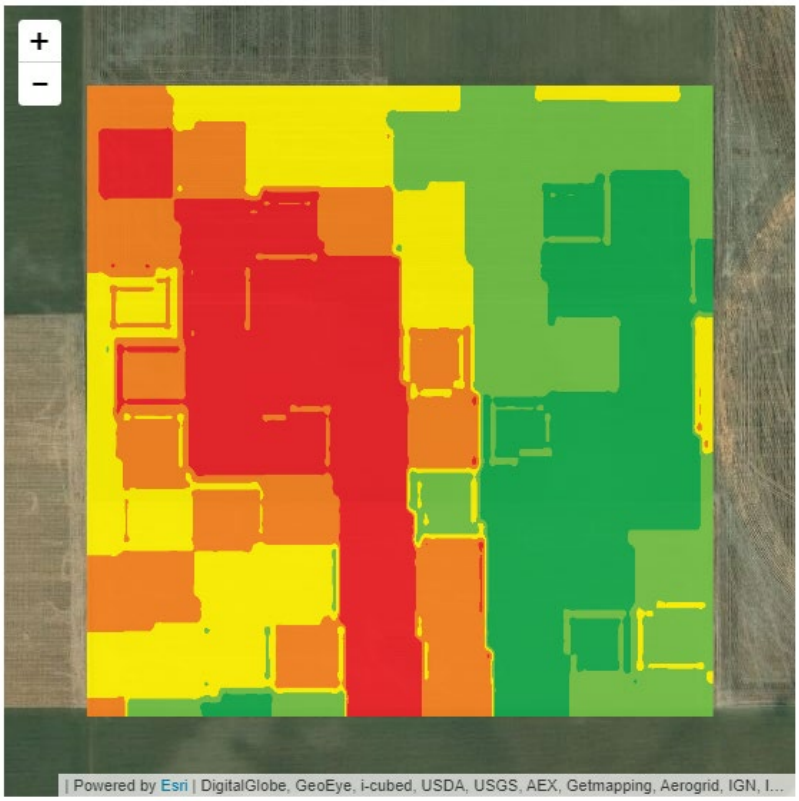
Ag-*Analytics*

Yield Model API Documentation

2019

Overview

The Ag-Analytics® Yield model API uses Artificial Intelligence algorithms to forecast the yield on a given field, based on geospatial data. The Yield Model API provides service by considering various factors like soil, vegetation index, location of the field, planting varieties to forecast the yield for a given geojson field.



Yield Model API, results represented in Ag-Analytics® FarmScope®.

API Specifications

Header Parameters

Execute Type: POST

content-type: "application/json"

Ocp-Apim-Subscription-Key: **Given upon purchase.**

This key is necessary to access the API and should be passed as a Header.

Request Parameters

MODELNAME (Type of Model, text, required): The type of AI Model
e.g. NeuralNetwork

VERSION (text, required): choose the version of model e.g. v1.1

SHAPE (GeoJson, text, required): The shape of a field in GeoJson format

{\"type\":\"Feature\",\"geometry\":{\"type\":\"Polygon\",\"coordinates\":[[[-89.199484,40.972729],[89.199773,40.97258],[-89.200135,40.972415],[-89.20034,40.972318],[-89.200445,40.972177],[89.200439,40.972001],[-89.200404,40.971815],[-89.200245,40.971599],[-89.20004,40.971397],[-89.199869,40.971233],[-89.199865,40.971097],[-89.199952,40.970952],[-89.200264,40.97078],[-89.200517,40.970664],[-89.200903,40.970471],[-89.201168,40.970345],[-89.201324,40.970277],[-89.201407,40.970174],[-89.201428,40.970042],[-89.20271,40.970005],[-89.202738,40.970421],[-89.202844,40.970431],[-89.202851,40.970648],[-89.203123,40.970666],[-89.203216,40.973626],[-89.20332,40.973635],[-89.203281,40.972154],[-89.203277,40.972049],[-89.203227,40.970607],[-89.204645,40.97055],[-89.204639,40.970427],[-89.205456,40.970446],[-89.205638,40.970467],[-89.206002,40.970527],[-89.206306,40.97059],[89.206516,40.970642],[-89.206711,40.97061],[-89.20688,40.970542],[-89.207086,40.970492],[89.207267,40.970414],[-89.207449,40.970364],[-89.207667,40.970286],[-89.207849,40.970255],[-89.208057,40.970251],[-89.208287,40.970328],[-89.208494,40.970369],[-89.208672,40.970421],[-89.208866,40.970506],[-89.208972,40.970511],[-89.209009,40.970595],[-89.20893,40.970671],[-89.208736,40.970787],[89.208535,40.970909],[-89.208325,40.971052],[-89.207907,40.971306],[-89.207633,40.971478],[-89.207313,40.971574],[-89.207065,40.971645],[-89.206566,40.971699],[-89.206246,40.971784],[-89.205998,40.971878],[-89.205548,40.972042],[-89.205013,40.97232],[-89.20468,40.972494],[-89.204246,40.972725],[-89.203988,40.972931],[-89.203819,40.973168],[-89.203666,40.973428],[-89.203616,40.973685],[-89.203552,40.973966],[-89.203548,40.9743],[-89.203411,40.974615],[-89.203284,40.974906],[-89.202723,40.975587],[-89.20283,40.975719],[-89.203383,40.975106],[-

ScalarVariables (Json, text, required): The constants for the given Shape

CropName_{cropname}(ScalarVariables,booleanInt,optional): Default 0 e.g.
CropName_CORN_WET:1 (key, value in ScalarVariables Json)

FIPSCode_{fipscodestate+county}(ScalarVariables,booleanInt,optional): Default 0 e.g.
FIPSCode_17123:1 (key, value in ScalarVariables Json)

GDD{month}(ScalarVariables,float,optional): The value of GDD for the particular month.
Default 0
e.g. GDD3:14.99 (key, value in ScalarVariables Json)

Precipitation{month}(ScalarVariables,float,optional): The value of precipitation for the particular month. Default 0.
a e.g. Precipitation3:140.99 (key, value in ScalarVariables Json)

N_rate(ScalarVariables,float,optional): The amount of nitrogen applied. Default 0 e.g. N_rate:20 (key, value in ScalarVariables Json)

N_date(ScalarVariables,int,optional): The day of year the nitrogen applied. Default 0

e.g. N_date:145 (key, value in ScalarVariables Json)

PlantingDay1(ScalarVariables,int,optional): The day of year the planting is done. Default 0

e.g. PlantingDay1:135 (key, value in ScalarVariables Json)

SeedingDensity(ScalarVariables,float,optional): The seeding density applied. Default 0

e.g. SeedingDensity:30000 (key, value in ScalarVariables Json)

Seeding_Variety1_{seedname}(ScalarVariables,text,optional): The seeding variety applied. Default 0

e.g. Seeding_Variety1_DKC:1 (key, value in ScalarVariables Json)

Response Parameters

raster_filename:

- URL to download result raster (.tif) file

rasterinfo.attributes.CellSize (resolution):

- Resolution of result Geotiff file in meters **rasterinfo.attributes.CoordinateSystem:**
- Coordinate System of the result raster

rasterinfo.attributes.Extent:

- Extents of the result raster

rasterinfo.attributes.Legend (list):

- Legend gives the following details for each range of values

i. Area: Area covered in percentage

ii. Count: number of pixels from the result raster in that range iii. CountAllPixels: total number of pixels in the result raster iv. Max: Maximum value in the range v. Min: Minimum value in the range vi. Mean: Mean value in the range

vii. color: Hexa color used for the range of values

rasterinfo.attributes.Matrix (list [rows, columns])

rasterinfo.attributes.Max (number): Maximum value from the result raster

rasterinfo.attributes.Min (number): Minimum value from the result raster

rasterinfo.attributes.Mean (number): Average value from the result raster **rasterinfo.attributes.Percentile5 (number):** 5th percentile value from result raster

rasterinfo.attributes.Percentile95 (number): 95th percentile value from result raster

rasterinfo.attributes.pngb64(link): base64png image of the result raster with legend entries

Example Request/Response

Request


```
{
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  "SHAPE": "{\"type\":\"Feature\",\"geometry\":{\"type\":\"Polygon\",\"coordinates\":[[[-
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  "ScalarVariables": {
    "CropName_CORN_WET": 1,
    "CropSeason": "2018",
    "FIPSCode_17123": 1,
    "GDD3": 0.4095000000000013,
    "GDD4": 44.784000000000006,
"GDD5": 602.3079,
    "GDD6": 712.3140000000001,
    "N_date": 455,
    "N_rate": "150",
    "PlantingDay1": 485,
    "Precipitation3": 69.03,
    "Precipitation4": 40.006,
    "Precipitation5": 106.593,
    "Precipitation6": 159.028,
    "SeedingDensity": "30000",
    "Seeding_Variety1_": 1
  },
  "ShapeVariables": {},
  "VERSION": "v1.1"
}
```

Response


```
[
   {
      "raster_filename": "result_yieldraster_20190724_175317_1474.tif",
      "rasterinfo": [
         {
            "attributes": {
               "CellSize": [
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                  -0.0001
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               "CoordinateSystem": "GEOGCS[\"WGS 84\",DATUM[\"WGS_1984\",SPHEROID[\"WGS
84\",6378137,298.257223563,AUTHORITY[\"EPSG\",\"7030\"]],AUTHORITY[\"EPSG\",\"6326\"]],PRIM
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                     "Count": 3971,
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                  {
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                     "CountAllPixels": 6584,
                     "Max": 127.99435679117839,
                     "Mean": 127.9306755065918,
                     "Min": 127.8669942220052,
                     "color": "#ff6666"
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                  {
                     "Area": "4.21 %",
                     "Count": 277,
                     "CountAllPixels": 6584,
                     "Max": 128.12171936035156,
                     "Mean": 128.05803807576498,
                     "Min": 127.99435679117839,
                     "color": "#ffff66"
                  }
               ],
               "Matrix": [
                  74,
                  97
               ],
              "Max": 128.12171936035156,
              "Mean": 127.86298838391774,
 "Min": 127.73963165283203,
```

Citation

Users who use the Yield Model API in their Applications must use the button provided below.

Users who use in publications or data analysis must cite us in your publications as

"Yield Forecast obtained via analytics.ag (Woodard,2016a; Woodard, 2016b)" or similar with the following references:

1.) Woodard, J.D., “Big data and Ag-Analytics: an open source, open data platform for agricultural & environmental finance, insurance, and risk,” Agricultural Finance Review, (2016) 76(1):15-26.

2.) Woodard, J.D., “Data Science and Management for Large Scale Empirical Applications in Agricultural and Applied Economics Research,” Applied Economic Perspectives and Policy, (2016) 38(3): 373-388.

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