CLPX-Ground: ISA Snow Depth Transects and Related Measurements, Version 2

USER GUIDE

How to Cite These Data

As a condition of using these data, you must include a citation:

Cline, D., R. Armstrong, R. Davis, K. Elder, and G. E. Liston. 2003. *CLPX-Ground: ISA Snow Depth Transects and Related Measurements, Version 2*. [Indicate subset used]. Boulder, Colorado USA. NASA National Snow and Ice Data Center Distributed Active Archive Center. https://doi.org/10.5060/D4MW2F23. [Date Accessed].

National Snow and Ice Data Center

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1   DETAILED DATA DESCRIPTION

1.1 Format

Data are stored in ASCII text files with a file extension of `.txt` and JPEG images with a file extension of `.jpg`.

Missing data are identified by "-999". Double quotes are used to delimit text within fields, and commas contained within the double quotes do not indicate a new field. Because of the general lack of snow in North Park, all the depth data were collected on the first day of ground observations.

There are three depth transect files (one per ISA) per MSA. Snow transect filenames are `depth_iopNMI_v1.txt`, where:

Depth_iop indicates snow depth data
N = IOP number (1-4)
M = MSA letter code
I = ISA letter code
v1 = Data release version 1
.txt = plain text file

Early copies of files with filenames that do not include "_v1" are obsolete and should be replaced with the v1 copies.

Transect files contain one record per transect location, with the following fields:

```
Column 1: TRANSECT - transect ID
              1-letter code for MSA:
                F = Fraser
                N = North Park
                R = Rabbit Ears
              1-letter code for ISA:
                A = Alpine
                B = Buffalo Pass
                F = Fool Creek
                I = Illinois River
                M = Michigan River
                P = Potter Creek
                S = Spring Creek (if MSA Code = R) or
                     St. Louis Creek (if MSA Code = F)
                W = Walton Creek
              1-letter sector ID: A,B,C, or D
              2-digit cell number: 01-25
              . decimal point
              1-digit location number: 1-5
    Column 2: IOP - IOPx (x = 1-4)
```

```
        Column 3: DATE - yyyymmdd
        Column 4: TIME - hhmm
        Column 5: UTME - UTM Easting (m)
        Column 6: UTMN - UTM Northing (m)
        Column 7: DEPTH - snow depth (cm)
        Column 8: SWET - surface wetness:
                d = Dry
                m = Moist
                w = Wet
                vw = Very Wet
        Column 9: SRUF - surface roughness photo taken (Y or N)
        Column 10: CNPY - canopy
                c = Coniferous
                cs = Snow-covered Coniferous
                g = Deciduous
                ds = Snow-covered Deciduous
                g = Grass (only used in North Park)
                s = Sage (only used in North Park)
                n = No Canopy
        Column 11: TEMP(F) - soil temperature, degrees Fahrenheit (only
measured in North Park)
        Column 12: SURVEYOR - surveyor names
        Column 13: COMMENTS - surveyor comments, prepended with Quality
Control flags for this record ["QC(XXX)", see below for QC flags]
```

Field comments for depth data were recorded per cell of an ISA sector. For purposes of data consistency, they were reproduced for each data point within that cell.

There are three depth transect summary files (one per ISA) per MSA. Snow transect summary filenames are depth_iopNMI_v1_summary.txt, where:

Depth_iop indicates snow depth data
N = IOP number (1-4)
M = MSA letter code
I = ISA letter code
v1 = data release number 1
summary = content is summary record for each transect
.txt = plain text file

Transect summary files contain one record per transect, with the following fields:

```
        Column 1: TRANSECT - transect ID
                1-letter code for MSA:
                  F = Fraser
                  N = North Park
                  R = Rabbit Ears
                1-letter code for ISA:
                  A = Alpine
                  B = Buffalo Pass
                  F = Fool Creek
                  I = Illinois River
```

```
                         M = Michigan River
                         P = Potter Creek
                         S = Spring Creek (if MSA Code = R) or
                                 St. Louis Creek (if MSA Code = F)
                         W = Walton Creek
                      1-letter sector ID: A,B,C, or D
                      2-digit cell number: 01-25
        Column 2: IOP - IOPx (x = 1-4)
        Column 3: DATE - yyyymmdd
        Column 4: TIME - hhmm
        Column 5: UTME - UTM Easting (m)
        Column 6: UTMN - UTM Northing (m)
        Column 7: #DONE - number of points measured / number of points
expected
        Column 8: MEAN - mean of non-missing depth measurements (cm)
        Column 9: SDEV - standard deviation of non-missing depth
measurements (cm)
        Column 10: MIN - minimum depth measured (cm)
        Column 11: MAX - maximum depth measured (cm)
        Columns 12,13,14,15,16: WETNESS - count of wetness values by
category (dry/moist/wet/very wet/missing
         Column 17: SRUF@PNT - transect point number where surface
roughness photo was taken
        Column 18: SURVEYOR - surveyor names
        Column 14: QC() - list of quality control flags triggered by this
transect
         Column 15: COMMENTS_FOUND? - YES or NO indicator that surveyors
included comments at this transect
```

1.1.1   Photos

Each JPEG (Joint Photographic Experts Group) file contains one digital photo. At least one snow roughness photo should have been taken at each sector cell. A photo of the general terrain was taken out along the depth transects. These photos should contain a card identifying the location of the photo using the misc.n convention.

Additional photos may also have been taken to show the general field work in progress for public relations purposes.

1.2 File and Directory Structure

Data are organized in the following structure:

```
clp/
    ground_data/
      nsidc0175_snow_transects/
         msa/
            data/
                iop/
             photos/
```

```
iop/
     isa/
     other/
     roughness/
     terrain/
```

- MSA's are: fraser, north_park, and rabbit_ears
- One LSOS, at Fraser
- ISA's are: alpine, buffalo_pass, fool_creek, illinois_river, michigan_river, potter_creek, spring_creek, st_louis_creek, and walton_creek.

1.3 File Naming Convention

The following code, known as "misc.n", are used in filenames (and for site names in the raw data):

```
MSA Code
        F = Fraser
        N = North Park
        R = Rabbit Ears

  ISA Code
        A = Alpine
        B = Buffalo Pass
        F = Fool Creek
        I = Illinois River
        M = Michigan River
        P = Potter Creek
        S = Spring Creek (if MSA Code = R) or
               St. Louis Creek (if MSA Code = F)
        W = Walton Creek

  ISA Sector
        A = Lower Left Quadrant - SW
        B = Upper Left Quadrant - NW
        C = Upper Right Quadrant - NE
        D = Lower Right Quadrant - SE

  Sector Cell Number (1-25, referring to 100-m x 100-m grid cells)

  Transect point number (1-5)
```

1.4 File Size

ASCII file sizes range from 3 to 215 KB. JPG file sizes range from 500 to 750 KB.

1.5 Spatial Coverage

Fraser, North Park, and Rabbit Ears MSAs in northern Colorado, US.

Table 1. IOP1 Transects Measured

MSA	Planned number of transects	Actual number of transects
Fraser	1,500	1,243
North Park	1,500	1,500
Rabbit Ears	1,500	1,484

Table 2. IOP2 Transects Measured

MSA	Planned number of transects	Actual number of transects
Fraser	1,500	1,486
North Park	1,500	1,460
Rabbit Ears	1,500	1,505*

Table 3. IOP3 Transects Measured

MSA	Planned number of transects	Actual number of transects
Fraser	2,052	2,042
North Park	2,052	2,047
Rabbit Ears	2,052	1,803

Table 4. IOP4 Transects Measured

MSA	Planned number of transects	Actual number of transects
Fraser	2,052	2,045
North Park	2,052	2,052
Rabbit Ears	2,052	2,036

1.6 Temporal Coverage

IOP1 took place 19-24 February 2002.
IOP2 took place 25-30 March 2002.
IOP3 took place 20-25 February 2003.
IOP4 took place 26-31 March 2003.

1.7 Parameter or Variable

Parameters include snow depth, surface wetness, surface roughness (photos only), canopy, and soil temperature.

For a complete description of parameters and measurements, please refer to the Measurements section of the CLPX Plan.

1.8 Quality Assessment

1.8.1 Snow Depth Quality Control Flags

```
Code    Description (what was reset/set/estimated: the reason why)
----    --------------------------------------------------------
000     QC OK: all tests passed
201     Temperature converted from Celsius to Fahrenheit: surveyor's probe
measured Celsius.
914     Canopy reset to missing value:  Snow depth is 0.
916     Surface wetness reset to missing value:  Snow depth is 0.
990     Warning: One or both UTM coordinates are missing.
991     Warning: Missing date and/or time field.

Detailed Explanations:
----------------------
000     QC OK: all tests passed

        No problems were detected, values have not been changed from the
        original forms.

        N.B. Soil temperature measurements were only taken in North Park;
        precision differed by surveying team, some surveyors measured to
        the nearest degree, some measured to the nearest tenth degree.
        During quality control, every effort was made to retain the
        precision recorded by the surveyor.

Temperature QC codes
--------------------

201     Temperature converted from Celsius to Fahrenheit: surveyor's probe
measured Celsius.

        Measurement protocol in North Park MSA included soil measurements
        at each transect point.  During IOP1 only, all but one of the
        thermometers used measured Fahrenheit temperatures.  The
        thermometer used by surveyor Armstrong and party was a Celsius
        thermometer.  Actual measurements at the location this surveyor
        measured were taken to the nearest tenth of a Celsius degree, and
        have been converted to the nearest tenth of Fahrenheit degree
        during the QC.

914     Canopy reset to missing value:  Snow depth is 0.
```

```
        Measurement protocol was to record canopy only when snow depth was
        greater than 0.  In this case a recorded canopy was reset to
        missing because the snow depth was 0.

916     Surface wetness reset to missing value:  Snow depth is 0.

        Measurement protocol was to record surface wetness only when
        snow
        depth was greater than 0.  In this case a recorded surface wetness
        was reset to missing because the snow depth was 0.

990     Warning: One or both UTM coordinates are missing.

        Transect coordinates are incomplete or missing.

991     Warning: Missing date and/or time field.

        Date and/or time field are missing.
```

2   DATA ACQUISITION AND PROCESSING

For complete information about data acquisition and processing, please see the CLPX Plan Web Site.

3   REFERENCES AND RELATED PUBLICATIONS

Please see the References section of the CLPX Plan.

4   CONTACTS AND ACKNOWLEDGMENTS

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5   DOCUMENT INFORMATION

5.1 Publication Date

12 August 2003

5.2 Date Last Updated

10 March 2021