BloomBridge

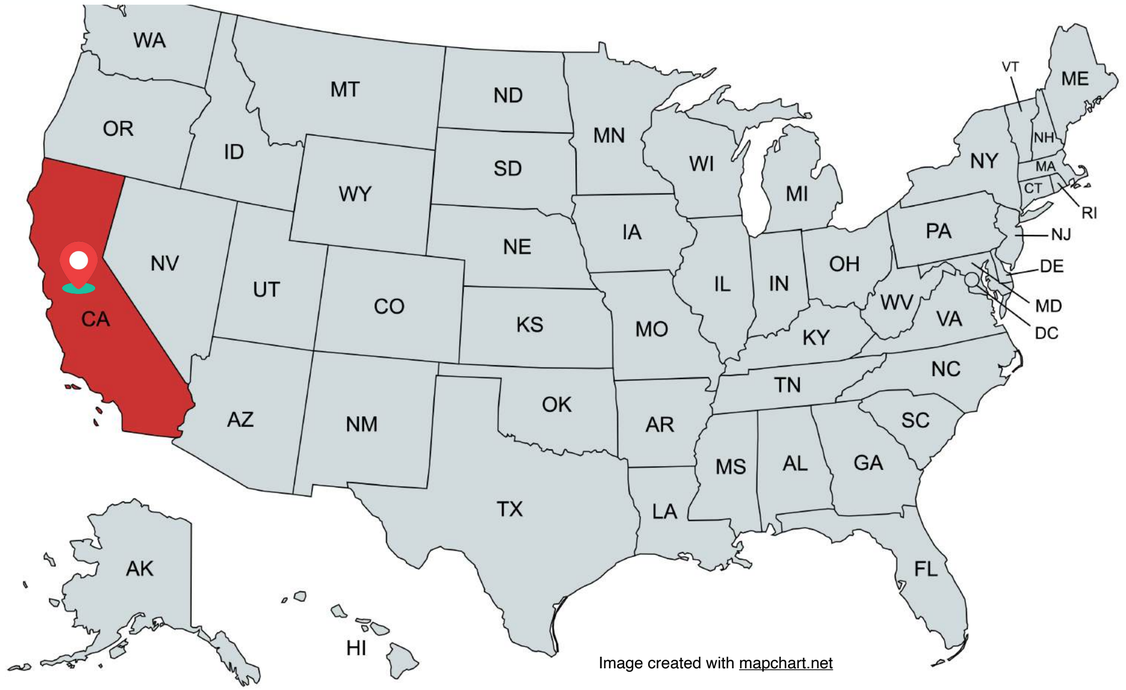
Intuitive blooming maps for Farmers

BloomBridge Team, 2025 NASA Space Apps Challenge

Climate change is disrupting flowering cycles — a critical phase for crops and vineyards

1.8M farmers in US

62.5K farmers in California



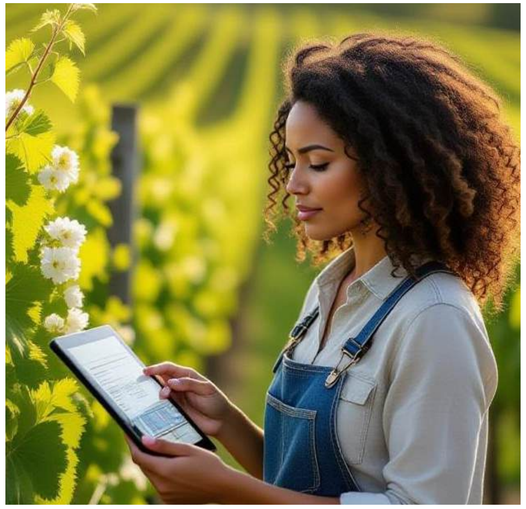
$362.4 B Agricultural Production Value 2023*

* https://www.fao.org/statistics/highlights-archive/highlights-detail/gross-domestic-product-and-agriculture-value-added-2014-2023/

John Farmer

Disrupted synchronization between flowering and pollinator activity may reduce almond yields by 10–20%**

When will it bloom?



Jennifer Winemaker

Shifts in bloom timing are impacting grape quality and yields in Napa Valley*

* Climate change forcing Napa vintners to make hard choices (Source https://krcb.org)

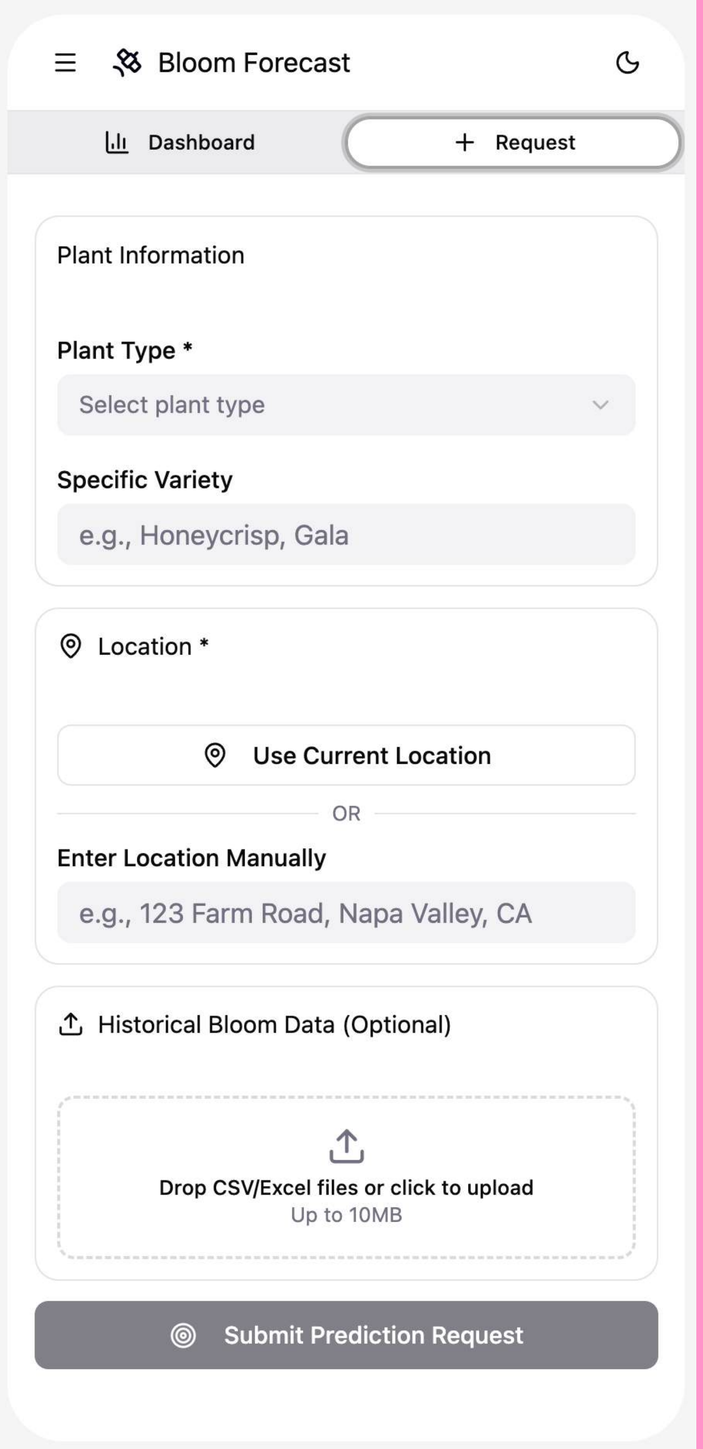
** Almond Board of California (Annual Report 2023), UC Davis Agricultural Extension (2022), USDA NASS Crop Report (2024).

Farmers need a simple tool to plan dates and locations

Mar ?, 2026

Apr ??, 2026

May ?, 2026

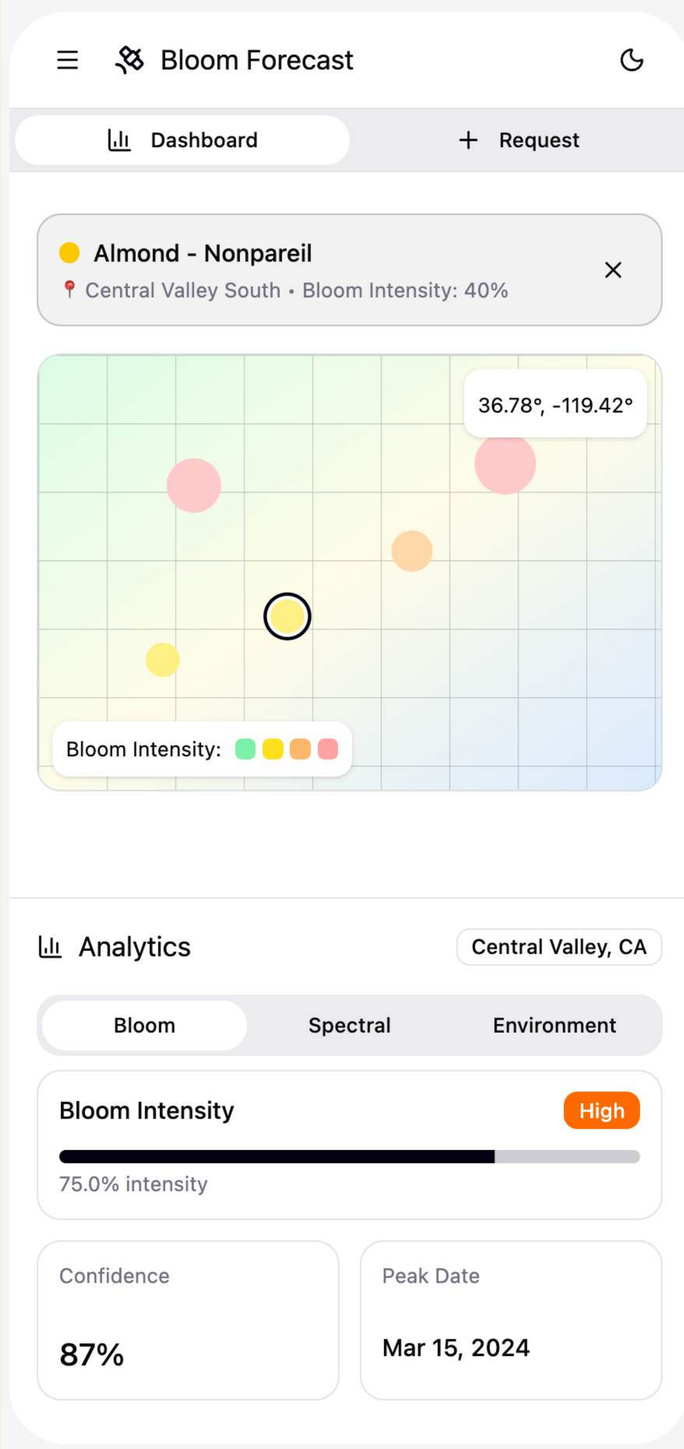


BloomBridge User App UI

Farmer enters **plant name**, **location** and optionally drops own historical phonology data

BloomBridge User App UI

Farmer gets **bloom Intensity probability with time period for** entered **locations**



BloomBridge Backend PoC

For NEON * datasets records with blooming dates and locations gets EMIT L2A RFL satellite imagery granules from NASA LP DAAC ** and turns them into analytical layers with calculation of spectral indices*** used for blooming detection algorithms.

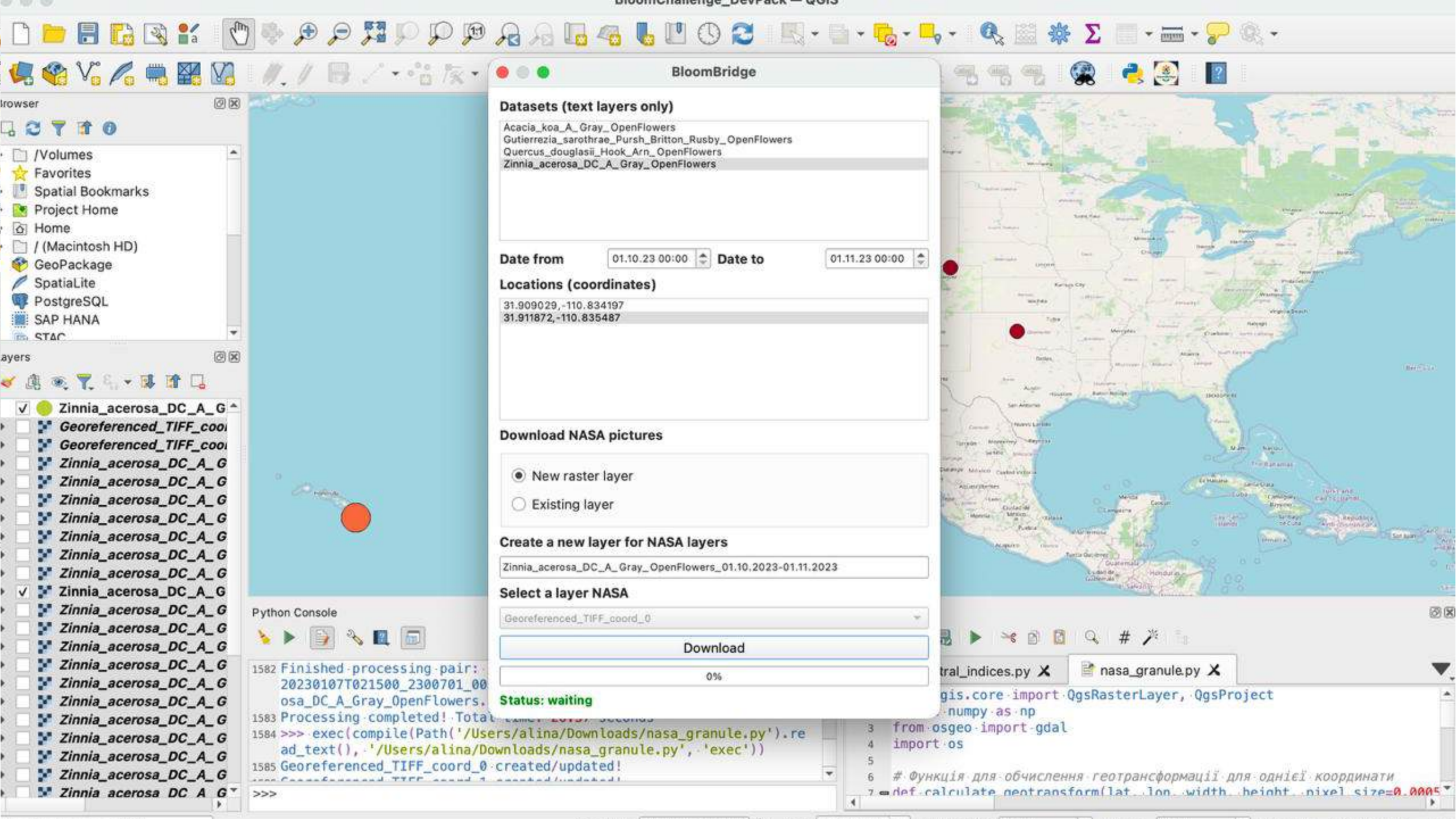
Key Tech Stack

* https://data.neonscience.org/data-products/DP1.10055.001

NEON (National Ecological Observatory Network). Plant phenology observations (DP1.10055.001), provisional data. Dataset accessed from https://data.neonscience.org/data-products/DP1.10055.001 on October 5, 2025.

** https://www.earthdata.nasa.gov/centers/lp-daac

*** NDVI, PRI, ARI, CRI, EVI, FLI, REIP, mNDVI, mSR, Flower Fraction

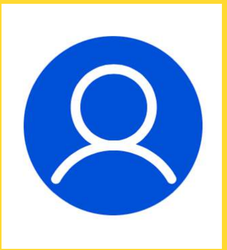

BloomBridge
Datasets (text layers only)
Acacia_koa_A_Gray_OpenFlowers
Gutierrezia_sarothrae_Pursh_Britton_Rusby_OpenFlowers
Quercus_douglasii_Hook_Arn_OpenFlowers
Zinnia_acerosa_DC_A_Gray_OpenFlowers
Date from
01.10.23 00:00
Date to
01.11.23 00:00
Locations (coordinates)
31.909029,-110.834197
31.911872,-110.835487
Download NASA pictures
New raster layer
Existing layer
Create a new layer for NASA layers
Zinnia_acerosa_DC_A_Gray_OpenFlowers_01.10.2023-01.11.2023
Select a layer NASA
Georeferenced_TIFF_coord_0
Download
0%
Status: waiting
Python Console
Finished processing pair:
20230107T021500_2300701_00
osa_DC_A_Gray_OpenFlowers.
Processing completed! Total
>>> exec(compile(Path('/Users/alina/Downloads/nasa_granule.py').re
ad_text(), '/Users/alina/Downloads/nasa_granule.py', 'exec'))
Georeferenced_TIFF_coord_0 created/updated!
>>>
nasa_granule.py
from osgeo import gdal
import os
# Функція для обчислення геотрансформації для однієї координати

BloomBridge Hackaton Team

Alina Kharchenko
Python Development
(QGIS)

Kirill Soshenkov
Python Development
(QGIS Plugin)

Alexander Yermolenko
Python Development
(Harmony API connector)



Vitaliy Konko
Team Lead
(Plugin + Connector)

Andriy Sabanskyy
PhD researcher, DNU
Project Lead

Kyrylo Holoborodko
Full professor, DNU
Ecology Consultant