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Agrible, Inc.
2021 South First Street, Suite 201
Champaign, IL 61820

Hackathon Data Sources for Agricultural and Environmental Analyses

1. Overview

Attached are various links to data sources for the hackathon for AB InBev and Agrible. We have jointly been working with AB InBev on a Barley Quality Engine that leverages the types of

data used as base data for calculations in Agrible's Morning Farm Report direct to grower platform. (www.MorningFarmReport.com).

1.1 Site Locations

Raster and vector spatial data have been compiled for a number of areas. One area was Champaign County since one could drive out to see the actual locations during the timeframe of the hackathon. Data for Champaign, IL, the State of Illinois in general, AB InBev's research location in Fort Collins, CO, and areas of Idaho were compiled. Data are available from a number of different sources for any area of interest - feel free to use anything from anywhere. However, data transfer and compilation services have specifically been processed for certain locations to avoid data transport times from national data services, which often take minutes and hours to download and process data.

2. Data and Data Sources

2.1 Imagery Data

2.1.1 Agrible Raw Drone Imagery Data

Agrible collects drone imagery for crop analysis and technology evaluation. A mission was planned for a field location with severe greensnap of corn due to wind damage. These are the flight images, details, and software (windows only for the software to interact). Drone systems are very much pre-commercial for the Grower and usually involve a number of post processing steps to utilize these data. We have done a number of those steps already

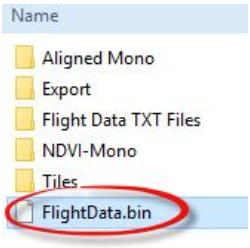
Greensnap Mission (08/26/2016)
NDVI Crop Copter Mission
https://www.dropbox.com/s/lr6frs5rxma28xq/Flight%20Data%20%28Week%3D1911%20TOW%3D136-47-43%29-20160913T110702Z.zip?dl=0

Phantom DJI Mission
https://www.dropbox.com/s/7c63rpbvllbkzut/DD_Rothermel_Field_H-20160913T111449Z.zip?dl=0

Greensnap Mission Available Orthomosaics from DroneDeploy
http://drdp.ly/rmXNVm
http://drdp.ly/6gvoGM

Crop Copter Mission Software (Not necessary to use the raw data, but it will show you the whole mission - Windows only)
https://www.dropbox.com/s/7yclw243za3uxmc/EZ%20Health%203.5%20Installer.msi?dl=0

After installation, launch and select the FlightData.bin



Video Footage (08/xx/2016)
Video was captured from various drone sources for various uses. It could be for technical or non-technical uses (for example for a quick animation for an app or for a commercial for marketing, etc). Soybeans were the primarily filmed crop both in overcast and non-overcast settings.

https://www.dropbox.com/sh/quxcjjjga1n9oqf/AAA-WFqOk3h5EYFAwCSgrN6sa?dl=0

2.1.2 Precisionhawk AB InBev Drone Imagery Data and Site Files

Precisionhawk flies military-type drones for image acquisition and have full-featured imagery analysis software (not free). These data were acquired over AB InBev's field trials in Fort Collins, CO.

https://www.dropbox.com/sh/y0plg2jf3vheyys/AAB23ewptdLFOFcIoAM6F8xVa?dl=0

2.1.3 Other Raw Satellite Imagery Data

Landsat
https://github.com/developmentseed/landsat-util
http://earthexplorer.usgs.gov/

2.1.4 Champaign NAIP Imagery Data

https://www.dropbox.com/sh/08rw0jg1pe80d7s/AADnhDkSZ1TlQnjF7R7BuHGCa?dl=0

2.1.5 Grain Image Analysis

Small files showcasing different kinds of grains for predicting plumpness of Barley. These are showcasing brown rice of different shapes.

https://www.dropbox.com/sh/b3nu6gfwain4x6y/AABApZ-RRPsapQvvBWyZR_q0a?dl=0

2.2 Soils Data

All Soils Data
https://www.dropbox.com/sh/6ribl9yy01up1u4/AACYF85-DvE_iThWZPkJ9WWoa?dl=0

2.3 Spatial Vector Data

Assorted Spatial data for Champaign and Illinois in General
https://www.dropbox.com/sh/jgfyxo8hzul6cpc/AABjpmITKX0POvAjEFFVsXu8a?dl=0
https://www.dropbox.com/sh/x30g6dla5qgoecb/AADw7WzIeIH1cgGq584aYA9fa?dl=0

Massive List of USGS Spatial Vector and Raster Data
http://water.usgs.gov/lookup/getgislist

2.4 Landuse Data

Cropland Data Layer by USDA NASS

Cropland data layer is processed for the CONUS. The last 3 years (2015-2013) are available at the following link:
https://www.dropbox.com/sh/o457wa6zq28utm4/AAAG_kZVOMnSSAOWRrxJPAXUa?dl=0

2.5 Terrain (Elevation) Data

LIDAR data were compiled for some areas. These data are very large even for small geographic areas.

Champaign LIDAR (11gb !)
https://www.dropbox.com/s/f35r7vtz7u7hnrr/champaign2008.zip?dl=0
Also
https://clearinghouse.isgs.illinois.edu/data/elevation/illinois-height-modernization-ilhmp-lidar-data

Champaign LIDAR LAS Point Cloud (This is an incredibly large file requiring software that can read LAS point cloud files. Something like PYLIDAR - 26 GB)
https://www.dropbox.com/s/ffxcu3zoumb5a1t/champaign-las.zip?dl=0
Also
https://clearinghouse.isgs.illinois.edu/data/elevation/illinois-height-modernization-ilhmp-lidar-data

Twin Falls Idaho Lidar (much smaller area including some irrigated fields and canyon that seems interesting)
https://www.dropbox.com/sh/3w2dnwglsdcqhan/AACaLiiR-aUOPggnCDVaQpcLa?dl=0

2.6 Meteorological Data

Meteorological data are available across the web. Here are some sources for these data.

AB InBev has contributed to the installation of some of these systems in key Barley areas - For example, Grace Station in Idaho. Link to Agrimet in the Pacific NW
http://www.usbr.gov/pn/agrimet/wxdata.html

PRISM - CONUS scale precipitation layers with 30 year normals. Data are available through anonymous FTP. They also have temperature and other variables.
http://www.prism.oregonstate.edu/documents/PRISM_downloads_FTP.pdf

2.7 Agricultural Field Data

Agrible Tractor Time Logistics
Available at the time of the event

Fort Collins Drought Study
See image data section above regarding Precision Hawk

3.0 Open Source Software Useful for Analysis or Display

QGIS
ORFEO Toolbox
OGR
GDAL
Python
R
OpenCV
Google Earth
http://leafletjs.com/

4.0 Closed Source Software Available to University Students

ArcGIS (Gridded Soil Data Are Available and in an ESRI ARCGIS format - other spatial data are there too in non-gridded form)