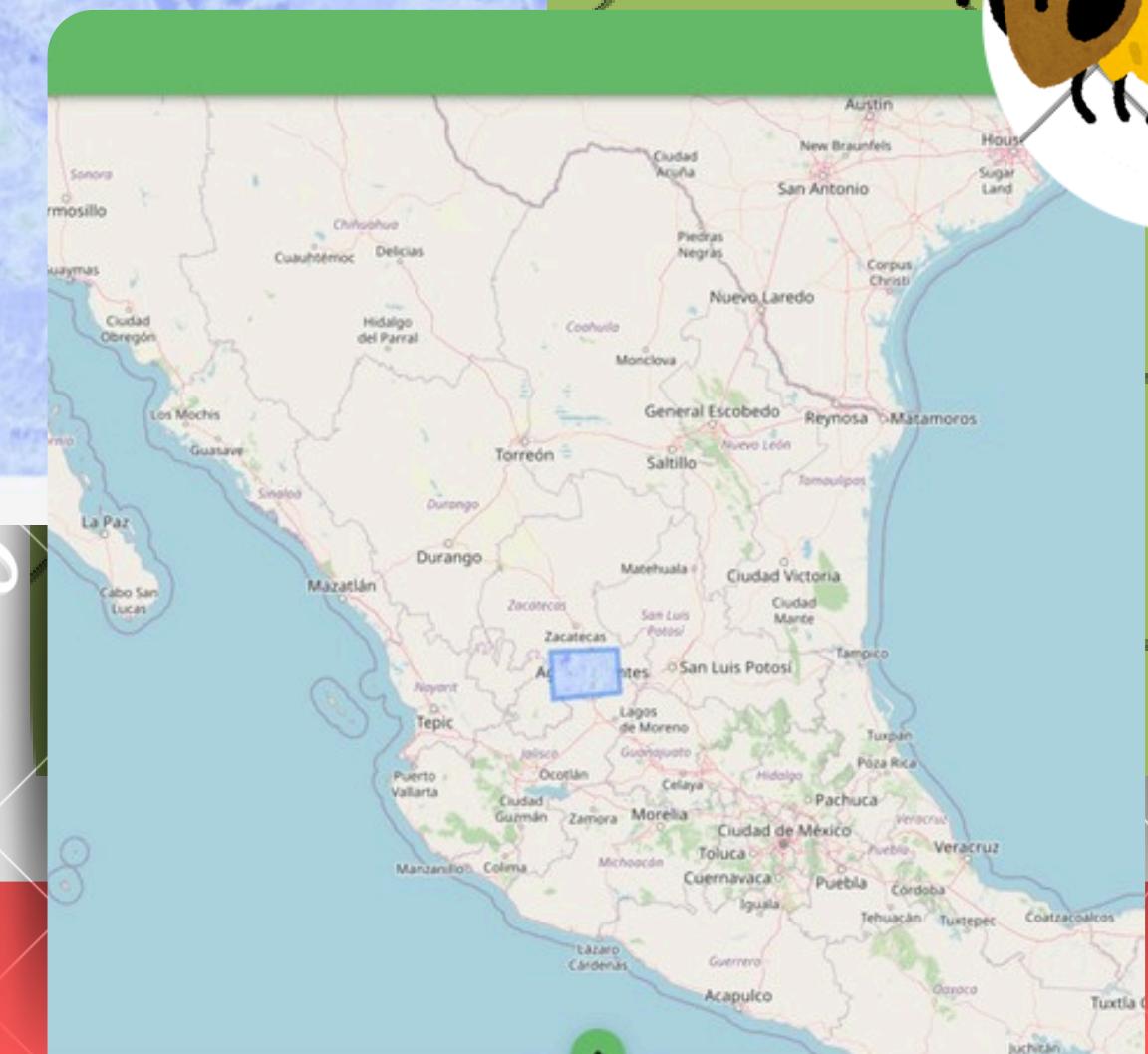


# GeoPoli

## Smart agriculture



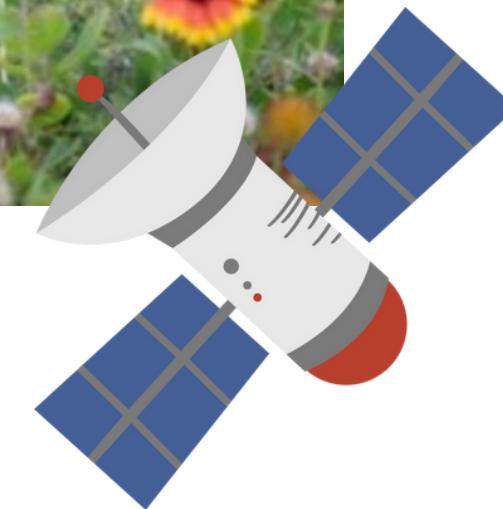
A precise scanning platform that  
empowers farmers and beekeepers to  
optimize resources, increase yields and  
reduce risks.



Team  
ASTRO-CODEX



# BloomWatch: An Earth Observation App for Flowering Phenology



## Project Goal

Our application, BloomWatch, provides a dynamic web platform to monitor and analyze plant flowering events, also known as phenology, using satellite data.

## Key Functionality

Users can interact with an Earth map, select a specific area of interest (a polygon), and get satellite-derived insights about the vegetation within that region.

## User Interface

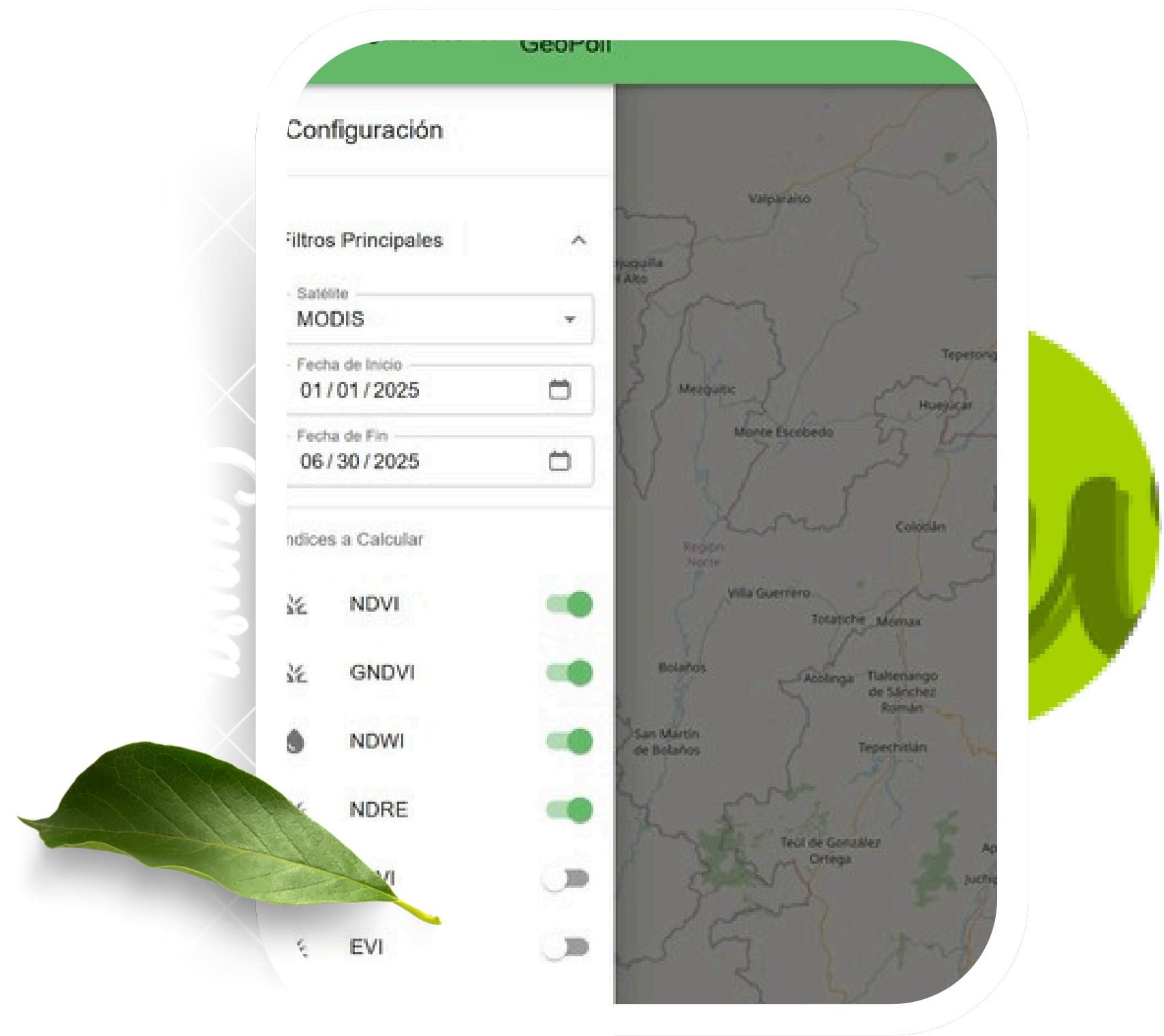
We developed a modern, user-friendly interface with a customizable map



# Consult vegetation Indicators

Toggle between different satellites images and select different indicators to access valuable information about , humidity, soil fertility and growth indicators.

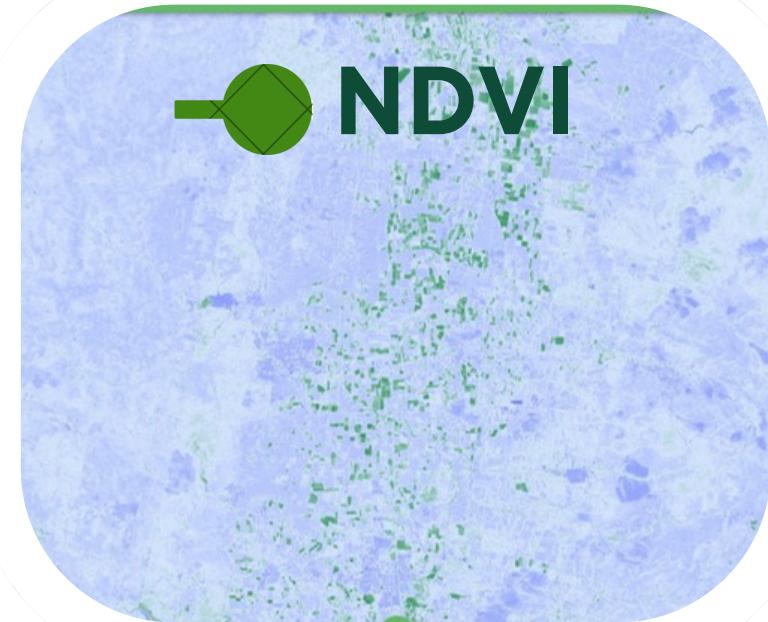
**Monitor crop health and development with  
a single click.**



# Vegetation indicators

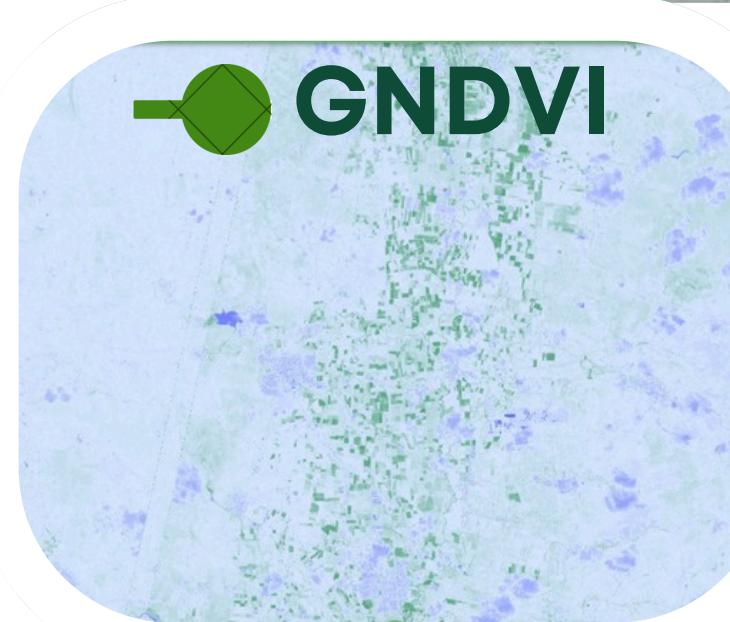


## — NDVI



Measures overall plant health and density. A high value simply means the crop is lush and vigorous.

## — GNDVI



Focuses on chlorophyll content. It's great for spotting early signs of plant stress and managing nitrogen fertilizer.

## — NDWI



Detects water stress in plants. It clearly shows which areas of a field are thirsty and need irrigation.

## — NDRE



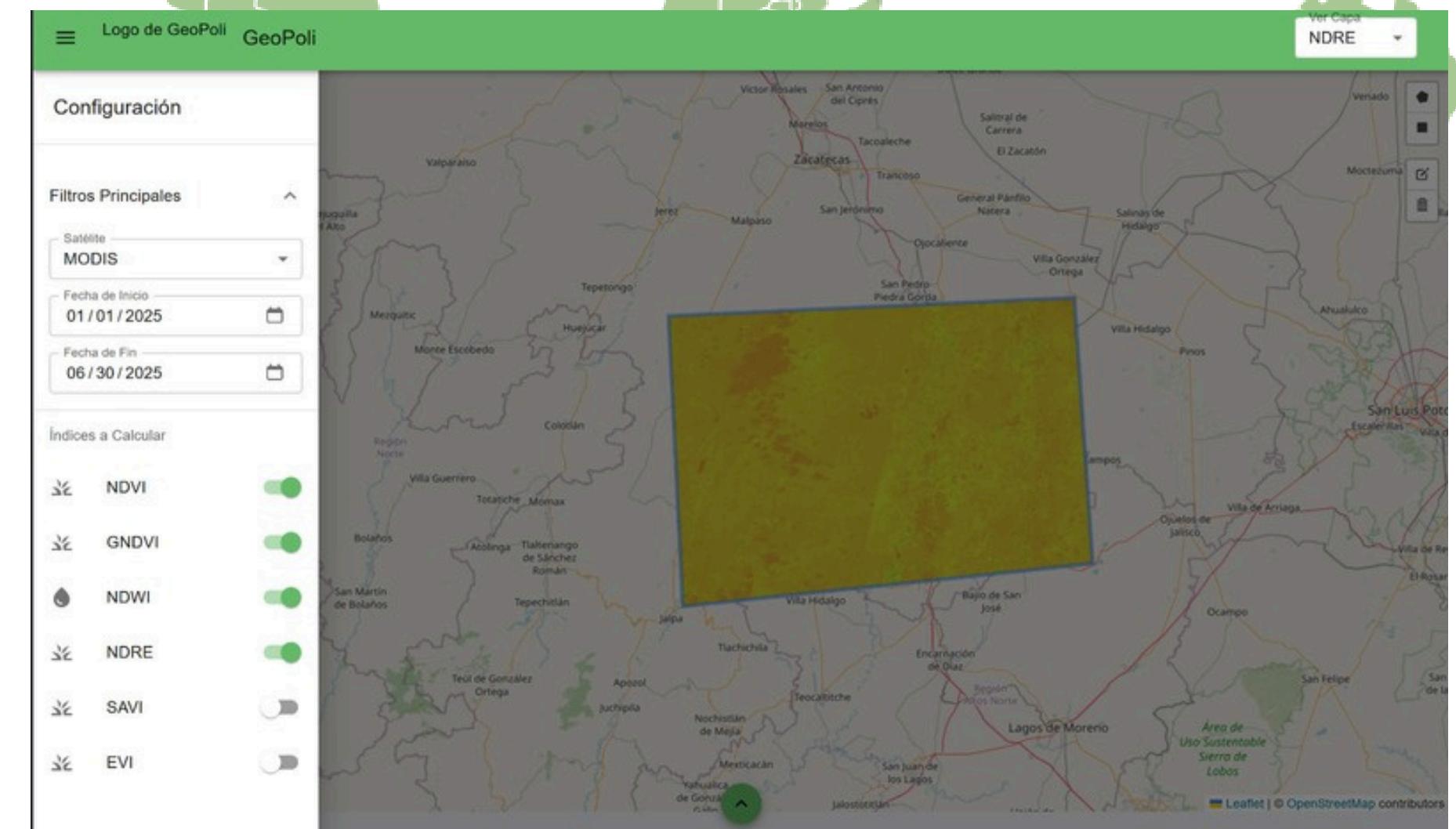
Measures chlorophyll in dense, mature crops. It's perfect for late-season health monitoring when other indices are less reliable.

# Analysis method

**Frontend:** Built with React and Materials UI, the web interface is dynamic and responsive. We use Leaflet to power the interactive map, enabling users to draw polygons and define their areas of study.

**Backend:** The application's core intelligence comes from integrating with powerful Earth Observation APIs. We use Google Earth Engine (GEE) to access massive amounts of satellite imagery from Landsat, Sentinel, and MODIS.

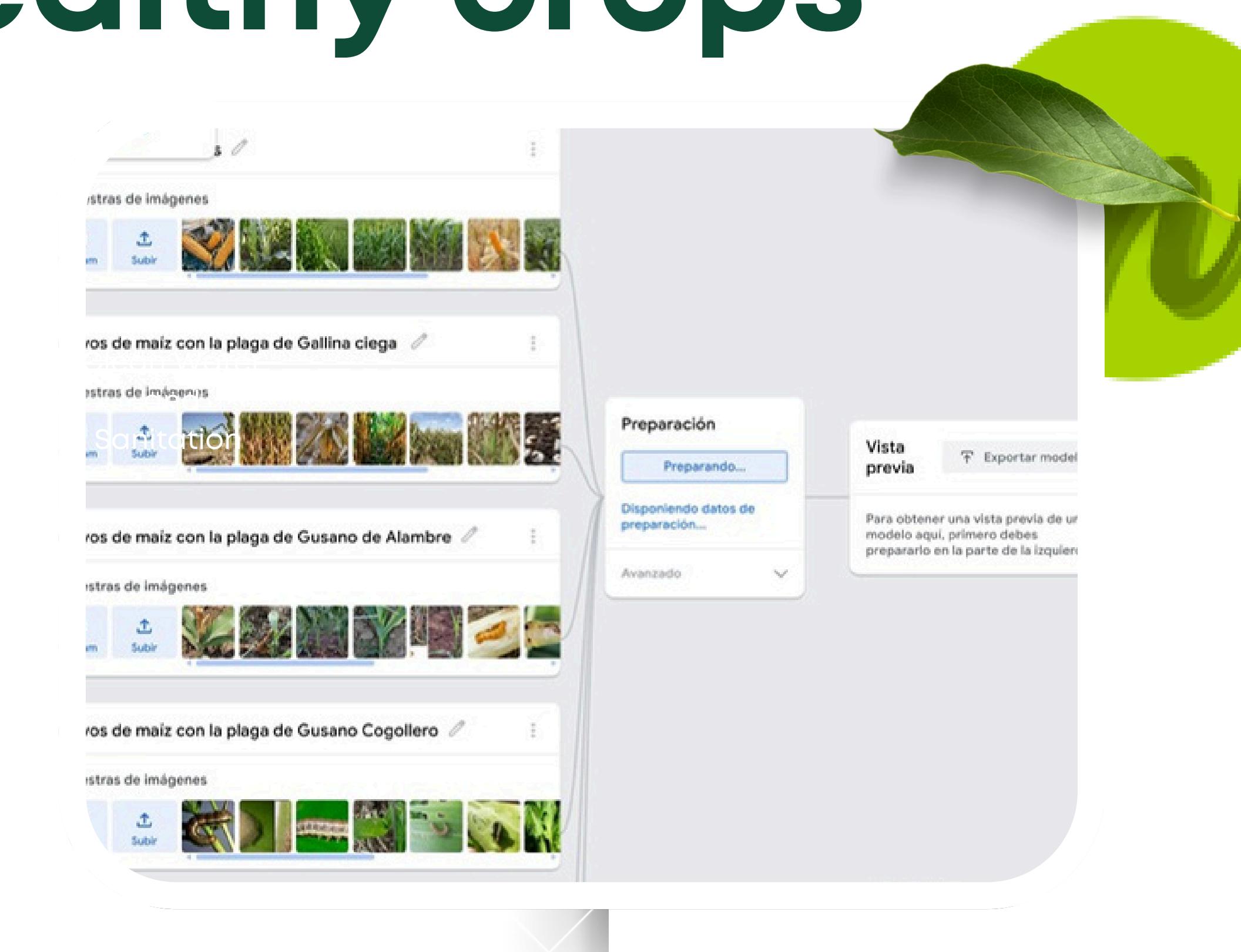
**Data Processing:** When a user selects a polygon, the application requests the data from GEE, which calculates various Vegetation Indices (like NDVI, NDWI) to analyze the health and density of vegetation. The results are then rendered as an analytical layer directly on the map.



# Additional features Identifies healthy crops

First, our AI trains on thousands of categorized satellite images. It learns the unique color and texture patterns of crop health, creating a predictive formula to differentiate conditions.

When analyzing your field, our model compares the new image to learned patterns. It then delivers a precise diagnosis with a confidence score, enabling targeted and data-driven action.



# Pollen Distribution Prediction

Our tool provides pollen predictive capabilities, being able to estimate pollen densities distributions by using NASA's meteorological data alongside Eulerian and Langrangian transportation models,



Pollen Prediction



Retrieve historical data



Differentiate between  
pollen sources



Generate animations



GeoPoli

