Earth Observation

// HACKEON

PIXELS FOR THE PLANET

Pitch Session:

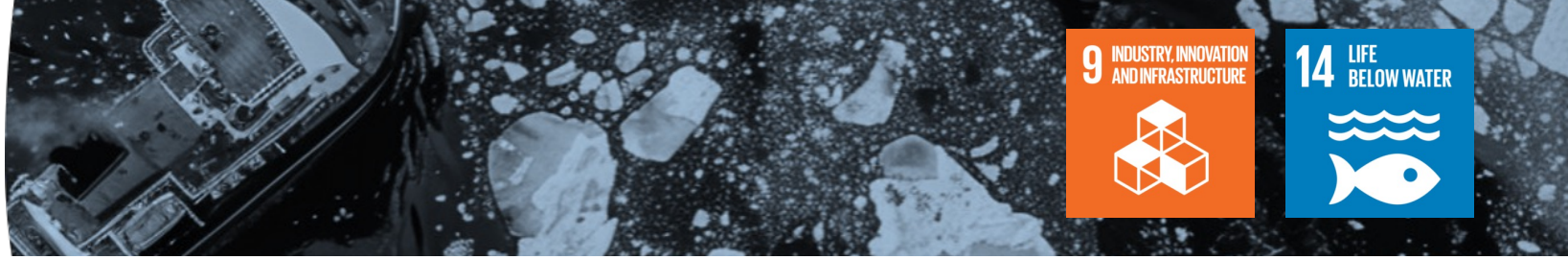
- Polaris arctic 🥇
- MUD 🥈
- Ground Truth 🥉
- Agrob Control
- Clearpath
- Farmtales
- Navscout
- Cropservation
- EO Guesser
- Solar Flares

15-17 Nov. 2024, ZKSD

DIZH · Universität Zürich[UZH] · zhaw

SWISSMEM Space Technology · esa BUSINESS INCUBATION CENTRE Switzerland

polaris
Arctic



Situation & Problem

- **Global Warming → Arctic Ice melting**
- **Arctic Traffic Increasing**
  - 1M Tons of Cargo in 2020
  - The Arctic Route make shorten over 30% compared to the route via Suez Canal

Technology

- **Shipping Route Optimization**
  - Risk-based route modeling
- **Iceberg Monitoring**
  - Sentinel-1 (SAR Data)
  - ASMR 2 (PMW Data)
- **Arctic Weather Data**
  - Copernicus Marine Data

Solution / Service

- **Arctic Voyage Conditioning Monitoring**
  - Real-time monitoring of icebergs and weather
- **Arctic Voyage Route Risk Assessment**
  - Risk assessment for shipping routes
- **Arctic Voyage Route Optimization**
  - Route planning and optimization

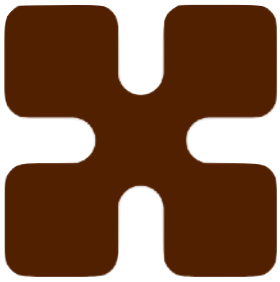
Business Model

- **Tiered-Subscription Model**
- **API Integration**
- **Enterprise Licensing**

- **Target Customer**
  - Shipping Company
  - Oil and Gas Company
  - Logistics and Supply Chain

Moisture Under Detection (MUD)

Revolutionising Crop Insurance



MUD

Problem:

- **Low insurance coverage:** Only 1% of Kenyan farmers have crop insurance.
- **Unprotected crops:** 60% of crop yields remain vulnerable, representing $113 billion in unprotected value globally.
- **Data issues:** Inaccurate rainfall data and evidence gaps hinder effective insurance solutions.

Solution:

MUD focuses on soil **moisture change** rather than absolute measurements, enabling:

- Enhanced data accuracy through synthetic data generation.
- Applicability in underserved regions like the Global South.

Key Benefits:

- **Farmers:** Increased trust, financial protection, reduced risks.
- **Insurance providers:** Better accuracy, cost savings, and improved client relationships.
- **Market:** Greater transparency and customer adoption.

Business Model:

- **B2B API Integration:** Simple, customised endpoints.
- **Subscription-based model:** Flexible and competitive pricing.

Go-to-Market Strategy:

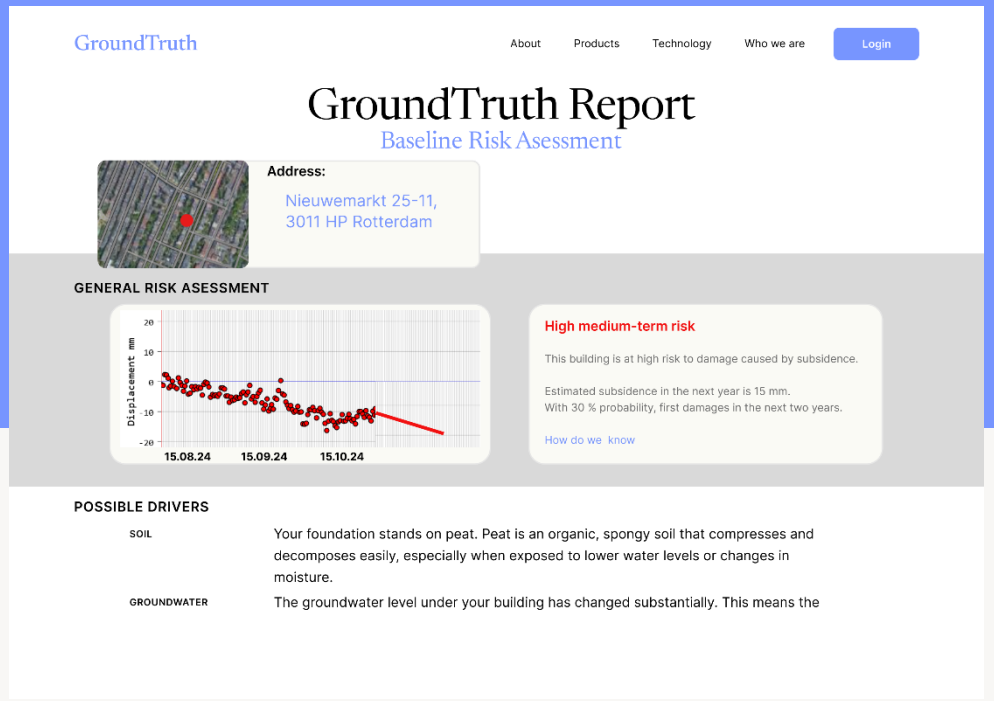
- Validate metrics and market needs.
- Launch pilot projects and foster collaborations.
- Participate in startup competitions for visibility.

Team:

- **Peter Pedersen:** Astronomer (Visionary).
- **Wojciech Adamczyk:** Quantum computing specialist (Technologist).
- **Céline Portenier:** Remote sensing professional (Strategist).

For more, visit itsmud.com

GroundTruth



The Problem

Sinking ground causes $20 billion in damages annually

Our Solution

- Risk Assessment for Buyers – One-time evaluation to help buyers avoid subsidence risks.
- Movement Monitoring for Owners – Ongoing tracking of building shifts to catch issues early.

How It Works

Using InSAR ground tracking, geological data, and machine learning, we deliver accurate risk insights based on local ground conditions and industrial activities. Value Actionable data to reduce risk and prevent costly ground-related damage

agrob Control

Problem

- Annual information on crops grown by farmers to receive direct payments should be controlled by cantons.
- Authorities are overwhelmed.

Our Solution

- Task-specific software to enable a fast and easy way to check on farm's data by comparing their informations with satellite-based crop classification

Gains Solutions

- Target-focused
- Transparency for both farmers and cantons
- Level of detail to choose by user
- Closed feedback loop enabeling model refinement, leading to better results

Future Extensions

- agrob Insurances
- agrob Declare

agrob

Clearpath. We navigate people out of flood crisis

Mission

Flood disasters cause extensive destruction in urban areas, and many cities lack effective evacuation routes.

To fill this gap, we provide a bidirectional navigation service that informs affected individuals on how to safely evacuate from flooded areas.

Flood predictions and optimal route navigation are calculated on the basis of various open data sources.

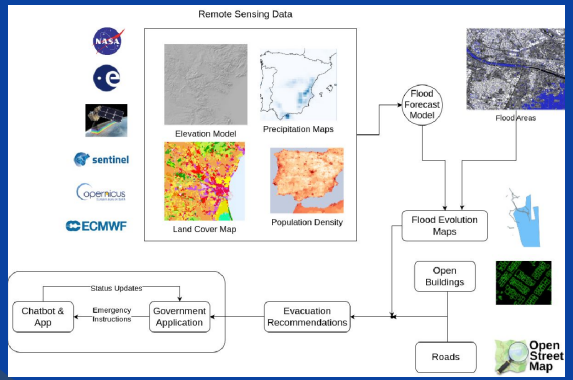
Team

Business Model

We offer an infrastructure allowing governments and NGOs to access real-time flood maps and calculate and live-updated evacuation routes.

The infrastructure can be accessed through a subscription plan, ensuring continuous improvement of the platform.

Data Flow Model



What it looks like

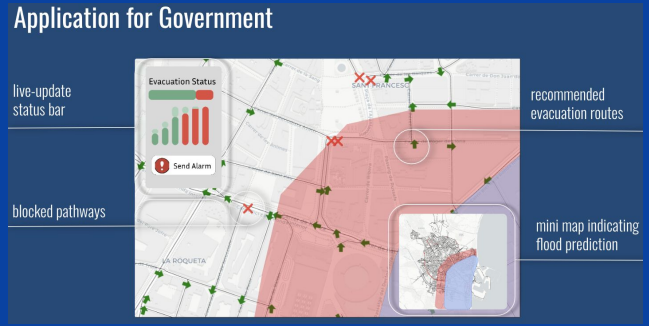
Chatbot interaction:

SEVERE WEATHER ALERT: There will be heavy rains. Please in dicate your possible modes of travel to plan optimal evacuation procedures: [‘foot’, ‘car’, ‘bicycle’]

Car or foot

Thank you. We recommend you to leave in 30 minutes and take the A42 towards Summertown by car. Detailed directions can be found here:
https://www.google.com/maps/yourdirections
Should the circumstances along this route change, we will update your plan.

Application for Government



FARMTALES

TANGIBLE INSIGHTS IN CONSUMER'S INTERESTS

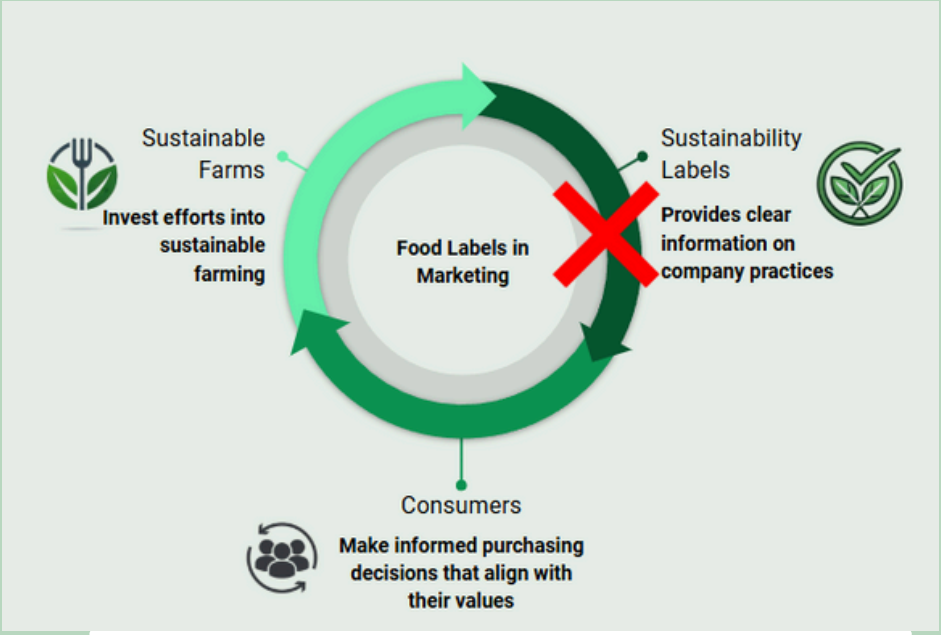
NIVEDITA, CAROLINA, VARUN

e-अर्थ

01.

Sustainability labels are not clear

Sustainability labels often fail to provide clear and transparent information, making it difficult for customers to understand the true environmental or ethical impact of their choices. Ambiguous language or vague criteria can lead to confusion and even mistrust.



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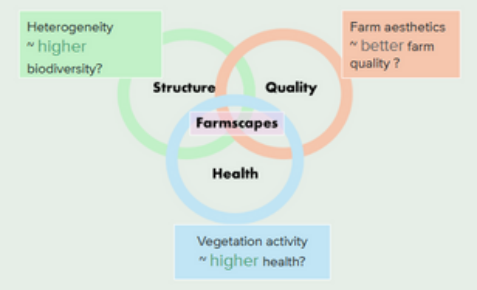
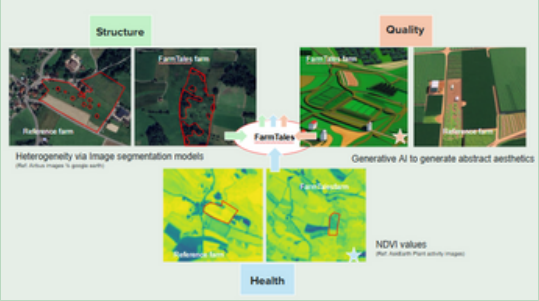


Our solution

Provide tangible information from public satellite data which provide insights about the farm health, structure and quality.

03.



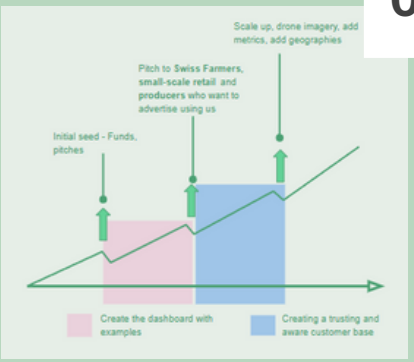
Insights

We provide insights such as landscape heterogeniety, vegetation health, etc.

Business Model

We start by charging small fees to local farms and producers, scaling up as our customer base grows

04.



NavScout

Emergency Navigation

The Problem

Traditional navigation systems rely on street networks, which can be blocked during natural disasters, hindering safe evacuation.

The Concern

Without real-time updates, users may unknowingly navigate into hazardous areas, increasing risk during emergencies.

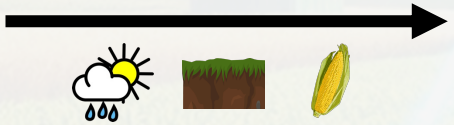
Our Solution

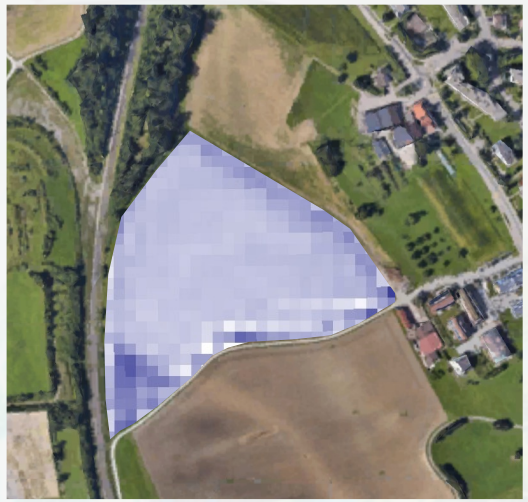
We leverage cutting-edge satellite data to calculate the best possible and safest routes, bypassing reliance on damaged road networks.

The cropservation™ workflow

Sentinel-1
Sentinel-2
FLEX (ESA, launches 2025)

Vegetation Indexes:
SIF, REIP, CI-red edge, GNDVI, …
Soil map





Plant health on crop field
- Fertilization / Invasives
- Water deficiency

Automated precision farming

EO-Guesser is a simple engaging game for geo enthusiasts
which will enable data scientist to get easy access to high quality labeled data.

Eo-Guesser®

Provide
Open Source API

Collect Labelled Data

Heat Wave Predictions

Central Idea:

Training a machine learning model which can predict heat waves and to create a website that provides access to the predictions resulting from the data.

Cause:

Preventing unnecessary accidents and death, related to extreme heat exposure.

Consequences:

Heat waves burden health and thus strain emergency services, increase risk of wildfires, result in low humidity that dries out vegetation and soil. Predicting heat waves allows governments, communities and also individuals to prepare in advance.

Target audience:

Tourist/work insurance can use the data on the website for accurate analysis.

Outline of Method:

- Satellite Data from earth engine
- Land surface temperature & soil moisture
- Heat index equation
- Score for risk analysis