NEON USER GUIDE TO RIPARIAN VEGETATION PERCENT COVER (NEON.DP1.20191)

PREPARED BY	ORGANIZATION	DATE
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CHANGE RECORD

REVISION	DATE	DESCRIPTION OF CHANGE
A	fillIn: mm/dd/yyyy	Initial Release

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1 DESCRIPTION

1.1 Purpose

This document provides an overview of the data included in this NEON Level 1 data product, the quality controlled product generated from raw Level 0 data, and associated metadata. In the NEON data products framework, the raw data collected in the field, for example, the dry weights of litter functional groups from a single collection event are considered the lowest level (Level 0). Raw data that have been quality checked via the steps detailed herein, as well as simple metrics that emerge from the raw data are considered Level 1 data products.

The text herein provides a discussion of measurement theory and implementation, data product provenance, quality assurance and control methods used, and approximations and/or assumptions made during L1 data creation.

1.2 Scope

This document describes the steps needed to generate the L1 data product Riparian vegetation % Cover - and associated metadata from input data. This document also provides details relevant to the publication of the data products via the NEON data portal, with additional detail available in the file, NEON Data Variables for Riparian vegetation percent cover (NEON.DP1.20191) (AD[05]), provided in the download package for this data product.

This document describes the process for ingesting and performing automated quality assurance and control procedures on the data collected in the field pertaining to AOS Protocol and Procedure: Riparian Habitat Assessment (AD[07]). The raw data that are processed in this document are detailed in the file, NEON Raw Data Validation for riparian composition and cover (NEON.DP0.20275) (AD[04]), provided in the download package for this data product. Please note that raw data products (denoted by 'DP0') may not always have the same numbers (e.g., '10033') as the corresponding L1 data product.

2 RELATED DOCUMENTS AND ACRONYMS

2.1 Associated Documents

AD[01]	NEON.DOC.000001	NEON Observatory Design (NOD) Requirements
AD[02]	NEON.DOC.000913	TOS Science Design for Spatial Sampling
AD[03]	NEON.DOC.002652	NEON Level 1, Level 2 and Level 3 Data Products Catalog
AD[04]	NEON.DP0.20275.001 _dataValidation.csv	NEON Raw Data Validation for riparian composition and cover (NEON.DP0.20275)
AD[05]	NEON.DP1.20191.001 _variables.csv	NEON Data Variables for Riparian vegetation percent cover (NEON.DP1.20191)
AD[06]	NEON.DOC.001152	Aquatic Sample Strategy
AD[07]	NEON.DOC.003826	AOS Protocol and Procedure: Riparian Habitat Assessment
AD[08]	NEON.DOC.000008	NEON Acronym List
AD[09]	NEON.DOC.000243	NEON Glossary of Terms
AD[10]	OS_Generic_Transitions .pdf	NEON Algorithm Theoretical Basis Document: OS Generic Transitions
AD[11]		NEON's Ingest Conversion Language (NICL) specifications

2.2 Acronyms

Acronym	Definition
ANPP	*Annual Net Primary Productivity*
STRI/CTFS	*Smithsonian Tropical Research Institute Center for Tropical Forest Science*

Do we need any acronyms, EPA or EMAP? I can't tell how much this follows them. if not delete the above

3 DATA PRODUCT DESCRIPTION

The riparian vegetation % cover product provides measurements of canopy cover over NEON wadeable streams. Cover is measured using a convex densiometer. The protocol is derived from methods developed by the U.S. Environmental Protection Agency (2008) and U.S. Fish and Wildlife Service (1997, 2009). The method follows Ode (2007), using the Strickler modification (17-point) of a convex spherical densiometer to correct for overestimation of canopy density (thickness and consistency of plant foliage) that occurs with unmodified readings (Strickler, 1959).

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3.1 Spatial Sampling Design

The vegetation % cover component of the riparian habitat asessment protocol is executed at wadeable stream sites. 10 stream transects are evenly distributed throughout the 1 km biological sampling reach (Figure 3). At each transect, measurements are taken at 3 points the center of the stream , 0.3 from the left bank and 0.3m from right bank. At the center stream sampling point, 4 densimeter readings are taken facing upstream, downstream, river right, and river left; at the left and right banks a single densimeter reading is taken, facing the bank.

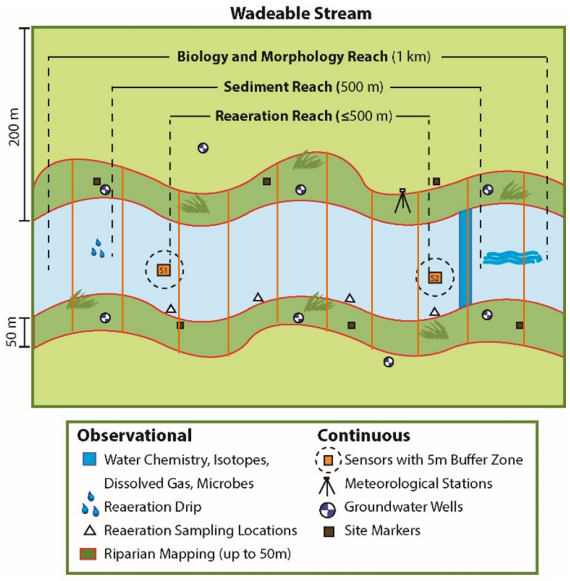

Figure 1: Riparian habitat assessment locations for wadeable streams

3.2 Temporal Sampling Design

Riparian vegetation % cover measurements occur once per year, during periods of peak-greenness as determined by the range of historical dates when MODIS NDVI greenness is within 90% of site maximum.

3.3 Variables Reported

All variables reported from the field or laboratory technician (L0 data) are listed in the file, NEON Raw Data Validation for riparian composition and cover (NEON.DP0.20275) (AD[04]). All variables reported in the published data (L1 data) are also provided separately in the file, NEON Data Variables for Riparian vegetation percent cover (NEON.DP1.20191) (AD[05]).

Field names have been standardized with Darwin Core terms (http://rs.tdwg.org/dwc/; accessed 16 February 2014), the Global Biodiversity Information Facility vocabularies (http://rs.gbif.org/vocabulary/gbif/; accessed 16 February 2014), the VegCore data dictionary (https://projects.nceas.ucsb.edu/nceas/projects/bien/wiki/VegCore; accessed 16 February 2014), where applicable. NEON TOS spatial data employs the World Geodetic System 1984 (WGS84) for its fundamental reference datum and Earth Gravitational Model 96 (EGM96) for its reference gravitational ellipsoid. Latitudes and longitudes are denoted in decimal notation to six decimal places, with longitudes indicated as negative west of the Greenwich meridian.

Some variables described in this document may be for NEON internal use only and will not appear in downloaded data.

3.4 Spatial Resolution and Extent

The finest resolution at which spatial data are reported is a measurementLocation within a single transect.

measurementLocation (xxx) →**namedLocation** (unique ID given to the individual transect) → **siteID** (ID of NEON site) → **domainID** (ID of a NEON domain).

Caren can you please fill in whatever is happening with the spatial data here? I have no idea how AQU spatial data works/what is being provided to CI ## Temporal Resolution and Extent The finest resolution at which temporal data are reported is the **startDate**, the date and time of day at which the assessment of a particular transect began.

3.5 Associated Data Streams

Caren I think none, if you agree please delete this section

3.6 Product Instances

Each of 10 transects per site is expected to be surveyed once per year. Each transect contains 3 points, sampled in either in 4 (center) or one (bank) directions, yielding 60 data product instances per site per calendar year.

3.7 Data Relationships

Caren I think none, if you agree please delete this section

3.8 Special Considerations

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4 DATA ENTRY CONSTRAINT AND VALIDATION

Many quality control measures are implemented at the point of data entry within a mobile data entry application or web user interface (UI). For example, data formats are constrained and data values controlled through the provision of dropdown options, which reduces the number of processing steps necessary to prepare the raw data for publication. An additional set of constraints are implemented during the process of ingest into the NEON database. The product-specific data constraint and validation requirements built into data entry applications and database ingest are described in the document NEON Raw Data Validation for riparian composition and cover (NEON.DP0.20275), provided with every download of this data product. Contained within this file is a field named 'entryValidationRulesForm', which describes syntactically the validation rules for each field built into the data entry application. Data entry constraints are described in Nicl syntax in the validation file provided with every data download, and the Nicl language is described in NEON's Ingest Conversion Language (NICL) specifications ([AD[15]).

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5 DATA PROCESSING STEPS

Following data entry into a mobile application of web user interface, the steps used to process the data through to publication on the NEON Data Portal are detailed in the NEON Algorithm Theoretical Basis Document: OS Generic Transitions (AD[14]).

6 REFERENCES

Ode (2007), using the Strickler modification (17-point) of a convex spherical densiometer to correct for overestimation of canopy density (thickness and consistency of plant foliage) that occurs with unmodified readings (Strickler, 1959).

Ode, P. 2007 Standard Operating Procedures for Collecting Benthic Macroinvertebrate Samples and//: Add in Commissioning Documents as appropriate

6.1 Acronyms

Acronym	Definition
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7.1 Spatial Sampling Design

The vegetation % cover component of the riparian habitat asessment protocol is executed at wadeable stream sites. 10 stream transects are evenly distributed throughout the 1 km biological sampling reach (Figure 3). At each transect, measurements are taken at 3 points: center, 0.3 m from the left bank, 0.3 m right bank. At the center point 4 densimeter readings are taken facing upstream, downstream, river right, and river left; at the left and right banks only a single (bank-facing) densiometer reading is taken.

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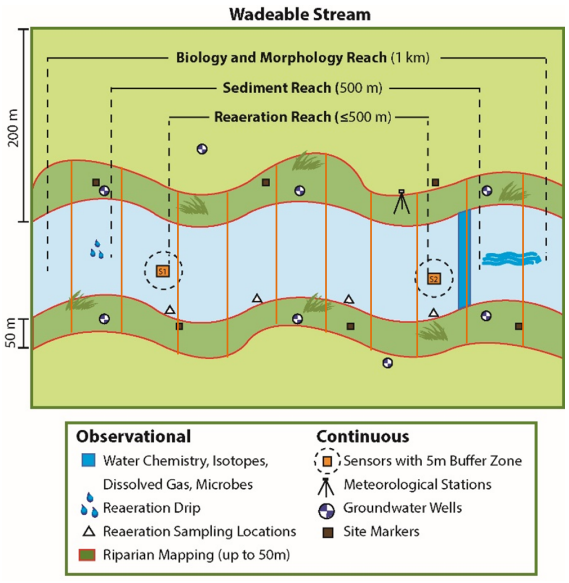

Figure 2: Riparian habitat assessment locations for wadeable streams

7.2 Temporal Sampling Design

Riparian vegetation % cover measurements occur once per year, during periods of peak-greenness as determined by the range of historical dates when MODIS NDVI greenness is within 90% of site maximum.

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7.4 Spatial Resolution and Extent

The finest resolution at which spatial data are reported is a measurementLocation within a single transect.

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7.5 Associated Data Streams

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7.6 Product Instances

Each of 10 transects per site is expected to be surveyed once per year. Each transect contains 1 center point, which is sampled in 4 directions, plus 2 bank points, each of which are sampled in 1 directions yielding 60 data product instances per site per calendar year.

7.7 Data Relationships

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7.8 Special Considerations

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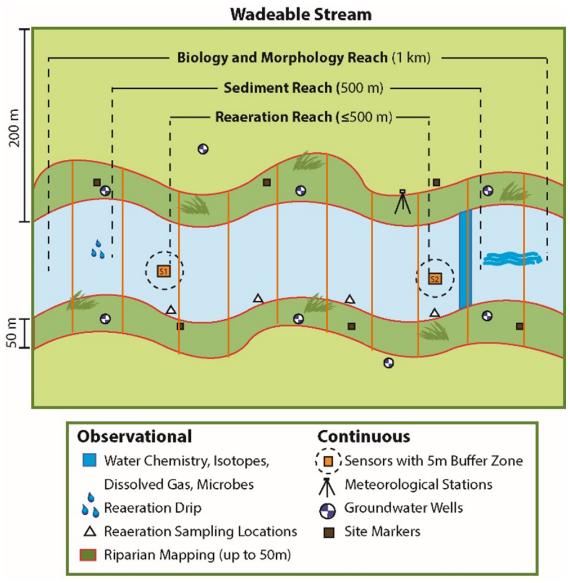

Figure 3: Riparian habitat assessment locations for wadeable streams

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11.6 Product Instances

Each of 10 transects per site is expected to be surveyed once per year. Each transect contains 5 points, each of which are sampled in 4 directions yielding 200 data product instances per site per calendar year.

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