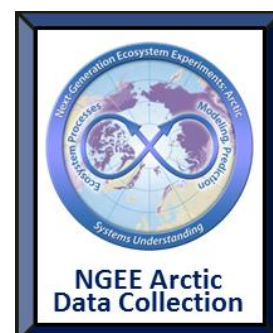


Inorganic Carbon Isotopes and Chemical Characterization of Watershed Drainages, Barrow, Alaska, 2013

Review and follow the current NGEE Data and Fair-Use Policies prior to using these data (<http://ngee-arctic.ornl.gov/content/ngee-arctic-data-management-policies-and-plans>).



Summary:

Data include results from geochemical and isotopic analyses for samples collected in Barrow, Alaska during July and September 2013. Samples were soil pore waters from 17 drainages that could be interlake (basins with polygonal terrain), different-aged drain thaw lake basins (young, medium, old, or ancient), or a combination of different aged basins. Samples taken in different drainage flow types at three different depths at each location in and around the Barrow Environmental Observatory. This dataset used in Throckmorton, et.al. 2015. Dataset doi: <http://dx.doi.org/10.5440/1221564>

Please use this citation to reference the data.

Throckmorton, H. T., J. M. Heikoop, B. D. Newman, and C. J. Wilson. 2015. Inorganic carbon isotopes and chemical characterization of watershed drainages, Barrow Alaska, 2013. Next Generation Ecosystem Experiments Arctic Data Collection, Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, Oak Ridge, Tennessee, USA. <http://dx.doi.org/10.5440/1221564>.

Data Characteristics

Data Dictionary

Data Files:

1. Throckmorton_etal_2015_20160216.csv
2. Throckmorton_etal_2015_locations_20160216.csv
3. Throckmorton_etal_2015_User_Guidance_Document_20160216.pdf

Throckmorton_etal_2015_20160216.csv

- Missing values (blank cells) are due to insufficient sample availability.
- Values of “0” indicate that a measurement was below the detection limit.
- Location measurements were taken with a hand held GPS (plus/minus 3m accuracy) using NAD 83 UTM Zone 4N.

| Column name | Units/format | Description |
|----------------------|-----------------|--|
| Region* | | Values: North Slope |
| Locale* | | Values: Barrow |
| Administrative_Area* | | Values: Barrow Environmental Observatory (BEO) |
| Site* | | Values: Intensive Site 1 |
| Area* | | Values: B, C, D, DTLB2 |
| Polygonal_Type | | Values: High_Center, Low_Center |
| Polygonal_Subunit | | Values: center, trough |
| Sample_Type | | Values: Liquid_Active_Layer_Water Description of the sample material |
| Sample_ID | | Unique sample identifier |
| Field_Site_ID | | Field site identifier as used in Throckmorton et al., 2015 |
| Date_Collected | yyyy-mm-dd | Date that samples were collected |
| Easting | m | Location coordinate |
| Northing | m | Location coordinate |
| Longitude | decimal degrees | Location coordinate |
| Latitude | decimal degrees | Location coordinate |
| Depth | cm | Depth of sample collection relative to soil surface. Depth classes: Surface water (S); Shallow (Sh), 6-12cm from the surface; Deep (D) > 12cm - at frost table |
| Dissolved_Oxygen | percent | Dissolved oxygen |
| pH | | pH |

| | | |
|---------------|-----------|--|
| Fe2 | mg/L | Dissolved Iron 2+ |
| Fe3 | mg/L | Dissolved Iron 3+ |
| Fe_oxide | percent | Portion of total Fe as Fe3+ |
| DIC | mMol_C | Dissolved inorganic carbon |
| delta_13C_DIC | delta_13C | Isotopic ratio of 13C/12C of dissolved inorganic carbon in active layer water samples in delta notation. |
| DOC | mg/L | Dissolved organic carbon |
| delta_13C_DOC | delta_13C | Isotopic ratio of 13C/12C of dissolved organic carbon in active layer water samples in delta notation. |
| CH4 | mMol | Dissolved methane |
| delta_13C_CH4 | delta_13C | Isotopic ratio of 13C/12C of methane in active layer water samples in delta notation. |
| DON_N | mg/L | Dissolved organic nitrogen |

Throckmorton_etal_2015_locations_20160216.csv

| Column name | Units/format | Description |
|-----------------|--------------|---|
| Watershed | | Values: interlake, medium, old, combination, ancient, young |
| Flow Type | | Values: stagnant, gentle Stagnant indicates wetlands with no observable flow upon sampling. Gentle indicates lateral surficial flow. |
| Basin Area | hectares | Basin area measured in hectares. Sites 13 are internal drainages that drain the same basin. |
| July Thaw Depth | cm | Depth to frozen ground measured in cm |
| Sept Thaw Depth | cm | Depth to frozen ground measured in cm |

* Values for these location fields have been standardized for NGEE Arctic and are required fields for all data dictionaries. (<http://ngee-arctic.ornl.gov/content/metadata-entry-data-upload-and-data-management-help>)

Example Data Records:

Throckmorton_etal_2015_20160216.csv

| |
|--|
| Region,Locale,Administrative_Area,Site,Area,Polygonal_Type,Polygonal_Subunit,Sample_Type,Sample_ID,Field_Site_ID,Date_Collected,Easting,Northing,Longitude,Latitude,Depth,Dissolved_Oxygen,pH,Fe2,Fe3,Fe_oxide,DIC,delta_13C_DIC,DOC,delta_13C_DOC,CH4,delta_13C_CH4,DON_N |
| ,,,,,,m,m,decimal degrees,decimal degrees,cm,Percent,,mg/L,mg/L,Percent,mMol_C,delta_13C,mg/L,delta_13C,mMol,delta_13C,mg/L |
| North_Slope,Barrow,NA,Intensive_Site_1,NA,NA,NA,Liquid_Active_Layer_Water,NG_2013_1A,1,7/12/2013,586018.2803,7910049.231,-156.5984,71.277454,0,80.1,5.9,1,1,50,1.2,-2.18,29,-28.7,0.004,-35.3,2.29 |
| North_Slope,Barrow,NA,Intensive_Site_1,NA,NA,NA,Liquid_Active_Layer_Water,NG_2013_1B,1,7/12/2013,586018.2803,7910049.231,-156.5984,71.277454,9,16.5,5.2,4,6,60,7.5,-13.35,31,-28,1.5,-45,3.26 |
| North_Slope,Barrow,NA,Intensive_Site_1,NA,NA,NA,Liquid_Active_Layer_Water,NG_2013_1C,1,7/12/2013,586018.2803,7910049.231,-156.5984,71.277454,34,25.8,6.1,6,381,98,8.1,-10.17,95,-26.7,0.466,-50.3,14.07 |

Throckmorton_etal_2015_locations_20160216.csv

| Site | Latitude | Longitude | Watershed | Flow Type | Basin Area | July Thaw Depth | Sept Thaw Depth |
|-------|-----------|-------------|-------------|-----------|------------|-----------------|-----------------|
| ,,,,, | hectares | cm | cm | | | | |
| 1 | 71.277454 | -156.5984 | Interlake | Stagnant | 2 | 34 | 57 |
| 2 | 71.279147 | -156.602033 | Interlake | Stagnant | 0 | 38 | 40 |
| 3 | 71.280787 | -156.600263 | Interlake | Stagnant | 8 | 31 | 50 |
| 4 | 71.282119 | -156.600268 | Interlake | Stagnant | 4 | 9 | 34 |
| 5 | 71.292036 | -156.596354 | Medium | Stagnant | 53 | 33 | 48 |
| 6 | 71.286382 | -156.620312 | Old | Gentle | 38 | 28 | 34 |
| 7 | 71.275814 | -156.609338 | Combination | Stagnant | 88 | 29 | 39 |
| 8 | 71.277356 | -156.588138 | Combination | Stagnant | 171 | 35 | 40 |
| 9 | 71.272044 | -156.587368 | Combination | Gentle | 33 | 27 | 40 |
| 10 | 71.272011 | -156.588408 | Combination | Gentle | 108 | 39 | 47 |
| 11 | 71.262014 | -156.560575 | Medium | Gentle | 120 | 37 | 48 |
| 12 | 71.261519 | -156.592656 | Old | Stagnant | 61 | 27 | 34 |
| 13_1 | 71.248544 | -156.582915 | Ancient | Stagnant | 17 | 31 | 40 |
| 13_2 | 71.248167 | -156.58167 | Ancient | Stagnant | 17 | 32 | 36 |
| 13_3 | 71.24875 | -156.581978 | Ancient | Stagnant | 17 | 30 | 38 |
| 14 | 71.258971 | -156.622916 | Young | Gentle | 303 | 35 | 47 |
| 15 | 71.269921 | -156.573338 | Combination | Gentle | 130 | 55 | 64 |

Data Acquisition Materials and Methods

For the water collection, surface waters were collected as grab samples from the edges of drainages. For shallow active layer samples, one stainless steel drive point sampler was installed at each sampling location. Tubing was installed into the drive point opening, and water was slowly siphoned into 1 L bottles using a hand-pump vacuum. For the collection of deeper samples, 14-20 macro-rhizon samplers were installed in an array down to the frost table. Multiple macro-rhizons were used to obtain sufficient water volume for chemical analyses.

For field measurements, Fe²⁺, temperature, DO, and pH were measured in the field on unfiltered pore waters immediately after extraction. Fe²⁺ was measured with a (Ferrous) Color Disc Test kit, DO with a Hach luminescence DO meter, and temperature with a thermal meter with internal temperature reference.

Laboratory analyses were performed using EPA and other standard published methods.

References

Throckmorton, H. M., J. M. Heikoop, B. D. Newman, G. L. Altmann, M. S. Conrad, J. D. Muss, G. B. Perkins, L. J. Smith, M. S. Torn, S. D. Wullschleger, et al. (2015), Pathways and transformations of dissolved methane and dissolved inorganic carbon in Arctic tundra watersheds: Evidence from analysis of stable isotopes, *Global Biogeochem. Cycles*, 29, 1893–1910, doi:[10.1002/2014GB005044](https://doi.org/10.1002/2014GB005044).

Data Access:

This data set is available through the Oak Ridge National Laboratory (ORNL) NGEE Arctic Project <http://ngee-arctic.ornl.gov/data>.

Disclaimer of Liability

Data and documents available from the NGEE Arctic web site (<http://ngee.ornl.gov/>) were prepared as an account of work sponsored by an agency of the U.S. Government. Neither the U.S. Government nor any agency thereof, or any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Further, Oak Ridge National Laboratory is not responsible for the contents of any off-site pages referenced.

The complete ORNL disclaimer can be viewed at <http://www.ornl.gov/ornlhome/disclaimers.shtml>.

Data Center Contact:

support@ngee-arctic.ornl.gov