**ISOTOPE DATA META FILE**
This file describes the instrumentation, field setup, and quality control procedures associated with the isotope data collected for 2003 and 2004 at the University of Minnesota, Rosemount Research Experiment Station (UMORE Park) located near St. Paul Minnesota.

Metafile Created: April 28, 2006
Metafile Updated: April 28, 2006
Metafile Updated: March 1, 2007 (added 2004 data details)
Isotope Raw Data Files First Posting: April 28, 2006

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**Investigators**
Please direct all questions, comments, or errors related to these data to:

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**Site Location and Description**
Rosemount Research and Outreach Center (RROC), Upper Midwest, St. Paul, Minnesota

Site G21 Conventional Management of Corn-Soybean Rotation
Note that 2003 was a corn year and 2004 was a soybean year

**RROC Station Coordinates**
Latitude 44º 42' Longitude 93º 05'
Met Tower G21: 44º 42' 51.50931" 93º 05' 23.43557" 259.7385 m

**Key Reference Papers**

"Determining Carbon Isotope Signatures from Micrometeorological Measurements: Implications for Studying Biosphere-Atmosphere Exchange Processes" **T.J. Griffis**, J. Zhang, J.M. Baker, N. Kljun, and K. Billmark. (*Boundary-Layer Meteorology*, 2007, DOI: 10.1007/s10546-006-9143-8)

"Using Continuous Stable Isotope Measurements to Partition Net Ecosystem $CO_2$ Exchange" J. Zhang, **T.J. Griffis** and J.M. Baker, (*Plant, Cell and Environment*, 2006, 29: 483-496)

"Seasonal Variation and Partitioning of Ecosystem Respiration in a Southern Boreal Aspen Forest" **T. J. Griffis**, T. A. Black, D. Gaumont-Guay, G. Drewitt, K. Morgenstern, Z. Nesic, A. Barr and N. Kljun (*Agricultural and Forest Meteorology*, 2004, 125: 207-223)

"Measuring Field-Scale Isotopic $CO_2$ Fluxes with Tunable Diode Laser Absorption Spectroscopy and Micrometeorological Techniques" **T.J. Griffis**, J.M. Baker, S. Sargent B. Tanner and J. Zhang (*Agricultural and Forest Meteorology*, 2004, 124: 15-29)

**Isotope Variables and Data Structure**

**Year 2003/Corn Canopy**
There are currently 5 variables contained within a comma delimited array. This array represents our best measure/quality control of the tunable diode laser carbon isotope variables to date and is subject to revision. See dates above for recent updates concerning the data file and metadata.

The following data are provided without headers for field sites **G21**:

| Column | Variable | Units | Instrument | *Notes |
|---|---|---|---|---|
| 1 | DDOY | - | - | - |
| 2 | sample height (z1) | m | - | - |
| 3 | 13CO2 | ppm | TDL | - |
| 4 | C16O2 | ppm | TDL | - |
| 5 | $\delta^{13}CO_2$ | per mil | TDL | - |

**Instrumentation and Calculations**
*All heights provided above are relative to the ground surface

Isotopologue mixing ratios were measured using a two-minute measurement cycle on a tunable diode laser (TGA100, Campbell Scientific Inc.)

The inlet height above the canopy ($z_1$) was adjusted seasonally according to canopy height.

**Year 2004/Soybean Canopy**
There are currently 4 variables contained within a comma delimited array. This array represents our best measure/quality control of the tunable diode laser carbon isotope variables to date and is subject to revision. See dates above for recent updates concerning the data file and metadata.

The following data are provided without headers for field sites **G21**:

| Column | Variable | Units | Instrument | *Notes |
|---|---|---|---|---|
| 1 | DDOY | - | - | - |
| 2 | 13CO2 | ppm | TDL | - |
| 3 | C16O2 | ppm | TDL | - |
| 4 | $\delta^{13}CO_2$ | per mil | TDL | - |

**Instrumentation and Calculations**
* These variables were measured at 1.85 m above the height of the ground surface.

**Calibration Notes**

Isotopologue mixing ratios were calibrated using a two-minute measurement cycle with two-point gain and offset factors.

All working standards are traceable to NOAA-CMDL standards.

A detailed record of all calibration values used can be provided in a separate file upon request.

**Data Files Recently Posted**
G21isotopedata2003.txt April 28, 2006
G21isotopedata2004.txt March 1, 2007

**Basic Post-Processing**
A minimum amount of processing has been applied to these data. In general, extreme outliers in both the mixing ratio and isotope ratio data have been filtered and replaced with "NaN" values. Our post processing for isotopic flux calculations involves examination of pressure biases between valve manifolds and examination of gain and offset factors etc. For further information on post-processing please do not hesitate to contact us (tgriffis@umn.edu).