

<i>Title:</i> NEON User Guide to Riparian composition and structure (NEON.DP1.20275)	<i>Date:</i> 05/22/2017
<i>Author:</i> Caren Scott	<i>Revision:</i> A

## NEON USER GUIDE TO RIPARIAN COMPOSITION AND STRUCTURE (NEON.DP1.20275)

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## CHANGE RECORD

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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 *fill in title of product and short description, e.g.: Litterfall and fine woody debris sampling - the dry weight of litterfall and fine woody debris collected from litter traps by plant functional type* - 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 composition and structure (NEON.DP1.20275) (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.DP1.20275.001_variables.csv	NEON Data Variables for Riparian composition and structure (NEON.DP1.20275)
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
<i>ANPP</i>	<i>Annual Net Primary Productivity</i>
<i>STRI/CTFS</i>	<i>Smithsonian Tropical Research Institute Center for Tropical Forest Science</i>

*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

Riparian composition and structure products provide an estimate of the riparian vegetation, human impacts, and bank characteristics, which buffer the banks of NEON Aquatic lakes, rivers, and streams. The protocol is derived from methods developed by the U.S. Environmental Protection Agency (2008), U.S. Fish and Wildlife Service (1979, 1997, 2009) and U.S. Department of Agriculture (1959).

#### 3.1 Spatial Sampling Design

The Riparian habitat assessment protocol is executed at NEON aquatic sites. At wadeable streams, 10 riparian transects are evenly distributed throughout the 1 km biological sampling reach (Figure 1). At lakes, 10 evenly spaced transects are established around the lake perimeter (Figure 2). Large river sites include 5 right bank and 5 left bank transects that are evenly spaced throughout the 1 km reach (Figure 3). The riparian area surveyed at each transect extends up to 50 m from the shoreline/bank towards the terrestrial systems (less if the plot is visibly obstructed) and 20 m (10 m each side of central point) along the shoreline.

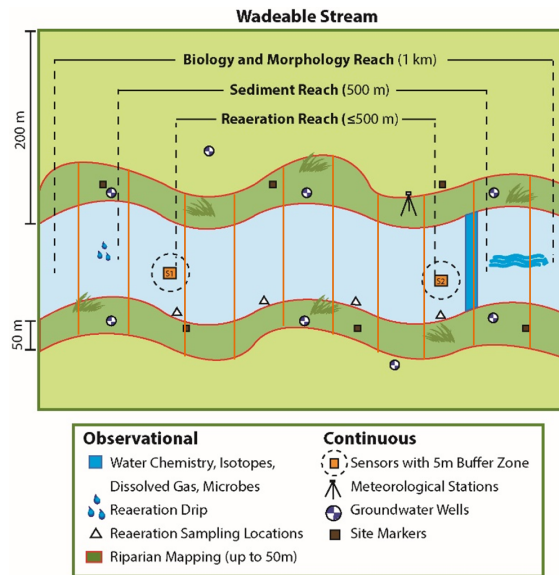


Figure 1: Riparian habitat assessment locations for wadeable streams

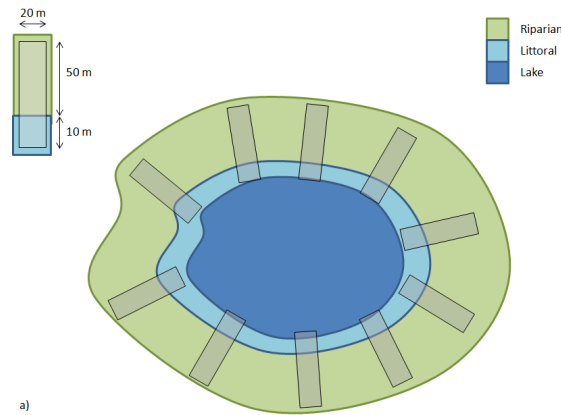


Figure 2: Riparian habitat assessment locations for lakes streams

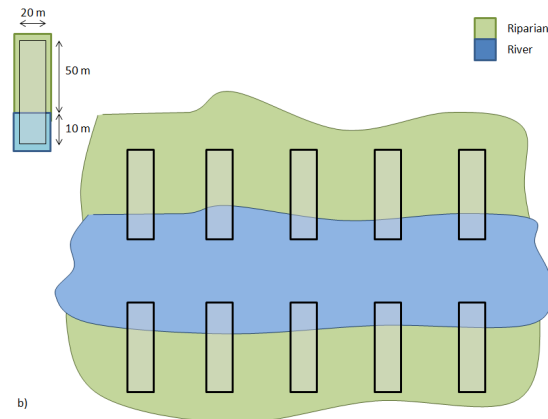


Figure 3: Riparian habitat assessment locations for rivers

### 3.2 Temporal Sampling Design

Riparian habitat assessment occurs 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 composition and structure (NEON.DP1.20275) (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 single transect.

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

The basic spatial data included in the data downloaded include the latitude, longitude, and elevation of the “riparian point” and associated uncertainty due to GPS error.

For stream sites, the reported “riparian point” is in the center of the stream channel, which is approximately where the field operations technician would stand to collect data from. The “riparian transect” extends 50 m from the stream bank away from the center of the stream and ten meters upstream and downstream from the technicians vantage point, making a 50 m by 20 m box.

For lake and river sites, the field technicians will be approximately 10 meters offshore from the reported riparian point. The “riparian transect” extends 50 m from the lake/river shore and ten meters left and right from the shore point, making a 50 m by 20 m box.

Observations are reported for the 50 m by 20 m “riparian transect” and also include some free-form notes about the adjacent area, approximately 15 m outside of the riparina transect.

### 3.5 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.

### 3.6 Associated Data Streams

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

### 3.7 Product Instances

Each of 10 transects per site is expected to be surveyed once per year, yielding 10 data product instances per site per calendar year.



### 3.8 Data Relationships

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

### 3.9 Special Considerations

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

## 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]).

*Caren Do you know if there is a schematic of the fulcrum app that would be useful/appropriate to include here?*

*kmc: I think Steph is in the process of updating the user guide for this app since it isn't in the new template. I have been adding her as a co-author to my userguides when I copy the flowcharts from the Fulcrum user guides to these user guides.*

1. The Riparian Assessment app requires data entry technicians to verify that it is correct when they enter data for fewer than 10 transects for a given site and date.
2. Records at stream sites cannot be saved without stream canopy measurements that include both measurement direction and measurement location entered. This is to ensure that the procedure is executed according to protocol.
3. **class** and **subclass** choices are constrained by **subsystem** and **class** choices according to Cowardin et al. (1979).
4. If vegetation type is "none", the app automatically sets density to "absent" for a given type.

## 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

U.S. Department of Agriculture. Strickler, G.S. 1959. Use of the densiometer to estimate density of forest canopy on permanent sample plots, Research Note Number 180, .

U.S. Environmental Protection Agency. 2008. Development for a Statewide Wetland and Riparian Mapping, Assessment and Monitoring Program 2009-2015. 29 pp.

U.S. Fish and Wildlife Service. 1997. A system for mapping riparian areas in the western United States. U. S. Fish and Wildlife Service. Washington, DC. 15 pp.

U.S. Fish and Wildlife Service. 2009. A system for mapping riparian areas in the western United States. U. S. Fish and Wildlife Service. Washington, DC. 7 pp.

U.S. Fish and Wildlife Service. Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. Washington, DC.FWS/OBS 79/31. 103 pp.