Overview: VT0007 Unplanned Deforestation Allocation (UDef-A), v1.0

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Photo by Bale Mountain REDD Project

Webinar Objectives

Stakeholders understand:

- Tool at a high level

- Key principles underpinning the tool

- Roles and responsibilities for risk mapping and allocation

- Current stage and next steps

*The primary context of this webinar is VMD0055 and VM0048

Agenda

- Welcome / Housekeeping

- Background

- Technical Overview

- Roles and Responsibilities

- Next Steps

- Q&A

Housekeeping

- Webinar will be recorded and posted on Verra's website. Registered participants should also receive a follow-up email with a link the the recording.

- Slides will be made available on Verra's website with the video

- Anticipating a good deal of questions – will get to as many as possible and will be prioritizing questions directly related to VT0007

- Please try to keep questions on-topic

Background

Team

Key design objectives

Relationship to VMD0055 and VM0048

Team

- Risk mapping and modeling and allocation procedures
  - Dr. Lucio Pedroni (Carbon Decisions International)
  - Juan Felipe Villegas (Carbon Decisions International)
  - Prof. Robert Gil Pontius (Clark University)
  - Prof. J. Ronald Eastman (Clark Labs)
  - Dr. Rebecca Dickson (Terra Carbon and Clark Labs)

- Verra staff
  - Andrew Copenhaver, Manager, Forest Carbon Data Innovation
  - Salvador Sánchez Colón, Manager, REDD+ Technical Innovation
  - Julie Baroody, Senior Director, Forest Carbon Innovation
  - Naomi Swickard, Senior Director, REDD+ Program Development and Innovation
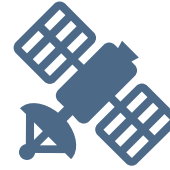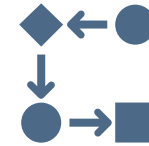
Key Design Objectives

The approach should minimize opportunities for biased allocations.

The approach must be effective in detecting areas where the risk of deforestation is negligible.

The data requirements of the approach should be as minimal as possible for the tool to be applicable in the widest possible country contexts.

The approach must be as simple as possible to minimize the possibility of mistakes in its application and the verification of its results while remaining effective in discriminating areas of different risk levels.

Relationship to VMD0055

- VT0007 is used within VMD0055 to proportionally allocate jurisdictional activity data (AD) across a jurisdiction based on the local risk of deforestation.

- Areas of higher risk of deforestation are allocated larger proportions of the jurisdictional AD

- <u>Verra is responsible for developing risk maps and allocating jurisdictional activity data for project proponents.</u>

- The project proponent is responsible for estimating baseline emissions from carbon stock changes for their project area using project-developed forest strata maps and the proportionally allocated AD within these strata.

Technical Overview

Applicability Conditions

Benchmark Mapping

Alternative Maps

Model Comparison and Selection

Definitions

- **Allocated risk:** A quantified expression of deforestation risk, expressed as deforestation density (ha/pixel) over a defined period

- **Allocation:** The process of spatially dividing a jurisdictional unplanned deforestation activity data baseline or forest reference emission level (FREL) into parts and assigning each part to lower-level programs and projects aimed at avoiding unplanned deforestation (AUD), according to the level of risk of unplanned deforestation that exists within each program or project area. In the context of *VMD0055*, the allocated parts of projected deforestation are used, in conjunction with project-specific emission factors, to construct the baseline of standalone AUD projects. In the context of applying the requirements of the VCS Jurisdictional and Nested REDD+ framework, the allocated parts of the FREL become the baselines of the nested programs and projects.

- **Deforestation risk:** The probability of deforestation as estimated based on recent historical experience

- **Deforestation risk modeling regions:** Portions of the jurisdiction that have similar situational and administrative characteristics. They are defined by an overlay (intersection) of two components – a map of administrative divisions and a map of deforestation vulnerability classes.

- **Negligible risk threshold:** The distance from forest edge at which 99.5 percent of the deforestation experienced over the historical reference period has occurred

- **Vulnerability to deforestation:** A measure of relative susceptibility to deforestation. It differs from deforestation risk in that risk is quantified on a ratio scale and expressed either as a probability or as an expected impact. Vulnerability is measured on an ordinal scale but otherwise does not represent a quantified measurement and should not be used to determine the distance between two categories or for comparison between models

Applicability Conditions

This tool is applicable under either of the following conditions:

1. The project is a standalone project meeting the applicability conditions for projects that aim to avoid unplanned deforestation as defined in VMD0055 and is seeking allocation of jurisdictional unplanned deforestation activity data; or

2. A higher-level jurisdiction is seeking to allocate their FREL to projects or lower-level jurisdictions aiming to avoid unplanned deforestation.

Data Prerequisites
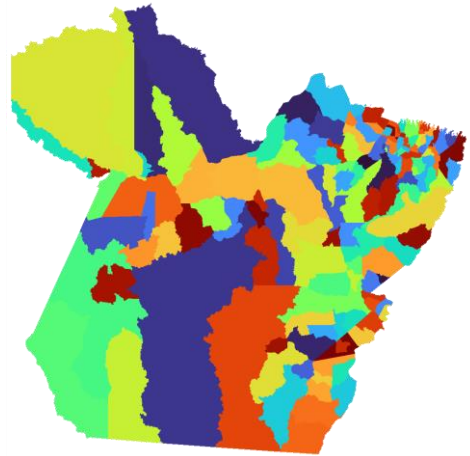
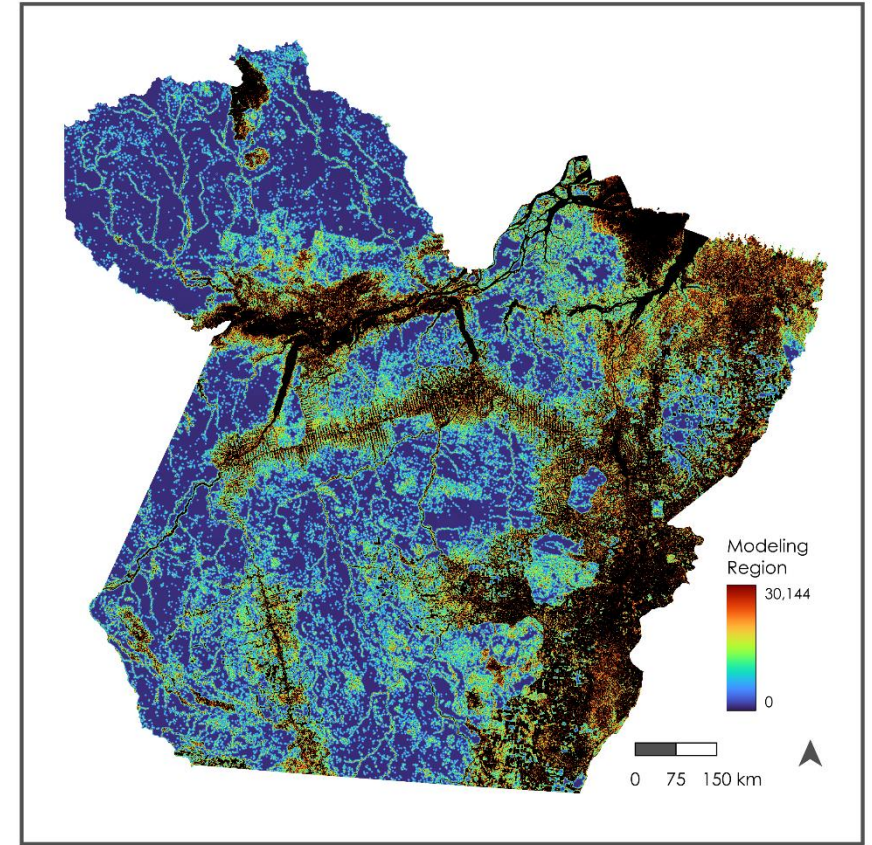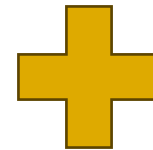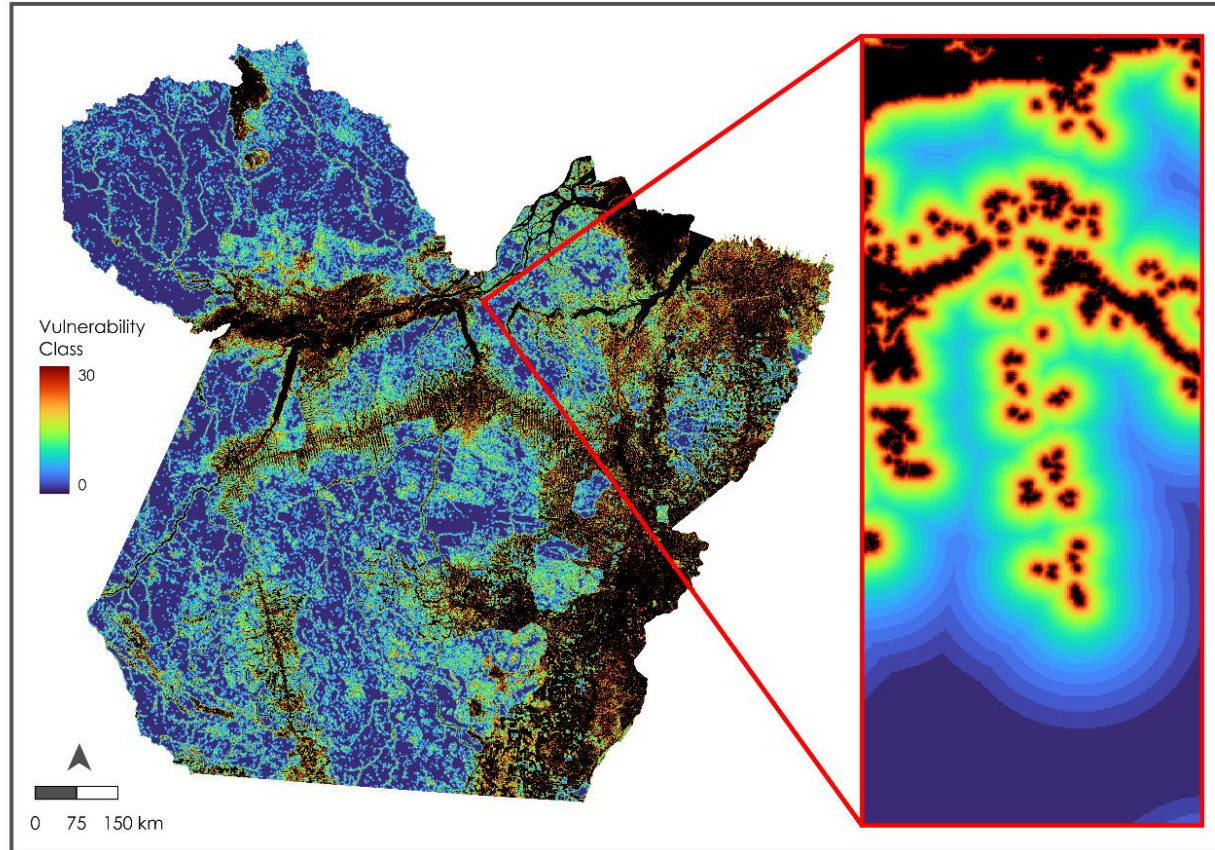| HRP Start Year Forest	HRP Midpoint Forest	HRP End Year Forest	FCBM Index	Allocated Risk Mapping Role			Interpretation
				Test Risk Map	HRP Risk Map	Validity Risk Map	
No	No	No	1	NF	NF	NF	Stable Non-Forest
No	No	Yes	2	NF	NF	NF	Stable Non-Forest
No	Yes	No	3	NF	NF	NF	Stable Non-Forest
No	Yes	Yes	4	NF	NF	NF	Stable Non-Forest
Yes	Yes	Yes	5	F	F	F	Stable Forest
Yes	No	No	6	F	NF	NF	Deforested T1–T2
Yes	No	Yes	7	F	NF	NF	Deforested T1–T2
Yes	Yes	No	8	F	F	NF	Deforested T2–T3
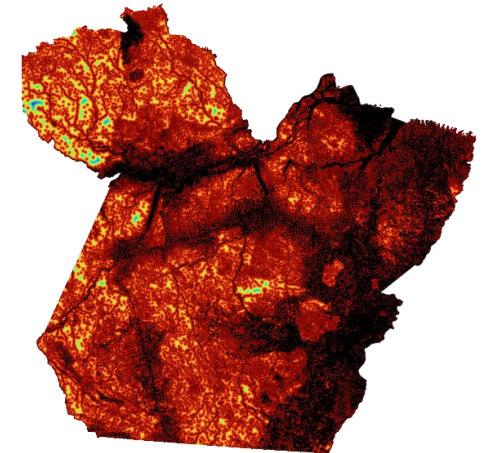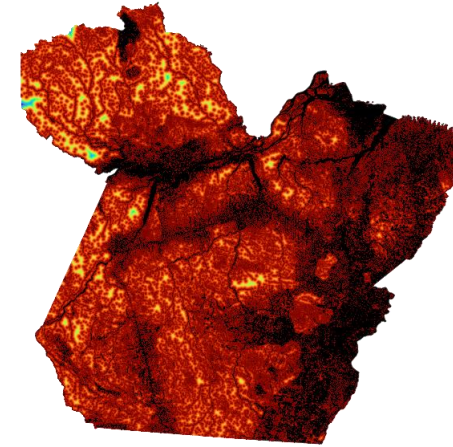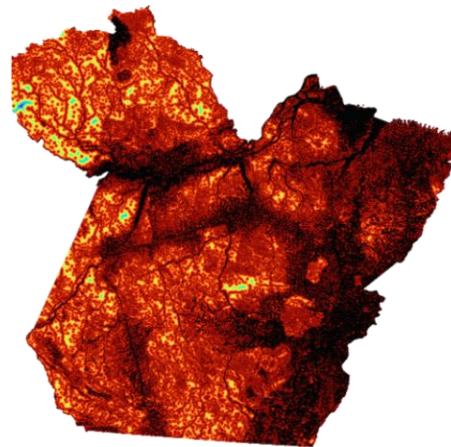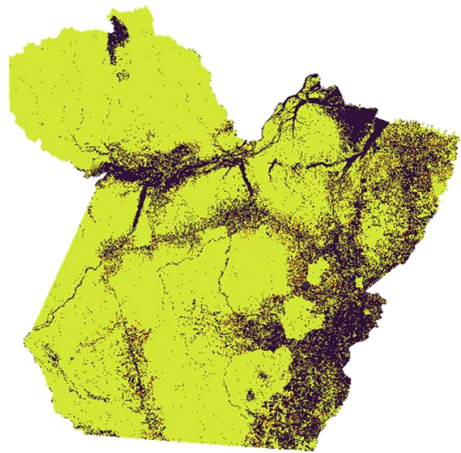
Risk Map Development Sequence
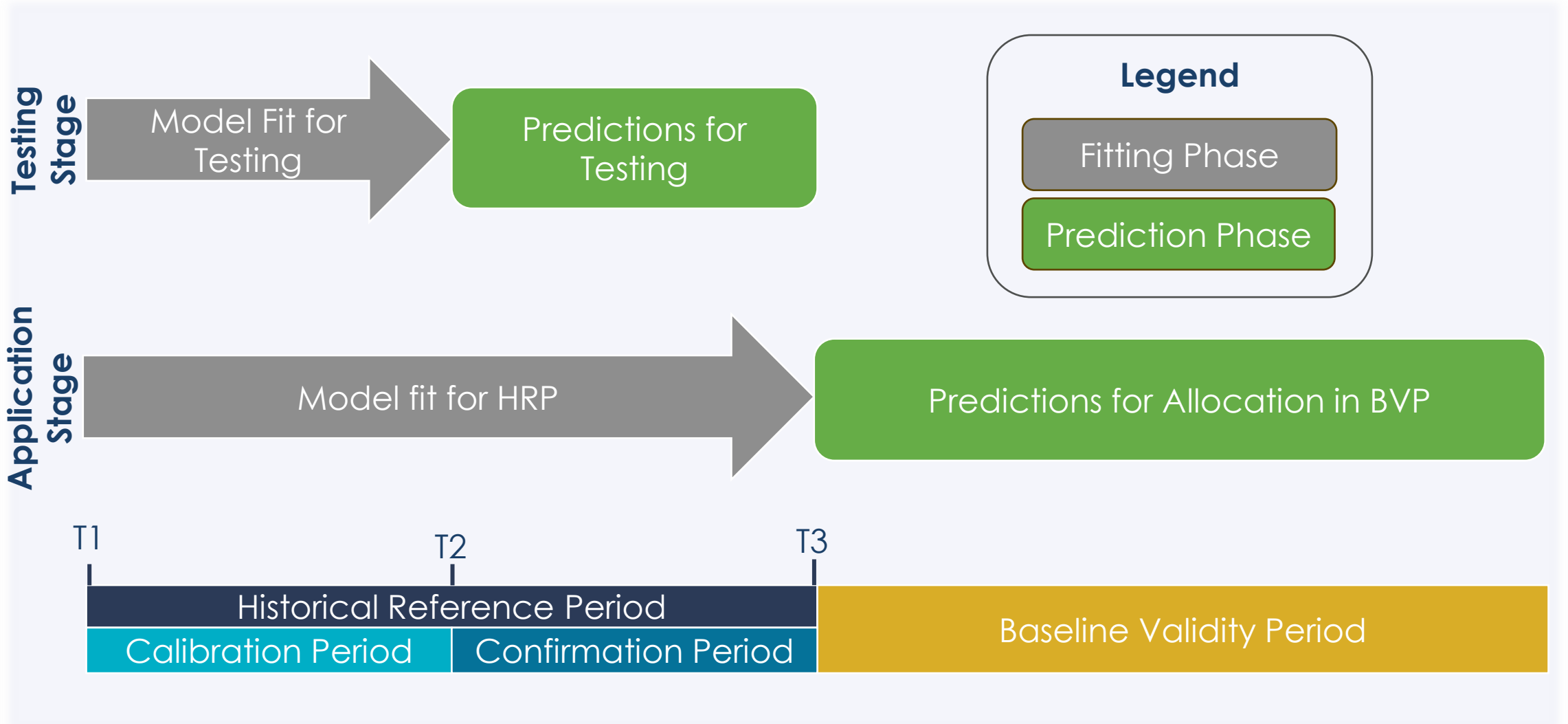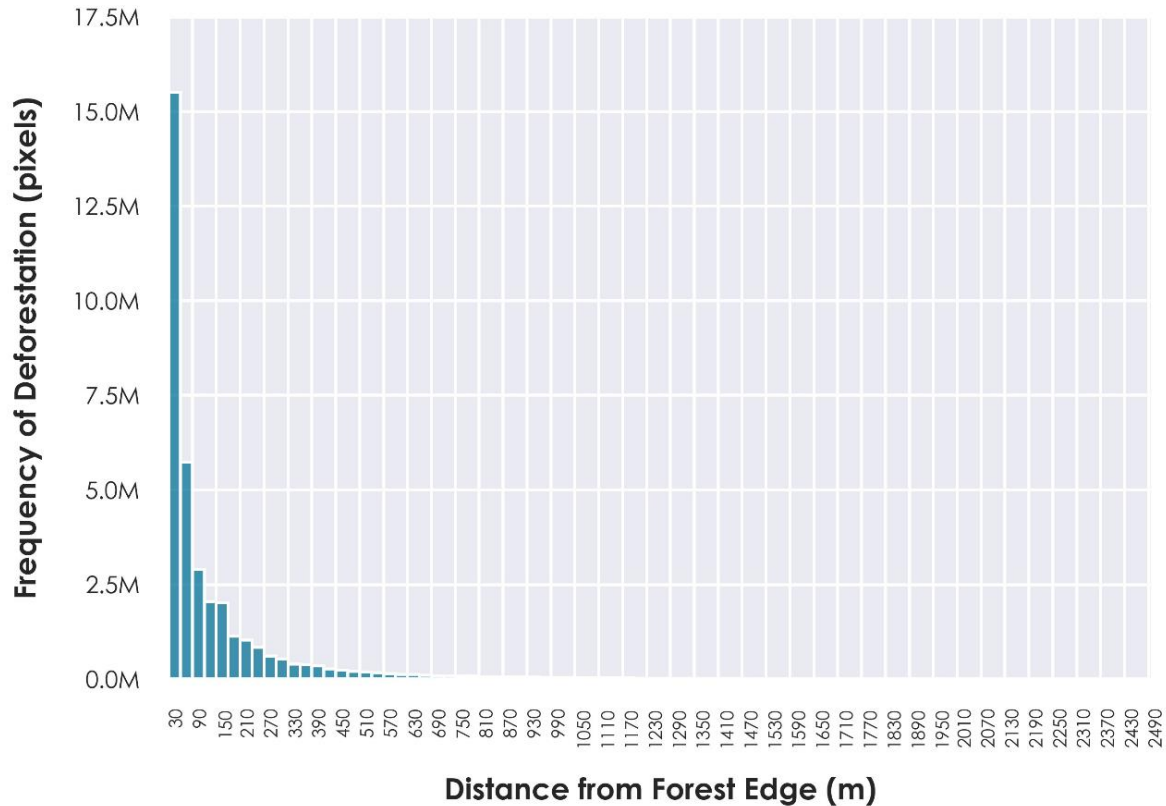
The NRT is defined as the distance from forest edge at which 99.5 percent of the deforestation experienced over the HRP has occurred
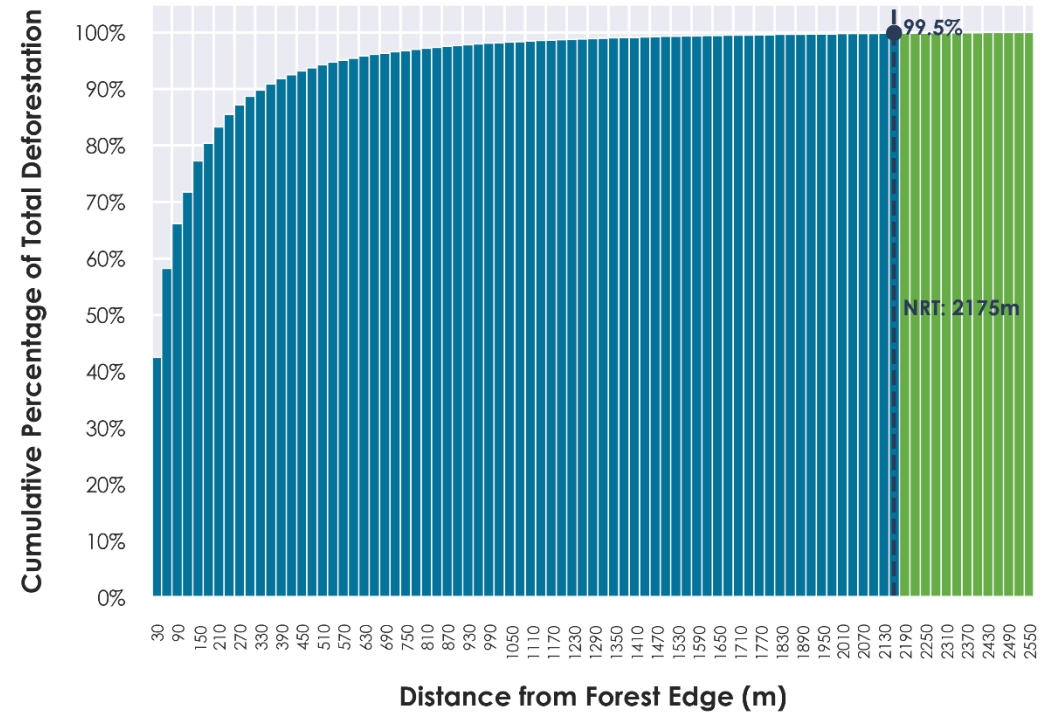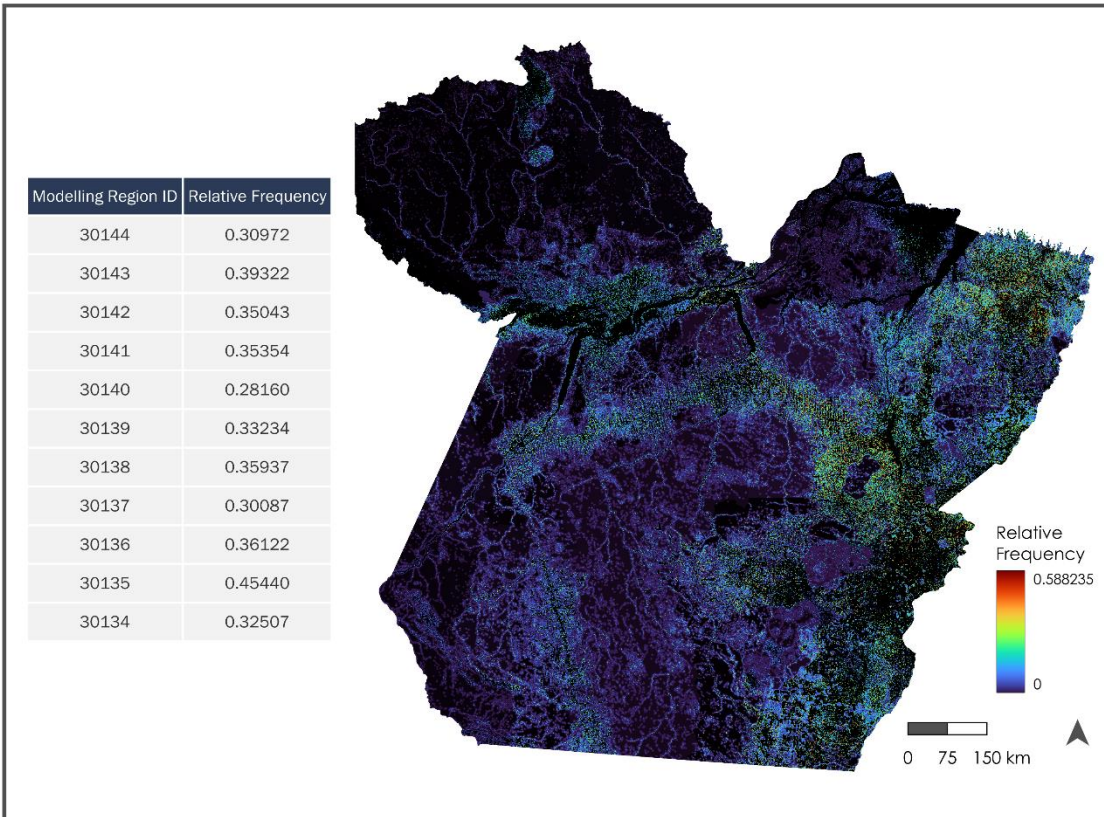
Create a map of vulnerability classes with values ranging from 1 to 29 in a geometric series between the forest edge and the NRT. Areas beyond the NRT are not included in the geometric classification and thus are assigned 0. The result is a 30-class map with values that range from 0 to 29.

Modelling Region ID	Relative Frequency
30144	0.30972
30143	0.39322
30142	0.35043
30141	0.35354
30140	0.28160
30139	0.33234
30138	0.35937
30137	0.30087
30136	0.36122
30135	0.45440
30134	0.32507

1. Calculate the relative frequencies of deforestation within the modeling regions for the fitting phase

2. Convert relative frequencies to deforestation densities
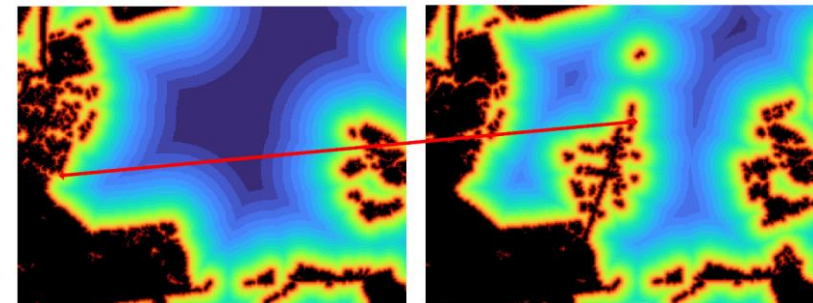
## 1. Create Prediction Vulnerability and Modeling Regions Maps

- Follow the same process as the fitting phase, with adjustments for different time periods.

- Exception: Use non-forest data from specific time periods (T2 for testing, T3 for application).

2. Assign Prediction Probabilities and Densities

- Utilize relative frequencies of deforestation from the fitting phase.

- Assign relative frequencies to prediction modeling regions.

## 3. Apply Quantity Adjustment

- In the testing stage: Adjust prediction quantity to match actual deforestation.

- In the application stage: Adjust prediction quantity based on projected deforestation from activity data sampling.

- This yields map of allocated risk – each pixel scaled to match estimated deforestation from AD sampling
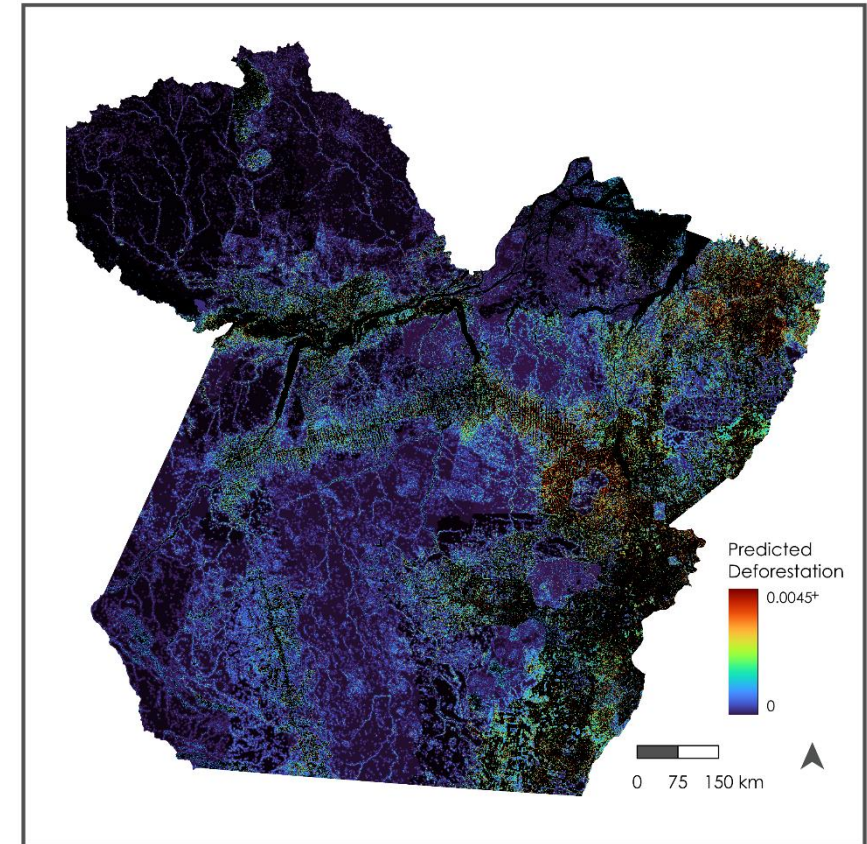
Alternative Risk Mapping (1/2)

The benchmark method is a standard against which alternative deforestation risk models may be compared. At least two alternative models must be tested with the goal of developing a more skillful model. However, an alternative model must pass two tests, as described in the coming slides, before being accepted for use.

Alternative Risk Mapping (2/2)

RF, MLP, CAR, Maxent, etc.
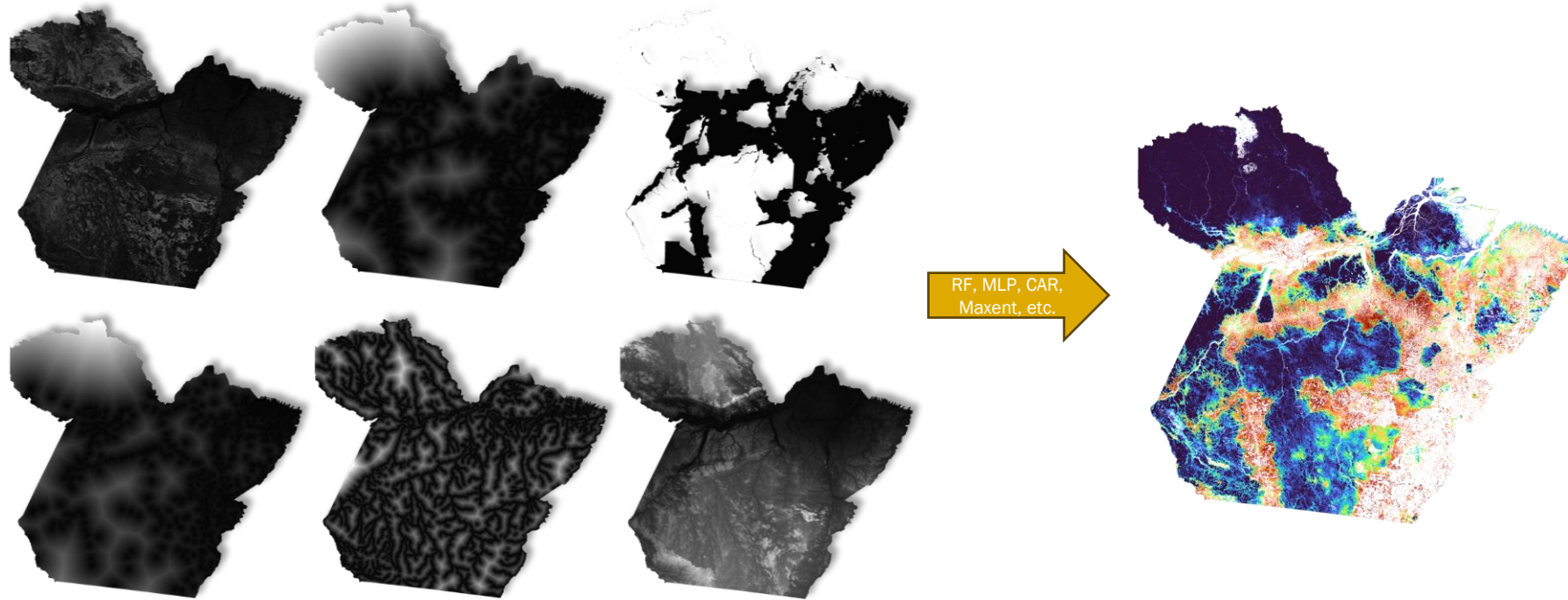
- Alternative map used to create ordinal vulnerability maps instead of distance to forest edge alone. Alternative maps scaled from 1 to 30, with 0 denoting excluded and non-forested areas (same as benchmark). Any classification scheme may be considered as long as it scales vulnerability from 1 to 30.

- Replicate the process used to create the benchmark with the new vulnerability map (intersection w/ admin divisions, relative frequency within modeling regions, assign relative frequencies to prediction modeling regions)

Model Evaluation and Selection

-Identification of model "best able" to predict deforestation in the coming years:

-Coarse grid cells sized to be representative of REDD projects in the jurisdiction

-Median Absolute Error (MedAE) calculated, in hectares, for predicted and mapped deforestation in the coarse grid cells for benchmark and alternative maps

-Alternative model must outperform benchmark model in both calibration and confirmation periods to be considered (i.e. lower MedAE for both tests)

$$MedAE = median(|y_1 - \hat{y}_1|, \dots, |y_i - \hat{y}_i|)$$
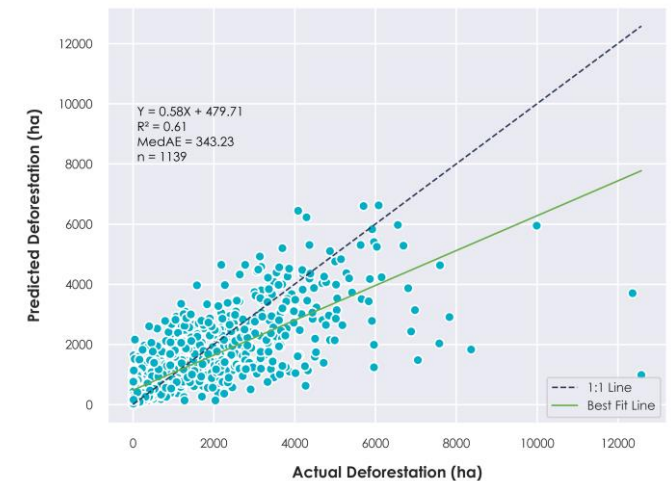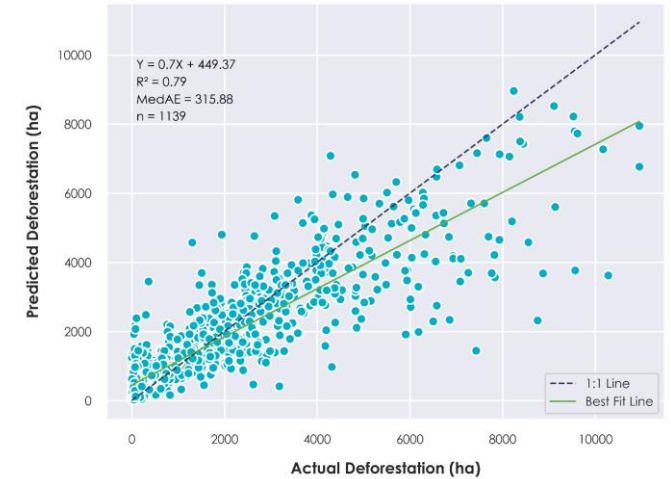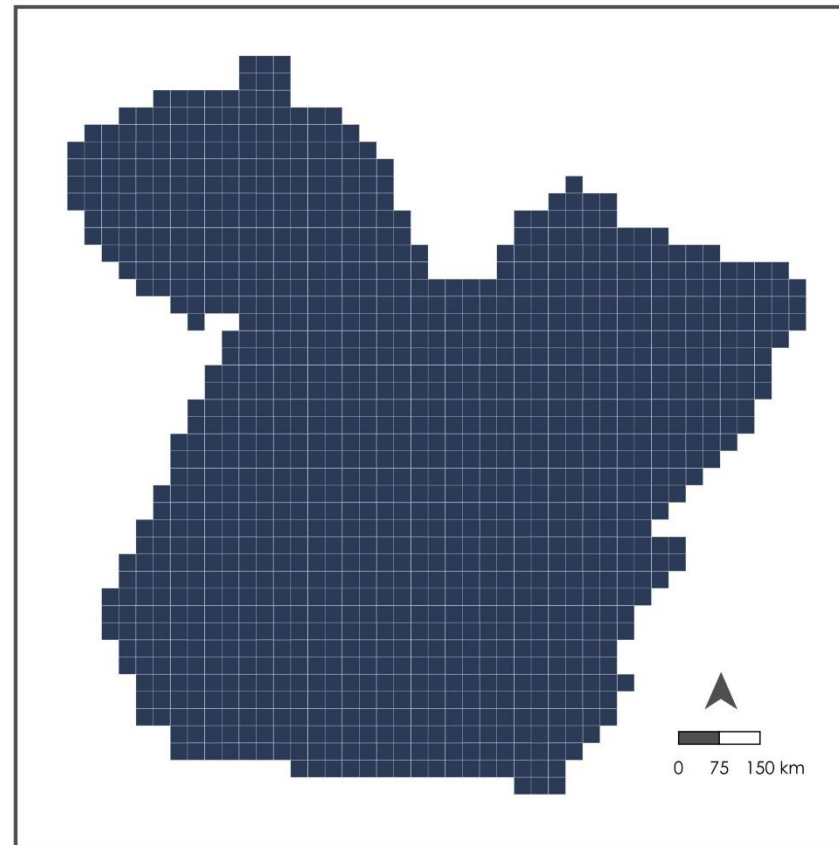
Roles and Responsibilities

Photo by FUNDAECO / REDD Conservation Coast Project

Consolidated REDD accounting approach

Roles and Responsibilities

Verra (through its DSPs) is responsible for risk mapping – both for benchmark risk maps and alternative risk maps. Verra has made this tool and the accompanying software available for transparency and continuous improvement.

Stakeholders have the opportunity to submit materials in advance of risk mapping activities.

VT0007 is intended for official use by service providers contracted to act on Verra's behalf. The activity data allocated by Verra take precedence over uses of this tool by other stakeholders.

Accounting approach of the consolidated REDD methodology

Independent technical assessment

Independent technical assessment

VVB assessment

Establish jurisdictional baseline activity data

- Satellite imagery (min 10-30m)
- Forest cover benchmark map
- Sample-based area estimation
- Draws from gov data, where possible

Establish a jurisdictional deforestation risk map

- Benchmark vs. alternatives

Allocate activity data per risk class to VCS REDD projects

Develop baseline, implement project, monitor

- Apply project-specific emission factors to allocated activity data

stakeholder inputs

Legend:

- Step done by Verra (including consultants)
- Step done by independent third party
- Step done by project proponent

Photo by Nick Hall /
Avoiding Planned Deforestation and Degradation in the Valdivian Coastal Reserve, Chile

Next steps

Questions?

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