**Document Names**

The G-res documents are split into 7 different folders: dataSources, gresInputDataBasicPublic, gresInputDataBasicPublicLanduse, gresInputDataBasicPublicLanduseChem, gresOutputBasicPublic, gresOutputBasicPublicLanduse, gresOutputBasicPublicLanduseChem.

*dataSources*

The dataSources folder holds the documents that contain data that was used to fill in values in G-res.

*gresInputDataBasicPublic*

The gresInputDataBasicPublic folder holds files that can be imported into G-res and contain the following fields of information:

1. Reservoir Area (basic- from an excel data sheet in github)
2. Maximum Depth (basic- from an excel data sheet in github)
3. Reservoir Volume (basic- from an excel data sheet in github)
4. Mean Depth (basic- from an excel data sheet in github)
5. Littoral Area (basic- from an excel data sheet in github)
6. Average Monthly Temperature (publicly available)
7. Annual Wind Speed (publicly available)
8. Global Horizontal Irradiance (publicly available)

*gresInputDataBasicPublicLanduse*

The gresInputDataBasicPublicLanduse folder holds files that can be imported into G-res and contain all of the fields of information included in gresInputDataBasicPublic as well as:

1. Land Use Characteristics
2. Catchment Area
3. Latitude and Longitude of the Lake

*gresInputDataBasicPublicLanduseChem*

The gresInputDataBasicPublicLanduseChem folder holds files that can be imported into G-res and contain all of the fields of information included in gresInputDataBasicPublicLanduse as well as:

*gresOutputBasicPublic*

The gresOutputBasicPublic folder contains the G-res output information when the data from gresInputDataBasicPublic is imported.

*gresOutputBasicPublicLanduse*

The gresOutputBasicPublicLanduse folder contains the G-res output information when the data from gresInputDataBasicPublicLanduse is imported.

*gresOutputBasicPublicLanduseChem*

The gresOutputBasicPublicLanduseChem folder contains the G-res output information when the data from gresInputDataBasicPublicLanduseChem is imported.

**Input Variable Information**

*Basic:*

*Excel Data:* If you input the Basic data (from the dataForGres excel file in jbeaulie/gres github), G-res calculates 0 values for Emission Rate (tCO2e/yr) of which CH4 and Emission Rate (gCO2e/m2/yr) and Emission Rate (gCO2e/m2/yr) of which CH4. It does not make calculations for the “Relative contribution to CH4 Post-Impoundment Emissions” section (which includes “Fraction of CH4 diffusive flux from Total Reservoir CH4 Emission (%)”, “Fraction of Degassing of CH4 from Total Reservoir CH4 Emissions (%)”, and “Fraction of Bubbling of CH4 from Total Reservoir CH4 Emission (%)”.

*Publicly Available:*

*Temperature Data:* If you input Temperature data into G-res, it calculates nonzero values for the fields listed above. However, they seem to be off and it calculates the “Relative contribution to CH4 Post-Impoundment Emissions” to be 100% diffusive flux and 0% bubbling.

*Wind Data:* If you input wind data into G-res, it does not change the numbers calculated from the excel and temperature data, but it does allow G-res to calculate the thermocline. G-res does not seem to be very sensitive to this value.

*Mean Global Horizontal Irradiance Data:* If you input mean global horizontal irradiance data into G-res, it calculates different numbers than it did just using the variables mentioned above (excel, temperature, wind). It also calculates the “Relative contribution to CH4 Post-Impoundment Emissions” as nonzero values for both diffusive flux and bubbling. Without water level data (and thermocline data), G-res considers degassing to be 0%.

*Land Use:*

*Land Use Data:* If you input land use data, the reservoir GHG output calculations do not change from the values calculated using excel and publicly available data.

**G-res Variable Notes**

*Sensitivity Tests*

Mean global horizontal irradiance: sensitive to small changes. This variable is important in determining relative contribution of ebullition.

Annual wind speed: not sensitive to small changes. This variable is important in determining the thermocline.

*Sources*

<https://windexchange.energy.gov/maps-data/215> (wind map of Ohio)

<http://w2.weather.gov/climate/index.php?wfo=iln> (National Weather Service has wind data)

<https://gis.ncdc.noaa.gov/maps/clim/> (temperature data)

<https://www.nrel.gov/gis/data.html> (global horizontal radiance data)

<https://www.ncdc.noaa.gov/cdo-web/datasets> (possible wind 🡺 Local Climatological Data 🡺 Mapping tool 🡺 <https://gis.ncdc.noaa.gov/maps/ncei/lcd>

\*\*Note: when you use the wind data from the wind sources listed and use the equation given my G-res in the user guide to calculate the wind at 10m, the numbers come out weird.

*Other Notes*

Land Use: in the ohio2016SampleFrameTable.xls file, the variable names and what they translate to in G-res are:

|  |  |  |
| --- | --- | --- |
| **Excel Variable Name** | **Translation** | **G-res Variable Name** |
| watershed\_ | Watershed area in m2 | Catchment Area (km2) |
| Percent\_op | Percent open water | Water Bodies (%) |
| Percent\_ur | Percent urban | Settlements (%) |
| Percent\_we | Percent wetland | Wetlands (%) |
| Percent\_gr | Percent grasslands | Grassland/Shrubland (%) |
| Percent\_ag | Percent agriculture (percent\_pa + percent\_cu = percent pasture + percent cultivated = percent\_ag) | Croplands (%) |