference Level and REDD+ Residuals

	2017	2018	Time 1 (Initial LU)	Time 2 (Final LU)	IPCC Code
MBL	MBL	MBL	FMBL		FF
SHIFTAGR	SHIFTAGR	SHIFTAGR	CANNUAL		CC
REGBUSH	SBL	SBL	GREG	FSBL	GF
REGBUSH	SBL	SBL	GREG	FSBL	GF
MBL	REGBUSH	REGBUSH	FMBL	GREGBUSH	FG



- Date
- Version
- Contact
- Vice-Minister
- Focal point REDD+
- Coordinator GHG
- Technical Lead
- Technical Lead

### INTRO

This calculation... and REDD+ results... maximize transp...

### LAND REPRESENTATION

This section inclu...

### AD-Database (Land use and Land Use Change)

This section refers to the Land Use and Land Use changes information, collected using a sampling approach at the national scale, for every year of the time series. The representation and the definitions of land use categories follows the 2013/2006 IPCC guidelines.

### AD-PlotSum

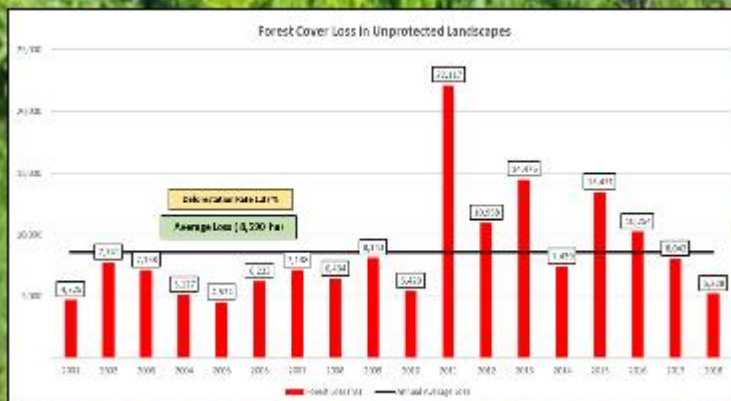
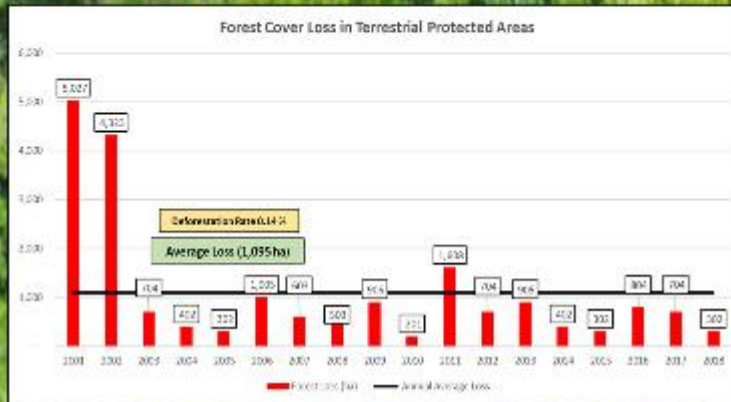
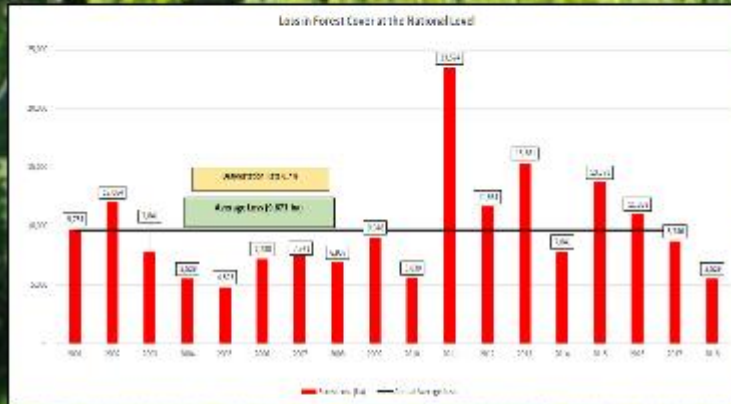
This section refers to a coding system created to aggregate plots with the same land use or land use change. It includes a Pivot Table counting the codes described in AD-Database for each land use or land use change, and were created to simplify the analysis as it considerably reduced the number of plots for which IPCC equations were applied.

MBL	MBL	MBL	MBL	FMBL		FF
MBL	MBL	MBL	MBL	FMBL		FF
MBL	MBL	MBL	MBL	FMBL		FF
SHIFTAGR	SHIFTAGR	SHIFTAGR	SHIFTAGR	CANNUAL		CC
MBL	MBL	MBL	MBL	FMBL		FF
MBL	SHIFTAGR	SHIFTAGR	SHIFTAGR	FMBL	CANNUAL	FC
REGBUSH	SBL	SBL	SBL	GREG	FSBL	GF
REGBUSH	SBL	SBL	SBL	GREG	FSBL	GF
MBL	REGBUSH	REGBUSH	REGBUSH	GREG		GG
MBL	MBL	MBL	MBL	FMBL		FF

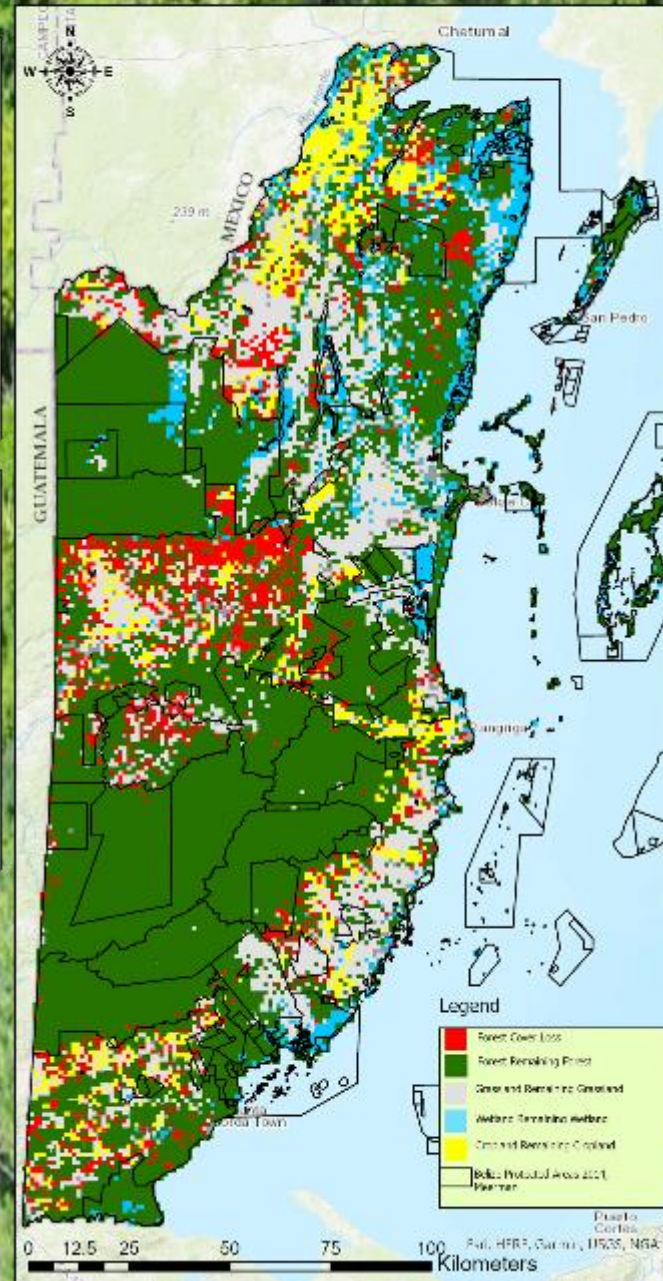
A magnifying glass with a blue lens and a brown handle is positioned over the word "Results". The lens is focused on the first few letters, "Re", making them appear larger and slightly blurred. The rest of the word, "sults", is visible but smaller. The entire scene is set against a white background that looks like a piece of paper with a slight shadow.

**Re**sults

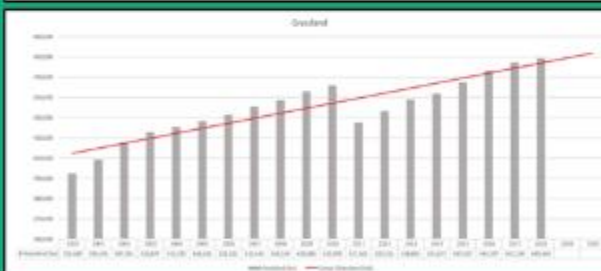
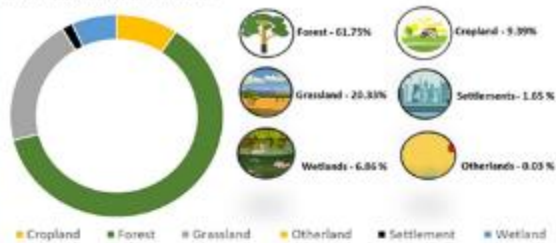
## INFOGRAPHICS SHOWING BELIZE'S LOSS IN FOREST COVER FOR THE PERIOD, 2000-2018



## BELIZE'S FOREST COVER LOSS, 2000-2018



### Landuse/Landcover 2018

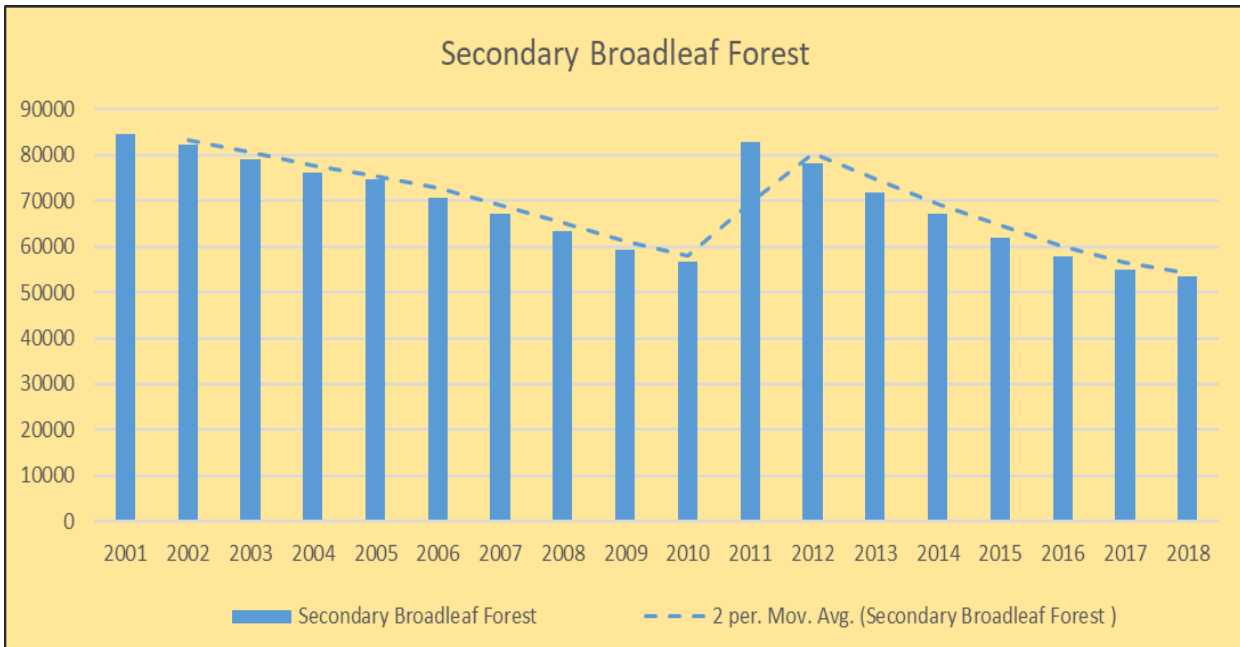
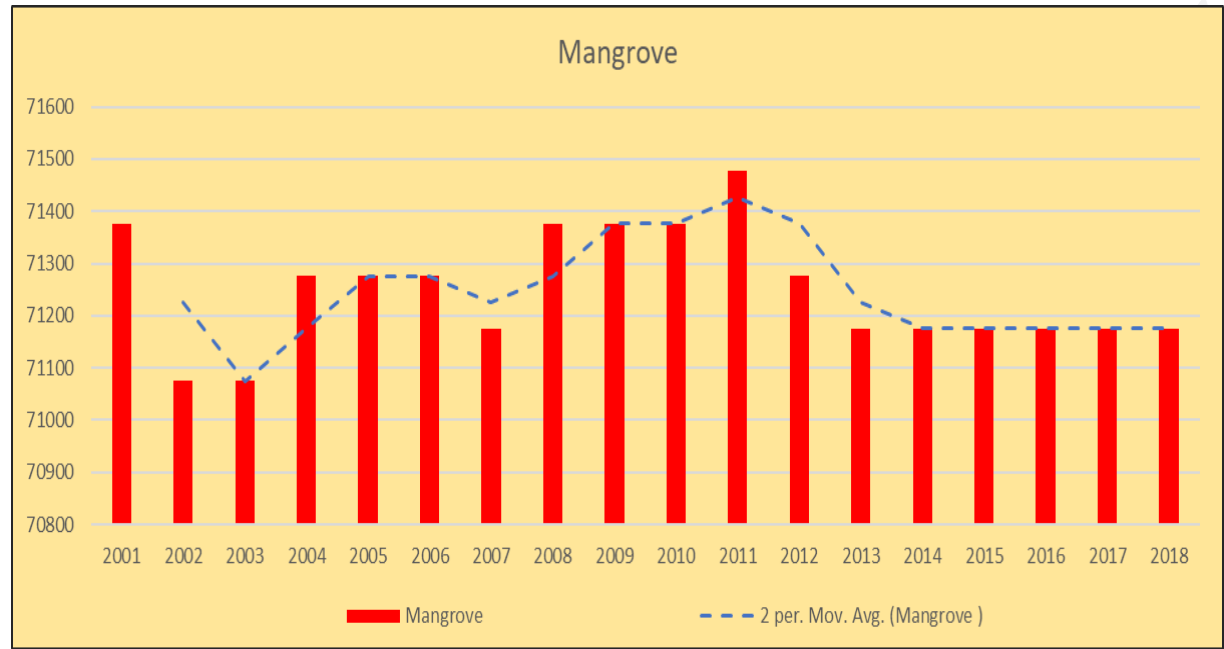
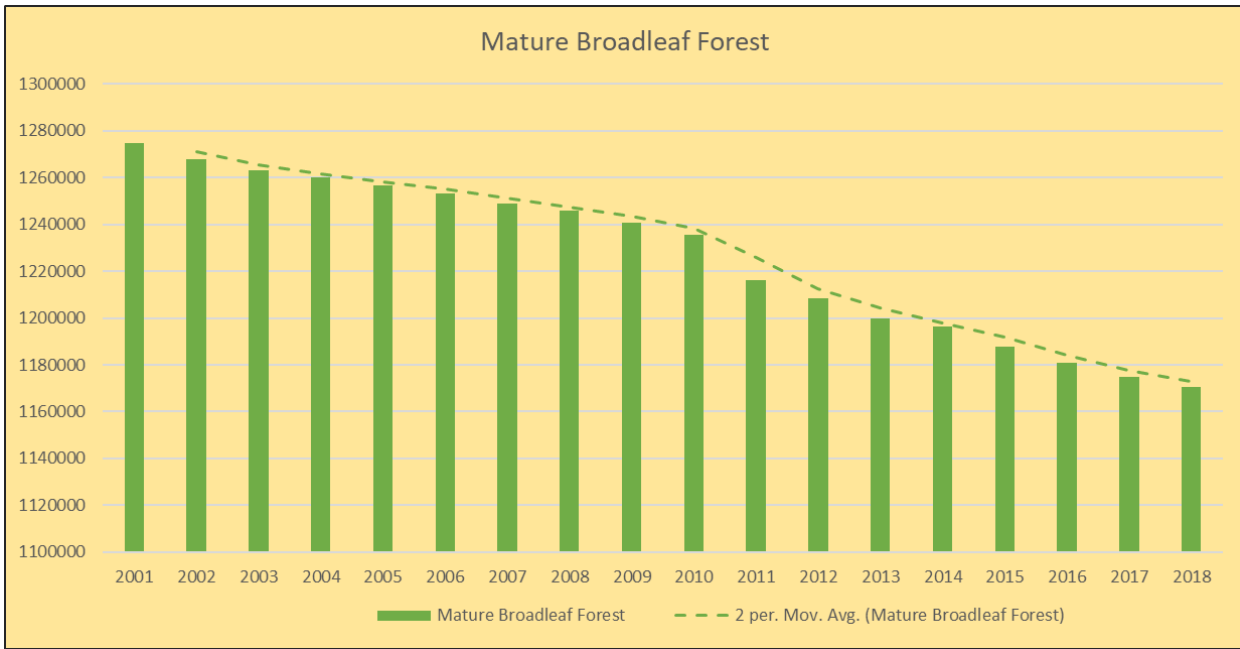


Landuse/Landcover 2018	Hectares	Percentage
<b>Cropland</b>	<b>207,494</b>	<b>9.39%</b>
Fallow Land	15,482	0.70%
Intensive Agriculture	156,525	7.08%
Swidden Farming	35,487	1.61%
<b>Forest</b>	<b>1,365,197</b>	<b>61.75%</b>
Mangroves	71,175	3.22%
Mature Broadleaf Forest	1,170,672	52.95%
Pine Forest	20,910	0.95%
Forest Plantation	1,307	0.06%
Regenerating Forest	47,651	2.16%
Secondary Broadleaf Forest	53,482	2.42%
<b>Grassland</b>	<b>449,369</b>	<b>20.33%</b>
Ferns/Thickets	11,460	0.52%
Pasture	139,134	6.29%
Regenerating Bushes and Shrubs	80,726	3.65%
Regenerating Bushes and Shrubs Pine	18,196	0.82%
Lowland Savannah	171,605	7.76%
Shrubland	28,249	1.28%
<b>Otherland</b>	<b>603</b>	<b>0.03%</b>
<b>Bare Soil</b>	<b>603</b>	<b>0.03%</b>
<b>Settlements</b>	<b>36,392</b>	<b>1.65%</b>
Aquaculture	4,222	0.19%
City	2,212	0.10%
Other Infrastructure	2,212	0.10%
Mining	1,709	0.08%
Other Settlements	4,122	0.19%
Roads	2,915	0.13%
Town	3,921	0.18%
Village	15,080	0.68%
<b>Wetland</b>	<b>151,700</b>	<b>6.86%</b>
Inland Water Bodies	37,900	1.71%
Wetlands	113,800	5.15%
<b>Grand Total</b>	<b>2,210,755</b>	<b>100.00%</b>

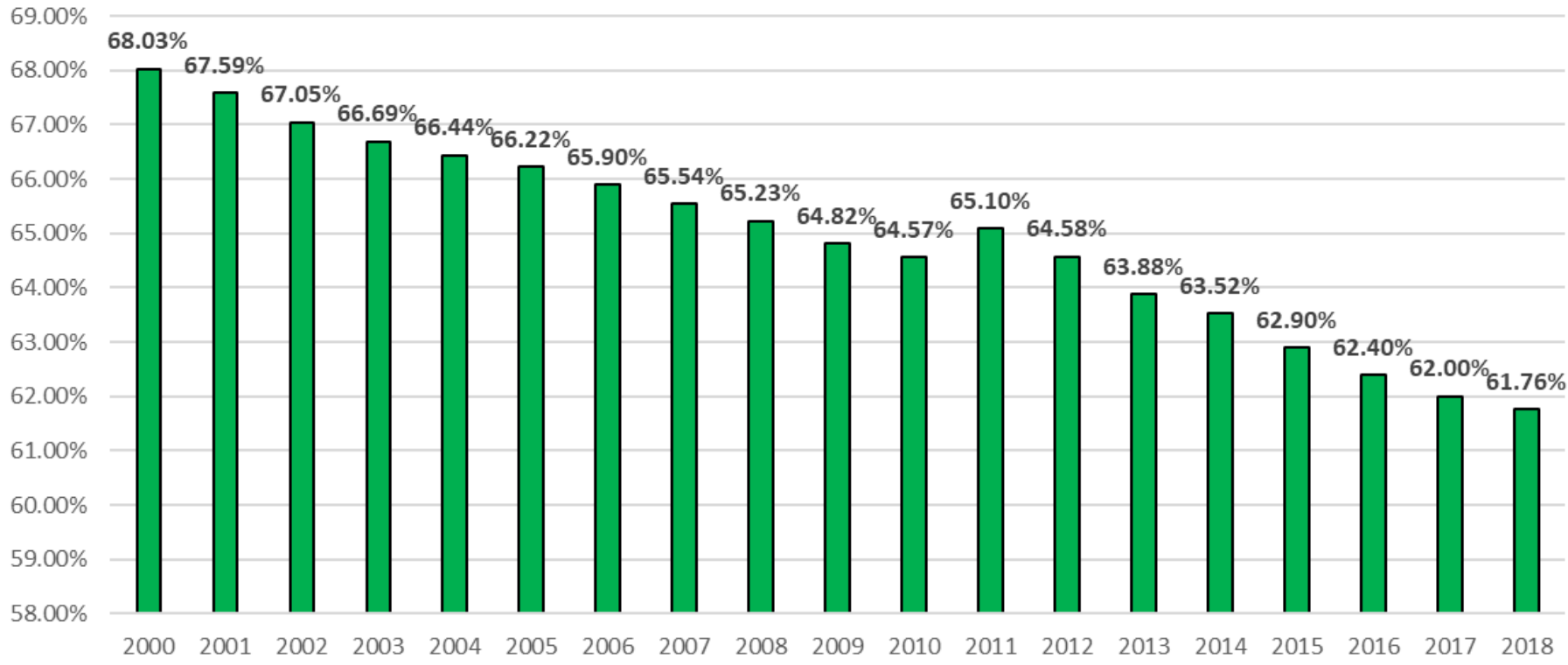


INFOGRAPHICS SHOWING BELIZE'S FOREST COVER CHANGE, FOR THE PERIOD, 2000-2018



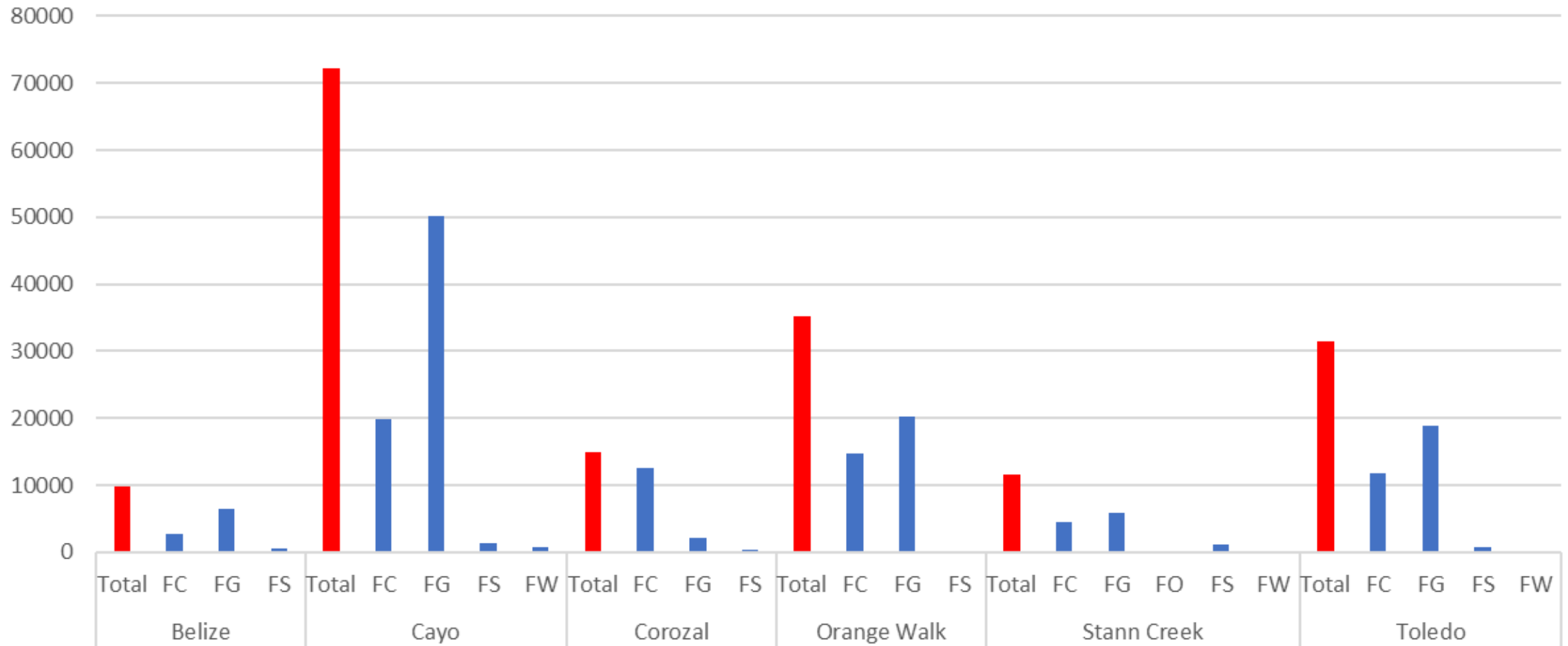


### Forest Cover Change Nationally from 2000-2018

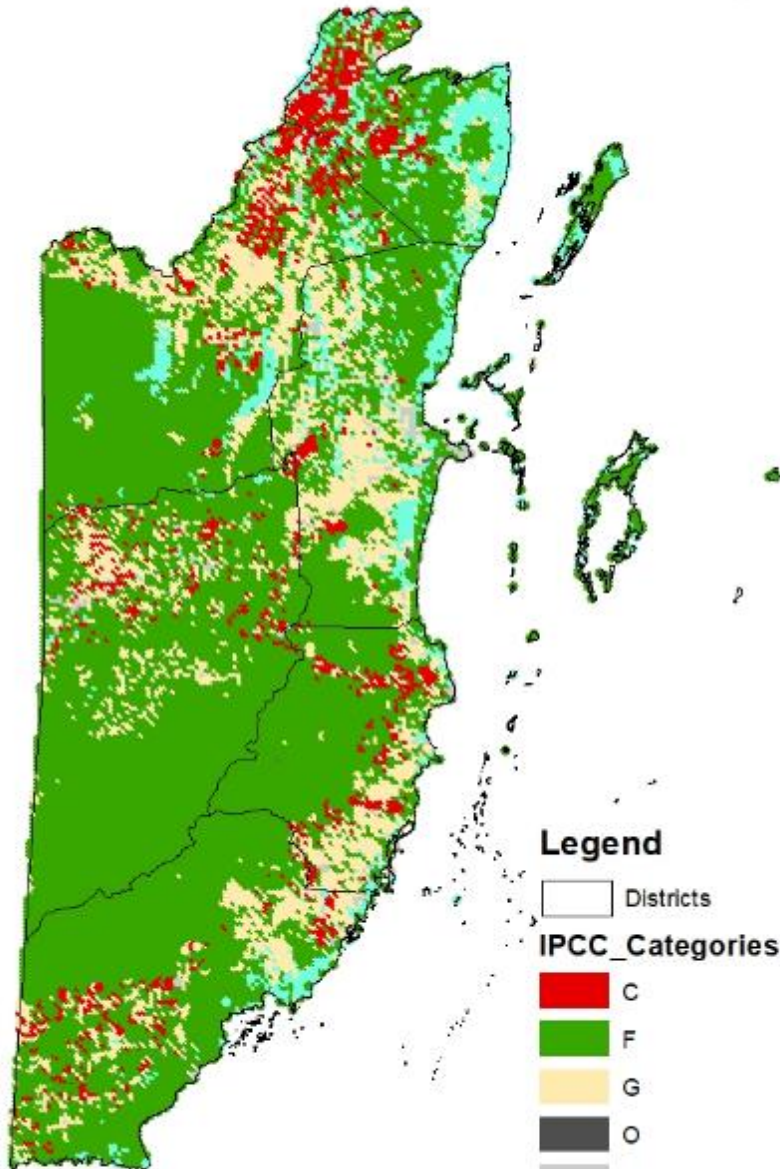


Forest Cover		
Year	Percentage	Ha
2000	68.03%	1504029
2001	67.59%	1494278
2002	67.05%	1482214
2003	66.69%	1474373
2004	66.44%	1468844
2005	66.22%	1464018
2006	65.90%	1456780
2007	65.54%	1449039
2008	65.23%	1442103
2009	64.82%	1433055
2010	64.57%	1427425
2011	65.10%	1439187
2012	64.58%	1427627
2013	63.88%	1412145
2014	63.52%	1404304
2015	62.90%	1390531
2016	62.40%	1379473
2017	62.00%	1370727
2018	61.76%	1365197

### Forest to Other landuse per District in Manged and Unmanged Lands 2000-2018



2000



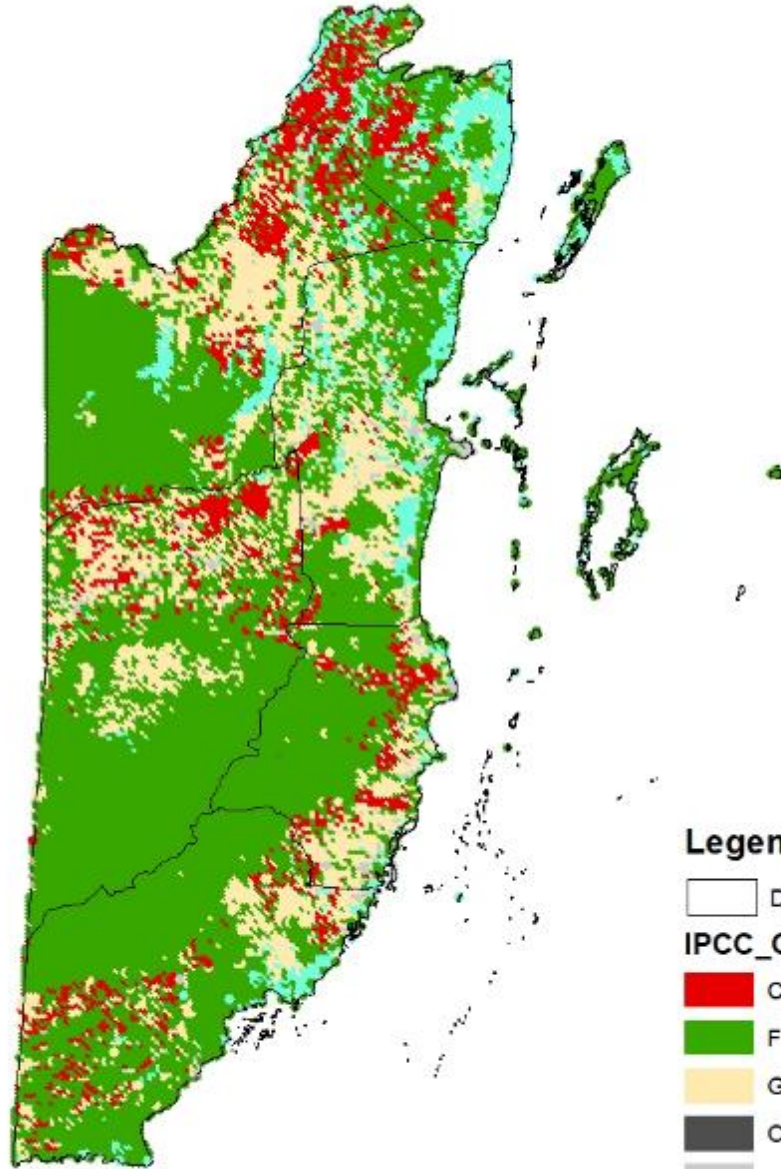
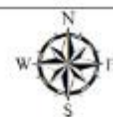
**Legend**

□ Districts

**IPCC\_Categories**

- C
- F
- G
- O
- S
- W

2018



**Legend**

□ Districts

**IPCC\_Categories**

- C
- F
- G
- O
- S
- W



# Sentinel 2 Land-Use Mapping Ground Truthing





## BELIZE COLLECT EARTH/OPEN FORIS LAND USE AND LAND USE CHANGE ASSESSMENT PROTOCOL



DECEMBER 30, 2019

MINISTRY OF AGRICULTURE, FISHERIES, FORESTRY, THE ENVIRONMENT, SUSTAINABLE DEVELOPMENT, AND IMMIGRATION

Lead Technical Expert: Edgar Correa, Forest Officer

Technical Experts: Florencia Guerra, Forest Officer  
Dr. Timoteo Mesh, REDD+ Social Expert

Advisors: Dr. Percival Cho, MAFFESDI Chief Executive Officer  
Eduardo Reyes, REDD+ Director & Technical Advisor

#### Collaborators:

Luis Balan, REDD+ Technician  
Sumeet Betancourt, REDD+ Technician  
Michael Burton, Forester  
Mercedes Carcamo, REDD+ Technician  
Alex Escalante, Forester  
Edalmi Grijalva, REDD+ Technician  
Kareem Reynolds, REDD+ Technician  
German Lopez, Sustainable Forest Management Manager  
Brittany Meighan, Climate Change Mitigation Officer  
Jorge Nabet, Forester  
Koren Sanchez, Forester  
Lewis Usher, Forester

#### Support Group:

Marcial Arias, Collect Earth/Open Foris Expert  
Dr. Santos Chicas, University of Belize, Science and Technology Faculty  
Javier Fernandez, Coalition for Rainforest Nations  
Dr. Lennox Gladden, Chief Climate Change Officer  
Dr. Elma Kay, University of Belize, ERI Terrestrial Scientist  
Jan Meerman, Consultant  
Wilber Sabido, Chief Forest Officer  
Alfonso Sánchez-Paus Días, Collect Earth/Open Foris Lead Consultant  
Milena Niño, Coalition for Rainforest Nations  
The Protected Areas Conservation Trust  
Marcelo Windsor, Deputy Chief Forest Officer

© Government of Belize 2019

Citation: Forest Department. 2019. Belize Collect Earth/Open Foris Land Use and Land Use Change Assessment Protocol. Belmopan City: Government of Belize.



Coalition for Rainforest Nations





# Present Achievements and Next Steps

# 4 Mandatory Requirements for REDD+

Par.71 Decision 1/CP16

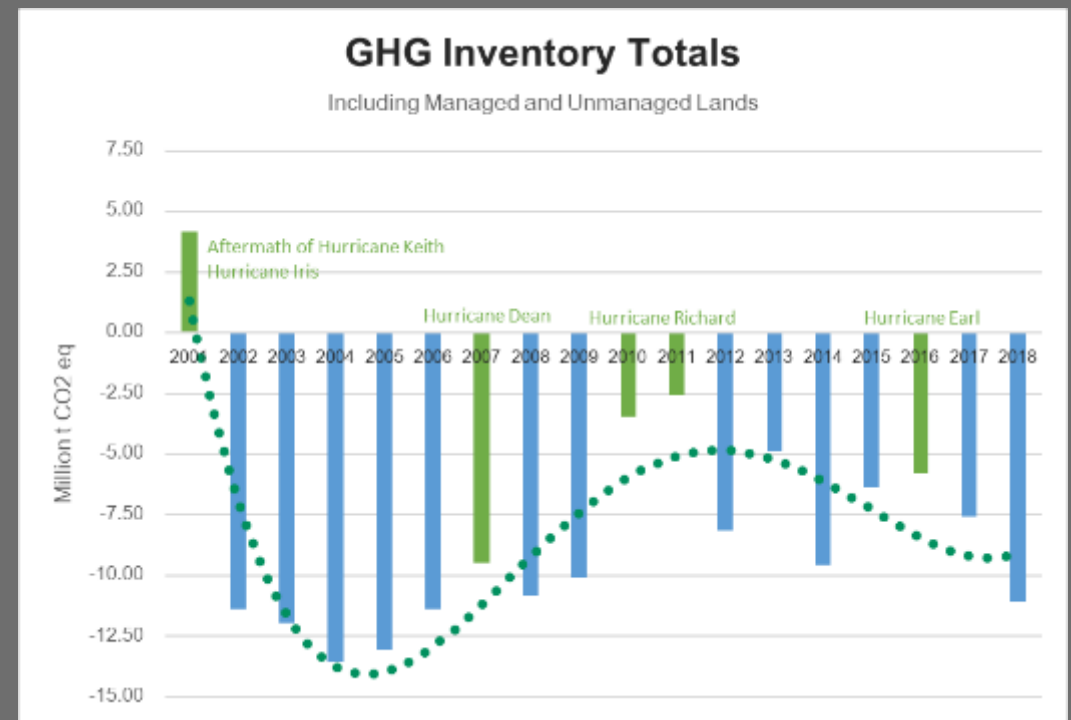
- REDD+ Strategy (Pending)
- National Reference Level + Technical Annex Report (Finalized and Submitted)
- National Forest Monitoring System (Pending)
- Safeguards – Pending



2020

**BELIZE FOREST  
REFERENCE LEVEL (FRL)  
2001 - 2015**

Ministry of Forestry,  
Fisheries, the Environment  
and Sustainable Development



- The Baseline for the FREL 2000-2015
- Looking at results for 2015-2018



United Nations

FCCC/TAR/2020/BLZ



Framework Convention on  
Climate Change

Distr.: General  
18 May 2021

English only

---

## Report on the technical assessment of the proposed forest reference level of Belize submitted in 2020

### *Summary*

This report covers the technical assessment of the voluntary submission of Belize on its proposed forest reference level (FRL) in accordance with decision 13/CP.19 and in the context of results-based payments. The FRL proposed by Belize covers the activities reducing emissions from deforestation, reducing emissions from forest degradation, conservation of forest carbon stocks, sustainable management of forests and enhancement of forest carbon stocks, which are the five activities included in decision 1/CP.16, paragraph 70. For its submission, Belize developed a national FRL. The FRL presented in the submission, for the reference period 2016–2020, corresponds to 4,606,875, 4,850,928, 5,094,981, 5,339,034 and 5,583,087 tonnes of carbon dioxide equivalent for 2016, 2017, 2018, 2019 and 2020, respectively. The assessment team notes that the data and information used by Belize in constructing its FRL are mostly transparent, complete and in overall accordance with the guidelines contained in the annex to decision 12/CP.17. This report contains the assessed FRL and a few areas identified by the assessment team for future technical improvement in accordance with the provisions on the scope of the technical assessment contained in the annex to decision 13/CP.19.

**APPROVED**

A magnifying glass with a blue lens and a brown handle is positioned over the word "Results". The lens is focused on the first few letters, "Re", making them appear larger and slightly blurred. The rest of the word, "sults", is visible but smaller. The magnifying glass has a black outline and a soft shadow beneath it.

**Re**sults

# Belize's updated Nationally



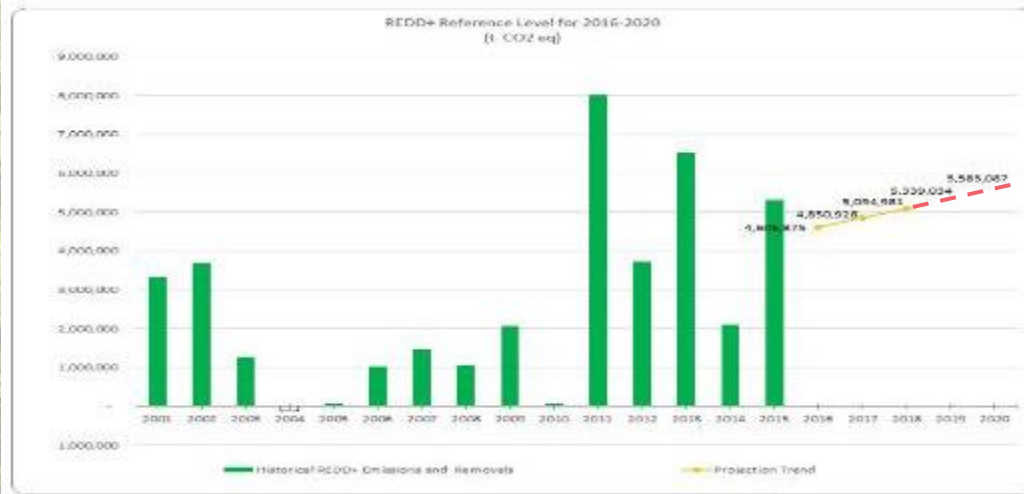
2020

**BELIZE FOREST REFERENCE LEVEL (FRL) 2001 - 2015**

Ministry of Forestry, Fisheries, the Environment and Sustainable Development



**Land Use, Land Use Change and Forestry Greenhouse gas (GHG) Inventory and REDD+ Reference Level and REDD+ Results**



## Determined Contribution

6.2.1 Land use change and forestry

Type		SDG linkages
Target	Reduce GHG emissions and increase GHG removals related to land use change totalling 7,053 KtCO2e <sup>21</sup> cumulative over the period from 2021 to 2030	13 Climate Action, 15 Life on Land
Action	Complete the REDD-plus Strategy, including options, implementation framework and assessment of social and environmental impacts, publish and maintain a National Forest Reference Level covering 2006-2020, and design systems for monitoring, information and safeguards including stock taking for tropical forest and mangrove cover and promotion of community land stewardship practices. Participate in REDD+ for performance-based payments for emissions reductions and removals increase achieved above and beyond the commitment in this NDC.	13 Climate Action, 15 Life on Land
Action	Implement reforestation practices for 1,400 hectares in forest areas inside protected areas, as well as the restoration of 6,000 hectares of degraded and deforested riparian forests <sup>22</sup> by 2030, with 750 hectares of this being restored in key watersheds by 2025	6 Clean Water and Sanitation, 13 Climate Action, 15 Life on Land
Action	Reduce degradation in 42,600 hectares of forest within protected areas by reducing fire incidence, improving logging practices, and controlling other human disturbance by 2030.	6 Clean Water and Sanitation, 13 Climate Action, 15 Life on Land



**REDD+ TECHNICAL ANNEX to first Biennial Update Report of Belize**

pursuant to Decision 14/CP.19

Results achieved by Belize from Reducing Greenhouse Gas Emissions from Deforestation, Forest Degradation, Enhancement of Forest Carbon Stocks, Sustainable Management of Forests and Conservation of Forest Carbon Stocks for REDD+ Results based Payments 2016- 2018.

2021

9-Dec-19

3.0.

**Contact Information and Focal Points**

Name	Email	Institution/Department
il Cho	<a href="mailto:ceof@environment.gov.bz">ceof@environment.gov.bz</a>	Ministry of Agriculture, Fisheries, Forestry, Sustainable Development, the Environment, Climate Change and Solid Waste Management Authority
adden	<a href="mailto:polko.coord@environment.gov.bz">polko.coord@environment.gov.bz</a>	Office of Climate Change
leigha	<a href="mailto:milg@envi.cc@environment.gov.bz">milg@envi.cc@environment.gov.bz</a>	Office of Climate Change
ea	<a href="mailto:edg@coores21@gmail.com">edg@coores21@gmail.com</a>	Forest Department
opez	<a href="mailto:brh@forest.gov.bz">brh@forest.gov.bz</a>	Forest Department

for the National Inventory Report (NIR) to be included in the country's first BUR. At the same time, this spreadsheet is the basis for the country's first REDD+ Reference Level REDD+. All GHG data is compiled here, in the same spreadsheet, to ensure full consistency in data, methods and assumptions. This spreadsheet is based on MS Excel to data made as part of Belize's national inventory totals.

n in Belize, relevant definitions and the acronyms used in AD-Database and AD-PlotSum.

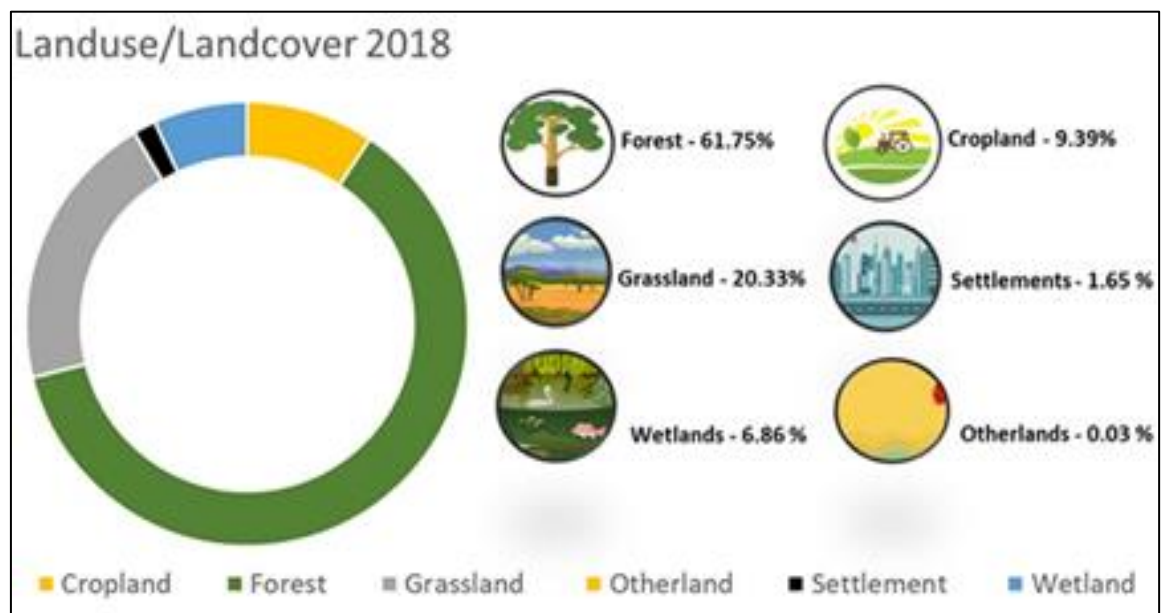
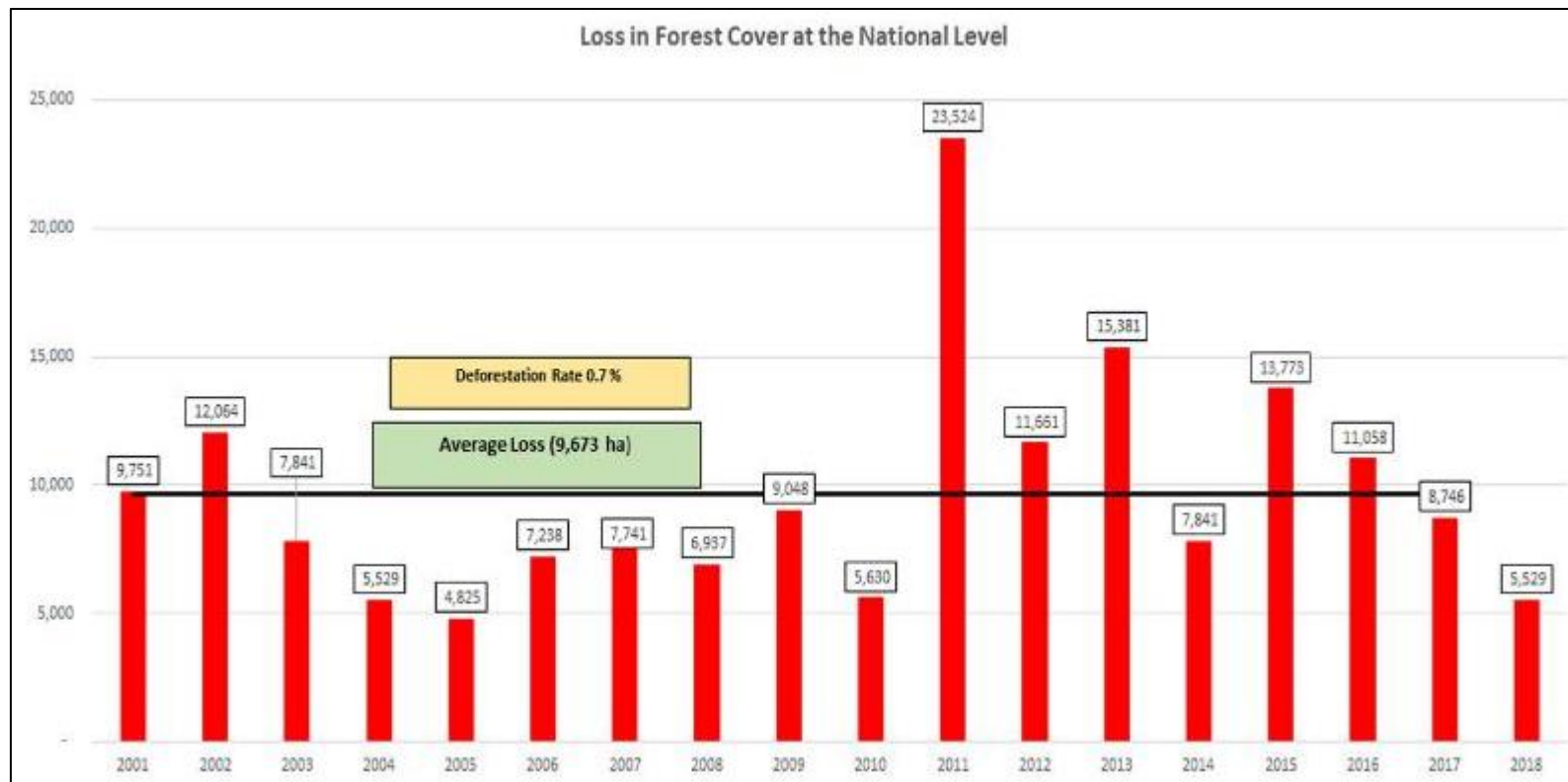
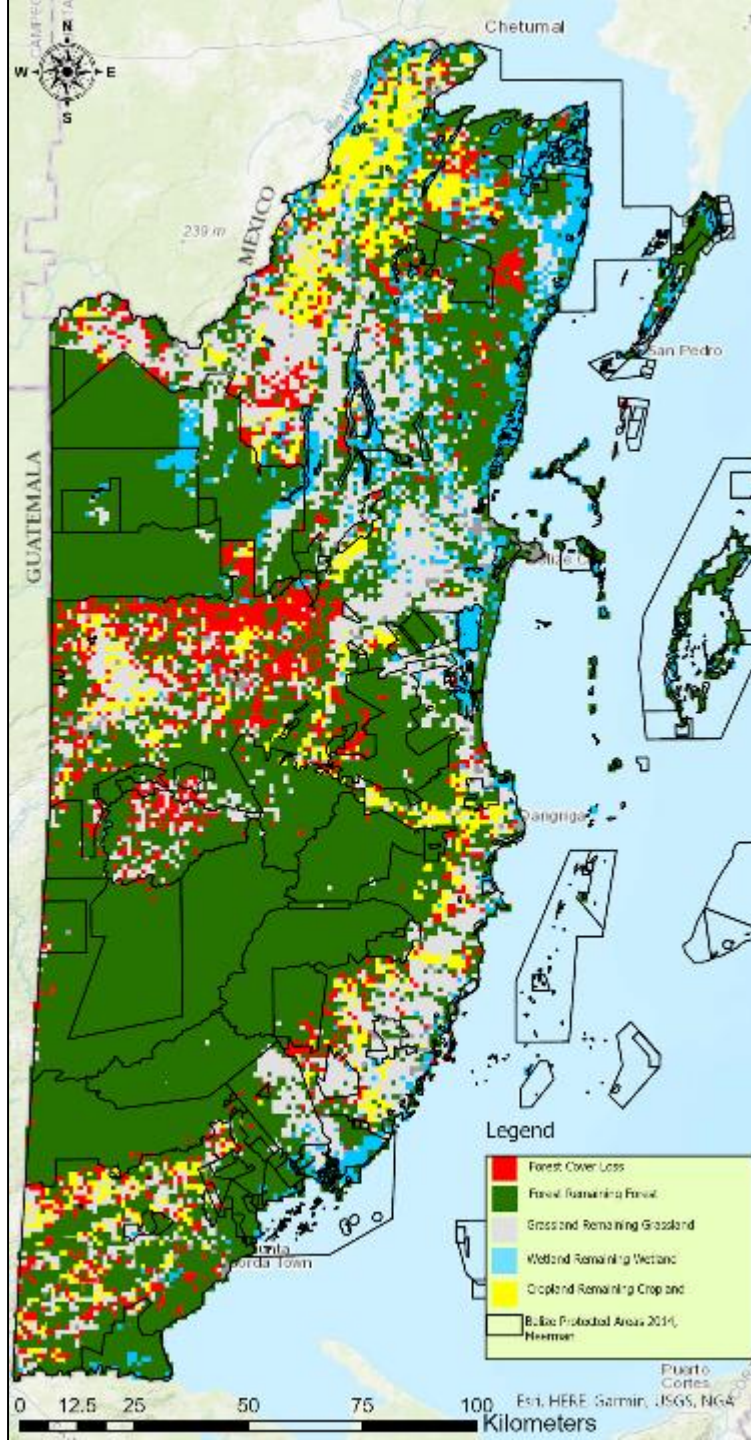
change)

use changes information, collected using a sampling approach at the national scale, for every year of the time series (2000-2018), using FAO's Collect Earth tool. Land categories follows the 2019/2006 IPCC guidelines.

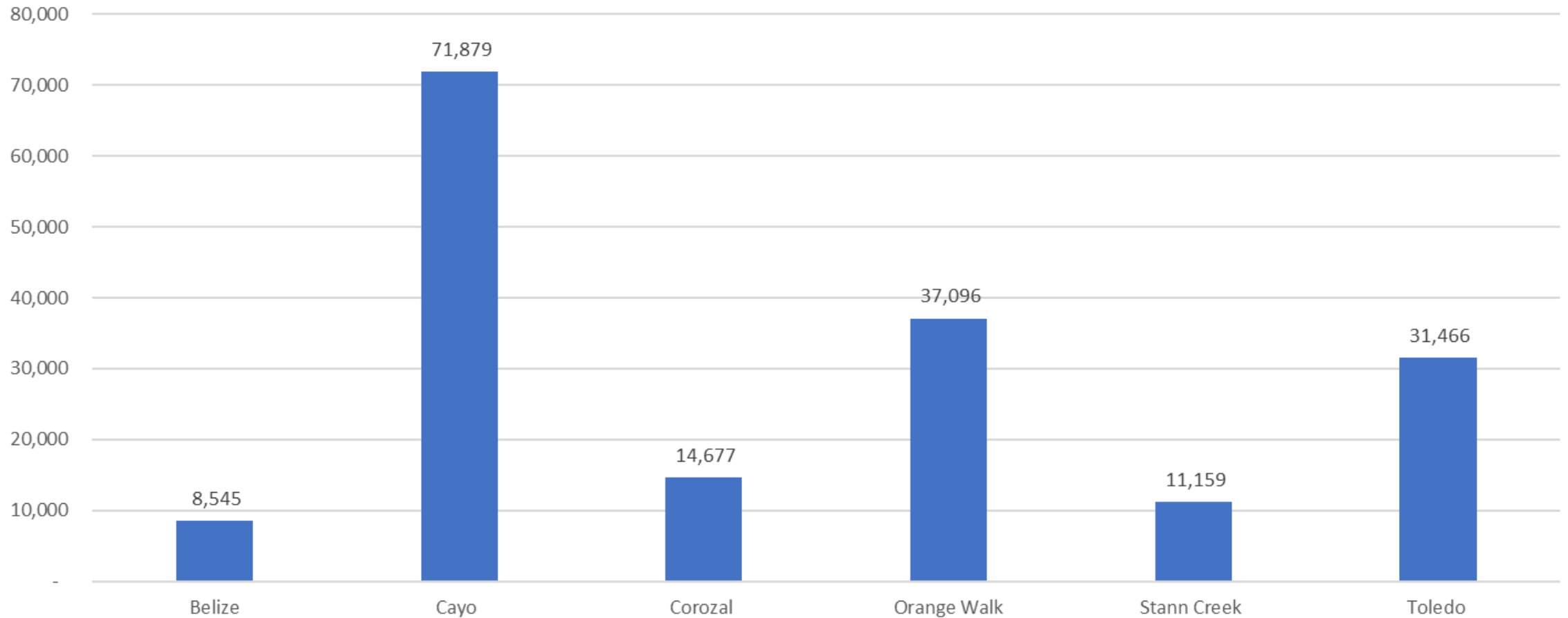
to aggregate plots with the same land use or land use change. It includes a Pivot Table counting the codes described in AD-Database. Codes depict a single trajectory in its simplification analysis as it considerably reduced the number of plots for which IPCC equations were applied.

Documentation: AD-Database, AD-PlotSum, REDD+ M&UE, REDD+ Strategy, Other Lands





Forest Cover Loss Per District for 2000-2018 (Ha)



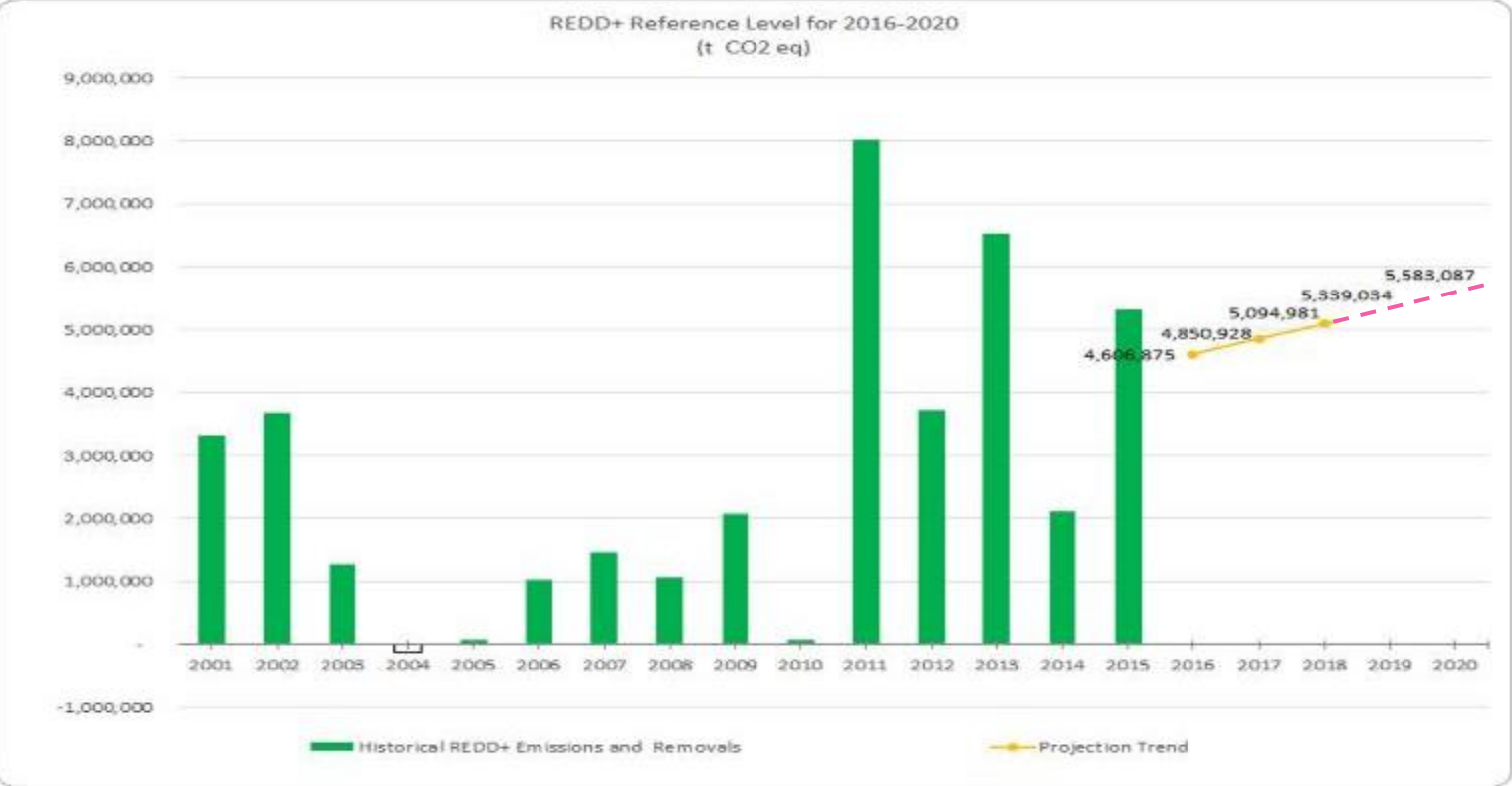
# Belize Forest Reference Level (Verified)



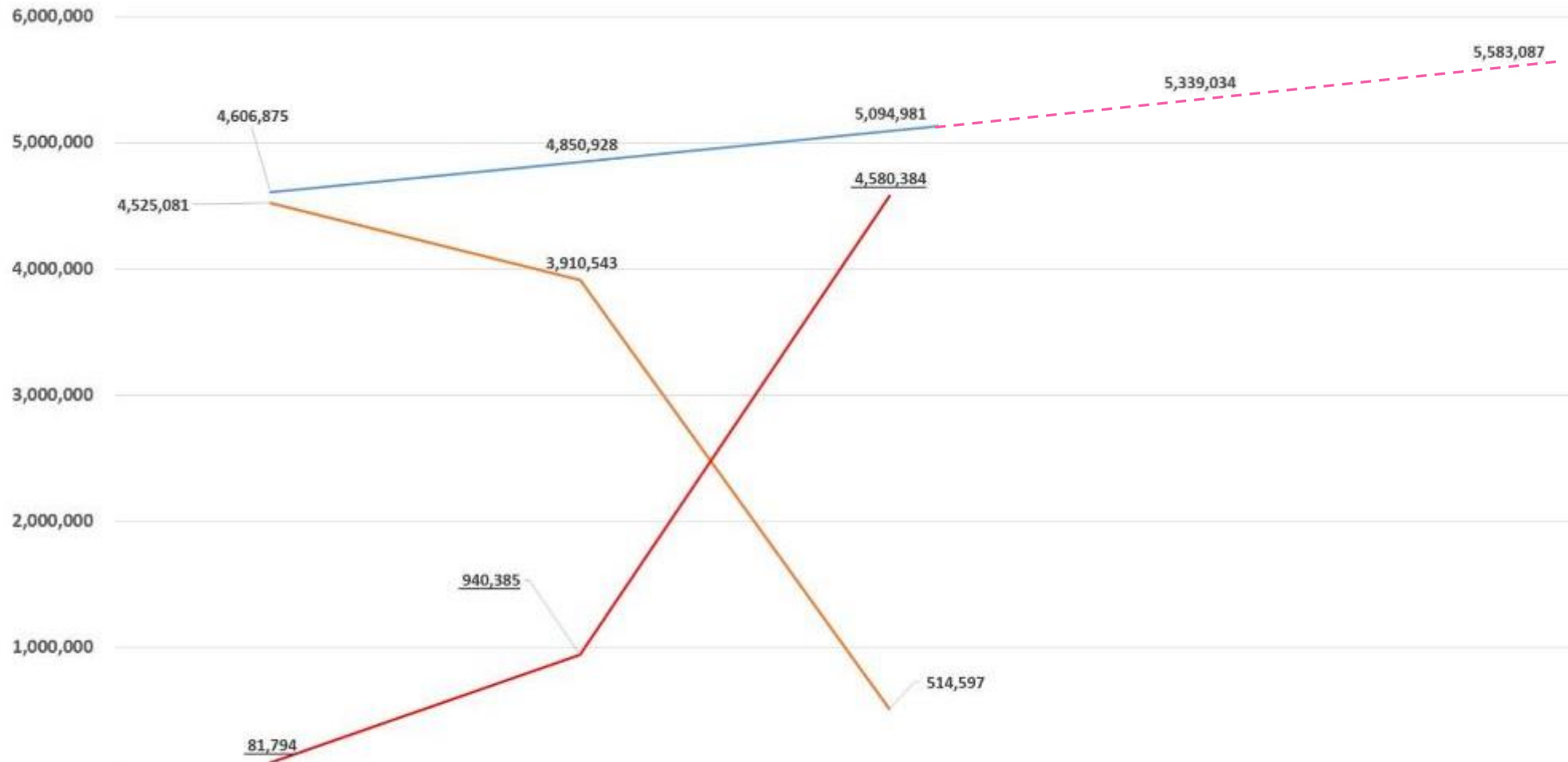
2020

**BELIZE FOREST  
REFERENCE LEVEL (FRL)  
2001 - 2015**

Ministry of Forestry,  
Fisheries, the Environment  
and Sustainable Development



**Belize REDD+ Achievements by 2016 - 2018 ( tCO<sub>2</sub>e)**



	2016	2017	2018	2019	2020
FRL Trend Values (Allowable Emission) (A)	4,606,875	4,850,928	5,094,981	5,339,034	5,583,087
GHGi Results ( Actual Results) (B)	4,525,081	3,910,543	514,597		
REDD+ Results or Achievements (A - B)	81,794	940,385	4,580,384		



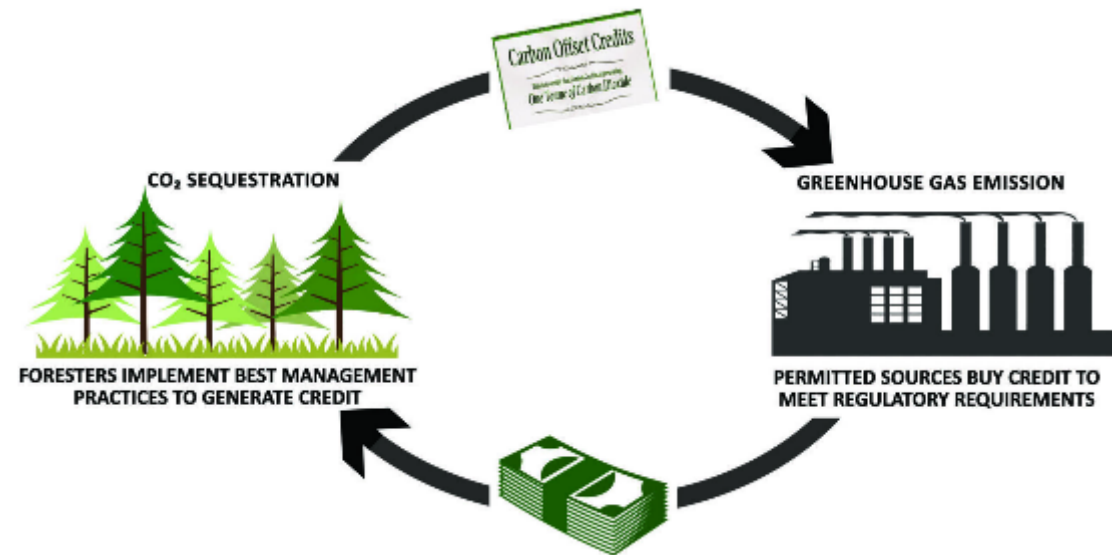
Potential Revenues

---

A small yellow circle is located at the bottom center of the image, with a bounding box of approximately [890, 480, 950, 520].

# What does this Results mean for Belize?

Results	
2016	81,794 (tCO <sub>2</sub> eq)
2017	940,385 (tCO <sub>2</sub> eq)
2018	4,580,384 (tCO <sub>2</sub> eq)
<b>Total</b>	<b>5,602,563 (tCO<sub>2</sub>eq)</b>



Results can be sold  
\$7.00 - \$ 11.00 USD/tCO<sub>2</sub>eq

Example: 5,602,563 x \$ 7.00 = **\$39,217,941 USD**

5,602,563 x \$ 11.00 = **\$61,628,193 USD**

# Payment for Results

## REDD+ WEB PLATFORM

[HOME](#)
[FACT SHEETS](#)
[SUBMISSIONS](#)
[INFO HUB](#)
[FORUM](#)
[MEETINGS](#)
[CONTACT](#)

Country	Date (Year)	Results (t CO <sub>2</sub> eq/year)	Assessed forest reference level (t CO <sub>2</sub> eq/year)	Quantities for which payments were received (t CO <sub>2</sub> eq/year)	Entity paying for results	Links to documentation
Brazil	2011	<b>622,451,671.72</b>	<b>907,959,466.33</b>	33,363,022.00	Government of Norway (see explanatory note)	<a href="#">FCCC/SBI/ICA/2017/TATR.2/BRA</a> Biennial update report with submission of REDD+ results (BUR 2)
	2012	<b>671,275,311.89</b>	<b>907,959,466.33</b>	32,733,224.00	Government of Norway (see explanatory note)	<a href="#">FCCC/TAR/2014/BRA</a> Submission on proposed reference level (Amazon biome) Modified submission on proposed reference level
				1,000,000.00	Government of Germany - KfW	
	2013	<b>606,111,615.42</b>	<b>907,959,466.33</b>	24,746,724.31	Government of Norway (see explanatory note)	1st Safeguards information summary 2nd Safeguards information summary National REDD+ Strategy Info Hub Brazil
				9,020,000.00	Government of Germany - KfW	
2014	<b>634,367,865.74</b>	<b>907,959,466.33</b>	24,000,000.00	Government of Norway (see explanatory note)		
2015	<b>620,295,262.00</b>	<b>907,959,466.33</b>	1,464,000.00	Government of Germany - KfW		
			9,515,517.98	Green Climate Fund		
				19,590,670.23	Government of Norway (see explanatory note)	
				11,534,093.04	Government of Germany - KfW	

Results are posted on the UNFCCC REDD+ Web Platform after completion of Technical Annex to the Biennial Update Report (BUR)

# REDD.plus: Going directly to the private sector



A New Opportunity



# How do we sell?

Confidential & Propriet

REDD.plus brings stakeholders together on a transparent and low-cost platform



# How do we sell?

<div style="text-align: center;"> <b>REDD+</b> WEB PLATFORM         </div>							
HOME		FACT SHEETS	SUBMISSIONS	INFO HUB	FORUM	MEETINGS	CONTACT
Country	Date (Year)	Results (t CO <sub>2</sub> eq/year)	Assessed forest reference level (t CO <sub>2</sub> eq/year)	Quantities for which payments were received (t CO <sub>2</sub> eq/year)	Entity paying for results	Links to documentation	
Brazil	2011	<b>622,451,671.72</b>	<b>907,959,466.33</b>	33,353,022.00	Government of Norway (see explanatory note)	<a href="#">FCCC/SBI/ICA/2017/TATR.2/BRA</a> Biennial update report with submission of REDD+ results (BUR 2)	
	2012	<b>671,275,311.89</b>	<b>907,959,466.33</b>	32,733,224.00	Government of Norway (see explanatory note)	<a href="#">FCCC/TAR/2014/BRA</a> Submission on proposed reference level (Amazon biome) Modified submission on proposed reference level	
				1,000,000.00	Government of Germany - KfW		
	2013	<b>606,111,615.42</b>	<b>907,959,466.33</b>	24,746,724.31	Government of Norway (see explanatory note)	1st Safeguards information summary 2nd Safeguards information summary National REDD+ Strategy Info Hub Brazil	
				9,020,000.00	Government of Germany - KfW		
	2014	<b>634,367,865.74</b>	<b>907,959,466.33</b>	24,000,000.00	Government of Norway (see explanatory note)		
1,454,000.00				Government of Germany - KfW			
9,515,517.98				Green Climate Fund			
2015	<b>620,295,262.00</b>	<b>907,959,466.33</b>	19,590,570.23	Government of Norway (see explanatory note)			
			11,534,093.04	Government of Germany - KfW			
			3,774,489.6	Government of the United Kingdom			

# REDD+ system established to manage

- National Forest Monitoring System
- Implementation of the National Registration System
- Framework and mechanism of carbon legislation
- Safeguard information system
- Benefit sharing mechanism
- National Forest MRV Working Group
- Forest Sector MRV Program



A word cloud on a dark blue background with a green and blue gradient at the top and bottom. The central focus is the phrase "Next Steps" in large, white, bold, sans-serif font. Surrounding this are various other words in different colors (blue, orange, white) and orientations (horizontal, vertical). The words include: "Innovation" (large blue), "Idea" (small blue), "Discuss" (orange), "Progress" (small white), "Process" (small white), "MEETING" (small blue), "Business" (small white), "Future" (small white), "Dialog" (small white), "Forum" (small white), "Communication" (small white), "SOLUTIONS" (small orange, vertical), "FORWARD" (small blue), "Strategy" (small white), "FUTURE" (small blue), "PROPOSAL" (small orange), "Creativity" (small white), "BUSINESS" (small blue), "TALK" (small orange), "Session" (small white), "Connection" (small blue), "IDEAS" (small white), "INPUT" (small blue), "QUESTIONS" (small white), "Exploration" (small orange), and "STRATEGY" (small white, vertical).

STRATEGY  
IDEAS  
Progress  
Discuss  
Process  
MEETING  
Business  
Future  
Innovation  
Dialog  
IDEAS  
Forum  
Communication  
Next Steps  
SOLUTIONS  
FORWARD  
Strategy  
FUTURE  
PROPOSAL  
Creativity  
BUSINESS  
TALK  
Session  
Connection  
IDEAS  
INPUT  
QUESTIONS  
Exploration

# Moving Forward...

---

- Completed and Ongoing Activities
  - ✓ Updated Nationally Determined Contributions (NDC) for the Forestry and Land use Sector
  - ✓ Grievance and Redress Mechanism
  - ✓ REDD+ Strategy
  - ✓ Safeguards Information System (Environmental and Social)
  - ✓ National Forest Monitoring System
  - ✓ Forest Reference Level
  - ✓ Benefit Sharing Mechanism (Ongoing)
- Institutional Arrangement for a Measuring, Reporting and Verification Program;
- Build capacity on REDD+ Registry and other payment avenues;
- Build out mechanisms for results-based payments for Blue Carbon and other carbon pools;
- Legislation on Carbon.



# Thank You!

## Questions?

**Contacts:**

**Edgar Correa (Mr.)**

**Forest Officer**

**MRV Program Coordinator**

**[gsmu.ecorrea@forest.gov.bz](mailto:gsmu.ecorrea@forest.gov.bz)**

**Cell: +501-670 -8480**