All the horseweed data and relevant files are under directory H:\pollen\_data\horseweed\

H:\pollen\_data\horseweed\TN\ for Tennessee.

H:\pollen\_data\horseweed\TN\final\_data\: pollen raw data (pollen counts on rotorod and depsoition slides, date information is in file names; time information in the files; location information is in the files). Deposition data are counted using 8-line method, concentration are counted using 1-line method (see Rongjian Ye’s explanation file about the counting methods (explain.docx in the same folder)).

H:\pollen\_data\horseweed\TN\final\_data-Copy\: the original pollen raw data provided by Rongjian Ye, the difference between this directory and ~\final\_data\ is there may be some mistakes in date and time records, some end times are 13am or 14am. This directory is given by Ye, I do not change it, just for back up.

H:\pollen\_data\horseweed\TN\pollen\pollen\: the first version of pollen raw data, incomplete, only from 20130813-20130927, the deposition data are counted using 8-point method.

H:\pollen\_data\horseweed\TN\pollen\_8line\: raw data of pollen deposition, 8-line method.

H:\pollen\_data\horseweed\TN\seed\: seed raw data.

H:\pollen\_data\horseweed\TN\wind\: TN meteorological data.

H:\pollen\_data\horseweed\TN\wind\2013 TN-field wind data\10hz\: 10Hz sonic measurements.

H:\pollen\_data\horseweed\TN\wind\\*2013\*INFO1: 1-min sonic measurements. “.dat” is the 10 Hz raw wind data (U V W TS);date and time information is in the files.

H:\pollen\_data\horseweed\TN\wind\WEATHER\WEATHER: 10- min weather data, include temperature (F), wind speed (MPH) and direction , RH (%), solar radiation (W/m2)…etc.

The following is the complete measurements:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Temp | Hi | Low | Out | Dew | Wind | Wind | Wind | Hi | Hi | Wind | Heat | THW | THSW |  |  | Rain | Solar | Solar | Hi Solar | UV | UV | Hi | Heat | Cool | In | In | In | In | In | In Air |  | Wind | Wind | ISS | Arc. |
| Date | Time | Out | Temp | Temp | Hum | Pt. | Speed | Dir | Run | Speed | Dir | Chill | Index | Index | Index | Bar | Rain | Rate | Rad. | Energy | Rad. | Index | Dose | UV | D-D | D-D | Temp | Hum | Dew | Heat | EMC | Density | ET | Samp | Tx | Recept | Int. |

H:\pollen\_data\horseweed\TN\dailyratio.txt: pollen concentration data measured by an in-situ instrument, independent from the Roto-rod, ask Rongjian Ye for details.

H:\pollen\_data\horseweed\TN\rotor-RPM-2013. Xlsx: Roto-rod rotation speeds (unit, RPM).

H:\pollen\_data\horseweed\TN\idlcode\: idl codes and results of the data analysis.

H:\pollen\_data\horseweed\TN\idlcode\reount\_deposition.pdf: explains the main idea of the source strength and deposition calculation.

First the wind data (10 Hz) was tilt corrected <http://www.ceamflux.com/Docs/EddyPro3_User_Guide.pdf>. The tilt effect is corrected using the method given in <http://www.ceamflux.com/Docs/EddyPro3_User_Guide.pdf>. In the analysis, using 30-min interval, by doing this average vertical wind speed of each 30-min becomes zero. The idl code does the correction

C:\Program Files\Exelis\IDL82\lib\testtilt.pro

Second , concentration and deposition were calculated.

Third, source strength was calculated (Wang and Yang 2009, <http://rsetserver.sws.uiuc.edu/Geneflow/WangandYang2009SourceStrength.pdf>

).

H:\pollen\_data\horseweed\TN\idlcode\pollensourcestrength\_final\_data.pro:

Calculates source strength from deposition, concentration and wind speeds at different heights.

This code calls subroutine cal\_wind\_corrected.pro to get the tilt corrected wind speed at 2.6 m, as well as vertical wind speed, L, ustar, virtual temperature, wind components.

The difference between this version and ~\cal\_wind.pro is the ~\cal\_wind.pro does not do any correction and the results are from the files H:\pollen\_data\horseweed\TN\wind\2013\*\_INFO1.DAT, one-min average.

The routine also calls a subroutine vertical\_wind.pro: calculates wind speed at different heights. I think I gave Xiufen a C++ code which can do the same thing.

The rest of the routine (pollensourcestrength\_final\_data.pro)is to get deposition, concentration source strength using the method described in H:\pollen\_data\horseweed\TN\idlcode\reount\_deposition.pdf.

H:\pollen\_data\horseweed\IL: Illinois data.

H:\pollen\_data\horseweed\IL\ballon\ ballon\_latlon.txt: latitude and longitude where the balloons were tied to the ground, many lat/lon were guessed from logs, the lat and lon are used to calculate x, y values relative to the NE pole location.

H:\pollen\_data\horseweed\IL\ballon\ ballon\_with\_height\_dis.txt: balloon raw data with height and distance, some heights and distances were guessed from the data of other dates.

H:\pollen\_data\horseweed\IL\ballon\ ballon\_with\_height\_dis\_old.txt: same as the previous file, but the old version, incomplete.

H:\pollen\_data\horseweed\IL\ballon\sample.txt and ~\sample\_dis.txt: sample files for IDL reading code, useless if you do not use IDL.

H:\pollen\_data\horseweed\IL\cem\: deposition raw data collected from the tiles placed on the ground.

H:\pollen\_data\horseweed\IL\cem\cem\_new.txt: the most recent deposition raw data, grains were counted with two methods, 8-point(column J to Q) and 4-line (column R to U). Seems the 4-line is better, 8-point will end up with very big data.

H:\pollen\_data\horseweed\IL\pole\: edge pole raw data.

The seed data are calculated using the same way. The only difference is the counting method of the seed. The seed numbers are obtained from counting all the grains on the slides by eye.

H:\pollen\_data\horseweed\IL\idlcode\ for Illinois.

gapfilling\_pollen.pro

In Line 90 , ‘IL\_pollen.sav' is the pollen raw data read from excel file, it is in binary format only can be accessed by IDL.

The methods are the same as TN. The names of subroutines may have different names, but the principal is the same.

The wind data in IL is worse than TN, there was no 10hz wind data for many days, so the tilt correction was only for the dates with 10 Hz data. Lots of missing data in con and dep, so this code also does an interpolation to scale the con /dep.

This code also outputs the concentration and deposition, source strength, and meteorological parameters for the experimental periods, begintime and endtime. Those data are used to generate the correlation analysis, diurnal variation.

gapfilling\_seed.pro: same as gapfilling\_pollen.pro, but for seed

buck\_con\_seed.pro: scaling seed source strength using bucket measurements

contour\_ballon.pro: read balloon data for pollen, outputs the concentration at different heights and distances, and gets the matched meteorological parameters based on begin time and endtime.

Ballonseedresult.pro: seed data from balloon.

cem\_pollendata.pro : read and gets pollen deposition on tiles, the calculation method is the same as for pollen.

cem\_seeddata.pro: same as previous code, but for seed.

pole\_pollendata.pro: read and gets the con at edge pole