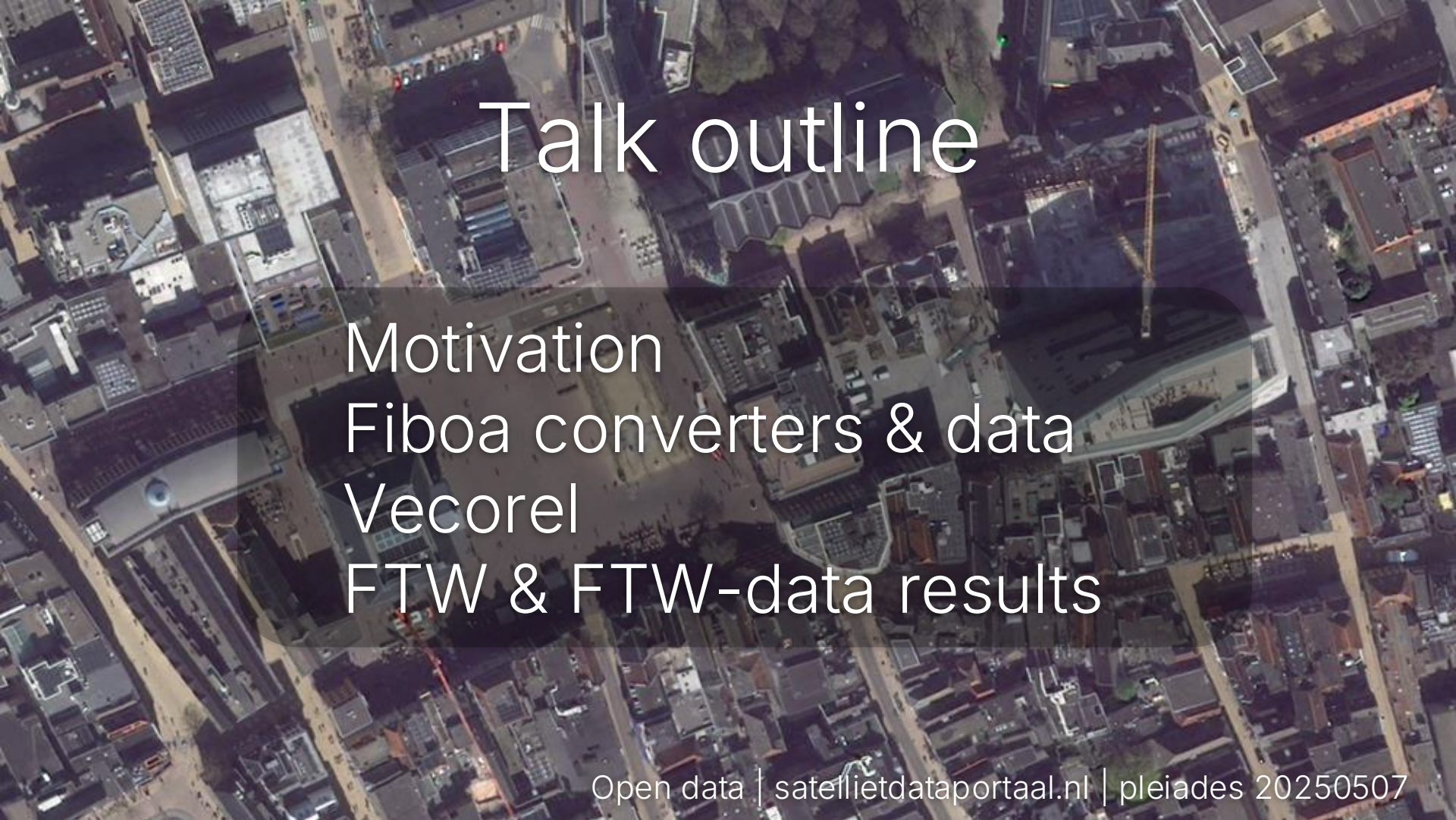


Field boundaries for agriculture

Ivor Bosloper
Taylor Geospatial



Foss4GNL 2026

An aerial photograph of a city street grid, likely in Amsterdam, showing a mix of residential and commercial buildings, streets, and green spaces. The image is used as a background for the presentation slides.

Talk outline

Motivation

Fiboa converters & data

Vecorel

FTW & FTW-data results

Fields of the World / Fiboa

 fiboa

Q Type ⁷ to search

Overview Repositories 23 Projects 2 Packages Teams People 18



Field Boundaries for Agriculture (fiboa)

An ecosystem of data schema specifications, tools and data for more interoperability between field boundaries and related agriculture & other data

124 followers United States of America <https://tgeengine.org>

Unfollow

README.md

Field Boundaries for Agriculture

About fiboa

The Field Boundaries for Agriculture (fiboa) specification is the concrete result to emerge from the Field Boundary Initiative, the first iteration of [Taylor Geospatial Engine's \(TGE\) Innovation Bridge Program](#). The TGE Field Boundary Initiative aims to enable practical applications of AI and computer vision to Earth observation imagery for a better understanding of global food security. The initiative has spurred collaboration between academia, industry, NGOs, and governmental organizations toward creating shared global field boundary datasets that can be used to create a more sustainable and equitable agriculture sector.

Key Features

The fiboa specification represents field boundary data in GeoJSON & GeoParquet in a standard way, with several optional 'extensions' that specify additional attributes. The core data schema of fiboa is quite simple - it is a set of definitions for attribute names and values. The number of attributes in the core is quite small by design. The idea is that most of the 'interesting' data about the field will be located in 'extensions'.

There will likely be lots of different types of extensions: some that are generally accepted as the main way to do things in fiboa and widely understood by tools and others that are very niche and not widely used but valuable to a small number of users (e.g. an extension specific to a company or organization to help them better validate their data).

View as: Public

You are viewing the README and pinned repositories as a public user.

People



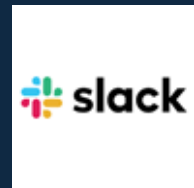
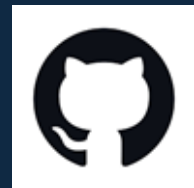
Top languages

JavaScript Python Jupyter Notebook

Most used topics

extension fiboa tooling crop-classification extensions

Manage



FIBOA Field Boundaries for Agriculture

- Many parties digitize field boundaries
- Fiboa enables data sharing & reuse
- Open Source & Open Data

Field boundaries



Copernicus Sentinel data (2018), [processed by ESA](#)

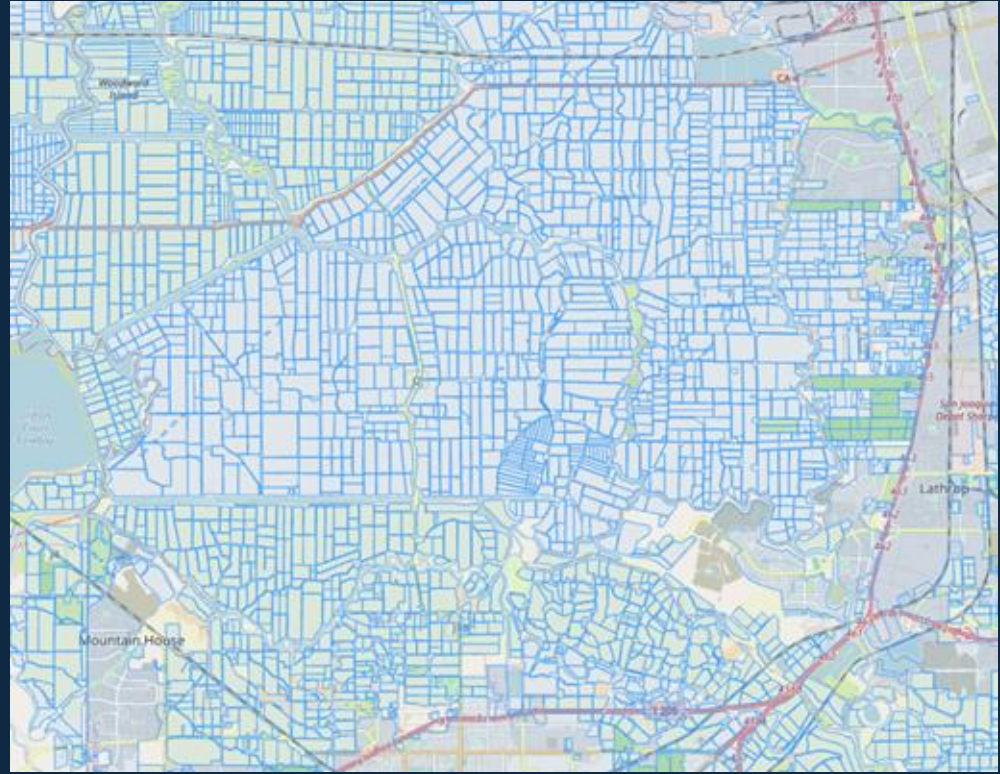


Basisregistratie Percelen PDOK / [boerenbunder.nl](#) (2024)

Field boundaries



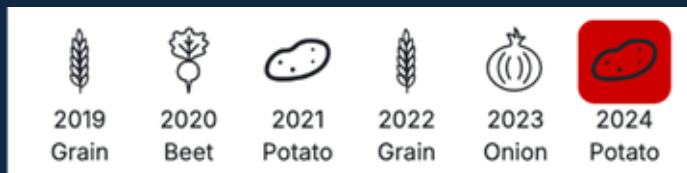
NASA, public domain (2006)



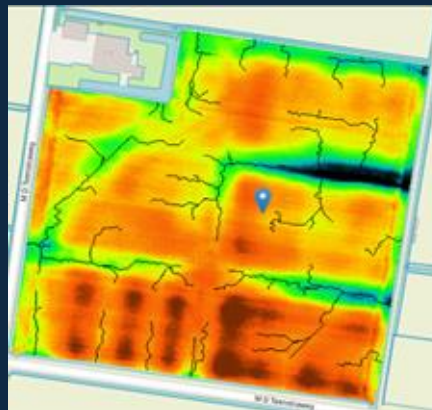
California Statewide Crop Mapping

Why are field boundaries relevant?

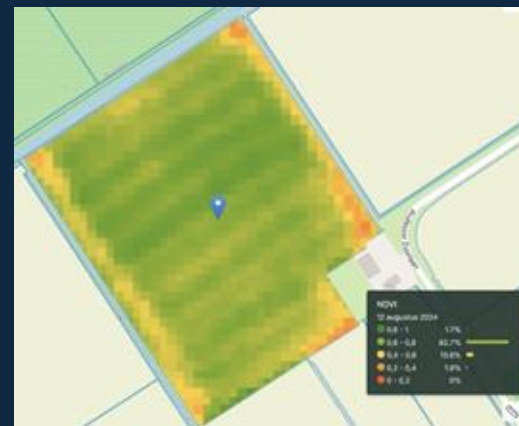
- Identify a field
- Spatial and temporal in-field analytics
- Regional statistics
- Overlay with GIS-data



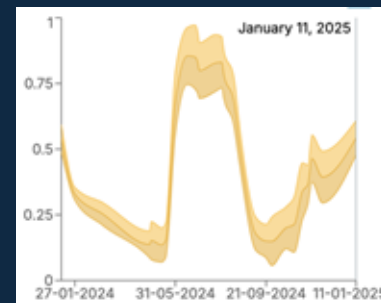
Crop rotation



Elevation model



Vegetation index



Different organizations digitize field boundaries

- Governments:
 - Census
 - Paying agency
 - Inspection service
- Farm Management
Solution providers
- Researchers
- Commercial
companies
- ...

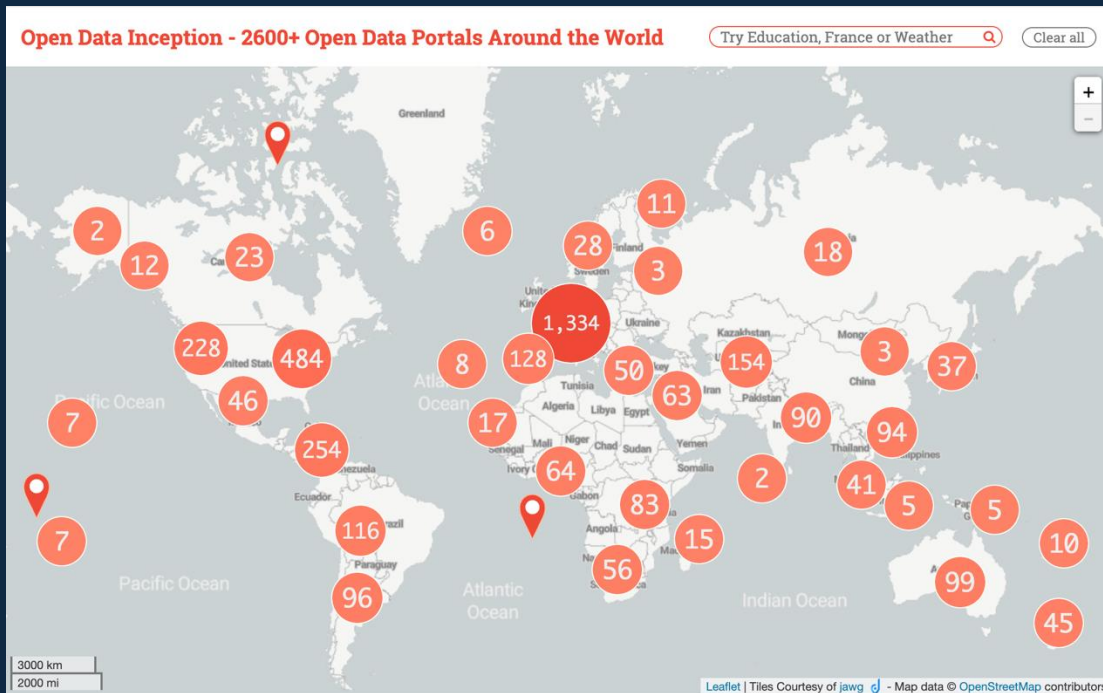
Field boundaries are shared on the web

- Governments:
 - Census
 - Paying agency
 - Inspection service
- Farm Management Solution providers
- Researchers
- Commercial companies
- ...



Using shared field boundaries is hard

- Where to find?
- Language
- Metadata (codes)
- Formats
- Projections
- Changes over time
- ...



<https://opendatainception.io/>

Fiboa and Vecorel

- Vecorel: CLI base for setting up Conversion project
- Vecorel Extensions (schema's)
- Fiboa extends Vecorel (CLI & schema's)

github.com/vecorel

**vecorel**

Q Type  to search

  |   |     

 **Overview**  Repositories **8**  Discussions  Projects  Packages  Teams  People **5**



Vector Core Language (Vecorel)

An ecosystem of data schema specifications and tools for more vector data interoperability

 **14** followers  United States of America  <https://tgengine.org>

[Unfollow](#)

README.md

Vector Core Language (Vecorel)

A generic and extensible way to describe geospatial vector data, with schemas for validation.

Please visit vecorel.org for more information.

 View as: **Public** 

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Top discussions this past month

Discussions are for sharing announcements, creating conversation in your community, answering questions, and more.

[Start a new discussion](#)

Pinned

 **specification** Public

A specification that describes important properties of geometries

 7

 **extension-template** Public template

A template for extensions

 2  1

 **sdl** Public

The schema definition language (SDL) for vecorel

 2  2

 **cli** Public

CLI for Vecorel (validation, inspection, schema and file creation)

 Python  1  1

People



Top languages

 Python  HTML

github.com/vecorel/specification

GeoParquet or GeoJSON Collection:

```
schemas: {"col": ["vecorel"]}
```

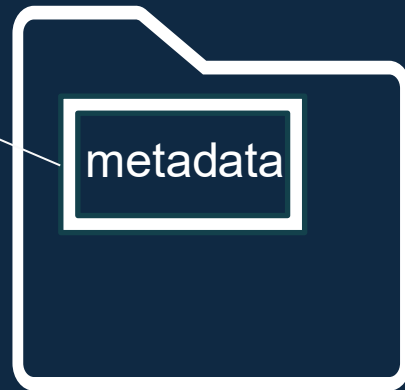
```
features: []
```

```
  collection: "col"
```

```
  id
```

```
  geometry
```

```
  bbox
```

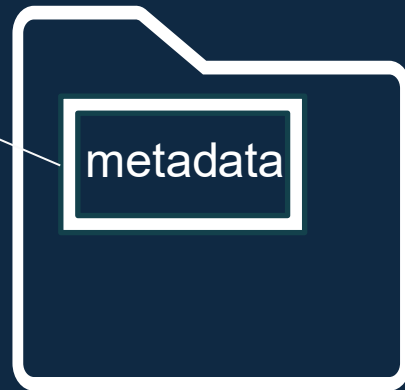


Geoparquet or
geojson file

github.com/ fiboa /crop-extension

GeoParquet or GeoJSON Collection:

```
schemas: {"col": ["vecorel", "crop_extension"]}]  
features: [  
  collection: "col"  
  id  
  geometry  
  bbox  
  crop:code_list  
  crop:code  
  crop:name
```



Geoparquet or
geojson file

fiboa.org/extensions

README

Apache-2.0 license

List of extensions

Title	Description
Administrative Division Extension	Administrative division on country and subdivision level based on ISO-3166
AI Ecosystem Extension	Extension for properties needed for fiboa to interface with AI ecosystem
Crop Extension	Identify crop codes and crop names from a custom codelist
Flik Extension	The area identifier (FLIK) is a 16-digit key to clearly identify field blocks and other entities, used mostly in Germany.
Hcat Extension	This Fiboa extension enables validation against the Hierarchical Crop and Agriculture Taxonomy (HCAT), which harmonizes all declared crops across the European Union.
Inspire Extension	Extension to define INSPIRE-compliant fields
Tillage Extension	Fiboa extension to describe tillage on a field
Timestamps Extension	Timestamps for the whole lifetime of field boundaries.

- Last updated: Jan 21 2025, 01:11
- Count: 8

github.com/vecorel/cli

```
import geopandas
```

```
# Simplified Version
```

```
class BaseConverter:
```

```
    def convert(self, **kwargs):
```

```
        urls = self.get_urls()
```

```
        paths = self.download_files(urls)
```

```
        gdf = geopandas.read_data(paths, **kwargs)
```

```
        # Run several migrations (hooks for subclasses)
```

```
        gdf = self.migrate(gdf)
```

```
        gdf = self.filter_rows(gdf)
```

```
        gdf = self.post_migrate(gdf)
```

```
        # Create output file
```

```
        create_parquet(gdf)
```

github.com/fiboa/cli

```
import geopandas
```

```
# Simplified Version
```

```
class BaseConverter:
```

```
    def convert(self, **kwargs):
```

```
        urls = self.get_urls()
```

```
        paths = self.download_files(urls)
```

```
        gdf = geopandas.read_parquet(paths)
```

```
        # Run several migrations
```

```
        gdf = self.migrate(gdf)
```

```
        gdf = self.filter_rows(gdf)
```

```
        gdf = self.post_migrate(gdf)
```

```
        # Create output file
```

```
        create_parquet(gdf, output_path)
```

```
class Converter(AdminConverterMixin, AddHCATMixin, FiboaBaseConverter):
    # see https://mze.gov.cz/public/app/eagriapp/lpisdata/
    url = "https://agris.gov.cz/portal/sharing/rest/content/items/7bcdda9b19724faba447585683c4cfd1/data"
    id = "cz"
    short_name = "Czech"
    title = "Field boundaries for Czech"
    description = "The cropfields of Czech (Plodina)"
    provider = "Czech Ministry of Agriculture (Ministr Zemědělství) <https://mze.gov.cz/public/portal/mze/farmer/LPIS>"
    license = "CC0-1.0"
    columns = {
        "geometry": "geometry",
        "ZAKRES_ID": "id",
        "DPB_ID": "block_id",
        "PLODINA_ID": "crop:code",
        "PLOD_NAZE": "crop:name",
        "ZAKRES_VYM": "metrics:area",
        "DATUM_REP": "determination:datetime",
    }
    column_migrations = {"DATUM_REP": lambda col: pd.to_datetime(col, format="%d.%m.%Y")}]
    ec_mapping_csv = "cz_2023.csv"
    missing_schemas = {
        "properties": {
            "block_id": {"type": "string"},
        }
    }
```

github.com/fiboa/cli

```
(fiboa) ivorbosloper@Ivor-MacBook cli % fiboa convert cz -o cz.parquet
Getting file(s) if not cached yet
- Reading layer GEOPROSTOR_ZADOSTI23_2024-08-01_epsg4258 into GeoDataFrame
...
Applying global migrations
Adding columns
Applying column migrations
Creating GeoParquet file: cz.parquet
Finished
```

Commands:

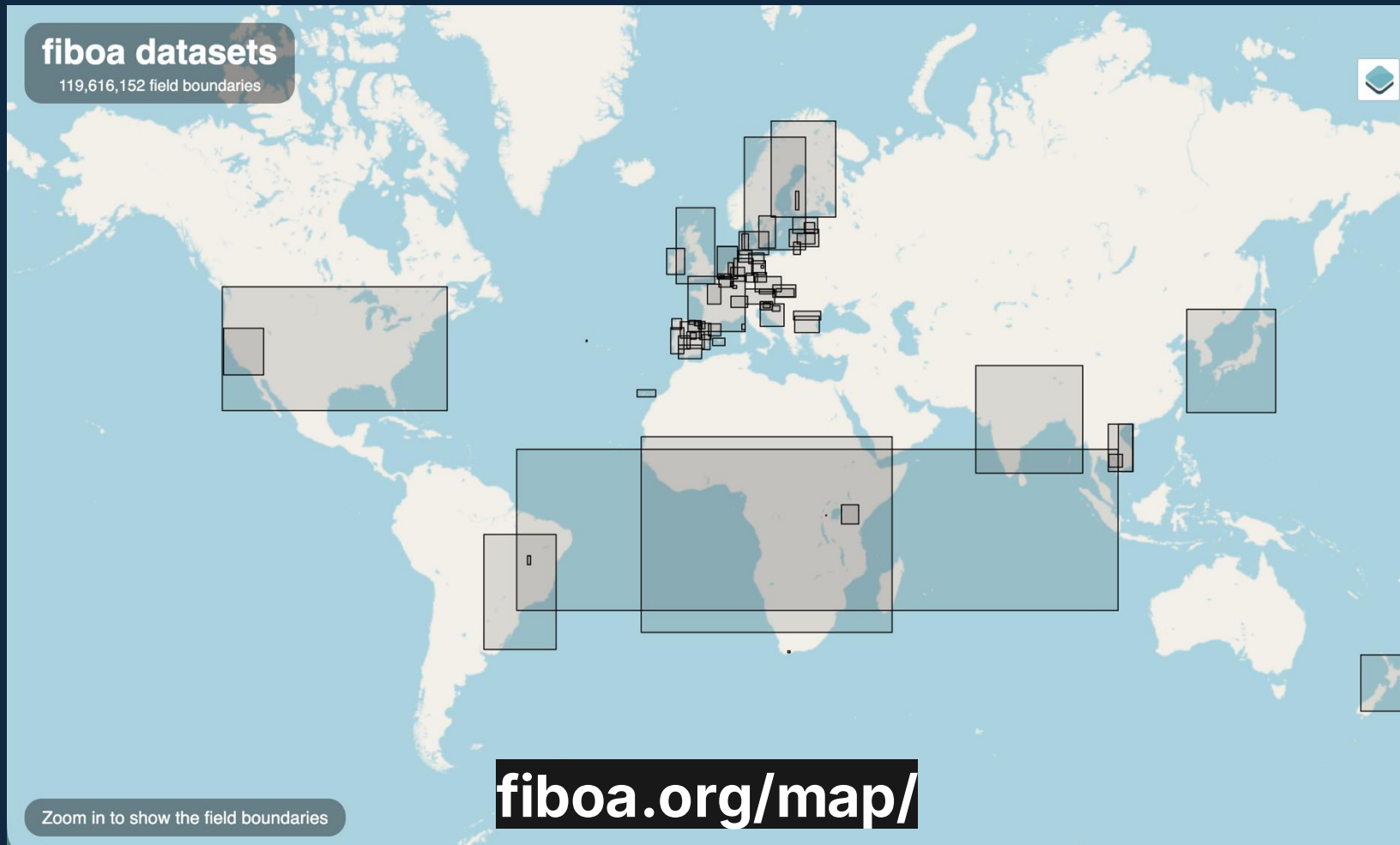
convert	Converts existing field boundary datasets to fiboa.
converters	Lists all available converters.
create-geojson	Create a fiboa GeoJSON file(s) from a fiboa...
create-geoparquet	Create a fiboa GeoParquet file from GeoJSON file(s).
describe	Inspects the content of a fiboa GeoParquet file.
improve	"Improves" a fiboa GeoParquet file according to the...
jsonschema	Create a JSON Schema for a fiboa Schema
merge	Merges multiple fiboa datasets to a combined fiboa...
rename-extension	Updates placeholders in an extension folder to the...
validate	Validates a fiboa GeoParquet or GeoJSON file.
validate-schema	Validates a fiboa schema file.

github.com/fiboa/cli

```
[(fiboa) ivorbosloper@MacBook-Pro-3 datasets % ls *.py
__init__.py      de_sax.py        es_cl.py         lacuna_labels.py
ai4sf.py         de_sh.py         es_cm.py         lt.py
at_block.py      de_sl.py         es_cn.py         lu.py
at.py            de_th.py         es_ex.py         lv.py
be_vlg.py        digifarm.py      es_ga.py         nl_block.py
be_wal.py        dk.py            es_ib.py         nl.py
bg.py            ec_be_vlg.py     es_md.py         nz.py
br_ba_lem.py     ec_ee.py         es_nc.py         planet_afb.py
br_conab.py      ec_lt.py         es_pv.py         pt.py
ch.py            ec_lv.py         es_vc.py         se.py
cz.py            ec_nl_crop.py    es.py            si.py
de_bb_block.py   ec_ro.py         fi.py            sk.py
de_bb.py         ec_si.py         fr.py            template.py
de_by.py         ee.py            hr.py            us_ca_scm.py
de_mv.py         es_an.py         ie.py            us_usda_cropland.py
de_nds_block.py  es_ar.py         india_10k.py     varda.py
de_nds.py        es_cat.py        jecam.py
de_nrw.py        es_cb.py        jp.py
```

fiboa datasets

119,616,152 field boundaries

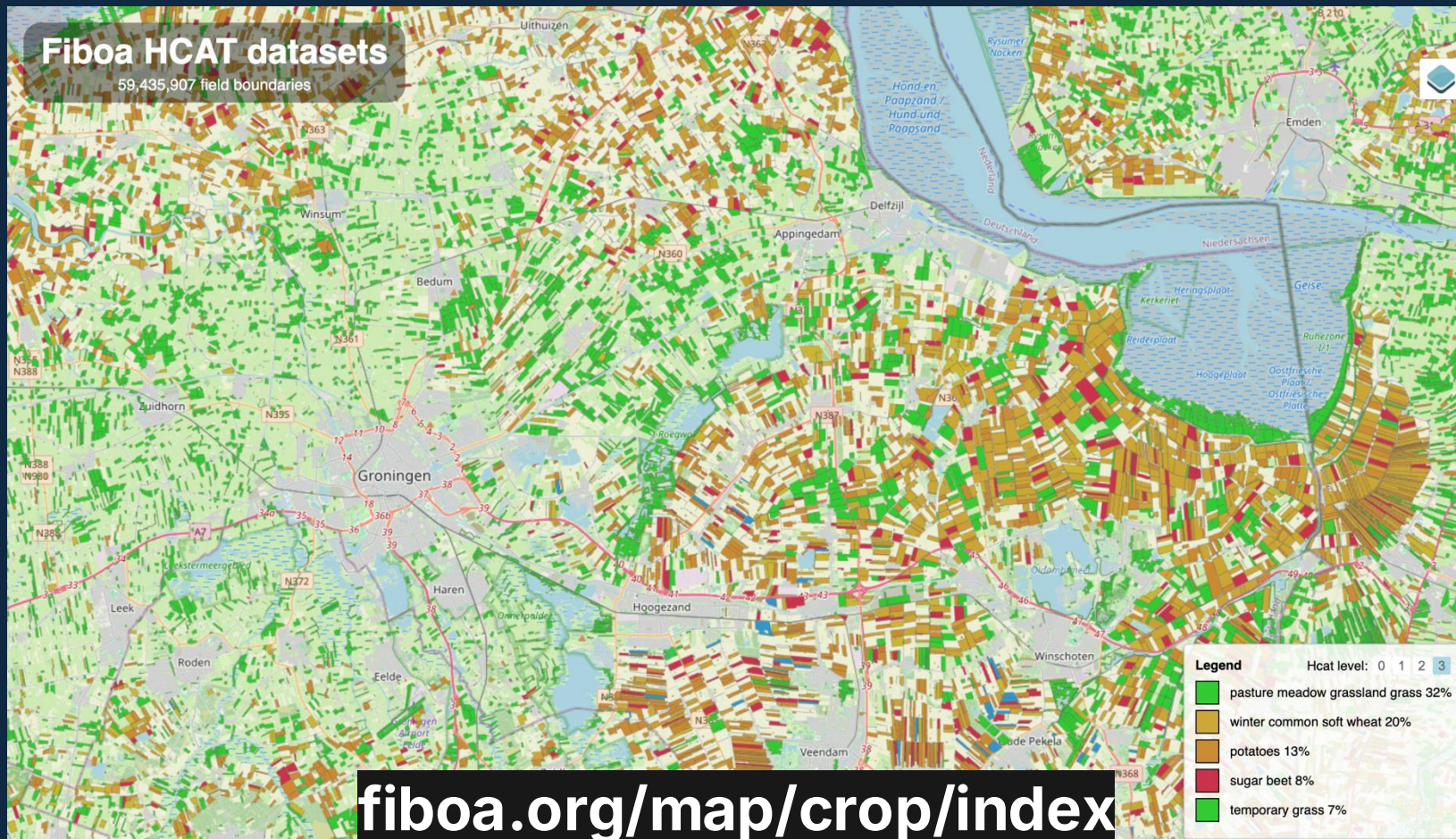


Zoom in to show the field boundaries

fiboa.org/map/

Fiboa HCAT datasets

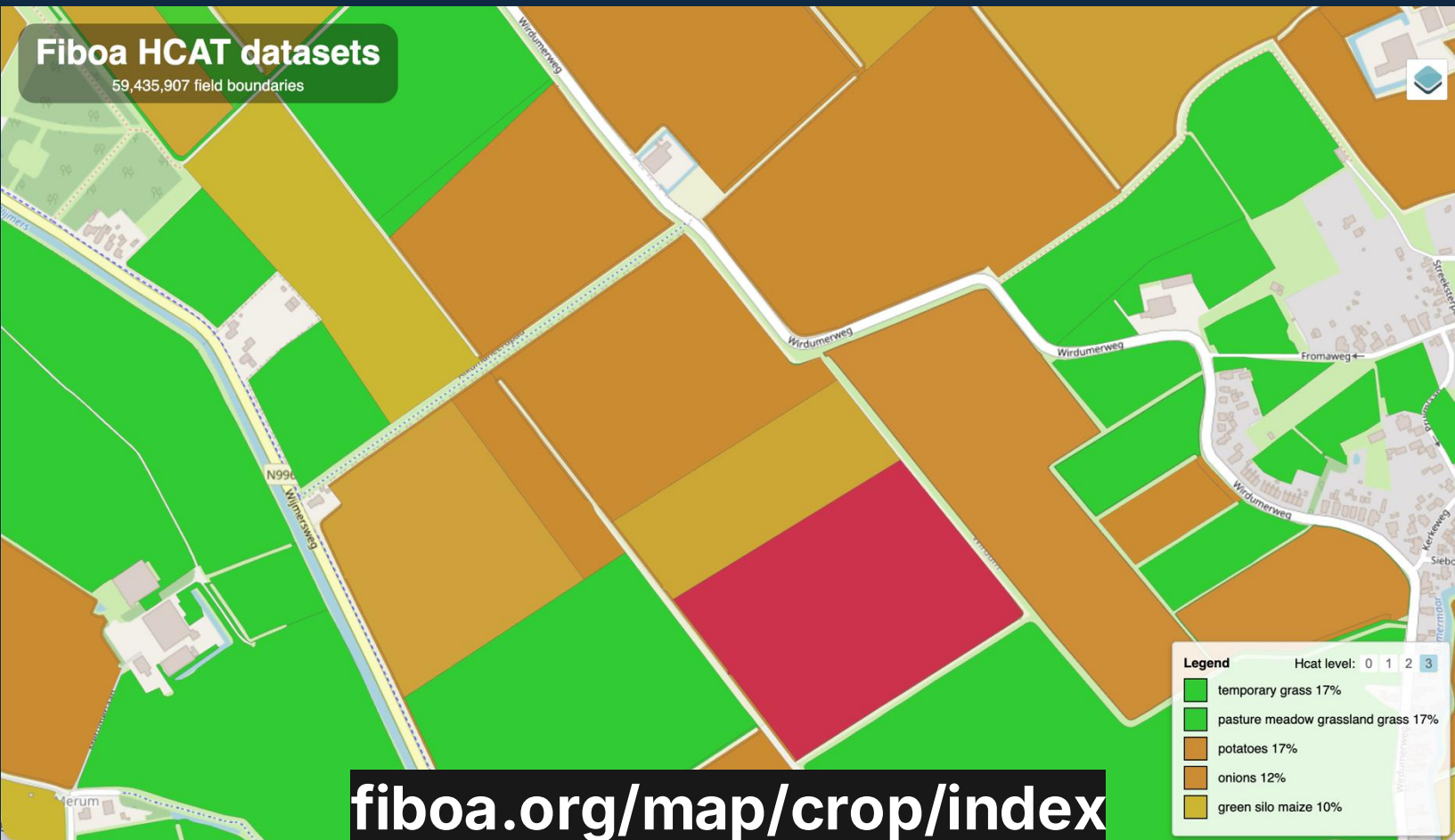
59,435,907 field boundaries



fiboa.org/map/crop/index

Fiboa HCAT datasets

59,435,907 field boundaries



Field Boundaries for Agriculture (fiboa)

- 📍 Somewhere on Planet Earth
- 📄 No Bio Provided

Repositories

Field boundaries for Cambodia and Vietnam (AI4SmallFarms)

The large-scale data set consists of 439,001 field polygons divided into 62 tiles of approximately 5x5 km distributed across Vietnam and Cambodia, covering a range of fields and diverse landscape types. The field polygons have been meticulously digitized from satellite images, following a rigorous m... [\[View More\]](#)

Provided By [@fiboa](#) • Published on August 13, 2024

[cambodia](#) [vietnam](#) [ml](#) [fiboa](#) [field boundaries](#) [geoparquet](#) [vector](#) [pmtiles](#)

Field boundaries for Austria

Provides ca. 1,300,000 official field boundaries for Austria. Converted from the INVEKOS Referenzen Österreich 2021 GeoPackage to a fiboa GeoParquet file. The layer includes all reference parcels ("Referenzparzellen") defined by the paying agency Agrarmarkt Austria and recorded landscape elements.

Provided By [@fiboa](#) • Published on April 12, 2024

[austria](#) [fiboa](#) [field boundaries](#) [invekös](#) [geoparquet](#) [vector](#) [pmtiles](#)

Crop field boundaries for Belgium - Flanders

Since 2020, the Department of Agriculture and Fisheries has been publishing a more extensive set of data related to agricultural use plots (from the 2008 campaign). From 2023, the downloadable dataset of agricultural use plots will also include the specialization given by the company (= company typo... [\[View More\]](#)

Provided By [@fiboa](#) • Published on August 13, 2024

[belgium](#) [flanders](#) [fiboa](#) [field boundaries](#) [geoparquet](#) [vector](#) [pmtiles](#)

Field boundaries for

The Crop Fields (PAA) are

source.coop/fiboa

Implementation of the Common



Fields
of The World

Mapping the world's agricultural fields at scale.

3.17B FIELD POLYGONS

241 COUNTRIES & TERRITORIES

10m RESOLUTION

2024-25 GLOBAL COVERAGE

A global field boundary ecosystem

Fields of The World (FTW) is an open ecosystem for agricultural field boundary detection — combining a global benchmark dataset, baseline ML models, inference tools, and web applications.

Most countries lack complete maps of their agricultural fields. FTW uses open Sentinel-2 satellite imagery and machine learning to detect and map field boundaries at scale.

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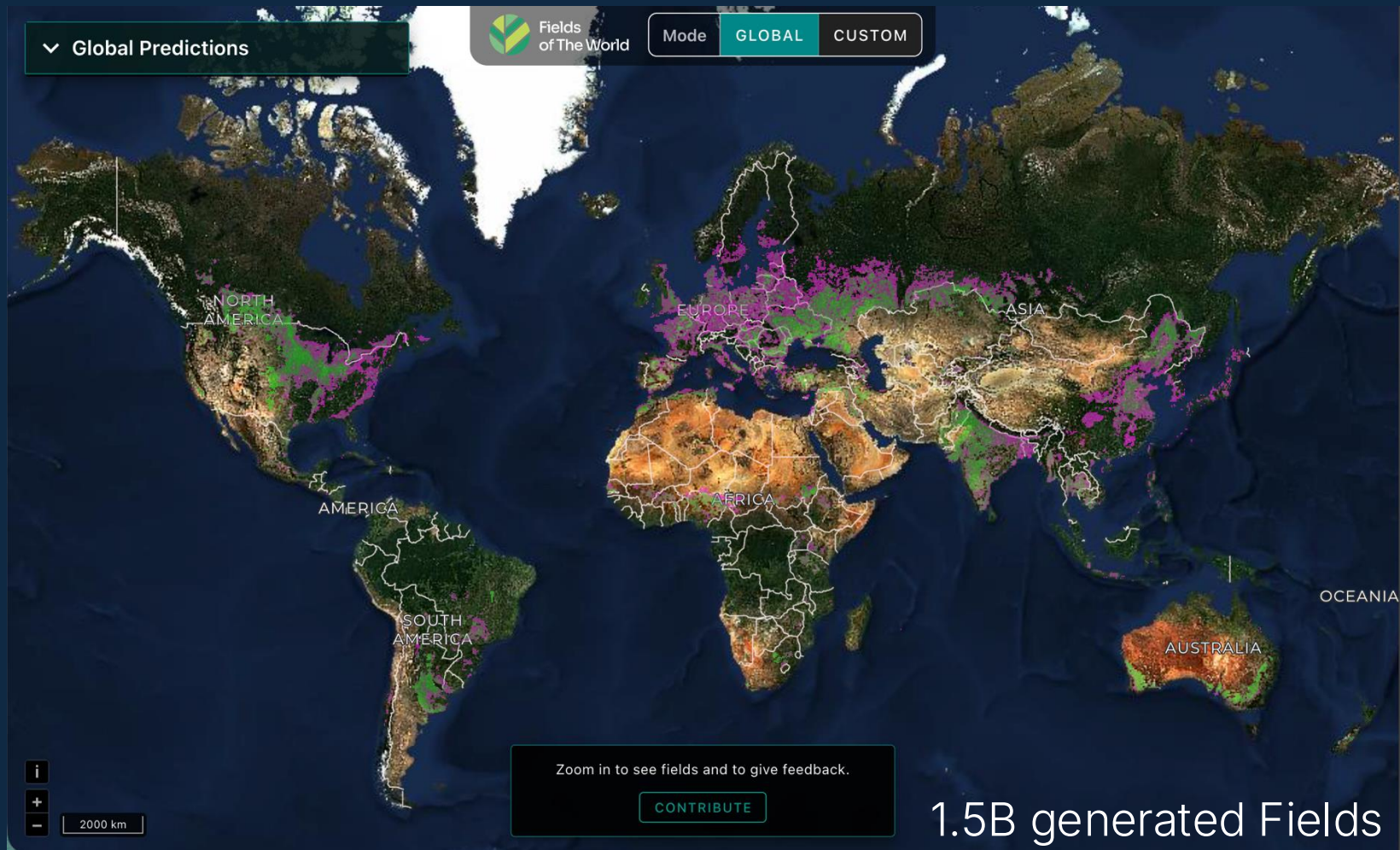
▼ Global Predictions



Mode

GLOBAL

CUSTOM



2000 km

Zoom in to see fields and to give feedback.

[CONTRIBUTE](#)

1.5B generated Fields

▼ Global Predictions



Mode

GLOBAL

CUSTOM



Zoom in to see fields and to give feedback.

CONTRIBUTE



200 km

▼ Global Predictions



Mode

GLOBAL

CUSTOM

Rate the Fields in this View

Poor

Acceptable

Good

CONTRIBUTE

SUBMIT



1000 m

▼ Global Predictions



Mode

GLOBAL

CUSTOM



50 m

Rate the Fields in this View



Poor

Acceptable

Good

CONTRIBUTE

SUBMIT

Thank You! Let's Connect.

fiboa.org / github.com/fiboa

vecorel.org / github.com/vecorel

fieldsofthe.world

source.coop/fiboa

Ivor Bosloper
Taylor Geospatial
ivorbosloper@gmail.com
linkedin.com/in/ivorbosloper/