

# IDP PROJECT/ Benchmarking and Development of a Carbon Model with LandPrint

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**Background and Context:** LandPrint, a NatureTech company specializing in digital MRV solutions, is seeking a group of students to work on a research project aimed at advancing methodologies for carbon modeling. The project is part of a Master's or research study where a student will work with LandPrint to develop a scientifically rigorous and scalable carbon model starting from an initial review of existing models. This model will serve as a critical component for evaluating carbon stocks, emissions, and sequestration potential across various landscapes, supporting nature-based solutions and corporate sustainability strategies.

**Objective:** The primary goal of this research project is to develop a **carbon model** that accurately quantifies carbon fluxes and sequestration across agricultural and natural ecosystems. The model will integrate **remote sensing data, in-situ measurements, and machine learning algorithms** to enhance precision and scalability in carbon assessments.

# Your profile

- Small team (up to 5 students)
- Carbon & Climate Science Understanding of carbon cycles and sequestration.
- Remote Sensing & GIS Have some basic understanding of satellite imagery and GIS tools
- Data Science Acquainted with statistical and numerical modeling.
- Research & Technical Writing Ability to conduct literature reviews, analyze models, and write research papers.

# Timeframe:

Up to 6 months

# **Key Research Questions:**



- What type of carbon models are being currently used?
- Which one can be used and why?
- How can we improve the accuracy of carbon stock estimations using data from satellite imagery and ground-based sensors?
- How analytical techniques can enhance predictive modeling for carbon sequestration and emissions tracking, aligning with global carbon accounting standards?
- What are the key parameters that can help improve the model and which data should be included in different land-use scenarios?

# Methodology:

# 1. Analysis of existing models:

- Evaluate the methodology and assumptions used in current carbon models.
- Compare data sources from literature, including satellite imagery, soil sampling, and remote sensing techniques.
- Identify limitations and gaps in existing models to inform improvements.

## 2. Model Development:

- Develop a theoretical model combining quantitative methods based on existing carbon model.
- Test different model structures to optimize performance in estimating carbon stocks and sequestration rates.

### 3. Validation and Benchmarking:

- Test model accuracy by benchmarking outputs against verified field data.
- Compare model outputs with existing carbon accounting frameworks.
- Conduct sensitivity analysis with real data to evaluate model robustness under different environmental conditions.

# 4. Application and Implementation:

 Integrate the model into LandPrint's SaaS platform to enhance carbon measurement and reporting capabilities.

# **Expected Outcomes:**

• An initial validated carbon model that improves the precision and scalability of carbon stock and sequestration estimates.

### **Collaboration Structure:**



- The student will work closely with LandPrint's research and data science team, receive technical orientation and training and gaining hands-on experience with real-world datasets and industry applications.
- Regular check-ins and progress reviews will be conducted on a biweekly basis to align research outcomes with both academic and industry needs.

## Interested?

Please send us an email with motivational letter, CV and expertise and how you envision the work: <u>dcesano@landprint.earth</u>