NEON DATA PRODUCT NUMBERING CONVENTION

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Change Record

REVISION	DATE	ECO #	DESCRIPTION OF CHANGE
A	01/28/2015	ECO-02073	Replaces and obsoletes NEON.DOC.000254
B	02/25/2016	ECO-03523	Edit to reflect updates in the spatial and temporal codes used by the various subsystems, and to add an appendix describing the controlled vocabulary of terms
C	10/26/2017	ECO-05125	-Add the new data product numbering code for HOR fields for the instrument hut -Modify the data product numbering code for HOR and VER fields for the buoy -Modify the sections describing OS data products to reflect new approach in new data model, implemented in 2016 -Add description of alphabetic rather than numeric TMI code for eddy covariance products
D	11/28/2018	ECO-05926	-Drop references to obsolete documents -Drop obsolete revision number code strategy -Add TMI codes for summary weather statistics -Add site-level HOR code for AIS -Add HOR codes for overhanging sensor design
E	03/05/2020	ECO-06385	-Add VER 511 for an additional temp chain depth -Add HOR 999 for a new index indicating a prototype sensor

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1 DESCRIPTION

This document describes the nomenclature used to uniquely identify measurements made by and data products derived from NEON observational systems.

1.1 Purpose

This document defines the nomenclature that supports all NEON data products.

2 RELATED DOCUMENTS AND ACRONYMS

2.1 Reference Documents

RD [01]	NEON.DOC.000008	NEON Acronym List
RD [02]	NEON.DOC.000243	NEON Glossary of Terms
RD [03]	NEON.DOC.002652	NEON Level 1 to Level 4 Data Products Catalog
RD [04]	NEON.DOC.004309	NEON Field Site Information

3 INTRODUCTION

Several major NEON subsystems are involved in design, development, maintenance, oversight, and publication of NEON data products. Science and engineering staff design and implement data acquisition systems and protocols, data storage and processing architectures, documentation, and organizational frameworks to meet end-to-end NEON scientific and engineering requirements. Through this process, raw field data gathered through NEON's infrastructure deployment is transformed into value-added information in the form of "data products", designed to be used by a wide variety of end-users.

The nomenclature framework described maintains multiple consistent fields across subsystems and processing levels, but has been optimized by subsystem to improve efficiencies. In the following sections, the nomenclature for data product numbering per subsystem is described.

4 TERRESTRIAL AND AQUATIC INSTRUMENT SUBSYSTEMS (TIS & AIS)

The data product numbering scheme employed for the TIS/AIS data products are discussed below, along with some examples.

4.1 TIS and AIS Level 0 – Level 3 Nomenclature

The nomenclature used for the TIS/AIS Level 0 – Level 3 Data Products accommodates the range and location of sensor measurements, including ancillary data streams used to track sensor health and any sensor replicates. The nomenclature used is shown below:

NEON.DOM.SITE.DPL.PRNUM.REV.TERMS.HOR.VER.TMI

Where:

- **NEON** denotes the organizational origin of the data product and identifies the product as operational; data collected as part of a special data collection exercise are designated by a separate, unique alphanumeric code created by the PI
- **DOM** is a three-character alphanumeric code, referring to the domain of data acquisition (D01 – D20).
- **SITE** is a four-character alphanumeric code, referring to the site of data acquisition; all sites are designated by a standardized four-character alphabetic code (e.g. HARV, PROV, etc., see RD [04] for complete list).
- **DPL** is a three-character alphanumeric code, referring to data product processing level.
- **PRNUM** is a five-character numeric code, referring to data product number from a specific subsystem, which is a five-digit numerical designation (e.g., 01234); data collected from the different subsystems are classified as below:
    - 0XXXX = TIS
    - 1XXXX = TOS
    - 2XXXX = AIS and AOS
    - 3XXXX = AOP
    - 4XXXX = AOP-PI designated collects
    - 5XXXX = MDP-PI designated collects

  The five-digit PRNUMs are determined by the Data Products Catalog (RD [03]). For TIS products implemented at AIS sites (mainly meteorological station products), the same TIS 0XXXX PRNUM is used with an aquatic SITE and the aquatic HOR and VER conventions are followed (see below and section 8.1).
- **REV** is a three-digit designation, referring to the revision number of the data product. Revisions indicate a change to the data product, such that data published in one revision are not directly comparable to data from another revision. All products start at REV = 001; for numbering details see section 8.2.
- **TERMS** is a five-digit designation corresponding to a unique entry in a controlled vocabulary of terms, also referred to as field names, that identifies a subproduct or a discrete vector of data or metadata; it is used to document the data streams and associated data that, together, form a data product. The terms vocabulary is shared across all subsystems; see Section 8.3 for an overview of the terms database and guidelines on term creation.
- **HOR** is a three-digit spatial index and refers to measurements differentiated by horizontal location (see section 8.1). For example, the TIS tower is one horizontal location (000) and each soil plot is one horizontal location.
- **VER** is a three-digit spatial index and refers to measurements differentiated by vertical location (see section 8.1). For example, each level on the TIS tower is one vertical location.

- **TMI** is the temporal index; it is a three-digit designation and refers to the measurement frequency, averaging period, or temporal coverage of the data product (e.g., minute, hour, month, year, sub-hourly, day, lunar month, single instance, seasonal, annual, multi-annual). See section 8.1 for temporal index codes.

4.2 TIS and AIS Data Product Numbering Examples

4.2.1 Level 0

4.2.1.1 Single horizontal, single vertical sensor with ancillary measurement stream

At a single horizontal and single vertical position, a single measurement is made per sampling frequency. Examples of these measurements might include a single sensor, mounted on the top of a tower, collecting atmospheric pressure data.

Example: Assume TIS data product number 00002 is collected from a sensor installed on the top of the core site tower in Domain 1, and an accompanying aspirated fan is a part of the sensor assembly and also produces a data stream. Assume the primary sensor output is a temperature measurement from a platinum resistance thermometer, with term PRTResistance, which is term #01325; and the aspirated fan output is fan speed, with term fanSpeed, #01326; assume initial version of product production; the designation for these two Level 0 subproducts would be

NEON.DOM.SITE.DPL.PRNUM.REV.TERMS.HOR.VER.TMI	
NEON.D01.HARV.DP0.00002.001.*01325*.000.060.000	PRTResistance
NEON.D01.HARV.DP0.00002.001.*01326*.000.060.000	fanSpeed

4.2.1.2 Single horizontal, multiple vertical sensors

A single measurement is taken at each of several vertically-arrayed positions, all aligned at one horizontal position. An example is profile measurements, made by collecting data from sensors at each of several levels along a tower height or along a chain beneath a lake buoy.

Example: Assume that at each of four tower heights on the Sterling tower, a single sensor is installed in an assembly to conduct vertical profile measurements of relative humidity (assume data product number 00098), and that this data product is now on its third revision release. The designations capture the measurement locations at different heights along the tower by varying the second-to-last (VER) column:

NEON.DOM.SITE.DPL.PRNUM.REV.TERMS.HOR.VER.TMI	
NEON.D10.STER.DP0.00098.003.01357.000.*010*.000	level 1
NEON.D10.STER.DP0.00098.003.01357.000.*020*.000	level 2
NEON.D10.STER.DP0.00098.003.01357.000.*030*.000	level 3
NEON.D10.STER.DP0.00098.003.01357.000.*040*.000	level 4

4.2.1.3 Multiple horizontal, multiple vertical sensors

At each of several horizontal positions, a single measurement is made at each of several vertical positions. An example is in each of several plots, soil temperature is measured via an array of sensors installed vertically in each soil plot.

Example: Assume at the Domain 8 Core Site, soil temperature (assume data product number is 00041, and revision number 6) is measured via vertical installations of temperature sensors in each of three plots. In each vertical installation, three measurements are performed at different soil depths (see Section 8.1.1.2 for vertical values). The relevant designations are:

NEON.DOM.SITE.DPL.PRNUM.REV.TERMS.HOR.VER.TMI	
NEON.D08.TALL.DP0.00041.006.01728.001.501.000	plot 1 horizon 1
NEON.D08.TALL.DP0.00041.006.01728.001.502.000	plot 1 horizon 2
NEON.D08.TALL.DP0.00041.006.01728.001.503.000	plot 1 horizon 3
NEON.D08.TALL.DP0.00041.006.01728.002.501.000	plot 2 horizon 1
NEON.D08.TALL.DP0.00041.006.01728.002.502.000	plot 2 horizon 2
NEON.D08.TALL.DP0.00041.006.01728.002.503.000	plot 2 horizon 3
NEON.D08.TALL.DP0.00041.006.01728.003.501.000	plot 3 horizon 1
NEON.D08.TALL.DP0.00041.006.01728.003.502.000	plot 3 horizon 2
NEON.D08.TALL.DP0.00041.006.01728.003.503.000	plot 3 horizon 3

4.2.2 Level 1

Example: A sensor collecting data at the top of the Core Site tower of Domain 4. This sensor's Level 0 data products are combined into one Level 1 data product, which consists of two subproducts: the mean and standard error of the raw time series. Each subproduct is calculated at 1-minute and 30-minute intervals, and data are collected at two heights on the tower. Assuming PRNUM=00123 and TERMS=00101 and 00102, the data product numbering would be:

NEON.DOM.SITE.DPL.PRNUM.REV.TERMS.HOR.VER.TMI		
NEON.D04.GUAN.DP1.00123.001.00101.000.010.001	1-min mean	level 1
NEON.D04.GUAN.DP1.00123.001.00102.000.010.001	1-min std.err.	level 1
NEON.D04.GUAN.DP1.00123.001.00101.000.010.030	30-min mean	level 1
NEON.D04.GUAN.DP1.00123.001.00102.000.010.030	30-min std.err.	level 1
NEON.D04.GUAN.DP1.00123.001.00101.000.020.001	1-min mean	level 2
NEON.D04.GUAN.DP1.00123.001.00102.000.020.001	1-min std.err.	level 2
NEON.D04.GUAN.DP1.00123.001.00101.000.020.030	30-min mean	level 2

NEON.D04.GUAN.DP1.00123.001.00102.000.020.030 30-min std.err. level 2

4.2.3 Level 2

TIS and AIS Level 2 Data Products are the Temporal Interpolations (gap-filled Data Products) of the continuously streaming Level 1 Data Products that have suffered any data drop-outs or "gaps".

Example: Same sensor as in 4.2.3 example. This sensor's Level 1 data products are combined into the Level 2 Temporally Interpolated Data Product, which consists of two sub-products: gap-filled data at 1-minute and 30-minute intervals. The data product numbering for the first tower level would be:

NEON.DOM.SITE.DPL.PRNUM.REV.TERMS.HOR.VER.TMI
NEON.D04.GUAN.DP2.00123.001.00101.000.010.001 Gap-filled 1-min mean
NEON.D04.GUAN.DP2.00123.001.00101.000.010.030 Gap-filled 30-min mean

4.2.4 Level 3

TIS/AIS Level 3 Data Products are the Spatially Interpolated or Profile Data Products, derived from the Temporally Interpolated Level 2 Data Products. For the TIS/AIS subsystems, spatially interpolated products in the current data product development plan are all vertically interpolated.

Example: Level 2 Data Product described above is further processed to create the Spatially Interpolated/Profile Level 3 Data product at this site. Since the L3 data product incorporates multiple vertical locations, the VER index is the indeterminate code 999 (see Section 8.1).

NEON.DOM.SITE.DPL.PRNUM.REV.TERMS.HOR.VER.TMI
NEON.D04.GUAN.DP3.00123.001.00101.000.999.001 Profile 1-min mean
NEON.D04.GUAN.DP3.00123.001.00101.000.999.030 Profile 30-min mean

5 TERRESTRIAL/AQUATIC OBSERVATIONS & FIELD COLLECTIONS (TOS & AOS)

5.1 TOS and AOS Level 0 – Level 3 Nomenclature

The nomenclature used for the TOS/AOS Data Products is an abbreviated version of the numbering used for TIS/AIS Data Products, and accommodates the range of field observations and sampling protocols. The designation specification is:

NEON.DOM.SITE.DPL.PRNUM.REV

Where:

- **NEON** denotes the organizational origin of the data product and identifies the product as operational; data collected as part of a special data collection exercise are designated by a separate, unique alphanumeric code created by the PI.
- **DOM** is a three-character alphanumeric code, referring to the domain of data acquisition (D01 – D20).
- **SITE** is a four-character alphanumeric code, referring to the site; all sites are designated by a standardized four-character alphabetic code (e.g. HARV, PROV, etc., see RD [04] for complete list).
- **DPL** is a three-character alphanumeric code, referring to data product processing level.
- **PRNUM** is a five-character numeric code, referring to data product number from a specific subsystem, which is a five-digit numerical designation (e.g., 01234); data collected from the different subsystems are classified as below:
    - 0XXXX = TIS
    - 1XXXX = TOS
    - 2XXXX = AIS and AOS
    - 3XXXX = AOP
    - 4XXXX = AOP-PI designated collects
    - 5XXXX = MDP-PI designated collects

  The five-digit PRNUMs are determined by the Data Products Catalog (RD [03]).
- **REV** is a three-digit designation, referring to the revision number of the data product. Revisions indicate a change to the data product, such that data published in one revision are not directly comparable to data from another revision. All products start at REV = 001; for numbering details see section 8.2.

Within the data products designated by NEON.DOM.SITE.DPL.PRNUM.REV nomenclature, individual data fields are identified by the combination of table name and field name. A single OS data product consists of one or more data tables, each with a number of data fields (see below). The field names in OS data products follow the same controlled vocabulary of TERMS as the other subsystems.

5.2 TOS and AOS Data Product Numbering Examples

5.3 Level 0

Example: A small mammal collection intended to gauge species abundance (assume data product number 10001) is performed at the Core Site of Domain 5. There are two data tables, one collected at the level of a night trapping event, and one at the level of a trap. At the night level, data fields record the number of traps set and the name of the technician setting traps. At the trap level, data fields record the taxon identification and tail length of the animal captured:

Data product number	*Table name*	*Field name*
NEON.D05.UNDE.DP0.10001.001	perNight	trapsSet

NEON.D05.UNDE.DP0.10001.001	perNight	setBy
NEON.D05.UNDE.DP0.10001.001	perTrap	taxonID
NEON.D05.UNDE.DP0.10001.001	perTrap	tailLength

5.4 Level 1

Example: For TOS and AOS, Level 0 and Level 1 numbering follow identical rules. Following the same example as above, assuming both subproducts are reported at Level 1 as well as Level 0, they have the same PRNUM value, and they are in the same table structure, the numbers for these subproducts would be:

Data product number	*Table name*	*Field name*
NEON.D05.UNDE.*DP1*.10001.001	perNight	trapsSet
NEON.D05.UNDE.*DP1*.10001.001	perNight	setBy
NEON.D05.UNDE.*DP1*.10001.001	perTrap	taxonID
NEON.D05.UNDE.*DP1*.10001.001	perTrap	tailLength

6 AIRBORNE OBSERVATION PLATFORM (AOP)

6.1 AOP Level 1 – Level 3 Nomenclature

The nomenclature used for the AOP Level 1, 2, and 3 Data Products accommodates the range of data collects from different sensors on the AOP platforms. The designation specification is:

NEON.DOM.SITE.DPL.PRNUM.REV.TERMS.SPI.SPT.YYYYMMDD

Where:

- **NEON** simply denotes the organizational origin of the data product and identifies the product as operational; data collected as part of a special data collection exercise are designated by a separate, unique alphanumeric code created by the PI.
- **DOM** is a three-character alphanumeric code, referring to the domain of data acquisition (D01 – D20).
- **SITE** is a four-character alphanumeric code, referring to the site; all sites are designated by a standardized four-character alphabetic code (e.g. HARV, PROV, etc., see Site Code table in the RD [04] for complete list); calibration sites or targets are also designated by a standardized four-character alphabetic code.
- **DPL** is a three-character alphanumeric code, referring to data product processing level.

- **PRNUM** is a five-character numeric code, referring to data product number from a specific subsystem, which is a five-digit numerical designation (e.g., 01234); data collected from the different subsystems are classified as below:
    - 0XXXX = TIS
    - 1XXXX = TOS
    - 2XXXX = AIS and AOS
    - 3XXXX = AOP
    - 4XXXX = AOP-PI designated collects
    - 5XXXX = MDP-PI designated collects

  The five-digit PRNUMs are determined by the Data Products Catalog (RD [03]).
- **REV** is a three-digit designation, referring to the revision number of the data product. Revisions indicate a change to the data product, such that data published in one revision are not directly comparable to data from another revision. All products start at REV = 001; for numbering details see section 8.2.
- **TERMS** is a five-digit designation and refers to a unique, controlled list of terms that primarily identify subproducts. The terms vocabulary is shared across all subsystems; see Section 8.2 for an overview of the terms database and guidelines on term creation.
- **SPI** is a three-digit designation; for L0, L1, and L2 products, it refers to a specific flight line and for L3 products it refers to the coordinate location along one axis of a specific data tile. Flight lines are tracked by an internal AOP database that links flight line numbers to flight plans. For data tiles, the data are mosaicked, then tiled based on a defined coordinate/grid system.
- **SPT** is a three-digit designation; for L0, L1, and L2 products it provides an index to track number of flights over the same site, if they occur on the same day. For L3 products, it refers to the coordinate location along one axis of a specific data tile, and is used together with SPI to identify a specific tile.
- **YYYYMMDD** is an eight-digit designation; it provides the date as year, month, day – an example is 20140605 (June 5, 2014). For L3 products, where a data product may be derived from flights on multiple days, the MMDD characters are filled with zeros, e.g. 20140000.

6.2 AOP Data Product Examples

6.2.1 Level 1

The Level 1 data products flowing from data collected by NEON's AOP subsystem go through several processing steps, including calibration, geolocation/orthorectification, and (for hyperspectral data) atmospheric correction; these processing steps result in separate data products for each of the AOP instruments. In addition, field spectral data collected by an ASD spectrometer are processed and released as Level 1 data products.

NEON.DOM.SITE.DPL.PRNUM.REV.TERMS.SPI.SPT.YYYYMMDD

NEON.D05.UNDE.DP1.30007.001.08050.010.001.20140530 Spectr-cal Flight line #10 30-May-2014
NEON.D05.UNDE.DP1.30007.001.08050.010.002.20140530 2nd overflight of same

6.2.2 Level 2

Level 2 data products generated from AOP are geophysical data products derived from the spectrometer; they are processed, stored, and distributed by flight line and are still in native resolution (~1 m).

NEON.DOM.SITE.DPL.PRNUN.REV.TERMS.SPI.SPT.YYYYMMDD
NEON.D05.UNDE.DP2.30026.001.09000.001.001.20140530 Veg Indices NDVI
NEON.D05.UNDE.DP2.30026.001.09011.001.001.20140530 Veg Indices EVI

6.2.3 Level 3

AOP Level 3 products are mosaicked into a single image for the site (AOP footprint may be larger or smaller than the actual site outline) at the native resolution of the original Level 2 product (~1m); these products are also resampled to a coarser spatial resolution (10m). The SPI and SPT values are the coordinates of the tile. The designation is:

NEON.DOM.SITE.DPL.PRNUM.REV.TERMS.SPI.SPT.YYYYMMDD
NEON.D05.UNDE.DP3.30012.001.00101.057.072.20140000 Mosaic native res tile position 57x72
NEON.D05.UNDE.DP3.30012.001.00102.062.101.20140000 Mosaic 10m res tile position 62x101

7 LEVEL 4 DATA PRODUCTS

Level 4 data products combine lower-level data products through mathematical, statistical, and/or algorithmic means. There are three scales of spatial representation within the Level 4 data products: site-level, AOP-region, and NEON Realm (continental scale). As a consequence, the point-based "site" substring (reflecting the combination of Domain and Site) is modified as follows:

- For continental scale products
  - DOM = D00
  - SITE = CONT

AOP-region products are centered on a site, and use the standard domain and site designations. The TERMS field is used to identify subproducts within a product.

7.1 Level 4 Site-level Data Product Examples

Example: The bundled eddy covariance products are available in either daily or monthly packages of data. Since these time categories represent not averaging intervals, but data extent, the TMI codes are DAY and MON respectively, instead of numeric codes. See Appendix 8.1.1 for details.

NEON.DOM.SITE.DPL.PRNUM.REV.TERMS.HOR.TMI
NEON.D01.HARV.DP4.00200.001.08001.000.DAY Package of daily data

Example: Assume the Level 4 data product derived from combining field and AOP data to create a Biomass Map over the AOP flight area; assume product number 00056. Let's say the Biomass product has three subproducts – Biomass/Tree, Biomass/Shrub, and Biomass/Total. These variables are reported at a single site, derived yearly. Note that the SPI and TMI codes used here are hypothetical and have not been formalized, because no realm-level products have been created yet.

NEON.DOM.SITE.DPL.PRNUM.REV.TERMS.SPI.TMI
NEON.D01.HARV.DP4.00056.001.*08001*.001.365 Total Biomass
NEON.D01.HARV.DP4.00056.001.*08002*.001.365 Biomass - Tree
NEON.D01.HARV.DP4.00056.001.*08003*.001.365 Biomass - Shrub

7.2 Level 4 Continental Data Product Example

Realm-level products have only one instance, although they may have temporal sub-products, and thus the designation is straightforward. Here, we show a hypothetical example for an Albedo map, generated as part of the CLM package. Note that the SPI and TMI codes used here are hypothetical and have not been formalized, because no realm-level products have been created yet.

NEON.DOM.SITE.DPL.PRNUM.REV.TERMS.SPI.TMI
NEON.*D00.CONT*.DP4.00011.001.00955.001.*001* Cont-scale daily
NEON.*D00.CONT*.DP4.00011.001.00955.001.*365* Cont-scale yearly

8 APPENDIX

8.1 Spatial and Temporal Numbering (HOR, VER, SPI, TMI)

The AIS and TIS groups have established standards for the spatial and temporal codes in the data product number. These standards are described in the sections below. New codes may be added as new use cases arise.

8.1.1 TIS Horizontal, Vertical, and Temporal Numbering (HOR.VER.TMI)

1. Horizontal (HOR):
    a. Tower = 000
    b. DFIR = 900
    c. Soil Array Plots = 001, 002, 003, 004, 005 (numbers taken from NEON.DOC.000779).
    d. If, at some point, a soil plot is “destroyed” that number will be retired and the next incremental number will be assigned (i.e. 006, 007, etc.).
    e. Instrument hut = 700. There are 3 scenarios:
        i. If there is only one sensor of that type in the hut, the HOR will be 700 and VER is 000. For example, LI840A IRGA will have HOR=700, VER=000.
        ii. If multiple sensors of the same type are located inside the instrument hut, the HOR will have a leading number of 7, with the second and third digit reflecting

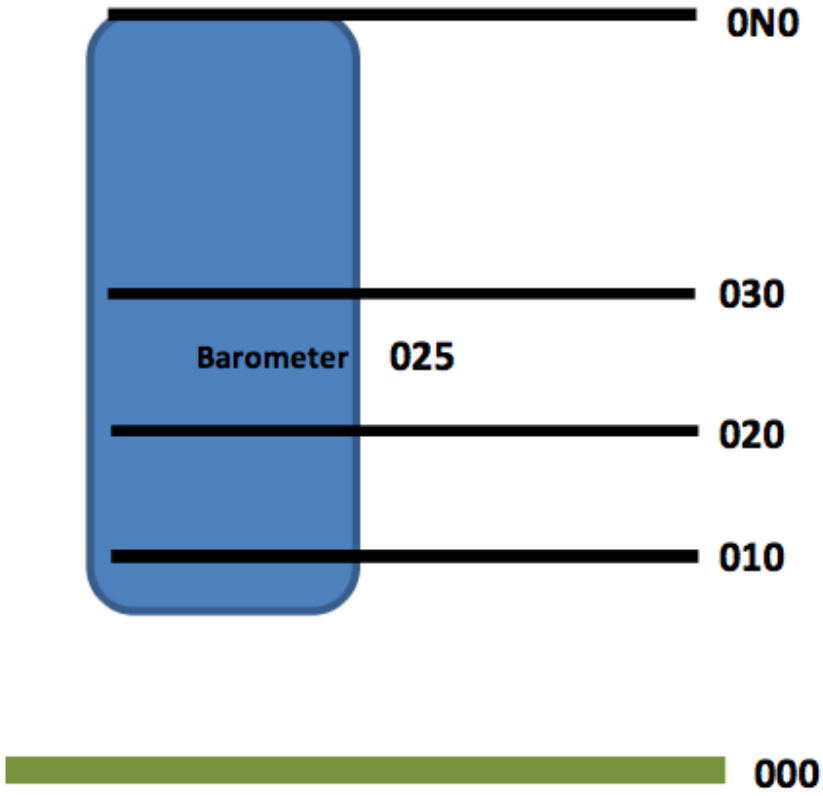
the different horizontal locations for individual sensors. VER will be 000. For example, the gas cylinder with low CO_2 concentration at location 12 of gas rack will have HOR=712, VER=000. The gas cylinder with high CO_2 concentration at location 14 of gas rack will have HOR=714, VER=000.

iii. If multiple sensors of the same type are located inside the instrument hut at the same cluster location, but each individual sensor is associated with the measurements of different vertical tower level, the HOR will be 700, with the VER to reflect different vertical tower level. For example, mass flow meter to measure flow rate of air in the measurement level 2 gas tubing will have HOR=700, and VER=020; mass flow meter to measure flow rate of air in the measurement level 6 gas tubing will have HOR=700, and VER=060.

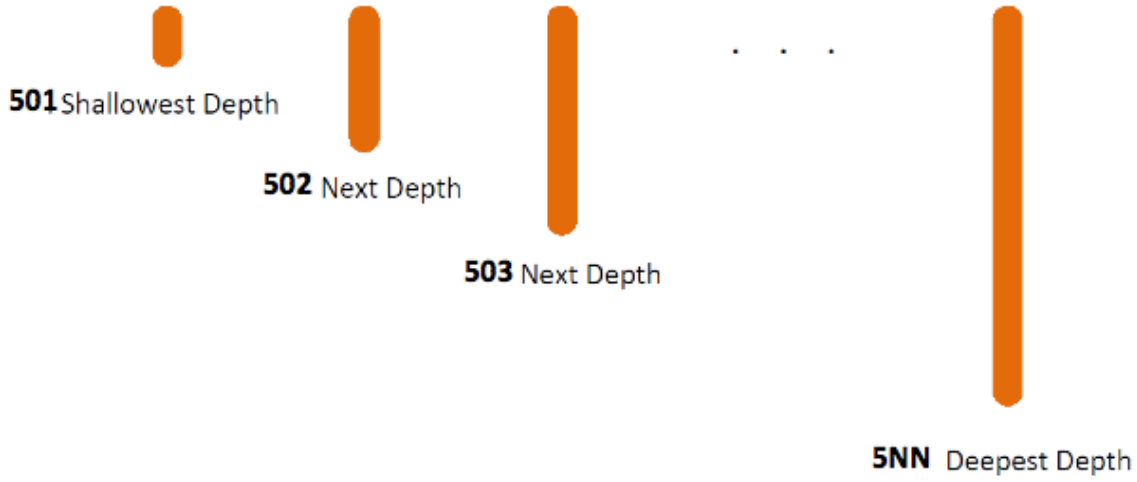
2. Vertical (VER):
    a. Surface = 000
    b. Tower levels have a leading 0, with the second digit incrementing from the surface = 010, 020, 030, …, 0N0 (example schematics below).
    c. Sensors mounted on the tower between levels have a trailing 5. For example, a sensor between levels 1 and 2 would be numbered as 015.
    d. Sensors mounted below the surface (e.g., in soil plots) have a leading 5 and increment naturally with depth = 501, 502, 503,… 510 (examples schematics below).
    e. Indeterminate vertical locations, e.g. profiles or other interpolated data = 999
    f. For sensors in the instrument hut, see bullet (e) above for VER numbering convention.

3. Temporal (TMI):
    a. Native resolution = 000. Generally used for L0 data; L0 data do occur at different resolutions (1 Hz, 20 Hz, etc) but this is not reflected in the TMI index.
    b. Native resolution, level 1 data = 100. Used for L1 data with a native resolution, where no averaging interval was applied.
    c. Averaging interval, in minutes, is directly represented in the temporal index: 001 = 1 minute, 005 = 5 minutes, 030 = 30 minutes, etc.
    d. Indeterminate or irregular time resolution, e.g. the sun photometer (samples several times per minute for a few minutes every few hours) = 999
    e. Data packaging interval for eddy covariance data is represented by DAY for daily files and MON for monthly files.
    f. Daily, monthly, and annual averaging intervals in the summary weather statistics data product are represented as: 01D = daily, 01M = monthly, 01Y = yearly.

8.1.1.1 Tower Vertical Numbering Schematic



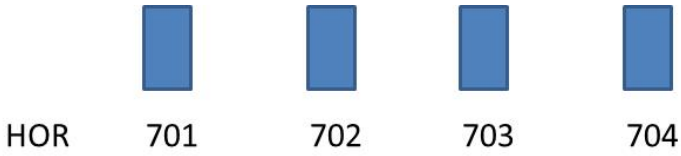
8.1.1.2 Soil Plot/Pit Vertical Numbering Schematic



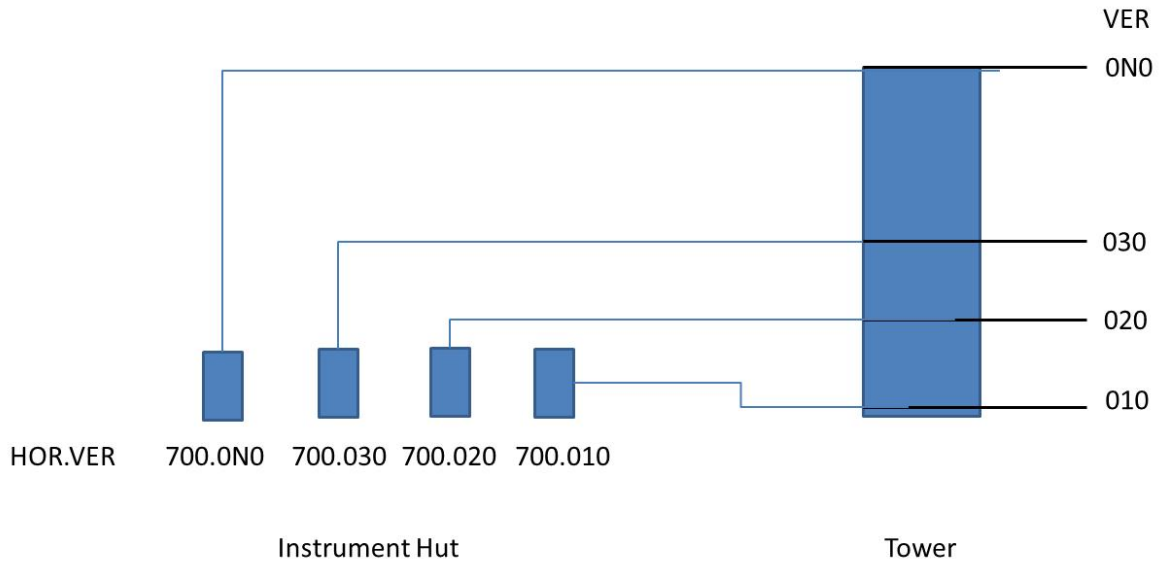
8.1.1.3 Instrument hut HOR and VER naming schematic

i. When there is only one sensor of that same type in the hut, HOR=700, VER=000.

ii. If multiple sensors of the same type are located inside the instrument hut, the HOR will have a leading number of 7, with the second and third digit to reflect the different horizontal locations for individual sensors. VER=000.



iii. If multiple sensors of the same type are located inside the instrument hut at the same cluster location, but each individual sensor is associated with the measurements of different vertical tower level, the HOR will be 700, with the VER to reflect different vertical tower level.



8.1.2 AIS Horizontal, Vertical, and Temporal Numbering (HOR.VER.TMI)

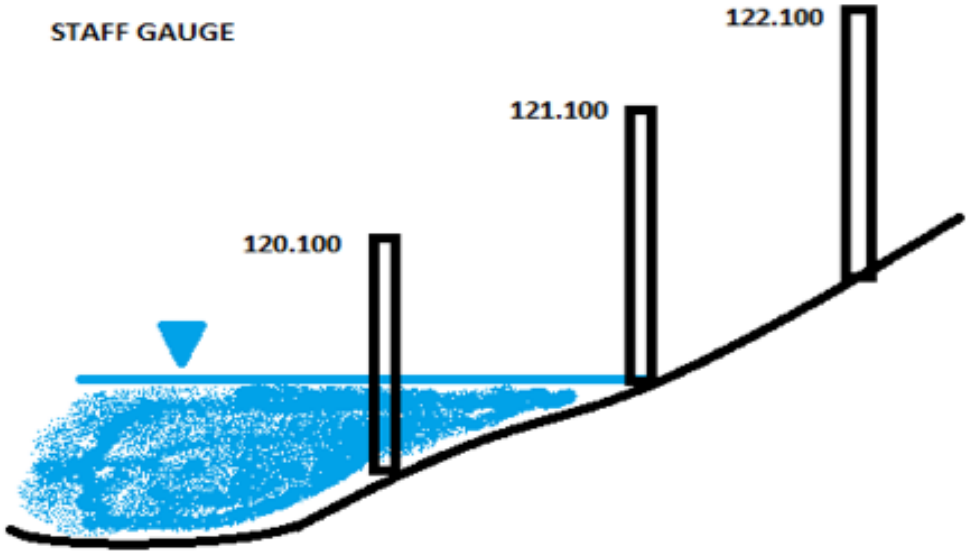
1. Horizontal (HOR):
    a. Site-level data = 100

b. Stream sensor stations: S1 = 101, S2 = 102; overhanging S1 = 111, overhanging S2 = 112
c. Water level sensor associated with overhanging S1 = 131, water level sensor associated with overhanging S2 = 132
d. Lake buoy, river buoy/sensor station = 103
e. Lake inlet = 130, outlet = 140, inflow = 150, outflow = 160
f. On-shore meteorological station = 200
g. DFIR = 900
h. Groundwater wells = 301-308
i. Camera = 110
j. NADP = 210
k. Secondary precipitation (tipping bucket) = 220
l. Prototype sensor = 999
m. Staff gauge = 120-12N (see schematic below). Used for the water level sensor when overhang design includes a level sensor at the staff gauge.

NOTE: Staff gauge data (DP1.20267.001) are ingested and transitioned in the OS system, so the HOR code does not appear in the data product number. For water level data (DP1.20016.001), where relevant, the HOR code is used in the data product number.

2. Vertical (VER):
    a. On-shore = 000
    b. In-stream/river/lake = 100
    c. Lake buoy, river buoy multisonde (single) = 100
    d. Lake buoy, river buoy multisonde (double) = 100 & 110
    e. Temperature chain (L1 data products) = 501-511, where 501 is closest to the water surface and 511 is deepest below the water surface
3. Temporal (TMI):
    a. Temporal numbering for AIS matches TIS; see section 8.1.1.

8.1.2.1 AIS Staff Gauge Schematic



8.2 Revisions (REV)

Revision numbers increment when a data product has changed, such that data from different revisions are not directly comparable. There are two pathways by which this might happen: a change in the algorithm used to calculate the data product, or a change in the instrument (IS and AOP products) or protocol (OS products) used to collect the data. In the case of algorithm changes, data published in the past may be re-processed to the new revision; in the case of instrument or protocol changes this is clearly impossible.

The numbering approach for revisions is under development and will be described in a future version of this document.

8.3 Terms (TERMS)

Terms represent data subproducts. Where data are published in tabular format, terms are used as column headers (see data portal). In some documentation terms are also referred to as field names.

1. Term names are written in camelCase.

2. No delimiters (e.g., comma, underscore) other than periods may be used in term names.
3. Term names are limited to 30 characters.
4. Terms may not be used more than once within the same subproduct table (OS) or temporal resolution (IS) of the same data product.
5. Every term has a unique description; e.g. uid is “Unique ID within NEON database; an identifier for the record” for all uses of uid.
6. Every term has a unique unit and data type; e.g. tailLength is an integer in millimeters for all uses, and plotID is a unitless string for all uses.
7. Terms are re-used between data products wherever possible and reasonable.
8. Preferred format for terms is modifierType, where Type is in the units of measurement, hence tailLength rather than lengthTail. Other examples:

Modifer	Type	Term
start	date	startDate
event	date	eventDate
domain	ID	domainID
site	ID	siteID
range	QM	rangeQM
spike	QM	spikeQM

   However, many terms deviate from this pattern; we may defer to internal consistency within subsystems, and consistency with external standards where they exist. Consult other IPT members or the DPS team if you are uncertain about the standards in your subsystem.
9. Terms may be used in conjunction with Lists of Values (LOVs), which describe a fixed list of potential values that may be used for a term within a data product. This is most frequently used to define values in a drop-down menu on data entry.
10. Terms are controlled by a database maintained by the Data Products team. Read access to the database is provided by an R Shiny app (current url: http://den-raven-1.ci.neoninternal.org/workbook-checker-app/). This app can be used to:
    a. Look up terms that have already been used, and which data products have used them
    b. Look up which terms are used for any given data product
    c. Submit new units and terms one at a time
    d. Submit new terms in bulk within an L0 (IS), ingest (OS) or publication (IS & OS) workbook. The app checks consistency between terms in the workbook and terms that are already in the database, identifies new terms if present, and allows submission of new terms.
    e. Look up Lists of Values (LOVs) that can be used with a term in a given data product.
11. DPS will review new terms and work with the submitter to adjust terms where needed.

12. Terms cannot be changed once CI has ingested data product workbooks and coded transitions. All changes must be made before ingest (and preferably before workbooks are submitted to CI) through discussion with DPS.