

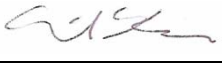




| | | |
|--|-------------------------------|------------------------|
| <i>Title:</i> NEON Level 1-3 Data Products Catalog | <i>Author:</i> Michael Keller | <i>Date:</i> 3/16/2010 |
| <i>NEON Doc. #:</i> NEON.MGMT.DPS.005004.REQ | | <i>Version:</i> C |

NEON Level 1-3 Data Products Catalog

| PREPARED BY | ORGANIZATION | DATE |
|--------------------|---------------------|-------------|
| Michael Keller | Science | 1/27/2010 |

| APPROVALS (Name and Signature) | ORGANIZATION | DATE |
|--|--------------------------------|-------------|
| Tony Beasley  | CCB Chairman COO | 3/16/2010 |
| Tom Cilke  | CCB Director of Engineering | 3/16/2010 |
| Michael Keller  | CCB Chief of Science | 3/16/2010 |
| Brian Damiani  | CCB Systems Engineer | 3/16/2010 |

| RELEASED BY (Name and Signature) | ORGANIZATION | DATE |
|--|--------------------------|-------------|
| Dina Cilke  | CCB Administrator DCS | 3/16/2010 |

| | | |
|--|-------------------------------|------------------------|
| <i>Title:</i> NEON Level 1-3 Data Products Catalog | <i>Author:</i> Michael Keller | <i>Date:</i> 3/16/2010 |
| <i>NEON Doc. #:</i> NEON.MGMT.DPS.005004.REQ | | <i>Version:</i> C |

Change Record

| VERSION | DATE | CRE # | REASON/INITIATION/REMARKS |
|----------------|-------------|--------------------------|--|
| A | 5/15/2009 | NEON.MGMT.DPS.000041.CRE | Initial Release |
| A.1 | 9/12/2009 | | Reformatting and renumbering of Level 1 with retention of all products from previous version. Addition of levels 2 and 3. Addition of explanatory text. |
| B | 09/22/2009 | NEON.MGMT.DPS.000088.CRE | Approval of submitted changes |
| B.1 | 02/02/2010 | | Deletion of duplicate data products. Deletion of data products from the Level 1 list that are synthetic and are already incorporated in Level 4 products. Shifting data products based on lab analyses among AQU, FIU, and FSU according to the team that is responsible for sample collection. All surface and subsurface water products are assigned to AQU and wet deposition products are assigned to FIU. |
| C | 03/16/2010 | NEON.MGMT.DPS.000214.CRE | CCB approved submitted changes |

| | | |
|--|-------------------------------|------------------------|
| <i>Title:</i> NEON Level 1-3 Data Products Catalog | <i>Author:</i> Michael Keller | <i>Date:</i> 3/16/2010 |
| <i>NEON Doc. #:</i> NEON.MGMT.DPS.005004.REQ | | <i>Version:</i> C |

TABLE OF CONTENTS

| | | |
|-----|-------------------------------------|----|
| 1 | DESCRIPTION..... | 1 |
| 1.1 | Purpose..... | 1 |
| 1.2 | Scope..... | 1 |
| 2 | RELATED DOCUMENTS AND ACRONYMS..... | 2 |
| 2.1 | Applicable Documents..... | 2 |
| 2.2 | Reference Documents..... | 2 |
| 2.3 | Verb Convention..... | 2 |
| 3 | INTRODUCTION..... | 3 |
| 4 | NEON DATA PRODUCTS..... | 4 |
| 5 | LEVEL 1 DATA PRODUCTS..... | 5 |
| 6 | LEVEL 2 DATA PRODUCTS..... | 54 |
| 7 | LEVEL 3 DATA PRODUCTS..... | 57 |

LIST OF TABLES

| | | |
|----------------|---|----|
| Table 1 | Definition of Data Product Levels for NEON..... | 4 |
| Table 2 | Level 1 data products for the Airborne Observation Platform (AOP) sub-system..... | 6 |
| Table 3 | Level 1 data products for the Aquatic/STREON sub-system..... | 7 |
| Table 4 | Level 1 data products for the Fundamental Instrument Unit (FIU) sub-system..... | 24 |
| Table 5 | Level 1 data for the Fundamental Sentinel Unit (FSU) sub-system..... | 33 |
| Table 6 | Level 1 data products for the Land Use Analysis Package (LUAP) sub-system..... | 51 |
| Table 7 | Level 2 data products for the Fundamental Instrument Unit (FIU) sub-system..... | 55 |
| Table 8 | Level 3 data products for the Airborne Observation Platform (AOP) sub-system..... | 58 |

LIST OF FIGURES

| | | |
|-----------------|---------------------------------------|---|
| Figure 1 | The NEON Design Process (AD[03])..... | 3 |
|-----------------|---------------------------------------|---|

| | | |
|--|-------------------------------|------------------------|
| <i>Title:</i> NEON Level 1-3 Data Products Catalog | <i>Author:</i> Michael Keller | <i>Date:</i> 3/16/2010 |
| <i>NEON Doc. #:</i> NEON.MGMT.DPS.005004.REQ | | <i>Version:</i> C |

1 DESCRIPTION

1.1 Purpose

This document provides a brief explanation of NEON data products and lists all products at levels 1 through 3. NEON staff, the NSF, the scientific community, and members of the public will use this catalog.

1.2 Scope

Data products from levels 1 through 3 from all science areas are included in this document. Five product teams produce level 1 data (AOP, AQU/STR, FIU, FSU, and LUAP). The MPD data is a sub-set of the FIU data that is described at level 0 AD[01]. For four of the product teams, NEON will produce the data and is responsible for calibration and validation. The LUAP data come from outside agencies that calibrate and validate their data. Data products at level 0 and level 4 are listed and described in separate documents AD[01] and AD[02] respectively.

| | | |
|--|-------------------------------|------------------------|
| <i>Title:</i> NEON Level 1-3 Data Products Catalog | <i>Author:</i> Michael Keller | <i>Date:</i> 3/16/2010 |
| <i>NEON Doc. #:</i> NEON.MGMT.DPS.005004.REQ | | <i>Version:</i> C |

2 RELATED DOCUMENTS AND ACRONYMS

2.1 Applicable Documents

| | |
|--------|--|
| AD[01] | NEON Level 0 Data Products Catalog |
| AD[02] | NEON.MGMT.DPS.005003.REQ_ NEON Scientific Data Products Catalog |
| AD[03] | NEON.DSDV.NPR.000001.REP_ NEON Observatory Design |
| AD[04] | NEON.DSDV.CYI.003052.SPE_ CI LUAP Interface Design Specification |

2.2 Reference Documents

| | |
|--------|---|
| RD[01] | NEON.MGMT.NPR.000008.GEN NEON Glossary of Abbreviations |
|--------|---|

2.3 Verb Convention

"Shall" is used whenever a specification expresses a provision that is binding. The verbs "should" and "may" express non-mandatory provisions. "Will" is used to express a declaration of purpose on the part of the design activity.

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

3 INTRODUCTION

The National Ecological Observatory Network (NEON) is a continental-scale research platform for discovering and understanding the impacts of climate change, land-use change, and invasive species on ecology. NEON will gather long-term data on ecological responses of the biosphere to changes in land use and climate, and on feedbacks with the geosphere, hydrosphere, and atmosphere.

NEON is designed to provide a physical and information infrastructure to enable understanding and forecasting of the impacts of climate change, land use change and invasive species on continental-scale ecology. The NEON design derives from the environmental Grand Challenges and the need to answer scientific questions (AD[03]). These questions, in turn, define the measurements and observations carried out through the scientific subsystems (Figure 1). In order to provide the necessary information infrastructure, NEON data from observations and experiments will need to be processed in sophisticated ways. These may range from averaging or smoothing for easy visualization up to processing through models for inference of parameters or unobserved quantities. NEON information will be made available to the scientific community, students, educators, decision makers and the public through the NEON cyberinfrastructure. Collectively, the information provided by NEON will be distributed as data

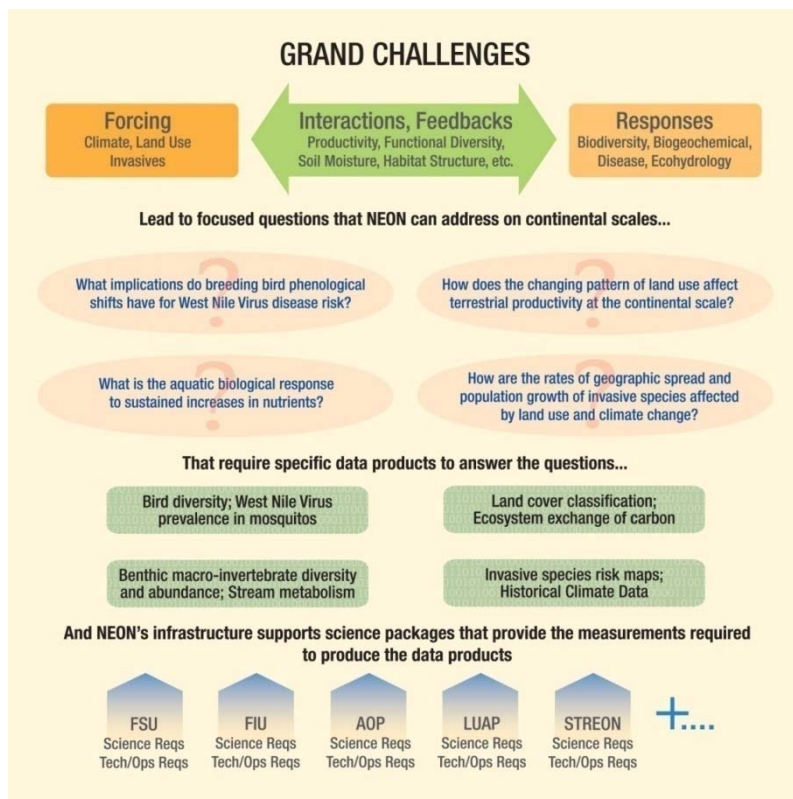


Figure 1 The NEON Design Process (AD[03])

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

4 NEON DATA PRODUCTS

NEON will publish data products for science, education, outreach, and decision support. The data products published by NEON will include raw measurement data and scientific data products from calibrated measurements (including the associated calibration data) through high-level products that combine multiple measurements and may involve considerable assumptions and interpretation. A more detailed description of the organization of NEON data products is found in the *NEON Scientific Data Products Catalog AD[02]*.

In order to organize the production and presentation of the NEON data products, NEON will use a parsimonious series of 5 data product levels. These start at raw data (Level 0) and proceed to calibration (Level 1). There are optional steps for temporal (Level 2) and spatial (Level 3) rectification. The highest level of processed data products (Level 4) derived from level 1, 2 and/or 3 data represent a range of complexities from simple summaries to complex analyses. This selection of data product levels is sufficient to inform the data users of the nature of a product and to guide internal management and cyberinfrastructure processes. It is not necessary for all data products to proceed uniformly from Level 0 to Level 4. A description of data product levels is presented in Table 1.

Table 1 Definition of Data Product Levels for NEON.

| | |
|---------|--|
| Level 0 | Raw data from instrumental or human observations. |
| Level 1 | Calibrated data generally from a single instrument, observer, or field sampling area. These data may include information on data quality. |
| Level 2 | Combinations of level 1 data used to create a gap filled data stream that may replace a level 1 product. Generally, products at this level this will reflect a stream from a single instrument, observer, or field sampling area. Annotations will indicate the gap filling approach employed. |
| Level 3 | Level 1 and /or 2 data mapped on a uniform space-time grid. |
| Level 4 | Derived products using levels 1, 2 and/or 3 data. Products at this level may combine observations from more than one instrument, observer, and/or sampling area. |

Data products for NEON levels 0, 1, 2, and 3 are derived primarily from a single instrument, observer, or a specific sampling location. These products are associated with the four principal observatory scientific sub-systems described in the NEON Observatory Design (AD[02]): Fundamental Sentinel Unit (FSU), the Fundamental Instrument Unit (FIU), the Airborne Observation Platform (AOP), and the Land Use Analysis Package (LUAP). These components scale ecological observations from the organismal level (FSU), to airsheds and watersheds (FIU), to small regions (~300 km²; AOP) and on to the national or continental scale using data sets collected outside of NEON (LUAP). For practical purposes, the FSU and FIU components are now managed as three scientific sub-systems that include the terrestrial portions of FSU and FIU that are referred to by those names, and an Aquatic sub-system that manages both organismal and instrumental measurements in streams and ponds. The aquatic sub-system referred to as Aquatic-STREON (AQU/STR) also manages the Stream Observational Network Experiment (STREON).

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

5 LEVEL 1 DATA PRODUCTS

Level 1 data products will be produced for all of the NEON sub-systems defined by the present management structure (AOP, AQU/STR, FIU, FSU, and LUAP). For all sub-systems with the exception of LUAP, NEON produces the data and is responsible for calibration and validation. The LUAP data come from outside agencies that calibrate and validate their data. Data products at level 0 and level 4 are listed and described in separate documents AD[01] and AD[02] respectively.

Level 1 data products are listed for each of the science sub-systems in a series of tables as follows (with the number of products in each table in parenthesis):

AOP in Table 2 (4);
 AQU/STR in Table 3 (164);
 FIU in Table 4 (104);
 FSU in Table 5 (269); and
 LUAP in Table 6 (43).

In total, there are 584 level 1 products.

Tables 2 through 6 all use the same column headings that are described below.

Level 1 ID: Each level 1 product has a unique identification number beginning with a prefix that identifies the name of the science sub-system. The numbering convention follows the form SSS.L.XXXX where SSS is a three letter abbreviation for the subsystem that produces the product (AOP, AQU, FIU, FSU, LUAP), L is the product level (1, 2, or 3) and XXXX is a four digit number.

Level 1 products: A descriptive name for the data product.

Spatial: The spatial unit for publication of the product. A measurement that will be collected across a site may have sub-site information included.

Temporal: The temporal division for publication of the product. Products may have more than one temporal division.

Base units: The scientific units for the product or a qualitative description of the data type.

Level 0 source: A generic description of the process for collection of the raw data.

Construction phase: An “x” indicates that the product will be produced during the construction phase of the project.

Operations phase: An “x” indicates that the product will be produced during observatory operations.

LUAP products derive from government agencies and other sources. The source of the LUAP data and its characteristics is described in the *CI LUAP Interface Design Specification* AD[04].

| | | |
|--|-------------------------------|------------------------|
| <i>Title:</i> NEON Level 1-3 Data Products Catalog | <i>Author:</i> Michael Keller | <i>Date:</i> 3/16/2010 |
| <i>NEON Doc. #:</i> NEON.MGMT.DPS.005004.REQ | | <i>Version:</i> C |

Table 2. Level 1 data products for the Airborne Observation Platform (AOP) sub-system.

| Level 1 ID | Level 1 Product | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|------------|-------------------------|-------------------|----------|---|----------------|--------------------|------------------|
| AOP.1.0001 | LiDAR vertical waveform | regional coverage | year | normalized intensity as function of height above the ground | LiDAR | | x |
| AOP.1.0002 | Spectral reflectance | regional coverage | year | reflectance as function of wavelength | Spectrometer | | x |
| AOP.1.0003 | Spectral radiance | regional coverage | year | radiance as function of wavelength | Spectrometer | | x |
| AOP.1.0004 | High resolution imagery | regional coverage | year | 2D imagery | Camera | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

Table 3. Level 1 data products for the Aquatic/STREON sub-system.

| Level 1 ID | Level 1 products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|--|-----------------------------------|-------------------------|--------------|-----------------|----------------------|--------------------|------------------|
| <i>Epilithic and planktonic algae + associated biofilm</i> | | | | | | | |
| AQU.1.0001 | Algae species identification | subsample, sample, site | season, year | ID | Laboratory processed | | x |
| AQU.1.0002 | # Algae species | subsample, sample, site | season, year | count | Laboratory processed | | x |
| AQU.1.0003 | Algae % cover | subsample, sample, site | season, year | % | Field processed | | x |
| AQU.1.0004 | Algae cell count | subsample, sample, site | season, year | count | Laboratory processed | | x |
| AQU.1.0005 | Algae cell volume | subsample, sample, site | season, year | mm ³ | Laboratory processed | | x |
| AQU.1.0006 | Algae chlorophyll a concentration | subsample, sample, site | season, year | µg/L | Laboratory processed | | x |
| AQU.1.0007 | Algae phaeophyton concentration | subsample, sample, site | season, year | µg/L | Laboratory processed | | x |
| AQU.1.0008 | Algae total carbon content | subsample, sample, site | season, year | g | Laboratory processed | | x |
| AQU.1.0009 | Algae total nitrogen content | subsample, sample, site | season, year | g | Laboratory processed | | x |
| AQU.1.0010 | Algae total phosphorous content | subsample, sample, site | season, year | g | Laboratory processed | | x |
| AQU.1.0011 | Algae total organic 13C | subsample, sample, site | season, year | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0012 | Algae total organic 15N | subsample, sample, site | season, year | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0013 | Algae total organic 34S | subsample, sample, site | season, year | ‰, part per mil | Laboratory processed | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|-------------------------|---|-------------------------|---|---------------|----------------------|--------------------|------------------|
| AQU.1.0014 | Biofilm microbial community sequence data | subsample, sample, site | season, year | sequence data | Laboratory processed | | x |
| AQU.1.0015 | Biofilm 16S rRNA sequence data | subsample, sample, site | season, year | sequence data | Laboratory processed | | x |
| AQU.1.0016 | Biofilm ITS rRNA sequence data | subsample, sample, site | season, year | sequence data | Laboratory processed | | x |
| AQU.1.0017 | Biofilm Bacteria qPCR | subsample, sample, site | season, year | sequence data | Laboratory processed | | x |
| AQU.1.0018 | Biofilm Archae qPCR | subsample, sample, site | season, year | sequence data | Laboratory processed | | x |
| AQU.1.0019 | Biofilm Fungal qPCR | subsample, sample, site | season, year | sequence data | Laboratory processed | | x |
| AQU.1.0020 | Biofilm microbial functional assay | subsample, sample, site | season, year | sequence data | Laboratory processed | | x |
| <i>Microbes - water</i> | | | | | | | |
| AQU.1.0021 | Community sequence data | subsample | year (up to 26x in streams, 12x in ponds) | sequence data | Laboratory processed | | x |
| AQU.1.0022 | 16S rRNA sequence data | sample, site | year (up to 26x in streams, 12x in ponds) | sequence data | Laboratory processed | | x |
| AQU.1.0023 | 18S rRNA sequence data | sample, site | year (up to 26x in streams, 12x in ponds) | sequence data | Laboratory processed | | x |
| AQU.1.0024 | ITS rRNA sequence data | sample, site | year (up to 26x in streams, 12x in ponds) | sequence data | Laboratory processed | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|------------|------------------------------|--------------|---|---------------|----------------------|--------------------|------------------|
| AQU.1.0025 | Bacteria qPCR | sample, site | year (up to 26x in streams, 12x in ponds) | sequence data | Laboratory processed | | x |
| AQU.1.0026 | Archae qPCR | sample, site | year (up to 26x in streams, 12x in ponds) | sequence data | Laboratory processed | | x |
| AQU.1.0027 | Fungal qPCR | sample, site | year (up to 26x in streams, 12x in ponds) | sequence data | Laboratory processed | | x |
| AQU.1.0028 | Total microbial biomass | sample, site | year (up to 26x in streams, 12x in ponds) | sequence data | Laboratory processed | | x |
| AQU.1.0029 | nifH sequence data | sample, site | year (up to 26x in streams, 12x in ponds) | sequence data | Laboratory processed | | x |
| AQU.1.0030 | Total nifH microbial biomass | sample, site | year (up to 26x in streams, 12x in ponds) | sequence data | Laboratory processed | | x |
| AQU.1.0031 | # unique 16S rRNA sequences | sample, site | year (up to 26x in streams, 12x in ponds) | sequence data | Laboratory processed | | x |
| AQU.1.0032 | # unique 18S rRNA sequences | sample, site | year (up to 26x in streams, 12x in ponds) | sequence data | Laboratory processed | | x |
| AQU.1.0033 | # unique ITS sequences | sample, site | year (up to 26x in streams, 12x in ponds) | sequence data | Laboratory processed | | x |
| AQU.1.0034 | microbial functional assay | sample, site | year (up to 26x in streams, 12x in ponds) | sequence data | Laboratory processed | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|--|---|--------------|--------------|-----------------|----------------------|--------------------|------------------|
| <i>Macrophytes, Bryophytes and Lichens</i> | | | | | | | |
| AQU.1.0035 | Macrophyte, Bryophyte and Lichen species identification | sample, site | season, year | ID | Laboratory processed | | x |
| AQU.1.0036 | # Macrophyte, Bryophyte and Lichen species | sample, site | season, year | count | Laboratory processed | | x |
| AQU.1.0037 | Fresh weight (macrophyte) | sample, site | season, year | g | Laboratory processed | | x |
| AQU.1.0038 | Dry weight (macrophyte) | sample, site | season, year | g | Laboratory processed | | x |
| AQU.1.0039 | Ash-free dry mass (macrophyte) | sample, site | season, year | g | Laboratory processed | | x |
| AQU.1.0040 | Total carbon content (macrophyte) | sample, site | season, year | g | Laboratory processed | | x |
| AQU.1.0041 | % cover (macrophyte <i>in situ</i>) | sample, site | season, year | % | Field processed | | x |
| <i>Benthic macro-invertebrates</i> | | | | | | | |
| AQU.1.0042 | Benthic Macro-invertebrate species identification | sample, site | season, year | ID | Laboratory processed | x | x |
| AQU.1.0043 | Benthic Macro-invertebrate DNA barcode identification | sample, site | season, year | ID | Laboratory processed | x | x |
| AQU.1.0044 | Benthic Macro-invertebrate Lowest Taxonomic Unit | sample, site | season, year | count | Laboratory processed | x | x |
| AQU.1.0045 | # Benthic Macro-invertebrate individuals per taxon | sample, site | season, year | count | Laboratory processed | x | x |
| AQU.1.0046 | Biovolume (macroinvertebrates) | sample, site | season, year | mm ³ | Laboratory processed | x | x |
| <i>Zooplankton (primarily measured in ponds)</i> | | | | | | | |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|--|---|--------------|----------------------------------|------------|----------------------|--------------------|------------------|
| AQU.1.0047 | Zooplankton species identification | sample, site | season, year | ID | Laboratory processed | x | x |
| AQU.1.0048 | Zooplankton DNA barcode identification | sample, site | season, year | ID | Laboratory processed | x | x |
| AQU.1.0049 | # Zooplankton Lowest Taxonomic Unit (LTU) | sample, site | season, year | count | Laboratory processed | x | x |
| AQU.1.0050 | # Zooplankton individuals | sample, site | season, year | count | Laboratory processed | x | x |
| <i>Fish/top predator</i> | | | | | | | |
| AQU.1.0051 | Fish/top predator species identification | CPUE, site | year | ID | Field processed | | x |
| AQU.1.0052 | Aquatic fauna DNA barcode library | CPUE, site | year | ID | Field processed | | x |
| AQU.1.0053 | # Fish/top predator species | CPUE, site | year | count | Field processed | | x |
| AQU.1.0054 | # Fish/top predator individuals | CPUE, site | year | count | Field processed | | x |
| AQU.1.0215 | Fish/top predator Individual length | CPUE, site | year | cm | Field processed | | x |
| AQU.1.0216 | Fish/top predator Individual weight | CPUE, site | year | mg | Field processed | | x |
| <i>Physical measurements and in-situ instrument measurements</i> | | | | | | | |
| AQU.1.0055 | Pond depth | sample, site | minute, day, month, season, year | m | Field processed | x | x |
| AQU.1.0056 | Pond fetch | sample, site | minute, day, month, season, year | m | Field processed | x | x |
| AQU.1.0057 | Pond maximum width | sample, site | minute, day, month, season, year | m | Field processed | x | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|------------|---------------------------------------|--------------|----------------------------------|---------------------------|------------------|--------------------|------------------|
| AQU.1.0058 | Water chlorophyll A (ponds only) | sample, site | minute, day, month, season, year | µg/L | Field processed | | x |
| AQU.1.0059 | Water input source (ponds only) | site | month, season, year | map | Field processed | x | x |
| AQU.1.0060 | Wind speed and direction (ponds only) | sample, site | minute, day, month, season, year | m sec ⁻¹ | Field processed | | x |
| AQU.1.0061 | Air temperature | sample, site | minute, day, month, season, year | °C | Field processed | | x |
| AQU.1.0062 | Barometric pressure | sample, site | minute, day, month, season, year | kPa | Field processed | | x |
| AQU.1.0063 | Coarse woody debris amount | site | year | m | Field processed | x | x |
| AQU.1.0064 | Coarse woody debris distribution | site | year | m | Field processed | x | x |
| AQU.1.0065 | Coarse woody debris movement | site | year | m | Field processed | x | x |
| AQU.1.0066 | Date of surface ice off | site | day, month, season, year | date | Field Instrument | | x |
| AQU.1.0067 | Date of surface ice on | site | day, month, season, year | date | Field Instrument | | x |
| AQU.1.0068 | Extent of riparian cover | site | year | % | Field processed | | x |
| AQU.1.0069 | Subsurface water height in well | sample, site | minute, day, month, season, year | m | Field Instrument | | x |
| AQU.1.0070 | DELETED | | | | | | |
| AQU.1.0217 | Subsurface water temperature | sample, site | minute, day, month, season, year | °C | Field Instrument | | x |
| AQU.1.0218 | Subsurface water specific conductance | sample, site | minute, day, month, season, year | µSiemens cm ⁻¹ | Field Instrument | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|------------|---|--------------|----------------------------------|--|------------------|--------------------|------------------|
| AQU.1.0071 | Location of exposed bars, islands | site | year | m | Field processed | x | x |
| AQU.1.0072 | Net radiation | sample, site | minute, day, month, season, year | W m ⁻² | Field Instrument | | x |
| AQU.1.0073 | PAR near water surface | sample, site | minute, day, month, season, year | μmoles m ⁻² s ⁻¹ | Field Instrument | | x |
| AQU.1.0074 | Point water depth at sample collection location | sample, site | season, year | m | Field processed | x | x |
| AQU.1.0075 | Riparian plant composition | site | year | species | Field processed | x | x |
| AQU.1.0076 | DELETED | | | | | | |
| AQU.1.0077 | Secchi depth at sample collection location | sample, site | month, year | m | Field processed | x | x |
| AQU.1.0078 | Sediment grain size | site | year | mm | Field processed | | x |
| AQU.1.0079 | DELETED | | | | | | |
| AQU.1.0080 | Timing of leaf fall | site | day, month, season, year | date | Field Instrument | | x |
| AQU.1.0081 | Timing of leaf out | site | day, month, season, year | date | Field Instrument | | x |
| AQU.1.0082 | Timing of leaf senescence | site | day, month, season, year | date | Field Instrument | | x |
| AQU.1.0083 | Surface water cDOM | sample, site | minute, day, month, season, year | μg L ⁻¹ | Field Instrument | | x |
| AQU.1.0084 | Surface water conductivity | sample, site | minute, day, month, season, year | μSiemens cm ⁻¹ | Field Instrument | x | x |
| AQU.1.0085 | Surface water dissolved oxygen | sample, site | minute, day, month, season, year | mg L ⁻¹ | Field Instrument | x | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|------------|---|--------------|----------------------------------|--------------------|------------------|--------------------|------------------|
| AQU.1.0086 | Surface water NH ₄ | sample, site | minute, day, month, season, year | µg L ⁻¹ | Field Instrument | | x |
| AQU.1.0087 | Surface water NO ₃ | sample, site | minute, day, month, season, year | µg L ⁻¹ | Field Instrument | | x |
| AQU.1.0088 | Surface water pH/ORP | sample, site | minute, day, month, season, year | unitless | Field Instrument | x | x |
| AQU.1.0089 | Surface water PO ₄ | sample, site | minute, day, month, season, year | µg L ⁻¹ | Field Instrument | | x |
| AQU.1.0090 | Surface water temperature | sample, site | minute, day, month, season, year | °C | Field Instrument | x | x |
| AQU.1.0091 | Surface water turbidity | sample, site | minute, day, month, season, year | NTU | Field Instrument | x | x |
| AQU.1.0092 | Location of stream pool-riffle complex | site | year | m | Field processed | x | x |
| AQU.1.0093 | Point water velocity at sample collection location (streams only) | sample, site | season, year | m s ⁻¹ | Field processed | | x |
| AQU.1.0094 | Stream bar location | site | year | m | Field processed | x | x |
| AQU.1.0095 | Stream bed slope | site | year | m | Field processed | x | x |
| AQU.1.0096 | Stream channel form | site | year | m | Field processed | x | x |
| AQU.1.0097 | DELETED | | | | | | |
| AQU.1.0098 | Stream discharge rating curve development | site | 12 x year | unitless | Field processed | x | |
| AQU.1.0099 | Stream discharge rating curve verification | site | year | unitless | Field processed | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|------------------------------------|---|---------|----------------------------------|-------------------|------------------|--------------------|------------------|
| AQU.1.0100 | Stream reach length | site | year | m | Field processed | x | x |
| AQU.1.0101 | Stream reaeration rating curve development | site | 12 x year | unitless | Field processed | x | |
| AQU.1.0102 | Stream reaeration rating curve verification | site | year | unitless | Field processed | | x |
| AQU.1.0103 | Stream sinuosity | site | year | degrees | Field processed | x | x |
| AQU.1.0104 | Stream thalweg location | site | year | m | Field processed | x | x |
| AQU.1.0105 | Stream width | site | year | m | Field processed | x | x |
| AQU.1.0106 | DELETED | | | | | | |
| AQU.1.0107 | DELETED | | | | | | |
| AQU.1.0108 | Surface water height, (pressure transducer) in stream | site | minute, day, month, season, year | m | Field Instrument | | x |
| AQU.1.0109 | Surface water velocity | site | minute, day, month, season, year | m s ⁻¹ | Field Instrument | | x |
| <i>Chemical measurements water</i> | | | | | | | |
| AQU.1.0110 | DELETED | | | | | | |
| AQU.1.0111 | DELETED | | | | | | |
| AQU.1.0112 | DELETED | | | | | | |
| AQU.1.0113 | DELETED | | | | | | |
| AQU.1.0114 | DELETED | | | | | | |
| AQU.1.0115 | DELETED | | | | | | |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|------------|------------------------------------|---|-------------------------------------|----------------------|----------------------|--------------------|------------------|
| AQU.1.0116 | Nitrate (NO3) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0117 | Nitrite (NO2) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0118 | Ammonia (NH4) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0119 | Total nitrogen (TN) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0120 | Total dissolved N (TDN) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0121 | Total phosphorous (TP) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0122 | Total dissolved phosphorous (TDP) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0123 | Soluble reactive phosphorous (SRP) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0124 | Dissolved inorganic carbon (DIC) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0125 | Dissolved organic carbon (DOC) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|------------|-----------------------------------|---|-------------------------------------|----------------------|----------------------|--------------------|------------------|
| AQU.1.0126 | Total inorganic carbon (TIC) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0127 | Total organic carbon (TOC) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0128 | C/N ratio | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | unitless | Laboratory processed | x | x |
| AQU.1.0129 | Carbon dioxide (CO ₂) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0130 | Total suspended solids (TSS) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0131 | TSS – Carbon content | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0132 | TSS – Nitrogen content | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0133 | TSS – Phosphorous content | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0134 | TSS – dry mass | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0135 | Total dissolved solids (TDS) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|------------|-------------------------------------|---|-------------------------------------|----------------------|----------------------|--------------------|------------------|
| AQU.1.0136 | Dissolved organic matter | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0137 | Nitrous oxide (N ₂ O) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0138 | Methane (CH ₄) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0139 | Argon | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0140 | N ₂ : Argon ratio | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | unitless | Laboratory processed | x | x |
| AQU.1.0141 | Hydrogen sulfide (H ₂ S) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0142 | Total silica (Si) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0143 | Chloride (Cl) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0144 | Bromine (Br) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0145 | Sulfate (SO ₄) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|---|------------------|---|-------------------------------------|-----------------------|----------------------|--------------------|------------------|
| AQU.1.0146 | Calcium (Ca) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0147 | Magnesium (Mg) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0148 | Sodium (Na) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0149 | Potassium (K) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0150 | Iron (Fe) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0151 | Manganese (Mn) | sample, site (2 per stream, 3-9 per pond) | year (26x in streams, 12x in ponds) | $\mu\text{g L}^{-1}$ | Laboratory processed | x | x |
| <i>Chemical measurements - sediment</i> | | | | | | | |
| AQU.1.0152 | Magnesium (Mg) | sample, site | year | $\mu\text{g kg}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0153 | Aluminum (Al) | sample, site | year | $\mu\text{g kg}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0154 | Potassium (K) | sample, site | year | $\mu\text{g kg}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0155 | Calcium (Ca) | sample, site | year | $\mu\text{g kg}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0156 | Titanium (Ti) | sample, site | year | $\mu\text{g kg}^{-1}$ | Laboratory processed | x | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|------------|------------------|--------------|----------|-----------------------|----------------------|--------------------|------------------|
| AQU.1.0157 | Vanadium (V) | sample, site | year | $\mu\text{g kg}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0158 | Manganese (Mn) | sample, site | year | $\mu\text{g kg}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0159 | Iron (Fe) | sample, site | year | $\mu\text{g kg}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0160 | Strontium (Sr) | sample, site | year | $\mu\text{g kg}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0161 | Molybdenum (Mo) | sample, site | year | $\mu\text{g kg}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0162 | Barium (Ba) | sample, site | year | $\mu\text{g kg}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0163 | Uranium (U) | sample, site | year | $\mu\text{g kg}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0164 | Arsenic (As) | sample, site | year | $\mu\text{g kg}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0165 | Cadmium (Cd) | sample, site | year | $\mu\text{g kg}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0166 | Chromium (Cr) | sample, site | year | $\mu\text{g kg}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0167 | Copper (Cu) | sample, site | year | $\mu\text{g kg}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0168 | Lead (Pb) | sample, site | year | $\mu\text{g kg}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0169 | Mercury (Hg) | sample, site | year | $\mu\text{g kg}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0170 | Nickel (Ni) | sample, site | year | $\mu\text{g kg}^{-1}$ | Laboratory processed | x | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|--------------------------|--|--------------|----------|-----------------------|----------------------|--------------------|------------------|
| AQU.1.0171 | Selenium (Se) | sample, site | year | $\mu\text{g kg}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0172 | Silver (Ag) | sample, site | year | $\mu\text{g kg}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0173 | Zinc (Zn) | sample, site | year | $\mu\text{g kg}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0174 | site specific PAHs (of concern) | sample, site | year | $\mu\text{g kg}^{-1}$ | Laboratory processed | x | x |
| AQU.1.0175 | site specific PCBs (of concern) | sample, site | year | $\mu\text{g kg}^{-1}$ | Laboratory processed | x | x |
| <i>Isotopes, aquatic</i> | | | | | | | |
| AQU.1.0176 | Benthic detritus Dissolved inorganic nitrogen ^{15}N | sample, site | year | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0177 | Benthic detritus Dissolved inorganic nitrogen ^{18}O | sample, site | year | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0178 | Benthic detritus ^{13}C | sample, site | year | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0179 | Benthic detritus ^{15}N | sample, site | year | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0180 | Benthic detritus ^{34}S | sample, site | year | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0181 | Subsurface water Dissolved inorganic nitrogen ^{18}O | sample, site | year | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0182 | Subsurface water ^{13}C | sample, site | year | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0183 | Subsurface water ^{15}N | sample, site | year | ‰, part per mil | Laboratory processed | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|------------|--|--------------|------------------------|-----------------|----------------------|--------------------|------------------|
| AQU.1.0184 | Subsurface water ¹⁸ O | sample, site | year | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0185 | Surface Water Dissolved inorganic nitrogen ¹⁵ N | sample, site | 26 x year, month, year | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0186 | Surface Water Dissolved inorganic nitrogen ¹⁸ O | sample, site | 26 x year, month, year | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0187 | Surface Water algae and biofilm ¹³ C | sample, site | bi-annual | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0188 | Surface Water algae and biofilm ¹⁵ N | sample, site | bi-annual | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0189 | Surface Water algae and biofilm ³⁴ S | sample, site | bi-annual | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0190 | Surface Water Dissolved inorganic nitrogen ¹⁵ N | sample, site | 26 x year, month, year | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0200 | Surface Water Dissolved organic matter ¹³ C | sample, site | 26 x year, month, year | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0201 | Surface Water Dissolved organic matter ¹⁵ N | sample, site | 26 x year, month, year | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0202 | Surface Water Dissolved organic matter ³⁴ S | sample, site | 26 x year, month, year | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0203 | Surface Water nitrate ¹⁵ N | sample, site | 26 x year, month, year | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0204 | Surface Water nitrate ¹⁸ O | sample, site | 26 x year, month, year | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0205 | Surface Water Particulate organic matter ¹³ C | sample, site | 26 x year, month, year | ‰, part per mil | Laboratory processed | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|------------|---|---------------------|------------------------|-----------------|----------------------|--------------------|------------------|
| AQU.1.0206 | Surface Water Particulate organic matter ¹⁵ N | sample, site | 26 x year, month, year | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0207 | Surface Water Particulate organic matter ³⁴ S | sample, site | 26 x year, month, year | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0208 | Surface Water ¹⁸ O | sample, site | 26 x year, month, year | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0209 | DELETED | | | | | | |
| AQU.1.0210 | DELETED | | | | | | |
| AQU.1.0211 | $\delta^{18}\text{O-H}_2\text{O}$, subsurface water | aquatic array, site | 1-wk | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0212 | $\delta^{18}\text{O-H}_2\text{O}$, surface flows | aquatic array, site | 1-wk | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0213 | $\delta^2\text{H-H}_2\text{O}$, subsurface water | aquatic array, site | 1-wk | ‰, part per mil | Laboratory processed | | x |
| AQU.1.0214 | $\delta^2\text{H-H}_2\text{O}$, surface flows | aquatic array, site | 1-wk | ‰, part per mil | Laboratory processed | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

Table 4. Level 1 data products for the Fundamental Instrument Unit (FIU) sub-system.

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|---------------------------|--------------------------------|-------------------------------|------------------|------------------------|-----------------------|--------------------|------------------|
| <i>Tower measurements</i> | | | | | | | |
| FIU.1.0001 | 2-d windspeed-profile | vertical profile, tower, site | 1-min and 30-min | m s ⁻¹ | Field Instrumentation | | x |
| FIU.1.0002 | Air temperature-profile | vertical profile, tower, site | 1-min and 30-min | C | Field Instrumentation | | x |
| FIU.1.0003 | Air temperature-WMO | tower top, site | 1-min and 30-min | C | Field Instrumentation | | x |
| FIU.1.0004 | Atmospheric pressure | tower bottom, site | 1-min and 30-min | kPa | Field Instrumentation | | x |
| FIU.1.0005 | Biological temperature-profile | vertical profile, tower, site | 1-min and 30-min | C | Field Instrumentation | | x |
| FIU.1.0006 | Bulk Precipitation | tower top, tower, site | 1-min and 30-min | mm | Field Instrumentation | | x |
| FIU.1.0007 | camera tower ground | tower, site | 4-h | pixels, digital number | Field Instrumentation | | x |
| FIU.1.0008 | camera tower middle | tower, site | 4-h | pixels, digital number | Field Instrumentation | | x |
| FIU.1.0009 | camera tower top | tower, site | 4-h | pixels, digital number | Field Instrumentation | | x |
| FIU.1.0010 | CO ₂ | tower top, site | 20 Hz | μmol mol ⁻¹ | Field Instrumentation | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|------------|---|-------------------------------|------------------|--------------------------------------|-----------------------|--------------------|------------------|
| FIU.1.0011 | CO ₂ -profile | vertical profile, tower, site | 1-min and 30-min | μmol mol ⁻¹ | Field Instrumentation | | x |
| FIU.1.0012 | cross-wind (lateral) windspeed, v _{3d} | tower top, site | 20 Hz | m s ⁻¹ | Field Instrumentation | | x |
| FIU.1.0013 | wind direction θ _{3d} | tower top, site | 1-min and 30-min | degree | Field Instrumentation | | x |
| FIU.1.0014 | diffuse PAR | tower top, site | 1-min and 30-min | W m ⁻² | Field Instrumentation | | x |
| FIU.1.0015 | H ₂ O | tower top, site | 20 Hz | μmol mol ⁻¹ | Field Instrumentation | | x |
| FIU.1.0016 | H ₂ O-profile | vertical profile, tower, site | 1-min and 30-min | μmol mol ⁻¹ | Field Instrumentation | | x |
| FIU.1.0017 | horizontal windspeed, u _{3d} | tower top, site | 20 Hz | m s ⁻¹ | Field Instrumentation | | x |
| FIU.1.0018 | inclinometer/β angle | tower top, site | 4-h | degree | Field Instrumentation | | x |
| FIU.1.0019 | inclinometer/α angle | tower top, site | 4-h | degree | Field Instrumentation | | x |
| FIU.1.0020 | Incoming PAR | tower top, site | 1-min and 30-min | μmol m ⁻² s ⁻¹ | Field Instrumentation | | x |
| FIU.1.0021 | Incoming radiation LW/tower | tower top, site | 1-min and 30-min | W m ⁻² | Field Instrumentation | | x |
| FIU.1.0022 | Incoming radiation SW primary/tower | tower top, site | 1-min and 30-min | W m ⁻² | Field Instrumentation | | x |
| FIU.1.0023 | Incoming radiation SW secondary/tower | tower top, site | 1-min and 30-min | W m ⁻² | Field Instrumentation | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|---------------------------|-----------------------------------|-------------------------------|------------------|--------------------------------------|-----------------------|--------------------|------------------|
| FIU.1.0024 | PAR-profile | vertical profile, tower, site | 1-min and 30-min | $\mu\text{mol m}^{-2} \text{s}^{-1}$ | Field Instrumentation | | x |
| FIU.1.0025 | Reflected PAR | tower top, site | 1-min and 30-min | $\mu\text{mol m}^{-2} \text{s}^{-2}$ | Field Instrumentation | | x |
| FIU.1.0026 | Reflected radiation LW/tower | tower top, site | 1-min and 30-min | W m^{-2} | Field Instrumentation | | x |
| FIU.1.0027 | Reflected radiation SW/tower | tower top, site | 1-min and 30-min | W m^{-2} | Field Instrumentation | | x |
| FIU.1.0028 | Relative humidity | tower top, site | 1-min and 30-min | % RH | Field Instrumentation | | x |
| FIU.1.0029 | Relative humidity-profile | vertical profile, tower, site | 1-min and 30-min | % RH | Field Instrumentation | | x |
| FIU.1.0030 | Snow water equivalent-primary | tower bottom, tower, site | 1-min and 30-min | g m^{-2} | Field Instrumentation | | x |
| FIU.1.0031 | Snow water equivalent-secondary | tower top, site | 1-min and 30-min | mm | Field Instrumentation | | x |
| FIU.1.0032 | Snow water equivalent-tertiary | tower top, site | 1-min and 30-min | mm | Field Instrumentation | | x |
| FIU.1.0033 | Sonic temperature | tower top, site | 20 Hz | C | Field Instrumentation | | x |
| FIU.1.0034 | vertical wind speed, w_{3d} | tower top, site | 20 Hz | m s^{-1} | Field Instrumentation | | x |
| FIU.1.0035 | $\delta^{13}\text{C-CO}_2$ | vertical profile, tower, site | 1-min and 30-min | ‰, part per mil | Field Instrumentation | | x |
| FIU.1.0036 | $\delta^{18}\text{O-H}_2\text{O}$ | vertical profile, tower, site | 1-min and 30-min | ‰, part per mil | Field Instrumentation | | x |
| <i>Water measurements</i> | | | | | | | |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|------------------------------------|--|----------------------------|-----------|---|-----------------------|--------------------|------------------|
| FIU.1.0037 | $\delta^{18}\text{O}$ -H ₂ O, precipitation | core and relocatable sites | 1-wk | ‰, part per mil | Laboratory processed | | x |
| FIU.1.0038 | DELETED | | | | | | |
| FIU.1.0039 | DELETED | | | | | | |
| FIU.1.0040 | $\delta^2\text{H}$ - H ₂ O, precipitation | core and relocatable sites | 1-wk | ‰, part per mil | Laboratory processed | | x |
| FIU.1.0041 | DELETED | | | | | | |
| FIU.1.0042 | DELETED | | | | | | |
| FIU.1.0105 | Wet deposition Dissolved inorganic nitrogen ¹⁵ N | sample, site | 26 x year | ‰, part per mil | Laboratory processed | | x |
| FIU.1.0106 | Wet deposition Dissolved inorganic nitrogen ¹⁸ O | sample, site | 26 x year | ‰, part per mil | Laboratory processed | | x |
| FIU.1.0107 | Wet deposition ¹³ C | sample, site | 26 x year | ‰, part per mil | Laboratory processed | | x |
| FIU.1.0108 | Wet deposition ¹⁵ N | sample, site | 26 x year | ‰, part per mil | Laboratory processed | | x |
| FIU.1.0109 | Wet deposition ³⁴ S | sample, site | 26 x year | ‰, part per mil | Laboratory processed | | x |
| <i>Sun photometer measurements</i> | | | | | | | |
| FIU.1.0043 | Aerosol Optic depth | tower top, site | 30-min | dimensionless | Field Instrumentation | | x |
| FIU.1.0044 | Filter 1- 8 (sky) | tower top, site | 30-min | $\mu\text{W cm}^{-1} \text{sr}^{-1} \text{nm}^{-1}$ | Field Instrumentation | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|-----------------------|---------------------------------------|----------------------|----------|---|-----------------------|--------------------|------------------|
| FIU.1.0045 | Langley (sky) | tower top, site | 30-min | $\mu\text{W cm}^{-1} \text{sr}^{-1} \text{nm}^{-1}$ | Field Instrumentation | | x |
| FIU.1.0046 | Almucantar (sky) | tower top, site | 30-min | $\mu\text{W cm}^{-1} \text{sr}^{-1} \text{nm}^{-1}$ | Field Instrumentation | | x |
| FIU.1.0047 | Principle (sky) | tower top, site | 30-min | $\mu\text{W cm}^{-1} \text{sr}^{-1} \text{nm}^{-1}$ | Field Instrumentation | | x |
| FIU.1.0048 | Filter 1- 8 (sun) | tower top, site | 30-min | $\mu\text{W cm}^{-1} \text{sr}^{-1} \text{nm}^{-1}$ | Field Instrumentation | | x |
| FIU.1.0049 | Langley (sun) | tower top, site | 30-min | $\mu\text{W cm}^{-1} \text{sr}^{-1} \text{nm}^{-1}$ | Field Instrumentation | | x |
| FIU.1.0050 | Triplet (sun) | tower top, site | 30-min | dimensionless | Field Instrumentation | | x |
| <i>Dry Deposition</i> | | | | | | | |
| FIU.1.0051 | Ozone concentration profile | tower top, site | 1 Hz | ppb | Field Instrumentation | | x |
| FIU.1.0052 | NO _y concentration profile | tower top, site | 1 Hz | ppb | Field Instrumentation | | x |
| FIU.1.0053 | NO ₃ concentration | advanced tower, site | 1 wk | g m^{-3} | Laboratory processed | | x |
| FIU.1.0054 | H concentration | advanced tower, site | 1 wk | g m^{-3} | Laboratory processed | | x |
| FIU.1.0055 | SO ₄ concentration | advanced tower, site | 1 wk | g m^{-3} | Laboratory processed | | x |
| FIU.1.0056 | NH ₄ concentration | advanced tower, site | 1 wk | g m^{-3} | Laboratory processed | | x |
| FIU.1.0057 | Ca concentration | advanced tower, site | 1 wk | g m^{-3} | Laboratory processed | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|-------------------|-----------------------------------|--------------------------------|----------------------------|--------------------------------------|-----------------------|--------------------|------------------|
| FIU.1.0058 | K concentration | advanced tower, site | 1 wk | g m^{-3} | Laboratory processed | | x |
| FIU.1.0059 | Mg concentration | advanced tower, site | 1 wk | g m^{-3} | Laboratory processed | | x |
| FIU.1.0060 | Cl concentration | advanced tower, site | 1 wk | g m^{-3} | Laboratory processed | | x |
| FIU.1.0061 | PO ₄ concentration | advanced tower, site | 1 wk | g m^{-3} | Laboratory processed | | x |
| FIU.1.0062 | Bulk particulate deposition | advanced tower, site | 2 wk | $\mu\text{g m}^{-3}$ | Field Instrumentation | | x |
| FIU.1.0063 | Particulate size characterization | advanced tower, site | 1 Hz | $\mu\text{g m}^{-3}$ (by size class) | Field Instrumentation | | x |
| <i>Soil Array</i> | | | | | | | |
| FIU.1.0064 | Canopy fill rates | sample, site | once/site characterization | mm h^{-1} | Field Instrumentation | | x |
| FIU.1.0065 | Maximum canopy capacitance | sample, site | once/site characterization | mm | Field Instrumentation | | x |
| FIU.1.0066 | PAR-line | sample, site | 1-min and 30-min | $\mu\text{mol s}^{-1} \text{m}^{-2}$ | Field Instrumentation | | x |
| FIU.1.0067 | Throughfall | sample, site | 1-min and 30-min | mm | Field Instrumentation | | x |
| FIU.1.0068 | Soil temperature profile | sample, site | 1-min and 30-min | C | Field Instrumentation | | x |
| FIU.1.0069 | Soil heat flux | sample, site | 1-min and 30-min | W m^{-2} | Field Instrumentation | | x |
| FIU.1.0070 | Soil bulk density/O horizons | horizon, sample, chamber, site | once/site characterization | kg m^{-3} | Laboratory processed | x | |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|------------|---------------------------------------|--------------------------------|----------------------------|--------------------|----------------------|--------------------|------------------|
| FIU.1.0071 | Soil bulk density/A horizons | horizon, sample, chamber, site | once/site characterization | kg m ⁻³ | Laboratory processed | x | |
| FIU.1.0072 | Soil bulk density/B horizons | horizon, sample, chamber, site | once/site characterization | kg m ⁻³ | Laboratory processed | x | |
| FIU.1.0073 | Soil bulk density/C horizons | horizon, sample, chamber, site | once/site characterization | kg m ⁻³ | Laboratory processed | x | |
| FIU.1.0074 | Soil porosity/O horizons | horizon, sample, chamber, site | once/site characterization | % | Laboratory processed | x | |
| FIU.1.0075 | Soil porosity/A horizons | horizon, sample, chamber, site | once/site characterization | % | Laboratory processed | x | |
| FIU.1.0076 | Soil porosity/B horizons | horizon, sample, chamber, site | once/site characterization | % | Laboratory processed | x | |
| FIU.1.0077 | Soil porosity/C horizons | horizon, sample, chamber, site | once/site characterization | % | Laboratory processed | x | |
| FIU.1.0078 | Soil texture-fractionation/O horizons | horizon, sample, chamber, site | once/site characterization | % sand, silt, clay | Laboratory processed | x | |
| FIU.1.0079 | Soil texture-fractionation/A horizons | horizon, sample, chamber, site | once/site characterization | % sand, silt, clay | Laboratory processed | x | |
| FIU.1.0080 | Soil texture-fractionation/B horizons | horizon, sample, chamber, site | once/site characterization | % sand, silt, clay | Laboratory processed | x | |
| FIU.1.0081 | Soil texture-fractionation/C horizons | horizon, sample, chamber, site | once/site characterization | % sand, silt, clay | Laboratory processed | x | |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|------------|---------------------------------|--------------------------------|----------------------------|---|-----------------------|--------------------|------------------|
| FIU.1.0082 | Soil semi-variogram/water | sample, site | once/site characterization | m | Field Instrumentation | x | |
| FIU.1.0083 | Soil semi-variogram/texture | sample, site | once/site characterization | m | Laboratory processed | x | |
| FIU.1.0084 | Soil semi-variogram/other | sample, site | once/site characterization | m | Laboratory processed | x | |
| FIU.1.0085 | Water release curves/O horizons | horizon, sample, chamber, site | once/site characterization | % water msec ⁻¹ | Laboratory processed | x | |
| FIU.1.0086 | Water release curves/A horizons | horizon, sample, chamber, site | once/site characterization | % water msec ⁻¹ | Laboratory processed | x | |
| FIU.1.0087 | Water release curves/B horizons | horizon, sample, chamber, site | once/site characterization | % water msec ⁻¹ | Laboratory processed | x | |
| FIU.1.0088 | Water release curves/C horizons | horizon, sample, chamber, site | once/site characterization | % water msec ⁻¹ | Laboratory processed | x | |
| FIU.1.0089 | DELETED | | | | | | |
| FIU.1.0090 | DELETED | | | | | | |
| FIU.1.0091 | DELETED | | | | | | |
| FIU.1.0092 | DELETED | | | | | | |
| FIU.1.0093 | Soil CO ₂ profile | sample, site | 1-min and 30-min | μmol mol ⁻¹ | Field Instrumentation | | x |
| FIU.1.0094 | Soil water content profile | sample, profile, chamber, site | 1-min and 30-min | m ³ _{water} m ⁻³ _{soil} | Field Instrumentation | | x |
| FIU.1.0095 | Minirhizotron fine root image | sample, site | 1 wk | Digital image | Field Instrumentation | | x |
| FIU.1.0096 | Minirhizotron hyphae image | sample, site | 1 wk | Digital image | Field Instrumentation | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|------------|-------------------------|--------------|----------------------------|------------|----------------------|--------------------|------------------|
| FIU.1.0097 | Matric potential | sample, site | once/site characterization | kPa | Laboratory processed | x | |
| FIU.1.0098 | Osmotic potential | sample, site | once/site characterization | kPa | Laboratory processed | x | |
| FIU.1.0099 | Pressure potential | sample, site | once/site characterization | kPa | Laboratory processed | x | |
| FIU.1.0100 | Permanent wilting point | sample, site | once/site characterization | kPa | Laboratory processed | x | |
| FIU.1.0101 | DELETED | | | | | | |
| FIU.1.0102 | Soil Order | sample, site | once/site characterization | name | Laboratory processed | x | |
| FIU.1.0103 | Soil Type | sample, site | once/site characterization | name | Laboratory processed | x | |
| FIU.1.0104 | Soil Association | sample, site | once/site characterization | name | Laboratory processed | x | |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

Table 5. Level 1 data for the Fundamental Sentinel Unit (FSU) sub-system.

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|--------------------------------|--|--------------------------------------|-----------------------|------------|----------------------|--------------------|------------------|
| <i>Mosquitoes</i> | | | | | | | |
| FSU.1.0001 | Species Identification | CO2 trap, gravid trap, habitat, site | day, session, year | ID | Field processed | x | x |
| FSU.1.0002 | Mosquito DNA barcode identification | CO2 trap, gravid trap, habitat, site | day, session, year | ID | Field processed | | x |
| FSU.1.0003 | # Mosquito individuals | CO2 trap, gravid trap, habitat, site | day, session, year | count | Field processed | | x |
| FSU.1.0004 | # Mosquito species | CO2 trap, gravid trap, habitat, site | day, session, year | count | Field processed | | x |
| FSU.1.0005 | Mosquito emergence date/species | CO2 trap, gravid trap, habitat, site | day, session, year | date | Field processed | | x |
| FSU.1.0006 | Activity period/species | CO2 trap, gravid trap, habitat, site | day, session, year | # days | Field processed | | x |
| FSU.1.0007 | # samples screened for West Nile Virus | CO2 trap, gravid trap, habitat, site | day, session, year | count | Laboratory processed | | x |
| FSU.1.0008 | # samples positive for West Nile Virus | CO2 trap, gravid trap, habitat, site | day, session, year | count | Laboratory processed | | x |
| FSU.1.0009 | # samples screened for Dengue virus | CO2 trap, gravid trap, habitat, site | day, session, year | count | Laboratory processed | | x |
| FSU.1.0010 | # samples positive for Dengue virus | CO2 trap, gravid trap, habitat, site | day, session, year | count | Laboratory processed | | x |
| FSU.1.0011 | Vertebrate host DNA barcode identification | CO2 trap, gravid trap, habitat, site | day, session, year | ID | Laboratory processed | | x |
| <i>Ground dwelling beetles</i> | | | | | | | |
| FSU.1.0012 | Species identification | trap, transect, habitat, site | session, season, year | ID | Field processed | x | x |
| FSU.1.0013 | Ground beetle DNA barcode identification | trap, transect, habitat, site | session, season, year | ID | Field processed | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|--------------------------------|--|------------------------------------|-----------------------|-------------|-----------------|--------------------|------------------|
| FSU.1.0014 | # Ground dwelling beetle individuals | trap, transect, habitat, site | session, season, year | count | Field processed | | x |
| FSU.1.0015 | # Ground dwelling beetle species | trap, transect, habitat, site | session, season, year | count | Field processed | | x |
| <i>Small Mammals</i> | | | | | | | |
| FSU.1.0016 | Species identification | trap, transect, web, habitat, site | day, season, year | ID | Field processed | x | x |
| FSU.1.0017 | Small mammal DNA barcode library | trap, transect, web, habitat, site | day, season, year | ID | Field processed | | x |
| FSU.1.0018 | # Small mammal individuals | trap, transect, web, habitat, site | day, season, year | count | Field processed | | x |
| FSU.1.0019 | # Small mammal species | trap, transect, web, habitat, site | day, season, year | count | Field processed | | x |
| <i>Peromyscus - demography</i> | | | | | | | |
| FSU.1.0020 | Individual tag ID | trap, transect, web, habitat, site | day, season, year | ID | Field processed | | x |
| FSU.1.0021 | <i>Peromyscus</i> species identification | trap, transect, web, habitat, site | day, season, year | ID | Field processed | x | x |
| FSU.1.0022 | Small mammal DNA barcode identification | trap, transect, web, habitat, site | day, season, year | ID | Field processed | | x |
| FSU.1.0023 | # <i>Peromyscus</i> individuals | trap, transect, web, habitat, site | day, season, year | count | Field processed | | x |
| FSU.1.0024 | # <i>Peromyscus</i> species | trap, transect, web, habitat, site | day, season, year | count | Field processed | | x |
| FSU.1.0025 | # <i>Peromyscus</i> individuals recaptured | trap, transect, web, habitat, site | day, season, year | count | Field processed | | x |
| FSU.1.0026 | <i>Peromyscus</i> gender | trap, transect, web, habitat, site | day, season, year | categorical | Field processed | | x |
| FSU.1.0027 | <i>Peromyscus</i> age class | trap, transect, web, habitat, site | day, season, year | categorical | Field processed | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|-----------------------------|---|------------------------------------|-------------------|-------------|----------------------|--------------------|------------------|
| FSU.1.0028 | <i>Peromyscus</i> reproductive status | trap, transect, web, habitat, site | day, season, year | categorical | Field processed | | x |
| FSU.1.0029 | <i>Peromyscus</i> snout vent length | trap, transect, web, habitat, site | day, season, year | mm | Field processed | | x |
| FSU.1.0030 | <i>Peromyscus</i> ear length | trap, transect, web, habitat, site | day, season, year | mm | Field processed | | x |
| FSU.1.0031 | <i>Peromyscus</i> hind foot length | trap, transect, web, habitat, site | day, season, year | mm | Field processed | | x |
| FSU.1.0032 | <i>Peromyscus</i> tail length | trap, transect, web, habitat, site | day, season, year | mm | Field processed | | x |
| FSU.1.0033 | <i>Peromyscus</i> body length | trap, transect, web, habitat, site | day, season, year | mm | Field processed | | x |
| FSU.1.0034 | <i>Peromyscus</i> body mass | trap, transect, web, habitat, site | day, season, year | cm | Field processed | | x |
| FSU.1.0035 | # <i>Peromyscus</i> females | trap, transect, web, habitat, site | day, season, year | cm | Field processed | | x |
| FSU.1.0036 | # <i>Peromyscus</i> males | trap, transect, web, habitat, site | day, season, year | count | Field processed | | x |
| FSU.1.0037 | # <i>Peromyscus</i> adult females | trap, transect, web, habitat, site | day, season, year | count | Field processed | | x |
| FSU.1.0038 | # <i>Peromyscus</i> adult females lactating | trap, transect, web, habitat, site | day, season, year | count | Field processed | | x |
| FSU.1.0039 | # <i>Peromyscus</i> adult females pregnant | trap, transect, web, habitat, site | day, season, year | count | Field processed | | x |
| <i>Peromyscus</i> - disease | | | | | | | |
| FSU.1.0040 | Total # <i>Peromyscus</i> individuals screened for Hantavirus | trap, transect, web, habitat, site | day, season, year | count | Laboratory processed | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|-----------------------------------|---|--|-------------------|------------|----------------------|--------------------|------------------|
| FSU.1.0041 | # <i>Peromyscus</i> individuals seropositive for Hantavirus (antibody test) | trap, transect, web, habitat, site | day, season, year | count | Laboratory processed | | x |
| FSU.1.0042 | # <i>Peromyscus</i> individuals positive for Hantavirus (active infection, saliva PCR) | trap, transect, web, habitat, site | day, season, year | count | Laboratory processed | | x |
| FSU.1.0043 | Total # <i>Peromyscus</i> individuals screened for <i>Borrelia burgdorferi</i> antibodies | trap, transect, web, habitat, site | day, season, year | count | Laboratory processed | | x |
| FSU.1.0044 | # <i>Peromyscus</i> individuals seropositive for <i>Borrelia burgdorferi</i> (antibody test) | trap, transect, web, habitat, site | day, season, year | count | Laboratory processed | | x |
| FSU.1.0045 | Total # <i>Ixodid</i> tick individuals screened for <i>Borrelia burgdorferi</i> (active infection, PCR) | host, trap, transect, web, habitat, site | day, season, year | count | Laboratory processed | | x |
| FSU.1.0046 | # <i>Ixodid</i> tick individuals positive for <i>Borrelia burgdorferi</i> (active infection, PCR) | host, trap, transect, web, habitat, site | day, season, year | count | Laboratory processed | | x |
| <i>Peromyscus</i> - ectoparasites | | | | | | | |
| FSU.1.0047 | <i>Peromyscus</i> species identification | host, trap, transect, web, habitat, site | day, season, year | ID | Field processed | x | x |
| FSU.1.0048 | Ectoparasite DNA barcode identification | host, trap, transect, web, habitat, site | day, season, year | ID | Field processed | x | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|------------------------------|---|--|--------------------|------------|-----------------|--------------------|------------------|
| FSU.1.0049 | <i>Peromyscus</i> ectoparasite species identification | host, trap, transect, web, habitat, site | day, season, year | ID | Field processed | x | x |
| FSU.1.0050 | # Ectoparasite individuals | host, trap, transect, web, habitat, site | day, season, year | count | Field processed | | x |
| FSU.1.0051 | # <i>Ixodid</i> individuals | host, trap, transect, web, habitat, site | day, season, year | count | Field processed | | x |
| FSU.1.0052 | # Ectoparasite species | host, trap, transect, web, habitat, site | day, season, year | count | Field processed | | x |
| FSU.1.0053 | # <i>Ixodid</i> species | host, trap, transect, web, habitat, site | day, season, year | count | Field processed | | x |
| FSU.1.0054 | # hosts | host, trap, transect, web, habitat, site | day, season, year | count | Field processed | | x |
| <i>Birds</i> | | | | | | | |
| FSU.1.0055 | Bird Species identification | grid, habitat, site | day, session, year | ID | Field processed | x | x |
| FSU.1.0056 | # Bird individuals | grid, habitat, site | day, session, year | count | Field processed | | x |
| FSU.1.0057 | # Bird species | grid, habitat, site | day, session, year | count | Field processed | | x |
| <i>Plants - biodiversity</i> | | | | | | | |
| FSU.1.0058 | Species identification | subplot, plot, habitat, site | year | ID | Field processed | x | x |
| FSU.1.0059 | Plant DNA barcode identification | subplot, plot, habitat, site | year | ID | Field processed | | x |
| FSU.1.0060 | # Plant individuals | subplot, plot, habitat, site | year | count | Field processed | | x |
| FSU.1.0061 | # Plant species | subplot, plot, habitat, site | year | count | Field processed | | x |
| FSU.1.0062 | % cover | subplot, plot, habitat, site | year | % | Field processed | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|---|----------------------------------|------------------------------|------------|-------------|-----------------|--------------------|------------------|
| FSU.1.0063 | native | subplot, plot, habitat, site | year | categorical | Field processed | | x |
| FSU.1.0064 | non-native | subplot, plot, habitat, site | year | categorical | Field processed | | x |
| <i>Plants population dynamics and phenology</i> | | | | | | | |
| FSU.1.0065 | Species identification | subplot, plot, habitat, site | year | ID | Field processed | x | x |
| FSU.1.0066 | Plant DNA barcode identification | subplot, plot, habitat, site | year | ID | Field processed | | x |
| FSU.1.0067 | # Plant individuals | subplot, plot, habitat, site | year | count | Field processed | | x |
| FSU.1.0068 | # Plant individuals recaptured | subplot, plot, habitat, site | year | count | Field processed | | x |
| FSU.1.0069 | DELETED | | | | | | |
| FSU.1.0070 | Emergence date | plot, habitat, site | week, year | date | Field processed | | x |
| FSU.1.0071 | Leafing date | plot, habitat, site | week, year | date | Field processed | | x |
| FSU.1.0072 | Flowering date | plot, habitat, site | week, year | date | Field processed | | x |
| FSU.1.0073 | Pollen release date | plot, habitat, site | week, year | date | Field processed | | x |
| FSU.1.0074 | Ripening date | plot, habitat, site | week, year | date | Field processed | | x |
| FSU.1.0075 | Leaf color change date | plot, habitat, site | week, year | date | Field processed | | x |
| FSU.1.0076 | Senescence date | plot, habitat, site | week, year | date | Field processed | | x |
| FSU.1.0077 | DELETED | | | | | | |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|--|--|---|----------|-----------------|-----------------|--------------------|------------------|
| FSU.1.0078 | DELETED | | | | | | |
| FSU.1.0079 | DELETED | | | | | | |
| FSU.1.0080 | DELETED | | | | | | |
| FSU.1.0081 | DELETED | | | | | | |
| FSU.1.0082 | DELETED | | | | | | |
| FSU.1.0083 | DELETED | | | | | | |
| FSU.1.0084 | % cover | subplot, plot, habitat, site | year | % | Field processed | | x |
| FSU.1.0085 | basal area | subplot, plot, habitat, site | year | cm ² | Field processed | | x |
| FSU.1.0086 | dbh | subplot, plot, habitat, site | year | cm | Field processed | | x |
| FSU.1.0087 | height | subplot, plot, habitat, site | year | m | Field processed | | x |
| FSU.1.0088 | life span | subplot, plot, habitat, site | year | # years | Field processed | | x |
| <i>Plants, productivity, herbs and grasses</i> | | | | | | | |
| FSU.1.0089 | Herbs and grasses species identification | subplot, plot, transect, habitat, airshed, site | year | ID | Field processed | x | x |
| FSU.1.0090 | Herbs and grasses DNA barcode identification | subplot, plot, transect, habitat, airshed, site | year | ID | Field processed | | x |
| FSU.1.0091 | DELETED | | | | | | |
| FSU.1.0092 | % cover forbs | subplot, plot, transect, habitat, airshed, site | year | % | Field processed | | x |
| FSU.1.0093 | % cover grasses | subplot, plot, transect, habitat, airshed, site | year | % | Field processed | | x |
| FSU.1.0094 | # individuals tree saplings | subplot, plot, transect, habitat, airshed, site | year | count | Field processed | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|-------------------------------------|---|---|----------|------------------|-----------------|--------------------|------------------|
| FSU.1.0095 | # individuals forbs | subplot, plot, transect, habitat, airshed, site | year | count | Field processed | | x |
| FSU.1.0096 | # individuals grasses | subplot, plot, transect, habitat, airshed, site | year | count | Field processed | | x |
| FSU.1.0097 | height forbs | subplot, plot, transect, habitat, airshed, site | year | cm | Field processed | | x |
| FSU.1.0098 | height grasses | subplot, plot, transect, habitat, airshed, site | year | cm | Field processed | | x |
| FSU.1.0099 | height tree saplings | subplot, plot, transect, habitat, airshed, site | year | cm | Field processed | | x |
| FSU.1.0100 | Dry mass per unit area live biomass – herbs and grasses | subplot, plot, transect, habitat, airshed, site | year | g/m ² | Field processed | | x |
| FSU.1.0101 | dry mass per unit area dead biomass – herbs and grasses | subplot, plot, transect, habitat, airshed, site | year | g/m ² | Field processed | | x |
| <i>Plants, productivity, shrubs</i> | | | | | | | |
| FSU.1.0102 | Shrubs species identification | plot, transect, habitat, airshed, site | year | ID | Field processed | | x |
| FSU.1.0103 | Shrubs DNA barcode identification | plot, transect, habitat, airshed, site | year | ID | Field processed | | x |
| FSU.1.0104 | basal area shrubs | plot, transect, habitat, airshed, site | year | cm ² | Field processed | | x |
| FSU.1.0105 | height shrubs | plot, transect, habitat, airshed, site | year | cm | Field processed | | x |
| FSU.1.0106 | canopy width shrubs | plot, transect, habitat, airshed, site | year | cm | Field processed | | x |
| FSU.1.0107 | standing dead biomass – shrubs | plot, transect, habitat, airshed, site | year | cm ³ | Field processed | | x |
| <i>Plants, productivity, trees</i> | | | | | | | |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|------------|---------------------------------|-------------------------|-------------|--------------------|-----------------|--------------------|------------------|
| FSU.1.0108 | Tree species identification | transect, airshed, site | year | ID | Field processed | | x |
| FSU.1.0109 | Tree DNA barcode identification | transect, airshed, site | year | ID | Field processed | | x |
| FSU.1.0110 | height live trees | transect, airshed, site | year | m | Field processed | | x |
| FSU.1.0111 | height standing dead trees | transect, airshed, site | year | m | Field processed | | x |
| FSU.1.0112 | dbh live trees | transect, airshed, site | year | cm | Field processed | | x |
| FSU.1.0113 | dbh change/year | transect, airshed, site | year | cm y ⁻¹ | Field processed | | x |
| FSU.1.0114 | dbh standing dead trees | transect, airshed, site | year | cm | Field processed | | x |
| FSU.1.0115 | canopy width | transect, airshed, site | year | m | Field processed | | x |
| FSU.1.0116 | Litter traps leaves | transect, airshed, site | month, year | g m ⁻² | Field processed | | x |
| FSU.1.0117 | Litter traps non-leaves | transect, airshed, site | month, year | g m ⁻² | Field processed | | x |
| FSU.1.0118 | Litterfall leaves | transect, airshed, site | month, year | g m ⁻² | Field processed | | x |
| FSU.1.0119 | Litterfall non-leaves | transect, airshed, site | month, year | g m ⁻² | Field processed | | x |
| FSU.1.0120 | Ground plots leaves | transect, airshed, site | month, year | g m ⁻² | Field processed | | x |
| FSU.1.0121 | Ground plots non-leaves | transect, airshed, site | month, year | g m ⁻² | Field processed | | x |
| FSU.1.0122 | Litter mass traps | transect, airshed, site | month, year | g m ⁻² | Field processed | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|--------------------------------------|-------------------------------------|--|--------------|-------------------|----------------------|--------------------|------------------|
| FSU.1.0123 | Litter mass ground plots | transect, airshed, site | month, year | g m ⁻² | Field processed | | x |
| <i>Plant, below-ground biomass</i> | | | | | | | |
| FSU.1.0124 | Total root biomass | sample, plot, site | year | g m ⁻² | Field processed | | x |
| FSU.1.0125 | Coarse root live biomass | sample, plot, site | year | g m ⁻² | Field processed | | x |
| FSU.1.0126 | Coarse root dead biomass | sample, plot, site | year | g m ⁻² | Field processed | | x |
| FSU.1.0127 | Fine root live biomass | sample, plot, site | year | g m ⁻² | Field processed | | x |
| FSU.1.0128 | Fine root dead biomass | sample, plot, site | year | g m ⁻² | Field processed | | x |
| FSU.1.0129 | Fine root live total C | sample, plot, site | year | g m ⁻² | Laboratory processed | | x |
| FSU.1.0130 | Fine root dead total C | sample, plot, site | year | g m ⁻² | Laboratory processed | | x |
| <i>Plant, above-ground necromass</i> | | | | | | | |
| FSU.1.0131 | standing dead biomass | decay class, subplot, transect, habitat, airshed, site | year | g m ⁻² | Field processed | | x |
| FSU.1.0132 | dry mass per unit area dead biomass | decay class, subplot, transect, habitat, airshed, site | season, year | g m ⁻² | Field processed | | x |
| FSU.1.0133 | Litter traps leaves | transect, airshed, site | month, year | g m ⁻² | Field processed | | x |
| FSU.1.0134 | Litter traps non-leaves | transect, airshed, site | month, year | g m ⁻² | Field processed | | x |
| FSU.1.0135 | Ground plots leaves | transect, airshed, site | month, year | g m ⁻² | Field processed | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|---------------------------------------|----------------------------|--|-------------|-------------------|-----------------|--------------------|------------------|
| FSU.1.0136 | Ground plots non-leaves | transect, airshed, site | month, year | g m ⁻² | Field processed | | x |
| FSU.1.0137 | Litterfall leaves | transect, airshed, site | month, year | g m ⁻² | Field processed | | x |
| FSU.1.0138 | Litterfall non-leaves | transect, airshed, site | month, year | g m ⁻² | Field processed | | x |
| FSU.1.0139 | Litter mass traps | transect, airshed, site | month, year | g m ⁻² | Field processed | | x |
| FSU.1.0140 | Litter mass ground plots | transect, airshed, site | month, year | g m ⁻² | Field processed | | x |
| FSU.1.0141 | Fine downed woody debris | decay class, subplot, transect, habitat, airshed, site | year | g m ⁻² | Field processed | | x |
| FSU.1.0142 | Coarse downed woody debris | decay class, subplot, transect, habitat, airshed, site | year | g m ⁻² | Field processed | | x |
| FSU.1.0143 | height standing dead trees | decay class, subplot, transect, habitat, airshed, site | year | m | Field processed | | x |
| FSU.1.0144 | dbh standing dead trees | decay class, subplot, transect, habitat, airshed, site | year | cm | Field processed | | x |
| <i>Plants, below-ground necromass</i> | | | | | | | |
| FSU.1.0145 | Coarse root dead biomass | sample, plot, site | year | g m ⁻² | Field processed | | x |
| FSU.1.0146 | Coarse root live biomass | sample, plot, site | year | g m ⁻² | Field processed | | x |
| FSU.1.0147 | Fine root live biomass | sample, plot, site | year | g m ⁻² | Field processed | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|---|----------------------------------|-------------------------|----------|-----------------------------------|----------------------|--------------------|------------------|
| FSU.1.0148 | Fine root dead biomass | sample, plot, site | year | g m ⁻² | Field processed | | x |
| FSU.1.0149 | Fine live root C content | sample, plot, site | year | g g ⁻¹ | Laboratory processed | | x |
| FSU.1.0150 | Fine dead root C content | sample, plot, site | year | g g ⁻¹ | Laboratory processed | | x |
| <i>Plants, foliar biomass and composition</i> | | | | | | | |
| FSU.1.0151 | Species identification | transect, airshed, site | year | ID | Field processed | x | x |
| FSU.1.0152 | Plant DNA barcode identification | transect, airshed, site | year | ID | Field processed | | x |
| FSU.1.0153 | DELETED | | | | | | |
| FSU.1.0154 | Leaf chlorophyll concentration | transect, airshed, site | year | g chlorophyll/ g leaf material | Laboratory processed | | x |
| FSU.1.0155 | Leaf C concentration | transect, airshed, site | year | g C/g leaf material | Laboratory processed | | x |
| FSU.1.0156 | Leaf N concentration | transect, airshed, site | year | g N/g leaf material | Laboratory processed | | x |
| FSU.1.0157 | Leaf K concentration | transect, airshed, site | year | g K/g leaf material | Laboratory processed | | x |
| FSU.1.0158 | Leaf P concentration | transect, airshed, site | year | g P/g leaf material | Laboratory processed | | x |
| FSU.1.0159 | Leaf Ca concentration | transect, airshed, site | year | g Ca/g leaf material | Laboratory processed | | x |
| FSU.1.0160 | Leaf Mg concentration | transect, airshed, site | year | g Mg/g leaf material | Laboratory processed | | x |
| FSU.1.0161 | Leaf lignin concentration | transect, airshed, site | year | g lignin/g leaf material | Laboratory processed | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|-------------------------------|--------------------------------|-------------------------|----------|--------------------------|----------------------|--------------------|------------------|
| FSU.1.0162 | DELETED | | | | | | |
| FSU.1.0163 | DELETED | | | | | | |
| FSU.1.0164 | DELETED | | | | | | |
| FSU.1.0165 | DELETED | | | | | | |
| FSU.1.0166 | DELETED | | | | | | |
| FSU.1.0167 | DELETED | | | | | | |
| FSU.1.0168 | DELETED | | | | | | |
| FSU.1.0169 | DELETED | | | | | | |
| <i>Plant litter chemistry</i> | | | | | | | |
| FSU.1.0170 | Litter C concentration leaves | transect, airshed, site | year | g C/g leaf material | Laboratory processed | | x |
| FSU.1.0171 | Litter N concentration leaves | transect, airshed, site | year | g N/g leaf material | Laboratory processed | | x |
| FSU.1.0172 | Litter K concentration leaves | transect, airshed, site | year | g K/g leaf material | Laboratory processed | | x |
| FSU.1.0173 | Litter P concentration leaves | transect, airshed, site | year | g P/g leaf material | Laboratory processed | | x |
| FSU.1.0174 | Litter Ca concentration leaves | transect, airshed, site | year | g Ca/g leaf material | Laboratory processed | | x |
| FSU.1.0175 | Litter Mg concentration leaves | transect, airshed, site | year | g Mg/g leaf material | Laboratory processed | | x |
| FSU.1.0176 | Litter lignin concentration | transect, airshed, site | year | g lignin/g leaf material | Laboratory processed | | x |
| FSU.1.0177 | DELETED | | | | | | |
| FSU.1.0178 | DELETED | | | | | | |
| FSU.1.0179 | DELETED | | | | | | |
| FSU.1.0180 | DELETED | | | | | | |
| FSU.1.0181 | DELETED | | | | | | |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|--|----------------------------|-------------------------|----------|------------------------------------|----------------------|--------------------|------------------|
| FSU.1.0182 | DELETED | | | | | | |
| FSU.1.0183 | DELETED | | | | | | |
| FSU.1.0184 | DELETED | | | | | | |
| <i>Soil physical and chemical measurements</i> | | | | | | | |
| FSU.1.0185 | DELETED | | | | | | |
| FSU.1.0186 | soil bulk density | transect, airshed, site | year | g m ⁻² | Laboratory processed | x | x |
| FSU.1.0187 | soil C concentration | transect, airshed, site | year | g C (g soil) ⁻¹ | Laboratory processed | | x |
| FSU.1.0188 | soil N concentration | transect, airshed, site | year | g N (g soil) ⁻¹ | Laboratory processed | | x |
| FSU.1.0189 | organic horizon mass | transect, airshed, site | year | g m ⁻² | Laboratory processed | x | x |
| FSU.1.0190 | particle size distribution | transect, airshed, site | year | categorical | Laboratory processed | x | x |
| FSU.1.0191 | pH | transect, airshed, site | year | pH scale | Laboratory processed | x | x |
| FSU.1.0192 | stone content | transect, airshed, site | year | % | Laboratory processed | x | x |
| FSU.1.0193 | % slope | transect, airshed, site | year | % | Field processed | x | x |
| FSU.1.0194 | depth of profile | transect, airshed, site | year | m | Field processed | x | x |
| FSU.1.0195 | color | transect, airshed, site | year | categorical | Field processed | x | x |
| FSU.1.0196 | rooting depth | transect, airshed, site | year | m | Field processed | x | x |
| FSU.1.0197 | cation exchange capacity | transect, airshed, site | year | cmol _c kg ⁻¹ | Laboratory processed | x | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|----------------------|---|------------------------------|----------|---------------|----------------------|--------------------|------------------|
| FSU.1.0198 | total P | transect, airshed, site | year | g P/g soil | Laboratory processed | | x |
| FSU.1.0199 | P fractions | transect, airshed, site | year | unitless | Laboratory processed | | x |
| <i>Soil microbes</i> | | | | | | | |
| FSU.1.0200 | Community sequence data | chamber, plot, airshed, site | year | sequence data | Laboratory processed | | x |
| FSU.1.0201 | 16S rRNA sequence data | chamber, plot, airshed, site | year | sequence data | Laboratory processed | | x |
| FSU.1.0202 | 18S rRNA sequence data | chamber, plot, airshed, site | year | sequence data | Laboratory processed | | x |
| FSU.1.0203 | ITS rRNA sequence data | chamber, plot, airshed, site | year | sequence data | Laboratory processed | | x |
| FSU.1.0204 | Bacteria qPCR | chamber, plot, airshed, site | year | sequence data | Laboratory processed | | x |
| FSU.1.0205 | Archae qPCR | chamber, plot, airshed, site | year | sequence data | Laboratory processed | | x |
| FSU.1.0206 | Fungal qPCR | chamber, plot, airshed, site | year | sequence data | Laboratory processed | | x |
| FSU.1.0207 | Total microbial biomass | chamber, plot, airshed, site | year | sequence data | Laboratory processed | | x |
| FSU.1.0208 | nifH sequence data | chamber, plot, airshed, site | year | sequence data | Laboratory processed | | x |
| FSU.1.0209 | Total nifH microbial biomass | chamber, plot, airshed, site | year | sequence data | Laboratory processed | | x |
| FSU.1.0210 | # unique ¹⁶ S rRNA sequences | chamber, plot, airshed, site | year | sequence data | Laboratory processed | | x |
| FSU.1.0211 | # unique ¹⁸ S rRNA sequences | chamber, plot, airshed, site | year | sequence data | Laboratory processed | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|------------------------------|--------------------------------------|------------------------------|-------------|-----------------|----------------------|--------------------|------------------|
| FSU.1.0212 | # unique ITS sequences | chamber, plot, airshed, site | year | sequence data | Laboratory processed | | x |
| FSU.1.0213 | microbial functional assay | chamber, plot, airshed, site | year | sequence data | Laboratory processed | | x |
| <i>Isotopes, terrestrial</i> | | | | | | | |
| FSU.1.0214 | leaf ¹³ C | sample, site | 3 x year | ‰, part per mil | Laboratory processed | | x |
| FSU.1.0215 | leaf ¹⁵ N | sample, site | 3 x year | ‰, part per mil | Laboratory processed | | x |
| FSU.1.0216 | litter ¹³ C | sample, site | 3 x year | ‰, part per mil | Laboratory processed | | x |
| FSU.1.0217 | litter ¹⁵ N | sample, site | 3 x year | ‰, part per mil | Laboratory processed | | x |
| FSU.1.0218 | leaf organic ¹⁸ O | sample, site | 3 x year | ‰, part per mil | Laboratory processed | | x |
| FSU.1.0219 | litter organic ¹⁸ O | sample, site | 3 x year | ‰, part per mil | Laboratory processed | | x |
| FSU.1.0220 | soil ¹⁵ N | sample, site | bi-annual | ‰, part per mil | Laboratory processed | | x |
| FSU.1.0221 | soil ¹³ C | sample, site | bi-annual | ‰, part per mil | Laboratory processed | | x |
| FSU.1.0222 | small mammal ¹³ C | sample, site | month, year | ‰, part per mil | Laboratory processed | | x |
| FSU.1.0223 | small mammal ¹⁵ N | sample, site | month, year | ‰, part per mil | Laboratory processed | | x |
| FSU.1.0224 | small mammal organic ² H | sample, site | month, year | ‰, part per mil | Laboratory processed | | x |
| FSU.1.0225 | small mammal organic ¹⁸ O | sample, site | month, year | ‰, part per mil | Laboratory processed | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|------------|----------------------------|--------------|----------|-----------------|----------------------|--------------------|------------------|
| FSU.1.0226 | stem water ¹⁸ O | sample, site | 3 x year | ‰, part per mil | Laboratory processed | | x |
| FSU.1.0227 | soil water ¹⁸ O | sample, site | 3 x year | ‰, part per mil | Laboratory processed | | x |
| FSU.1.0228 | DELETED | | | | | | |
| FSU.1.0229 | DELETED | | | | | | |
| FSU.1.0230 | DELETED | | | | | | |
| FSU.1.0231 | DELETED | | | | | | |
| FSU.1.0232 | DELETED | | | | | | |
| FSU.1.0233 | DELETED | | | | | | |
| FSU.1.0234 | DELETED | | | | | | |
| FSU.1.0235 | DELETED | | | | | | |
| FSU.1.0236 | DELETED | | | | | | |
| FSU.1.0237 | DELETED | | | | | | |
| FSU.1.0238 | DELETED | | | | | | |
| FSU.1.0239 | DELETED | | | | | | |
| FSU.1.0240 | DELETED | | | | | | |
| FSU.1.0241 | DELETED | | | | | | |
| FSU.1.0242 | DELETED | | | | | | |
| FSU.1.0243 | DELETED | | | | | | |
| FSU.1.0244 | DELETED | | | | | | |
| FSU.1.0245 | DELETED | | | | | | |
| FSU.1.0246 | DELETED | | | | | | |
| FSU.1.0247 | DELETED | | | | | | |
| FSU.1.0248 | DELETED | | | | | | |
| FSU.1.0249 | DELETED | | | | | | |

| | | |
|--|-------------------------------|------------------------|
| <i>Title:</i> NEON Level 1-3 Data Products Catalog | <i>Author:</i> Michael Keller | <i>Date:</i> 3/16/2010 |
| <i>NEON Doc. #:</i> NEON.MGMT.DPS.005004.REQ | | <i>Version:</i> C |

| Level 1 ID | Level 1 Products | Spatial | Temporal | Base units | Level 0 source | Construction phase | Operations phase |
|------------|------------------|---------|----------|------------|----------------|--------------------|------------------|
| FSU.1.0250 | DELETED | | | | | | |
| FSU.1.0251 | DELETED | | | | | | |
| FSU.1.0252 | DELETED | | | | | | |
| FSU.1.0253 | DELETED | | | | | | |
| FSU.1.0254 | DELETED | | | | | | |
| FSU.1.0255 | DELETED | | | | | | |
| FSU.1.0256 | DELETED | | | | | | |
| FSU.1.0257 | DELETED | | | | | | |
| FSU.1.0258 | DELETED | | | | | | |
| FSU.1.0259 | DELETED | | | | | | |
| FSU.1.0260 | DELETED | | | | | | |
| FSU.1.0261 | DELETED | | | | | | |
| FSU.1.0262 | DELETED | | | | | | |
| FSU.1.0263 | DELETED | | | | | | |
| FSU.1.0264 | DELETED | | | | | | |
| FSU.1.0265 | DELETED | | | | | | |
| FSU.1.0266 | DELETED | | | | | | |
| FSU.1.0267 | DELETED | | | | | | |
| FSU.1.0268 | DELETED | | | | | | |
| FSU.1.0269 | DELETED | | | | | | |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

Table 6. Level 1 data products for the Land Use Analysis Package (LUAP) sub-system.

| Level 1 ID | Level 1 products | Spatial | Temporal | Base units | Construction phase | Operations phase |
|---|--|------------|-------------------|------------|--------------------|------------------|
| <i>Satellite remote sensing MODIS subproducts</i> | | | | | | |
| LUAP.1.0001 | NASA MODIS MCD43 B1, BRDF Albedo Model Parameters | NEON Realm | 16 day | | | x |
| LUAP.1.0002 | NASA MCD43 B2, BRDF Albedo Quality | NEON Realm | 16 day | | | x |
| LUAP.1.0003 | NASA MODIS MCD43 B3, Combined Albedo | NEON Realm | 16 day | | | x |
| LUAP.1.0004 | NASA MODIS MCD43 B4, Nadir BRDF adjusted reflectance | NEON Realm | 16 day | | | x |
| LUAP.1.0005 | NASA MODIS MOD09 A1, Surface reflectance | NEON Realm | 8 day | | | x |
| LUAP.1.0006 | NASA MODIS MOD11 A2, Land surface temperature and emissivity | NEON Realm | 8 day | | | x |
| LUAP.1.0007 | NASA MODIS MOD12 Q1, Land cover | NEON Realm | 1 year | | | x |
| LUAP.1.0008 | NASA MODIS MOD12 Q2, Land cover dynamics | NEON Realm | 1 year | | | x |
| LUAP.1.0009 | NASA MODIS MOD15 A2, LAI, fPAR | NEON Realm | 8 day | | | x |
| LUAP.1.0010 | NASA MODIS MYD09 A1, Surface reflectance | NEON Realm | 8 day | | | x |
| LUAP.1.0011 | NASA MODIS MYD15 A2, LAI, fPAR | NEON Realm | 8 day | | | x |
| | <i>Physical geographic information</i> | | | | | |
| LUAP.1.0012 | Protected Areas Database of the United States (PAD-US) | NEON Realm | Variable | | | x |
| LUAP.1.0013 | FEMA National Flood Hazard Layer (NFHL) | NEON Realm | Variable | | | x |
| LUAP.1.0014 | Kuchler Potential Natural Vegetation map | NEON Realm | Single collection | | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 products | Spatial | Temporal | Base units | Construction phase | Operations phase |
|-------------|--|------------|-------------------|------------|--------------------|------------------|
| LUAP.1.0015 | MRLC National Land Cover Database (NLCD 2001) | NEON Realm | Variable | | | x |
| LUAP.1.0016 | DELETED | | | | | |
| LUAP.1.0017 | National Atmospheric Deposition Program National Trends Program (NADP/NTN) | NEON Realm | 1 Week | | | x |
| LUAP.1.0018 | USGS National Bird Breeding Survey | NEON Realm | 1 year | | | x |
| LUAP.1.0019 | National Transportation Atlas Database 2008 (NTAD) | NEON Realm | Variable | | | x |
| LUAP.1.0020 | National Transportation Atlas Database 2008 (NTAD) Airports | NEON Realm | Variable | | | x |
| LUAP.1.0021 | National Transportation Atlas Database 2008 (NTAD) Ports | NEON Realm | Variable | | | x |
| LUAP.1.0022 | National Transportation Atlas Database 2008 (NTAD) Railroads | NEON Realm | Variable | | | x |
| LUAP.1.0023 | United States Historical Climatology Network | NEON Realm | Variable | | | x |
| LUAP.1.0024 | DELETED | | | | | |
| LUAP.1.0025 | DELETED | | | | | |
| LUAP.1.0026 | USDA NRCS MUIR database | NEON Realm | Variable | | | x |
| LUAP.1.0027 | USDA NRCS SIR database | NEON Realm | Variable | | | x |
| LUAP.1.0028 | USDA NRCS SSURGO | NEON Realm | Variable | | | x |
| LUAP.1.0029 | USDA NRCS STATSGO2 | NEON Realm | Variable | | | x |
| LUAP.1.0030 | USDA Watershed Boundaries Dataset | NEON Realm | Single collection | | | x |
| LUAP.1.0031 | USFWS National Wetlands Inventory (NWI) | NEON Realm | Variable | | | x |
| LUAP.1.0032 | DELETED | | | | | |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

| Level 1 ID | Level 1 products | Spatial | Temporal | Base units | Construction phase | Operations phase |
|-------------------------------------|--|------------|-------------------|------------|--------------------|------------------|
| LUAP.1.0033 | USGS Elevation Derivatives for National Applications (EDNA) | NEON Realm | Variable | | | x |
| LUAP.1.0034 | DELETED | | | | | |
| LUAP.1.0035 | DELETED | | | | | |
| LUAP.1.0036 | USGS National Atlas | NEON Realm | Variable | | | x |
| LUAP.1.0037 | USGS National Elevation Dataset | NEON Realm | Variable | | | x |
| LUAP.1.0038 | USGS National Hydrography Dataset (NHD) | NEON Realm | Variable | | | x |
| LUAP.1.0039 | USGS Quadrangle maps | NEON Realm | Variable | | | x |
| LUAP.1.0040 | USGS Watershed Boundaries Dataset | NEON Realm | Variable | | | x |
| LUAP.1.0045 | USGS HYDRO1k | NEON Realm | Single collection | | | x |
| LUAP.1.0046 | USGS National Map Forest Cover Types | NEON Realm | Single collection | | | x |
| LUAP.1.0047 | NCEP NARR (32km2 grid cell resolution, pulling selected cells for site characterization) | NEON Realm | Variable | | | x |
| <i>Human geographic information</i> | | | | | | |
| LUAP.1.0041 | U.S. Bureau of Census Data | NEON Realm | 10 year | | | x |
| LUAP.1.0042 | USDA National Agricultural Census | NEON Realm | 5 year | | | x |
| LUAP.1.0043 | EPA AIRS Database Facility Subsystem | NEON Realm | Variable | | | x |
| LUAP.1.0044 | USDA FIA | NEON Realm | 5 year | | | x |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

6 LEVEL 2 DATA PRODUCTS

Only the FIU sub-system will produce level 2 data products. These products are listed in Table 7. Column headings are similar to those for Tables 2 through 6 and are explained again here. All level 2 products will be implemented only during operations so the columns listing construction and operations phases have been deleted.

Level 2 ID: Each level 2 product has a unique identification number beginning with a prefix that identifies the name of the science sub-system. The numbering convention follows the form SSS.L.XXXX where SSS is a three letter abbreviation for the sub-system that produces the product (AOP, AQU, FIU, FSU, LUAP), L is the product level (1, 2, or 3) and XXXX is a four digit number.

Level 2 products: A descriptive name for the data product.

Spatial: The spatial unit for publication of the product. A measurement that will be collected across a site may have sub-site information included.

Temporal: The temporal division for publication of the product. Products may have more than one temporal division.

Base units: The scientific units for the product or a qualitative description of the data type.

Level 1 source: The principle level 1 data product that will be used to produce the level 2 data product.

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

Table 7. Level 2 data products for the Fundamental Instrument Unit (FIU) sub-system.

| Level 2 ID | Level 2 Products | Spatial | Temporal | Base units | Level 1 source |
|------------|---------------------------------------|-------------------------------|------------------|--------------------------------------|----------------|
| FIU.2.0001 | 2-d windspeed-profile | vertical profile, tower, site | 1-min and 30-min | m s^{-1} | FIU.1.0001 |
| FIU.2.0002 | Air temperature-profile | vertical profile, tower, site | 1-min and 30-min | C | FIU.1.0002 |
| FIU.2.0003 | Air temperature-WMO | tower top, site | 1-min and 30-min | C | FIU.1.0003 |
| FIU.2.0004 | Atmospheric pressure | tower bottom, site | 1-min and 30-min | kPa | FIU.1.0004 |
| FIU.2.0005 | Biological temperature-profile | vertical profile, tower, site | 1-min and 30-min | C | FIU.1.0005 |
| FIU.2.0006 | Bulk Precipitation | tower top, tower, site | 1-min and 30-min | mm | FIU.1.0006 |
| FIU.2.0011 | CO ₂ -profile | vertical profile, tower, site | 1-min and 30-min | $\mu\text{mol mol}^{-1}$ | FIU.1.0011 |
| FIU.2.0013 | wind direction Θ_{3d} | tower top, site | 1-min and 30-min | degree | FIU.1.0013 |
| FIU.2.0014 | diffuse PAR | tower top, site | 1-min and 30-min | W m^{-2} | FIU.1.0014 |
| FIU.2.0016 | H ₂ O-profile | vertical profile, tower, site | 1-min and 30-min | $\mu\text{mol mol}^{-1}$ | FIU.1.0016 |
| FIU.2.0020 | Incoming PAR | tower top, site | 1-min and 30-min | $\mu\text{mol m}^{-2} \text{s}^{-1}$ | FIU.1.0020 |
| FIU.2.0021 | Incoming radiation LW/tower | tower top, site | 1-min and 30-min | W m^{-2} | FIU.1.0021 |
| FIU.2.0022 | Incoming radiation SW primary/tower | tower top, site | 1-min and 30-min | W m^{-2} | FIU.1.0022 |
| FIU.2.0023 | Incoming radiation SW secondary/tower | tower top, site | 1-min and 30-min | W m^{-2} | FIU.1.0023 |
| FIU.2.0024 | PAR-profile | vertical profile, tower, site | 1-min and 30-min | $\mu\text{mol m}^{-2} \text{s}^{-1}$ | FIU.1.0024 |
| FIU.2.0025 | Reflected PAR | tower top, site | 1-min and 30-min | $\mu\text{mol m}^{-2} \text{s}^{-2}$ | FIU.1.0025 |
| FIU.2.0026 | Reflected radiation LW/tower | tower top, site | 1-min and 30-min | W m^{-2} | FIU.1.0026 |
| FIU.2.0027 | Reflected radiation SW/tower | tower top, site | 1-min and 30-min | W m^{-2} | FIU.1.0027 |
| FIU.2.0028 | Relative humidity | tower top, site | 1-min and 30-min | % RH | FIU.1.0028 |
| FIU.2.0029 | Relative humidity-profile | vertical profile, tower, site | 1-min and 30-min | % RH | FIU.1.0029 |
| FIU.2.0030 | Snow water equivalent-primary | tower bottom, tower, site | 1-min and 30-min | g m^{-2} | FIU.1.0030 |
| FIU.2.0031 | Snow water equivalent-secondary | tower top, site | 1-min and 30-min | mm | FIU.1.0031 |
| FIU.2.0032 | Snow water equivalent-tertiary | tower top, site | 1-min and 30-min | mm | FIU.1.0032 |
| FIU.2.0035 | $\delta^{13}\text{C-CO}_2$ | vertical profile, tower, site | 1-min and 30-min | ‰, part per mil | FIU.1.0035 |
| FIU.2.0036 | $\delta^{18}\text{O-H}_2\text{O}$ | vertical profile, tower, site | 1-min and 30-min | ‰, part per mil | FIU.1.0036 |

| | | |
|--|-------------------------------|------------------------|
| <i>Title:</i> NEON Level 1-3 Data Products Catalog | <i>Author:</i> Michael Keller | <i>Date:</i> 3/16/2010 |
| <i>NEON Doc. #:</i> NEON.MGMT.DPS.005004.REQ | | <i>Version:</i> C |

| Level 2 ID | Level 2 Products | Spatial | Temporal | Base units | Level 1 source |
|-------------------|------------------------------|--------------------------------|------------------|---|-----------------------|
| FIU.2.0066 | PAR-line | sample, site | 1-min and 30-min | $\mu\text{mol s}^{-1} \text{m}^{-2}$ | FIU.1.0066 |
| FIU.2.0067 | Throughfall | sample, site | 1-min and 30-min | mm | FIU.1.0067 |
| FIU.2.0068 | Soil temperature profile | sample, site | 1-min and 30-min | C | FIU.1.0068 |
| FIU.2.0069 | Soil heat flux | sample, site | 1-min and 30-min | W m^{-2} | FIU.1.0069 |
| FIU.2.0093 | Soil CO ₂ profile | sample, site | 1-min and 30-min | $\mu\text{mol mol}^{-1}$ | FIU.1.0093 |
| FIU.2.0094 | Soil water content profile | sample, profile, chamber, site | 1-min and 30-min | $\text{m}^3_{\text{water}} \text{m}^{-3}_{\text{soil}}$ | FIU.1.0094 |

| | | |
|---|------------------------|-----------------|
| Title: NEON Level 1-3 Data Products Catalog | Author: Michael Keller | Date: 3/16/2010 |
| NEON Doc. #: NEON.MGMT.DPS.005004.REQ | | Version: C |

7 LEVEL 3 DATA PRODUCTS

Only the AOP sub-system will produce level 3 data products. These products are listed in Table 8. Column headings are similar to those for Tables 2 through 7 and are explained again here. All level 3 products will be implemented only during operations so the columns listing construction and operations phases have been deleted.

Level 3 ID: Each level 3 product has a unique identification number beginning with a prefix that identifies the name of the science sub-system. The numbering convention follows the form SSS.L.XXXX where SSS is a three letter abbreviation for the subsystem that produces the product (AOP, AQU, FIU, FSU, LUAP), L is the product level (1, 2, or 3) and XXXX is a four digit number.

Level 3 products: A descriptive name for the data product.

Spatial: The spatial unit for publication of the product. A measurement that will be collected across a site may have sub-site information included.

Temporal: The temporal division for publication of the product. Products may have more than one temporal division.

Base units: The scientific units for the product or a qualitative description of the data type.

Level 1 source: The principle level 1 data product that will be used to produce the level 3 data product.

| | | |
|--|-------------------------------|------------------------|
| <i>Title:</i> NEON Level 1-3 Data Products Catalog | <i>Author:</i> Michael Keller | <i>Date:</i> 3/16/2010 |
| <i>NEON Doc. #:</i> NEON.MGMT.DPS.005004.REQ | | <i>Version:</i> C |

Table 8. Level 3 data products for the Airborne Observation Platform (AOP) sub-system.

| Level 3 ID | Level 3 Products | Spatial | Temporal | Base units | Level 1 source |
|-------------------|---|-------------------------------------|-----------------|---|-----------------------|
| AOP.3.0001 | LiDAR vertical waveform, nearest neighbor | 5 m resolution, regional coverage | year | normalized intensity as function of height above the ground | AOP.1.0001 |
| AOP.3.0002 | LiDAR vertical waveform, spatial average | 5 m resolution, regional coverage | year | normalized intensity as function of height above the ground | AOP.1.0001 |
| AOP.3.0003 | Spectral reflectance | 5 m resolution, regional coverage | year | reflectance as function of wavelength | AOP.1.0003 |
| AOP.3.0004 | High resolution imagery | 0.6 m resolution, regional coverage | year | 2D imagery | AOP.1.0004 |