Title: Stream chemistry concentrations and fluxes using proportional sampling in the Andrews Experimental Forest, 1968 to present

Abstract:
Stream chemistry sampling and analysis was initiated at the H.J. Andrews Experimental Forest in 1968 in two small watersheds (Watersheds 9,10). Sampling has expanded as additional paired watershed studies (Watersheds 1, 2, 6, 7, 8) and monitoring (Mack, Lookout Cr) were initiated over time. Water samples are collected proportionally to streamflow as a function of stage height and composited at each stream gauging site. Composite sample periods are generally three weeks and 3 one-week samples are commonly composited in the lab before analysis. Water samples are analyzed at the Cooperative Chemical Analytical Lab (CCAL) (http://www.ccal.oregonstate.edu/ ). Concentrations of analytes include dissolved and particulate nitrogen, phosphorus, carbon, as well pH, conductivity, suspended sediment, and full suite of cations and anions. Monthly and annual mean concentrations are calculated by weighting 3-week periods by streamflow. Fluxes are calculated using concentrations and flow. The original objective was to examine the nutrient budgets for small watersheds and to evaluate changes in average concentrations and fluxes following timber harvest in comparison with unharvested reference watersheds. This study is conducted in conjunction with Andrew's precipitation chemistry (CP002) and the U.S. National Atmospheric Deposition Program (NADP).

Keywords: Discharge; Dissolved load; Hydrology; Water; Logging; Long-Term Ecological Research (LTER); Nutrients; Solution transport; Streamflow; Timber harvesting; Water; Water chemistry; Inorganic nutrients; Inorganic nutrients; Organic matter; Long-Term Ecological Research (LTER); Hydrology; water chemistry; suspended solids; discharge; streamflow; timber harvest; inorganic nutrients; nutrients; dissolved nutrients; water;

Date data commenced: 1968-10-02

Date data terminated: 2019-05-22

Principal Investigator: Sherri L. Johnson

List of Entities:
1. Proportional stream water sample nutrient concentrations
2. Stream water nutrient mean monthly concentrations
3. Stream water nutrient mean annual concentrations
4. Stream water nutrient monthly outflow (kg/ha)
5. Stream water nutrient outflow (kg/ha) for each proportional sampling interval
6. Stream water sample log sheet: field and laboratory comments

**1. Proportional stream water sample nutrient concentrations**

This is the raw proportional sample concentration data collected periodically (usually every three weeks). Please see mean monthly concentration data provided in entity 2.

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2. Stream water nutrient mean monthly concentrations

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**5. Stream water nutrient outflow (kg/ha) for each proportional sampling interval**

Data are calculated outflow fluxes for each proportional sample period. Alternatively, please consider use of monthly outflow fluxes provided in entity 4.

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</table>
Attributes Definitions:

ALK
Alkalinity as calcium carbonate (CaCO3); method: electrometric titration to pH 4.5; all data is converted from the formerly used units of bicarbonate carbon (HCO3-C)

ALK_MO
Mean monthly alkalinity concentration as CaCO3 (calcium carbonate)

ALK_OUT_MO
Total monthly alkalinity outflow as CaCO3 (calcium carbonate). All units are now converted from HCO3-C (bi-carbonate)

ALK_OUTPUT
Alkalinity outflow as CaCO3 (calcium carbonate)

ALK_YR
Mean annual alkalinity concentration as CaCO₃ (calcium carbonate). All units are now converted from HCO₃-C (bi-carbonate).

**ALKCODE**
- Alkalinity value qualifier code

**ALKCODE_MO**
- Monthly alkalinity qualifier value code

**ALKCODE_YR**
- Annual alkalinity qualifier value code

**ANCA**
- Anion-cation ratio: micro equivalence ratio of anions to cations by calculation - provided only as an analytical check. Requires anions: ALK, SO₄S, CL, NO₃N, PO₄P, cations: pH, Na, K, Ca, Mg, NH₄N

**ANCACODE**
- Anion-cation ratio qualifier code

**CA**
- Ca, dissolved calcium (filtrable) concentration; method flame atomic absorption spectroscopy

**CA_MO**
- Mean monthly calcium concentration

**CA_OUT_MO**
- Total monthly calcium outflow

**CA_OUTPUT**
- Calcium outflow

**CA_YR**
- Mean annual calcium concentration

**CACODE**
- Ca value qualifier code

**CACODE_MO**
- Monthly calcium value qualifier code

**CACODE_YR**
- Annual Ca value qualifier code

**CL**
- Chloride (dissolved) concentration; method: ion chromatography (automated ferric thiocyanate before 1993)

**CL_MO**
- Mean monthly chloride concentration

**CL_OUT_MO**
- Total monthly chloride outflow

**CL_OUTPUT**
- Chloride outflow

**CL_YR**
- Mean annual chloride concentration
CLCODE
   CI value qualifier code
CLCODE_MO
   Monthly chloride value qualifier code
CLCODE_YR
   Annual CI value qualifier code
COND
   Specific conductance; method: wheatstone bridge
COND_MO
   Mean monthly specific conductivity concentration
COND_YR
   Mean annual specific conductivity concentration
CONDCODE
   Conductivity value qualifier code
CONDCODE_MO
   Monthly conductivity value qualifier code
CONDCODE_YR
   Annual conductivity value qualifier code
DATE_TIME
   Collection date and time (PST) of the stream water sample - sample collected proportionally to streamflow from the previous sample date and time. Assume beginning date of first sample period for each collector is October 1st.
DOC
   DOC, dissolved organic carbon concentration; method: combustion
DOC_MO
   Mean monthly dissolved organic carbon concentration
DOC_OUT_MO
   Total monthly dissolved organic carbon outflow
DOC_OUTPUT
   Dissolved organic carbon outflow
DOC_YR
   Mean annual dissolved organic carbon concentration
DOCCODE
   DOC value qualifier code
DOCCODE_MO
   Monthly dissolved organic carbon value qualifier code
DOCCODE_YR
   Annual DOC value qualifier code
DON
Dissolved organic nitrogen - not measured analytically; mathematically determined by subtracting NH3-N and NO3-N from Total dissolved nitrogen. Values before May 2005 are determined by TKN minus NH3-N.

DON_MO
Mean monthly dissolved organic N concentration - not measured analytically; mathematically determined by subtracting NH3-N and NO3-N from Total dissolved nitrogen. Values before May 2005 are determined by TKN minus NH3-N

DON_OUT_MO
Total monthly dissolved organic N outflow - not measured analytically; mathematically determined by subtracting NH3-N and NO3-N from Total dissolved nitrogen. Values before May 2005 are determined by TKN minus NH3-N

DON_OUTPUT
Dissolved organic N outflow - not measured analytically; mathematically determined by subtracting NH3-N and NO3-N from Total dissolved nitrogen. Values before May 2005 are determined by TKN minus NH3-N

DON_YR
Mean annual dissolved organic N concentration - not measured analytically; mathematically determined by subtracting NH3-N and NO3-N from Total dissolved nitrogen. Values before May 2005 are determined by TKN minus NH3-N

DONCODE
Dissolved organic nitrogen value qualifier code

DONCODE_MO
Monthly dissolved organic N value qualifier code

DONCODE_YR
Annual dissolved organic N value qualifier code

ENTITY
Entity number

FIELD_COMMENTS
Field comments related to the collection of the water sample

INTERVAL
Proportional sampling interval length in days

K
K, dissolved potassium (filtrable) concentration; method flame atomic absorption spectroscopy

K_MO
Mean monthly potassium concentration

K_OUT_MO
Total monthly potassium outflow

K_OUTPUT
Potassium outflow

K_YR
Mean annual potassium concentration

KCODE
K value qualifier code

KCODE_MO
Monthly potassium value qualifier code
KCODE_YR
  Annual K value qualifier code
LAB_COMMENTS
  Laboratory comments related to the handling and analyses of the sample
LABNO
  Lab number code for sample
LOW_VOLUME
  Indicator of a low volume sampler that may restrict the breadth of laboratory analyses
MEAN_LPS
  Mean discharge over the sampling interval
MG
  Mg, dissolved magnesium (filtrable) concentration; method flame atomic absorption spectroscopy
MG_MO
  Mean monthly magnesium concentration
MG_OUT_MO
  Total monthly magnesium outflow
MG_OUTPUT
  Magnesium outflow
MG_YR
  Mean annual magnesium concentration
MGCODE
  Mg value qualifier code
MGCODE_MO
  Monthly magnesium value qualifier code
MGCODE_YR
  Annual Mg value qualifier code
MONTH
  Month of summary
NA
  Na, dissolved sodium (filtrable) concentration; method flame atomic absorption spectroscopy
NA_MO
  Mean monthly sodium concentration
NA_OUT_MO
  Total monthly sodium outflow
NA_OUTPUT
  Sodium outflow
NA_YR
Mean annual sodium concentration

NACODE
Na value qualifier code

NACODE_MO
Monthly sodium value qualifier code

NACODE_YR
Annual Na value qualifier code

NH3N
Ammonia-nitrogen (NH3-N) concentration, ammonia as nitrogen; method: automated phenate

NH3N_MO
Mean monthly ammonia-nitrogen (NH3-N) concentration

NH3N_OUT_MO
Total monthly ammonia-nitrogen (NH3-N) outflow

NH3N_OUTPUT
Ammonia-nitrogen (NH3-N) outflow

NH3N_YR
Mean annual ammonia (NH3-N) concentration

NH3NCODE
NH3-N value qualifier code

NH3NCODE_MO
Monthly ammonia-nitrogen (NH3-N) value qualifier code

NH3NCODE_YR
Annual NH3-N value qualifier code

NO3N
Nitrate-nitrogen (NO3-N), nitrate + nitrite as nitrogen concentration; method: automated cadmium reduction

NO3N_MO
Mean monthly nitrate-nitrogen (NO3-N) concentration

NO3N_OUT_MO
Total monthly nitrate-nitrogen (NO3-N) outflow

NO3N_OUTPUT
Nitrate-nitrogen (NO3-N) outflow

NO3N_YR
Mean annual nitrate-nitrogen (NO3-N) concentration

NO3NCODE
NO3-N value qualifier code

NO3NCODE_MO
Monthly nitrate-nitrogen (NO3-N) value qualifier code

NO3NCODE_YR

Annual NO3-N value qualifier code

PARTN

Particulate N, also known as total suspended nitrogen - not measured analytically; mathematically determined by subtraction of Total dissolved nitrogen (TDN) from Unfiltered Total nitrogen (UTN). Values before May 2005 are determined by UTKN minus TKN.

PARTN_MO

Mean monthly particulate N concentration - not measured analytically; mathematically determined by subtraction of Total dissolved nitrogen (TDN) from Unfiltered Total nitrogen (UTN). Values before May 2005 are determined by UTKN minus TKN.

PARTN_OUT_MO

Total monthly particulate N outflow - not measured analytically; mathematically determined by subtraction of Total dissolved nitrogen (TDN) from Unfiltered Total nitrogen (UTN). Values before May 2005 are determined by UTKN minus TKN.

PARTN_OUTPUT

Particulate N outflow - not measured analytically; mathematically determined by subtraction of Total dissolved nitrogen (TDN) from Unfiltered Total nitrogen (UTN). Values before May 2005 are determined by UTKN minus TKN.

PARTN_YR

Mean annual particulate N concentration - not measured analytically; mathematically determined by subtraction of Total dissolved nitrogen (TDN) from Unfiltered Total nitrogen (UTN). Values before May 2005 are determined by UTKN minus TKN.

PARTNCODE

Particulate N value qualifier code

PARTNCODE_MO

Monthly particulate N value qualifier code

PARTNCODE_YR

Annual particulate N value qualifier code

PARTP

Particulate P, also known as total suspended phosphorus - not measured analytically; mathematically determined by subtraction of Total Dissolved P (TDP) from Unfiltered Total P (UTP)

PARTP_MO

Mean monthly particulate P - not measured analytically; mathematically determined by subtraction of Total Dissolved P (TDP) from Unfiltered Total P (UTP)

PARTP_OUT_MO

Total monthly particulate P outflow - not measured analytically; mathematically determined by subtraction of Total Dissolved P (TDP) from Unfiltered Total P (UTP)

PARTP_OUTPUT

Particulate P outflow - not measured analytically; mathematically determined by subtraction of Total Dissolved P (TDP) from Unfiltered Total P (UTP)

PARTP_YR

Mean annual particulate P - not measured analytically; mathematically determined by subtraction of Total Dissolved P (TDP) from Unfiltered Total P (UTP)

PARTPCODE

Particulate P value qualifier code

PARTPCODE_MO
Monthly particulate P value qualifier code
PARTPCODE_YR

Annual particulate P value qualifier code

PH
pH (hydrogen concentration); method: glass electrode
PH_MO
Mean monthly pH
PH_YR
Mean annual pH

PHCODE
pH value qualifier code
PHCODE_MO
Monthly pH value qualifier code
PHCODE_YR
Annual pH value qualifier code

PO4P
Ortho phosphorus concentration, soluble reactive phosphorus, phosphate (PO4-P); method: ascorbic acid finish
PO4P_MO
Mean monthly ortho phosphorus (PO4-P) concentration
PO4P_OUT_MO
Total monthly ortho phosphorus (PO4-P) outflow

PO4P_OUTPUT
Ortho phosphorus (PO4-P) outflow

PO4P_YR
Mean annual ortho phosphorus (PO4-P) concentration

PO4PCODE
Ortho phosphorus value qualifier code
PO4PCODE_MO
Monthly ortho phosphorus (PO4-P) value qualifier code
PO4PCODE_YR
Annual ortho phosphorus value qualifier code

PVOL
Sample volume from streamflow proportional sampler
PVOLCODE
Sample volume code

Q_AREA_CM
Streamflow in cm for the time interval represented by the proportional sample
Q_AREA_MO  
Total monthly streamflow over watershed area

Q_AREA_YR  
Total annual streamflow for the wateryear

QA_SAMPLE  
Quality assurance sample number assigned if sample water is further analyzed for internal laboratory purposes

QCCODE  
Quality control sample codes are assigned to samples collected for examining integrity of proportional sample analysis

QCODE  
Streamflow value qualifier code

QCODE_MO  
Monthly streamflow value qualifier code

QCODE_YR  
Annual streamflow value qualifier code

SAMPLER_TYPE  
Type of water sampler or method used to collect water

SEQ_INDEX  
Sequential index generated primarily by the temporal order in which samples are collected

SI  
Silica as silicon concentration; method: automated molybdenum blue

SI_MO  
Mean monthly silica concentration

SI_OUT_MO  
Total monthly silica outflow

SI_OUTPUT  
Silica outflow

SI_YR  
Mean annual silica concentration

SICODE  
Silica value qualifier code

SICODE_MO  
Monthly silica value qualifier code

SICODE_YR  
Annual silica value qualifier code

SITECODE  
Gaging station site code

SO4S
SO4-S (dissolved) concentration, sulfate as sulfur; method: ion chromatography (automated barium sulfate before 1993)

SO4S_MO
Mean monthly sulfate-sulfur (SO4-S) concentration

SO4S_OUT_MO
Total monthly sulfate-sulfur (SO4-S) outflow

SO4S_OUTPUT
SO4-S (sulfate-sulfur) outflow

SO4S_YR
Mean annual SO4-S (sulfate-sulfur) concentration

SO4SCODE
SO4-S value qualifier code

SO4SCODE_MO
Monthly sulfate-sulfur (SO4-S) value qualifier code

SO4SCODE_YR
Annual SO4-S value qualifier code

SSED
Suspended sediment concentration; method: nonfiltrable residue, gravimetric

SSED_MO
Mean monthly suspended sediment concentration

SSED_OUT_MO
Total monthly suspended sediment outflow

SSED_OUTPUT
Suspended sediment outflow

SSED_YR
Mean annual suspended sediment concentration

SSEDCODE
Suspended sediment value qualifier code

SSEDCODE_MO
Monthly suspended sediment value qualifier code

SSEDCODE_YR
Annual suspended sediment value qualifier code

STCODE
Study code

TDN
Total dissolved nitrogen concentration (filtered sample); method: persulfate digestion and analysis by automated colorimetric analysis; instrument: Technicon Auto-Analyzer II

TDN_MO
Mean monthly total dissolved nitrogen concentration
TDN_OUT_MO
Total monthly total dissolved nitrogen outflow (filtered sample)

TDN_OUTPUT
Total dissolved nitrogen outflow (filtered sample)

TDN_YR
Mean annual total dissolved nitrogen concentration

TDNCODE
Total dissolved nitrogen value qualifier code

TDNCODE_MO
Monthly total dissolved nitrogen value qualifier code

TDNCODE_YR
Annual total dissolved nitrogen value qualifier code

TDP
Total dissolved phosphorus concentration; method: persulfate/H2SO4 digestion, ascorbic acid finish

TDP_MO
Mean monthly total dissolved phosphorus concentration

TDP_OUT_MO
Total monthly total dissolved phosphorus outflow

TDP_OUTPUT
Total dissolved phosphorus outflow

TDP_YR
Mean annual total dissolved phosphorus concentration

TDPCODE
Total dissolved phosphorus value qualifier code

TDPCODE_MO
Monthly total dissolved phosphorus value qualifier code

TDPCODE_YR
Annual total dissolved phosphorus value qualifier code

TKN
Total Kjeldahl nitrogen concentration on filtered sample (dissolved); method: Kjeldahl digestion H2SO4, CuSO4/KCl, nessler finish

TKN_MO
Mean monthly total kjeldahl nitrogen concentration (dissolved)

TKN_OUT_MO
Total monthly total Kjeldahl nitrogen (dissolved) outflow

TKN_OUTPUT
Total Kjeldahl nitrogen (dissolved) outflow

TKN_YR
Total Kjeldahl nitrogen (dissolved) outflow
Mean annual total kjeldahl nitrogen concentration (dissolved)

TKNCODE
Total Kjeldahl nitrogen value qualifier code

TKNCODE_MO
Monthly total Kjeldahl nitrogen (dissolved) value qualifier code

TKNCODE_YR
Annual total Kjeldahl nitrogen value qualifier code

TYPE
Sample type indicator

UTKN
Total Kjeldahl nitrogen concentration on unfiltered sample; method: Kjeldahl digestion H2SO4, CuSO4/KCl, nessler finish

UTKN_MO
Mean monthly unfiltered total Kjeldahl nitrogen concentration

UTKN_OUT_MO
Total monthly unfiltered total Kjeldahl nitrogen outflow

UTKN_OUTPUT
Unfiltered total Kjeldahl nitrogen outflow

UTKN_YR
Mean annual unfiltered total Kjeldahl nitrogen concentration

UTKNCODE
Unfiltered total Kjeldahl nitrogen value qualifier code

UTKNCODE_MO
Monthly unfiltered total Kjeldahl nitrogen value qualifier code

UTKNCODE_YR
Annual unfiltered total Kjeldahl nitrogen value qualifier code

UTN
Total nitrogen concentration (unfiltered sample); method: persulfate digestion and analysis by automated colorimetric analysis; instrument: Technicon Auto-Analyzer II

UTN_MO
Mean monthly total nitrogen concentration (unfiltered samples)

UTN_OUT_MO
Total monthly total nitrogen outflow (unfiltered sample)

UTN_OUTPUT
Total nitrogen outflow (unfiltered sample)

UTN_YR
Mean annual total nitrogen concentration (unfiltered samples)

UTNCODE
Unfiltered total nitrogen value qualifier code
UTNCODE_MO
Monthly unfiltered total nitrogen value qualifier code

UTNCODE_YR
Annual unfiltered total nitrogen value qualifier code

UTP
Unfiltered total phosphorus concentration; method: persulfate/H2SO4 digestion, ascorbic acid finish

UTP_MO
Mean monthly unfiltered total phosphorus concentration

UTP_OUT_MO
Total monthly unfiltered total phosphorus outflow

UTP_OUTPUT
Unfiltered total phosphorus outflow

UTP_YR
Mean annual unfiltered total phosphorus concentration

UTPCODE
Unfiltered total phosphorus value qualifier code

UTPCODE_MO
Monthly unfiltered total phosphorus value qualifier code

UTPCODE_YR
Annual unfiltered total phosphorus value qualifier code

WATERYEAR
Water year of sample or annual summary (October-September)

YEAR
Calendar year of annual or monthly summary

Enumerated Domains:

Enumerated Domain for Attribute: ALKCODE
* Value is below detection limit for analysis (used beginning in 1991)
A Accepted value
E Estimated value
N No analytical measurement
Q Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: ANCACODE
D Derived anion-cation ratio value is based on the full set of anions and cations
N No anion-cation ratio calculation determined due to missing analytical components
D* Derived value - mathematically determined from other analytical measurements, one or more of which were below the detection limit
DE Derived value - mathematically determined from other analytical measurements, one or more of which were estimated values
DQ Derived value - mathematically determined from other analytical measurements,
one or more of which were questionable values

Enumerated Domain for Attribute: CACODE
* Value is below detection limit for analysis (used beginning in 1991)
A Accepted value
E Estimated value
N No analytical measurement
Q Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: CLCODE
* Value is below detection limit for analysis (used beginning in 1991)
A Accepted value
E Estimated value
N No analytical measurement
Q Value is questionable (used beginning in 1991)
C Value confirmed, contamination or experimental tracer suspected (code use begins May 2007)

Enumerated Domain for Attribute: CONDCODE
* Value is below detection limit for analysis (used beginning in 1991)
A Accepted value
E Estimated value
N No analytical measurement
Q Value is questionable (used beginning in 1991)
C Confirmed value, contamination or experimental tracer suspected (code use begins May 2007)

Enumerated Domain for Attribute: DOCCODE
* Value is below detection limit for analysis (used beginning in 1991)
A Accepted value
E Estimated value
N No analytical measurement
Q Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: KCODE
* Value is below detection limit for analysis (used beginning in 1991)
A Accepted value
E Estimated value
N No analytical measurement
Q Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: MGCODE
* Value is below detection limit for analysis (used beginning in 1991)
A  Accepted value
E  Estimated value
N  No analytical measurement
Q  Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: NACODE
+  Value is below detection limit for analysis (used beginning in 1991)
A  Accepted value
E  Estimated value
N  No analytical measurement
Q  Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: NH3NCODE
+  Value is below detection limit for analysis (used beginning in 1991)
A  Accepted value
E  Estimated value
N  No analytical measurement
Q  Value is questionable (used beginning in 1991)
C  Value confirmed, contamination suspected (code use begins May 2007)

Enumerated Domain for Attribute: NO3NCODE
+  Value is below detection limit for analysis (used beginning in 1991)
A  Accepted value
E  Estimated value
N  No analytical measurement
Q  Value is questionable (used beginning in 1991)
C  Value confirmed, contamination suspected (code use begins May 2011)

Enumerated Domain for Attribute: PO4PCODE
+  Value is below detection limit for analysis (used beginning in 1991)
A  Accepted value
E  Estimated value
N  No analytical measurement
Q  Value is questionable (used beginning in 1991)
C  Value confirmed, contamination suspected (code use begins May 2011)

Enumerated Domain for Attribute: DONCODE
N  No derived value is calculated due to missing analytical components
D  Derived value - mathematically determined from other analytical measurements
D* Derived value - mathematically determined from other analytical measurements, one or more of which were below the detection limit
DE Derived value - mathematically determined from other analytical measurements, one or more of which were estimated values
DQ Derived value - mathematically determined from other analytical measurements, one or more of which were questionable values
DC Derived value confirmed, contamination suspected (code use begins May 2007)

Enumerated Domain for Attribute: PHCODE
A Accepted value
E Estimated value
N No analytical measurement
Q Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: PARTNCODE
N No derived value is calculated due to missing analytical components
D Derived value - mathematically determined from other analytical measurements
D* Derived value - mathematically determined from other analytical measurements, one or more of which were below the detection limit
DE Derived value - mathematically determined from other analytical measurements, one or more of which were estimated values
DQ Derived value - mathematically determined from other analytical measurements, one or more of which were questionable values
DC Derived value confirmed, contamination suspected (code use begins May 2007)

Enumerated Domain for Attribute: PARTPCODE
N No derived value is calculated due to missing analytical components
D Derived value - mathematically determined from other analytical measurements
D* Derived value - mathematically determined from other analytical measurements, one or more of which were below the detection limit
DE Derived value - mathematically determined from other analytical measurements, one or more of which were estimated values
DQ Derived value - mathematically determined from other analytical measurements, one or more of which were questionable values

Enumerated Domain for Attribute: PVOLCODE
A Accepted value for sample volume
E Sample volume value is estimated
Q Sample volume value is questionable - typically implies volume is measured correctly, but volume does not proportionally represent the collection period
N No sample volume value available

Enumerated Domain for Attribute: QCODE
A Accepted value for streamflow
N No streamflow available for period
E Estimated streamflow value
P Provisional streamflow value is likely to change - used for USGS Lookout Creek streamflow
Q Streamflow value for the period is questionable

Enumerated Domain for Attribute: SICODE
* Value is below detection limit for analysis (used beginning in 1991)
A  Accepted value
E  Estimated value
N  No analytical measurement
Q  Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: SO4SCODE
*  Value is below detection limit for analysis (used beginning in 1991)
A  Accepted value
E  Estimated value
N  No analytical measurement
Q  Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: SSEDCODE
A  Accepted value
E  Estimated value
N  No analytical measurement
Q  Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: STCODE
CF002  Study code CF002

Enumerated Domain for Attribute: TKNCODE
*  Value is below detection limit for analysis (used beginning in 1991)
A  Accepted value
E  Estimated value
N  No analytical measurement
Q  Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: TDPCODE
*  Value is below detection limit for analysis (used beginning in 1991)
A  Accepted value
E  Estimated value
N  No analytical measurement
Q  Value is questionable (used beginning in 1991)
C  Value confirmed, contamination suspected (code use begins May 2011)

Enumerated Domain for Attribute: TYPE
QB  Quality control samples taken below turbulence box
QS  Quality control sample taken through sampler
QL  Quality control sample taken through sampler and left in gage house until next collection
QA  Quality control sample taken above flume
C  Sample combined with preceding saved sample(s) for analysis - not used after 1981
G  Grab sample taken in lieu of proportional sample
S  Sample saved to combine with following collection (type ’C’) due to insufficient water (not used after 1981). Nutrient concentrations of the following stream water sample are used to determine fluxes for this period.
N  No sample is collected for this period
F  Complete, full sample. Sampler operational throughout sampling period.
YE Year end marker allows summary by water year - this is not a sample. Flux values are calculated from streamflow ending Sep 30 and use analyte concentrations from the following sample. ’Y’ markers are inserted every Sep30
A  Augmented sample - grab sample added to insufficient proportional sample (rarely used after 1987)
P  Partial sample - proportional sampler did not operate successfully over entire period
B  Biased sample - consecutive samples are proportionally separated and combined based on streamflow - code use begins WY 2008 to approx. two 3-week sampling intervals (where one sample is for 4 wks and the next for 2 wks)

Enumerated Domain for Attribute: UTKCODE
* Value is below detection limit for analysis (used beginning in 1991)
A  Accepted value
E  Estimated value
N  No analytical measurement
Q  Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: UTPCODE
* Value is below detection limit for analysis (used beginning in 1991)
A  Accepted value
E  Estimated value
N  No analytical measurement
Q  Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: UTNCODE
* Value is below detection limit for analysis (used beginning in 1991)
A  Accepted value
E  Estimated value
Q  Value is questionable (used beginning in 1991)
D  Derived value - mathematically determined from other analytical measurements
D* Derived value - mathematically determined from other analytical measurements, one or more of which were below the detection limit
DE Derived value - mathematically determined from other analytical measurements, one or more of which were estimated values
DQ Derived value - mathematically determined from other analytical measurements, one or more of which were questionable values
N  No analytical measurement or no derived value calculated due to missing analytical components
C Value confirmed, contamination suspected (code use begins May 2011)

Enumerated Domain for Attribute: TDNCODE
A Accepted value
E Estimated value
Q Value is questionable (used beginning in 1991)
D Derived value - mathematically determined from other analytical measurements
D* Derived value - mathematically determined from other analytical measurements, one or more of which were below the detection limit
DE Derived value - mathematically determined from other analytical measurements, one or more of which were estimated values
DQ Derived value - mathematically determined from other analytical measurements, one or more of which were questionable values
N No analytical measurement or no derived value calculated due to missing analytical components
C Value confirmed, contamination suspected (code use begins May 2007)

Enumerated Domain for Attribute: STCODE
CF002 Study code CF002

Enumerated Domain for Attribute: TYPE
QB Quality control samples taken below turbulence box
QS Quality control sample taken through sampler
QL Quality control sample taken through sampler and left in gage house until next collection
QA Quality control sample taken above flume
C Sample combined with preceding saved sample(s) for analysis - not used after 1981
G Grab sample taken in lieu of proportional sample
S Sample saved to combine with following collection (type 'C') due to insufficient water (not used after 1981). Nutrient concentrations of the following stream water sample are used to determine fluxes for this period.
N No sample is collected for this period
F Complete, full sample. Sampler operational throughout sampling period.
YE Year end marker allows summary by water year - this is not a sample. Flux values are calculated from streamflow ending Sep 30 and use analyte concentrations from the following sample. 'Y' markers are inserted every Sep30
A Augmented sample - grab sample added to insufficient proportional sample (rarely used after 1987)
P Partial sample - proportional sampler did not operate successfully over entire period
B Biased sample - consecutive samples are proportionally separated and combined based on streamflow - code use begins WY 2008 to approx. two 3-week sampling intervals (where one sample is for 4 wks and the next for 2 wks)

Enumerated Domain for Attribute: ALKCODE_MO
A Accepted monthly value
* Monthly value includes one or more values measured below the detection limit
E Monthly value includes estimated values
I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N No analyses conducted for proportional samples taken during the month
Q Monthly value includes questionable sample values

Enumerated Domain for Attribute: CACODE_MO
A Accepted monthly value
E Monthly value includes estimated values
I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N No analyses conducted for proportional samples taken during the month
Q Monthly value includes questionable sample values
IE Monthly value incomplete - only 6-25 days are proportionally sampled in the month; one or more values estimated

Enumerated Domain for Attribute: CLCODE_MO
A Accepted monthly value
I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N No analyses conducted for proportional samples taken during the month
E Monthly value includes estimated values

Enumerated Domain for Attribute: CONDCODE_MO
A Accepted monthly value
E Monthly value includes estimated values
I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N No analyses conducted for proportional samples taken during the month
Q Monthly value includes questionable sample values
IE Monthly value incomplete - only 6-25 days are proportionally sampled in the month; one or more values estimated

Enumerated Domain for Attribute: DOCCODE_MO
A Accepted monthly value
I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N No analyses conducted for proportional samples taken during the month
Q Monthly value includes questionable sample values
E Monthly value includes estimated values

Enumerated Domain for Attribute: DONCODE_MO
D Monthly value based on derived values
D* Monthly value based on derived values; one or more values measured below the detection limit
DE Monthly value based on derived values; one or more values estimated
DQ Monthly value based on derived values; one or more values questionable
DQ* Monthly value based on derived values; one or more values questionable; one or more values measured below the detection limit
<table>
<thead>
<tr>
<th>ID</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID*</td>
<td>Monthly value incomplete - only 6-25 days are proportionally sampled in the month; one or more values measured below the detection limit</td>
</tr>
<tr>
<td>N</td>
<td>No analyses conducted for proportional samples taken during the month</td>
</tr>
<tr>
<td>DE*</td>
<td>Monthly value based on derived values; one or more values estimated</td>
</tr>
</tbody>
</table>

**Enumerated Domain for Attribute: KCODE_MO**

<table>
<thead>
<tr>
<th>A</th>
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</thead>
<tbody>
<tr>
<td>E</td>
<td>Monthly value includes estimated values</td>
</tr>
<tr>
<td>I</td>
<td>Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary</td>
</tr>
<tr>
<td>N</td>
<td>No analyses conducted for proportional samples taken during the month</td>
</tr>
<tr>
<td>Q</td>
<td>Monthly value includes questionable sample values</td>
</tr>
</tbody>
</table>

**Enumerated Domain for Attribute: MGCODE_MO**

<table>
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<tr>
<th>A</th>
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</thead>
<tbody>
<tr>
<td>E</td>
<td>Monthly value includes estimated values</td>
</tr>
<tr>
<td>I</td>
<td>Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary</td>
</tr>
<tr>
<td>N</td>
<td>No analyses conducted for proportional samples taken during the month</td>
</tr>
<tr>
<td>Q</td>
<td>Monthly value includes questionable sample values</td>
</tr>
</tbody>
</table>

**Enumerated Domain for Attribute: NACODE_MO**

<table>
<thead>
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<th>A</th>
<th>Accepted monthly value</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Monthly value includes estimated values</td>
</tr>
<tr>
<td>I</td>
<td>Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary</td>
</tr>
<tr>
<td>N</td>
<td>No analyses conducted for proportional samples taken during the month</td>
</tr>
<tr>
<td>Q</td>
<td>Monthly value includes questionable sample values</td>
</tr>
</tbody>
</table>

**Enumerated Domain for Attribute: NH3NCODE_MO**

<table>
<thead>
<tr>
<th>A</th>
<th>Accepted monthly value</th>
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</thead>
<tbody>
<tr>
<td>*</td>
<td>Monthly value includes one or more values measured below the detection limit</td>
</tr>
<tr>
<td>E</td>
<td>Monthly value includes estimated values</td>
</tr>
<tr>
<td>I</td>
<td>Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary</td>
</tr>
<tr>
<td>N</td>
<td>No analyses conducted for proportional samples taken during the month</td>
</tr>
<tr>
<td>Q*</td>
<td>Monthly value includes questionable sample values</td>
</tr>
<tr>
<td>I*</td>
<td>Monthly value incomplete - only 6-25 days are proportionally sampled in the month; one or more values measured below the detection limit</td>
</tr>
<tr>
<td>E*</td>
<td>Monthly value includes estimated values; one or more values measured below the detection limit</td>
</tr>
</tbody>
</table>

**Enumerated Domain for Attribute: NO3NCODE_MO**

<table>
<thead>
<tr>
<th>A</th>
<th>Accepted monthly value</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>Monthly value includes one or more values measured below the detection limit</td>
</tr>
</tbody>
</table>
Monthly value includes estimated values

Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary

No analyses conducted for proportional samples taken during the month

Monthly value includes questionable sample values

Monthly value includes questionable sample values

Monthly value incomplete - only 6-25 days are proportionally sampled in the month; one or more values measured below the detection limit

Monthly value includes estimated values; one or more values measured below the detection limit

Monthly value based on derived values

Monthly value based on derived values; one or more values measured below the detection limit

Monthly value based on derived values; one or more values estimated

Monthly value based on derived values; one or more values questionable

Monthly value incomplete - only 6-25 days are proportionally sampled in the month; monthly value based on derived values

No analyses conducted for proportional samples taken during the month

Monthly value based on derived values; one or more values measured below the detection limit; one or more values questionable

Monthly value incomplete - only 6-25 days are proportionally sampled in the month; monthly value based on derived values; one or more values measured below the detection limit

Monthly value incomplete - only 6-25 days are proportionally sampled in the month; monthly value based on derived values; one or more values estimated

Monthly value based on derived values

Monthly value based on derived values; one or more values estimated

Monthly value based on derived values; one or more values questionable

Monthly value incomplete - only 6-25 days are proportionally sampled in the month; monthly value based on derived values

No analyses conducted for proportional samples taken during the month

Monthly value incomplete - only 6-25 days are proportionally sampled in the month; monthly value based on derived values of which one or more values are estimated

Monthly value includes estimated values

Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary

No analyses conducted for proportional samples taken during the month

Monthly value includes questionable sample values

Monthly value includes questionable sample values

Monthly value incomplete - only 6-25 days are proportionally sampled in the month; one or more values estimated

Accepted monthly value

Accepted monthly value
* Monthly value includes one or more values measured below the detection limit
E Monthly value includes estimated values
I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N No analyses conducted for proportional samples taken during the month
Q Monthly value includes questionable sample values

Enumerated Domain for Attribute: OCODE_MO
A Accepted monthly value
E Monthly value includes estimated values
I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N No analyses conducted for proportional samples taken during the month
Q Monthly value includes questionable sample values

Enumerated Domain for Attribute: SICODE_MO
A Accepted monthly value
I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N No analyses conducted for proportional samples taken during the month
Q Monthly value includes questionable sample values
IQ Monthly value incomplete - only 6-25 days are proportionally sampled in the month; one or more values questionable
E Monthly value includes estimated values
EQ Monthly value includes estimated values; one or more values were questionable

Enumerated Domain for Attribute: SO4SCODE_MO
A Accepted monthly value
E Monthly value includes estimated values
I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N No analyses conducted for proportional samples taken during the month

Enumerated Domain for Attribute: SSEDCODE_MO
A Accepted monthly value
E Monthly value includes estimated values
I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N No analyses conducted for proportional samples taken during the month
Q Monthly value includes questionable sample values

Enumerated Domain for Attribute: TDNCODE_MO
* Monthly value includes one or more values measured below the detection limit
D Monthly value based on derived values
D* Monthly value based on derived values; one or more values measured below the detection limit

DE Monthly value based on derived values; one or more values estimated

DQ Monthly value based on derived values; one or more values questionable

DQ* Monthly value based on derived values; one or more values questionable; one or more values measured below the detection limit

I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary

ID Monthly value incomplete - only 6-25 days are proportionally sampled in the month; monthly value based on derived values

ID* Monthly value incomplete - only 6-25 days are proportionally sampled in the month; monthly value based on derived values of which one or more values measured below the detection limit

IDE Monthly value incomplete - only 6-25 days are proportionally sampled in the month; monthly value based on derived values of which one or more values are estimated

N No analyses conducted for proportional samples taken during the month

Q Monthly value includes questionable sample values

E Monthly value includes estimated values

DE* Monthly value based on derived values; one or more values estimated

Q* Monthly value includes questionable sample values; one or more values measured below the detection limit

A Accepted monthly value

I* Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary; one or more values measured below the detection limit

E* One or more values estimated; one or more values measured below the detection limit

Enumerated Domain for Attribute: TDPCODE_MO
A Accepted monthly value

E Monthly value includes estimated values

I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary

N No analyses conducted for proportional samples taken during the month

Q Monthly value includes questionable sample values

Enumerated Domain for Attribute: TKNCODE_MO
A Accepted monthly value

* Monthly value includes one or more values measured below the detection limit

E Monthly value includes estimated values

I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary

N No analyses conducted for proportional samples taken during the month

Q Monthly value includes questionable sample values

Enumerated Domain for Attribute: UTKNCODE_MO
A Accepted monthly value

* Monthly value includes one or more values measured below the detection limit

E Monthly value includes estimated values
I  Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N  No analyses conducted for proportional samples taken during the month
Q  Monthly value includes questionable sample values

Enumerated Domain for Attribute: UTNCODE_MO
*  Monthly value includes one or more values measured below the detection limit
D  Monthly value based on derived values
D*  Monthly value based on derived values; one or more values measured below the detection limit
DE  Monthly value based on derived values; one or more values estimated
DQ  Monthly value based on derived values; one or more values questionable
DQ*  Monthly value based on derived values; one or more values questionable; one or more values measured below the detection limit
ID  Monthly value incomplete - only 6-25 days are proportionally sampled in the month; monthly value based on derived values
ID*  Monthly value incomplete - only 6-25 days are proportionally sampled in the month; monthly value based on derived values of which one or more values measured below the detection limit
IDE  Monthly value incomplete - only 6-25 days are proportionally sampled in the month; monthly value based on derived values of which one or more values are estimated
N  No analyses conducted for proportional samples taken during the month
Q  Monthly value includes questionable sample values
E  Monthly value includes estimated values
DE*  Monthly value based on derived values; one or more values estimated; one or more values measured below the detection limit
Q*  Monthly value includes questionable sample values; one or more values measured below the detection limit
A  Accepted monthly value
I  Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
I*  Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary; one or more values measured below the detection limit
E*  One or more values estimated; one or more values measured below the detection limit

Enumerated Domain for Attribute: UTPCODE_MO
A  Accepted monthly value
E  Monthly value includes estimated values
I  Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N  No analyses conducted for proportional samples taken during the month
Q  Monthly value includes questionable sample values
IE  Monthly value incomplete - only 6-25 days are proportionally sampled in the month; one or more values estimated

Enumerated Domain for Attribute: ALKCODE_YR
N  No analyses conducted in water year
Q  Annual value includes questionable sample values
I  Annual value incomplete; values are missing for part of the year and not
included in annual summary

E  Annual value includes estimated values
A  Accepted annual value
*  Annual value includes one or more values measured below the detection limit
I*  Annual value incomplete; one or more values are missing for part of the year; one or more values measured below the detection limit
IE  Annual value incomplete; one or more values are missing for part of the year; one or more values estimated
IQ  Annual value incomplete; one or more values are missing for part of the year; one or more values questionable

Enumerated Domain for Attribute: CACODE_YR
N  No analyses conducted in water year
Q  Annual value includes questionable sample values
I  Annual value incomplete; values are missing for part of the year and not included in annual summary
E  Annual value includes estimated values
A  Accepted annual value
*  Annual value includes one or more values measured below the detection limit
I*  Annual value incomplete; one or more values are missing for part of the year; one or more values measured below the detection limit
IE  Annual value incomplete; one or more values are missing for part of the year; one or more values estimated
IQ  Annual value incomplete; one or more values are missing for part of the year; one or more values questionable

Enumerated Domain for Attribute: CLCODE_YR
N  No analyses conducted in water year
Q  Annual value includes questionable sample values
I  Annual value incomplete; values are missing for part of the year and not included in annual summary
E  Annual value includes estimated values
A  Accepted annual value
*  Annual value includes one or more values measured below the detection limit
I*  Annual value incomplete; one or more values are missing for part of the year; one or more values measured below the detection limit
IE  Annual value incomplete; one or more values are missing for part of the year; one or more values estimated
IQ  Annual value incomplete; one or more values are missing for part of the year; one or more values questionable

Enumerated Domain for Attribute: CONDCODE_YR
N  No analyses conducted in water year
Q  Annual value includes questionable sample values
I  Annual value incomplete; values are missing for part of the year and not included in annual summary
E  Annual value includes estimated values
A  Accepted annual value
*  Annual value includes one or more values measured below the detection limit
I* Annual value incomplete; one or more values are missing for part of the year; one or more values measured below the detection limit
IE Annual value incomplete; one or more values are missing for part of the year; one or more values estimated
IQ Annual value incomplete; one or more values are missing for part of the year; one or more values questionable

Enumerated Domain for Attribute: DOCCODE_YR
N No analyses conducted in water year
Q Annual value includes questionable sample values
I Annual value incomplete; values are missing for part of the year and not included in annual summary
E Annual value includes estimated values
A Accepted annual value
* Annual value includes one or more values measured below the detection limit
I* Annual value incomplete; one or more values are missing for part of the year; one or more values measured below the detection limit
IE Annual value incomplete; one or more values are missing for part of the year; one or more values estimated
IQ Annual value incomplete; one or more values are missing for part of the year; one or more values questionable

Enumerated Domain for Attribute: KCODE_YR
N No analyses conducted in water year
Q Annual value includes questionable sample values
I Annual value incomplete; values are missing for part of the year and not included in annual summary
E Annual value includes estimated values
A Accepted annual value
* Annual value includes one or more values measured below the detection limit
I* Annual value incomplete; one or more values are missing for part of the year; one or more values measured below the detection limit
IE Annual value incomplete; one or more values are missing for part of the year; one or more values estimated
IQ Annual value incomplete; one or more values are missing for part of the year; one or more values questionable

Enumerated Domain for Attribute: MGCODE_YR
N No analyses conducted in water year
Q Annual value includes questionable sample values
I Annual value incomplete; values are missing for part of the year and not included in annual summary
E Annual value includes estimated values
A Accepted annual value
* Annual value includes one or more values measured below the detection limit
I* Annual value incomplete; one or more values are missing for part of the year; one or more values measured below the detection limit
IE Annual value incomplete; one or more values are missing for part of the year; one or more values estimated
IQ Annual value incomplete; one or more values are missing for part of the year; one or more values questionable

Enumerated Domain for Attribute: NACODE_YR
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Accepted annual value</td>
</tr>
<tr>
<td>*</td>
<td>Annual value includes one or more values measured below the detection limit</td>
</tr>
<tr>
<td>I</td>
<td>Annual value incomplete; one or more values are missing for part of the year; one or more values measured below the detection limit</td>
</tr>
<tr>
<td>IE</td>
<td>Annual value incomplete; one or more values are missing for part of the year; one or more values estimated</td>
</tr>
<tr>
<td>IQ</td>
<td>Annual value incomplete; one or more values are missing for part of the year; one or more values questionable</td>
</tr>
</tbody>
</table>

**Enumerated Domain for Attribute: DONCODE_YR**

- **N**: No derived values are calculated for the entire water year
- **D**: Annual value based on derived values
- **D***: Annual value based on derived values; one or more values measured below the detection limit
- **DE**: Annual value based on derived values; one or more values estimated
- **DQ**: Annual value based on derived values; one or more values questionable
- **ID**: Annual value incomplete; one or more values are missing for part of the year; annual value based on derived values
- **ID***: Annual value incomplete; one or more values are missing for part of the year; annual value based on derived values of which one or more values measured below the detection limit
- **IDE**: Annual value incomplete; one or more values are missing for part of the year; annual value based on derived values of which one or more values are estimated
- **IDQ**: Annual value incomplete; one or more values are missing for part of the year; annual value based on derived values of which one or more values are questionable

**Enumerated Domain for Attribute: PHCODE_YR**

- **N**: No analyses conducted in water year
- **Q**: Annual value includes questionable sample values
- **I**: Annual value incomplete; values are missing for part of the year and not included in annual summary
- **E**: Annual value includes estimated values
- **A**: Accepted annual value
- **IE**: Annual value incomplete; one or more values are missing for part of the year; one or more values estimated
- **IQ**: Annual value incomplete; one or more values are missing for part of the year; one or more values questionable

**Enumerated Domain for Attribute: PARTNCODE_YR**

- **N**: No derived values are calculated for the entire water year
- **D**: Annual value based on derived values
- **D***: Annual value based on derived values; one or more values measured below the detection limit
- **DE**: Annual value based on derived values; one or more values estimated
- **DQ**: Annual value based on derived values; one or more values questionable
- **ID**: Annual value incomplete; one or more values are missing for part of the year; annual value based on derived values
- **ID***: Annual value incomplete; one or more values are missing for part of the year; annual value based on derived values of which one or more values measured below the detection limit
- **IDE**: Annual value incomplete; one or more values are missing for part of the year; annual value based on derived values of which one or more values are estimated
- **IDQ**: Annual value incomplete; one or more values are missing for part of the year; annual value based on derived values of which one or more values are questionable
estimated

IDQ  Annual value incomplete; one or more values are missing for part of the year; annual value based on derived values of which one or more values are questionable

Enumerated Domain for Attribute: PARTPCODE_YR

N  No derived values are calculated for the entire water year
D  Annual value based on derived values
D* Annual value based on derived values; one or more values measured below the detection limit
DE Annual value based on derived values; one or more values estimated
DQ Annual value based on derived values; one or more values questionable
ID Annual value incomplete; one or more values are missing for part of the year; annual value based on derived values
ID* Annual value incomplete; one or more values are missing for part of the year; annual value based on derived values of which one or more values measured below the detection limit
IDE Annual value incomplete; one or more values are missing for part of the year; annual value based on derived values of which one or more values are estimated
IDQ Annual value incomplete; one or more values are missing for part of the year; annual value based on derived values of which one or more values are questionable

Enumerated Domain for Attribute: QCODE_YR

N  No streamflow available for period
E  Total includes estimated streamflow values
I  Incomplete, parts of year missing from annual summary
A  Accepted value - all streamflow is included and not estimated for the wateryear
P  Provisional streamflow is included (subject to change) used for USGS Lookout Creek streamflow

Enumerated Domain for Attribute: SICODE_YR

N  No analyses conducted in water year
Q  Annual value includes questionable sample values
I  Annual value incomplete; values are missing for part of the year and not included in annual summary
E  Annual value includes estimated values
A  Accepted annual value
* Annual value includes one or more values measured below the detection limit
I* Annual value incomplete; one or more values are missing for part of the year; one or more values measured below the detection limit
IE Annual value incomplete; one or more values are missing for part of the year; one or more values estimated
IQ Annual value incomplete; one or more values are missing for part of the year; one or more values questionable

Enumerated Domain for Attribute: SO4SCODE_YR

N  No analyses conducted in water year
Q  Annual value includes questionable sample values
I  Annual value incomplete; values are missing for part of the year and not included in annual summary
E Annual value includes estimated values
A Accepted annual value
* Annual value includes one or more values measured below the detection limit
I* Annual value incomplete; one or more values are missing for part of the year; one or more values measured below the detection limit
IE Annual value incomplete; one or more values are missing for part of the year; one or more values estimated
IQ Annual value incomplete; one or more values are missing for part of the year; one or more values questionable

Enumerated Domain for Attribute: SSEDCODE_YR
N No analyses conducted in water year
Q Annual value includes questionable sample values
I Annual value incomplete; values are missing for part of the year and not included in annual summary
E Annual value includes estimated values
A Accepted annual value
IE Annual value incomplete; one or more values are missing for part of the year; one or more values estimated
IQ Annual value incomplete; one or more values are missing for part of the year; one or more values questionable

Enumerated Domain for Attribute: STCODE
CF002 Study code CF002

Enumerated Domain for Attribute: TKNCODE_YR
N No analyses conducted in water year
Q Annual value includes questionable sample values
I Annual value incomplete; values are missing for part of the year and not included in annual summary
E Annual value includes estimated values
A Accepted annual value
* Annual value includes one or more values measured below the detection limit
I* Annual value incomplete; one or more values are missing for part of the year; one or more values measured below the detection limit
IE Annual value incomplete; one or more values are missing for part of the year; one or more values estimated
IQ Annual value incomplete; one or more values are missing for part of the year; one or more values questionable

Enumerated Domain for Attribute: TDPCODE_YR
N No analyses conducted in water year
Q Annual value includes questionable sample values
I Annual value incomplete; values are missing for part of the year and not included in annual summary
E Annual value includes estimated values
A Accepted annual value
* Annual value includes one or more values measured below the detection limit
I* Annual value incomplete; one or more values are missing for part of the year; one or more values measured below the detection limit
**ID** | Annual value incomplete; one or more values are missing for part of the year; annual value based on derived values  
**ID*** | Annual value incomplete; one or more values are missing for part of the year; annual value based on derived values of which one or more values measured below the detection limit  
**IDE** | Annual value incomplete; one or more values are missing for part of the year; annual value based on derived values of which one or more values are estimated  
**IDQ** | Annual value incomplete; one or more values are missing for part of the year; annual value based on derived values of which one or more values are questionable  
**IE** | Annual value incomplete; one or more values are missing for part of the year; one or more values estimated  
**IQ** | Annual value incomplete; one or more values are missing for part of the year; one or more values questionable  

**Enumerated Domain for Attribute: TDNCODE_YR**  
**N** | No analyses conducted in water year  
**Q** | Annual value includes questionable sample values  
**I** | Annual value incomplete; values are missing for part of the year and not included in annual summary  
**E** | Annual value includes estimated values  
**A** | Accepted annual value  
**D** | Annual value based on derived values  
**D*** | Annual value based on derived values; one or more values measured below the detection limit  
**DE** | Annual value based on derived values; one or more values estimated  
**DQ** | Annual value based on derived values; one or more values questionable  
**I*** | Annual value incomplete; one or more values are missing for part of the year; one or more values measured below the detection limit  
**ID** | Annual value incomplete; one or more values are missing for part of the year; annual value based on derived values  
**ID*” | Annual value incomplete; one or more values are missing for part of the year; annual value based on derived values of which one or more values measured below the detection limit  
**IDE** | Annual value incomplete; one or more values are missing for part of the year; annual value based on derived values of which one or more values are estimated  
**IDQ** | Annual value incomplete; one or more values are missing for part of the year; annual value based on derived values of which one or more values are questionable  
**IE** | Annual value incomplete; one or more values are missing for part of the year; one or more values estimated  
**IQ** | Annual value incomplete; one or more values are missing for part of the year; one or more values questionable  

**Enumerated Domain for Attribute: STCODE**  
**CF002** | Study code CF002  

**Enumerated Domain for Attribute: TYPE**  
**QB** | Quality control samples taken below turbulence box  
**QS** | Quality control sample taken through sampler  
**QL** | Quality control sample taken through sampler and left in gage house until next collection  
**QA** | Quality control sample taken above flume
C Sample combined with preceding saved sample(s) for analysis - not used after 1981
G Grab sample taken in lieu of proportional sample
S Sample saved to combine with following collection (type 'C') due to insufficient water (not used after 1981). Nutrient concentrations of the following stream water sample are used to determine fluxes for this period.
N No sample is collected for this period
F Complete, full sample. Sampler operational throughout sampling period.
YE Year end marker allows summary by water year - this is not a sample. Flux values are calculated from streamflow ending Sep 30 and use analyte concentrations from the following sample. 'Y' markers are inserted every Sep 30
A Augmented sample - grab sample added to insufficient proportional sample (rarely used after 1987)
P Partial sample - proportional sampler did not operate successfully over entire period
B Biased sample - consecutive samples are proportionally separated and combined based on streamflow - code use begins WY 2008 to approx. two 3-week sampling intervals (where one sample is for 4 wks and the next for 2 wks)

Enumerated Domain for Attribute: ALKCODE_MO
A Accepted monthly value
* Monthly value includes one or more values measured below the detection limit
E Monthly value includes estimated values
I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N No analyses conducted for proportional samples taken during the month
Q Monthly value includes questionable sample values

Enumerated Domain for Attribute: CACODE_MO
A Accepted monthly value
E Monthly value includes estimated values
I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N No analyses conducted for proportional samples taken during the month
Q Monthly value includes questionable sample values
IE Monthly value incomplete - only 6-25 days are proportionally sampled in the month; one or more values estimated

Enumerated Domain for Attribute: CLCODE_MO
A Accepted monthly value
I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N No analyses conducted for proportional samples taken during the month
E Monthly value includes estimated values

Enumerated Domain for Attribute: DOCCODE_MO
A Accepted monthly value
I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N No analyses conducted for proportional samples taken during the month
Q  Monthly value includes questionable sample values
E  Monthly value includes estimated values

Enumerated Domain for Attribute: DONCODE_MO
D  Monthly value based on derived values
D* Monthly value based on derived values; one or more values measured below the detection limit
DE Monthly value based on derived values; one or more values estimated
DQ Monthly value based on derived values; one or more values questionable
DQ* Monthly value based on derived values; one or more values questionable; one or more values measured below the detection limit
ID Monthly value incomplete - only 6-25 days are proportionally sampled in the month; monthly value based on derived values
ID* Monthly value incomplete - only 6-25 days are proportionally sampled in the month; monthly value based on derived values of which one or more values measured below the detection limit
N No analyses conducted for proportional samples taken during the month
DE* Monthly value based on derived values; one or more values estimated

Enumerated Domain for Attribute: KCODE_MO
A  Accepted monthly value
E  Monthly value includes estimated values
I  Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N  No analyses conducted for proportional samples taken during the month
Q  Monthly value includes questionable sample values

Enumerated Domain for Attribute: MGCODE_MO
A  Accepted monthly value
E  Monthly value includes estimated values
I  Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N  No analyses conducted for proportional samples taken during the month
Q  Monthly value includes questionable sample values

Enumerated Domain for Attribute: NACODE_MO
A  Accepted monthly value
E  Monthly value includes estimated values
I  Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N  No analyses conducted for proportional samples taken during the month
Q  Monthly value includes questionable sample values

Enumerated Domain for Attribute: NH3NCODE_MO
A  Accepted monthly value
* Monthly value includes one or more values measured below the detection limit
E  Monthly value includes estimated values
I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N No analyses conducted for proportional samples taken during the month
Q* Monthly value includes questionable sample values
I* Monthly value incomplete - only 6-25 days are proportionally sampled in the month; one or more values measured below the detection limit
E* Monthly value includes estimated values; one or more values measured below the detection limit

Enumerated Domain for Attribute: NO3NCODE_MO
A Accepted monthly value
  * Monthly value includes one or more values measured below the detection limit
E Monthly value includes estimated values
I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N No analyses conducted for proportional samples taken during the month
Q Monthly value includes questionable sample values
Q* Monthly value includes questionable sample values
I* Monthly value incomplete - only 6-25 days are proportionally sampled in the month; one or more values measured below the detection limit
E* Monthly value includes estimated values; one or more values measured below the detection limit

Enumerated Domain for Attribute: PARTNCODE_MO
D Monthly value based on derived values
D* Monthly value based on derived values; one or more values measured below the detection limit
DE Monthly value based on derived values; one or more values estimated
DQ Monthly value based on derived values; one or more values questionable
ID Monthly value incomplete - only 6-25 days are proportionally sampled in the month; monthly value based on derived values
N No analyses conducted for proportional samples taken during the month
DQ* Monthly value based on derived values; one or more values measured below the detection limit; one or more values questionable
ID* Monthly value incomplete - only 6-25 days are proportionally sampled in the month; monthly value based on derived values; one or more values measured below the detection limit
DE* Monthly value incomplete - only 6-25 days are proportionally sampled in the month; monthly value based on derived values; one or more values estimated

Enumerated Domain for Attribute: PARTPCODE_MO
D Monthly value based on derived values
DE Monthly value based on derived values; one or more values estimated
DQ Monthly value based on derived values; one or more values questionable
ID Monthly value incomplete - only 6-25 days are proportionally sampled in the month; monthly value based on derived values
IDE Monthly value incomplete - only 6-25 days are proportionally sampled in the month; monthly value based on derived values of which one or more values are estimated
N No analyses conducted for proportional samples taken during the month

Enumerated Domain for Attribute: PO4PCODE_MO
A  Accepted monthly value

*  Monthly value includes one or more values measured below the detection limit

E  Monthly value includes estimated values

I  Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary

N  No analyses conducted for proportional samples taken during the month

Q  Monthly value includes questionable sample values

Enumerated Domain for Attribute: QCODE_MO

A  Accepted monthly value

E  Monthly value includes estimated values

I  Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary

N  No analyses conducted for proportional samples taken during the month

Q  Monthly value includes questionable sample values

P  Monthly value includes provisional values subject to change

Enumerated Domain for Attribute: SICODE_MO

A  Accepted monthly value

I  Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary

N  No analyses conducted for proportional samples taken during the month

Q  Monthly value includes questionable sample values

IQ  Monthly value incomplete - only 6-25 days are proportionally sampled in the month; one or more values questionable

E  Monthly value includes estimated values

EQ  Monthly value includes estimated values; one or more values were questionable

Enumerated Domain for Attribute: SO4SCODE_MO

A  Accepted monthly value

E  Monthly value includes estimated values

I  Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary

N  No analyses conducted for proportional samples taken during the month

Enumerated Domain for Attribute: SSEDCODE_MO

A  Accepted monthly value

E  Monthly value includes estimated values

I  Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary

N  No analyses conducted for proportional samples taken during the month

Q  Monthly value includes questionable sample values

Enumerated Domain for Attribute: TDNCODE_MO

*  Monthly value includes one or more values measured below the detection limit
D Monthly value based on derived values
D* Monthly value based on derived values; one or more values measured below the detection limit
DE Monthly value based on derived values; one or more values estimated
DQ Monthly value based on derived values; one or more values questionable
DQ* Monthly value based on derived values; one or more values questionable; one or more values measured below the detection limit
I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
ID Monthly value incomplete - only 6-25 days are proportionally sampled in the month; monthly value based on derived values
ID* Monthly value incomplete - only 6-25 days are proportionally sampled in the month; monthly value based on derived values of which one or more values measured below the detection limit
IDE Monthly value incomplete - only 6-25 days are proportionally sampled in the month; monthly value based on derived values of which one or more values are estimated
N No analyses conducted for proportional samples taken during the month
Q Monthly value includes questionable sample values
E Monthly value includes estimated values
DE* Monthly value based on derived values; one or more values estimated
Q* Monthly value includes questionable sample values; one or more values measured below the detection limit
A Accepted monthly value
I* Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary; one or more values measured below the detection limit
E* One or more values estimated; one or more values measured below the detection limit

Enumerated Domain for Attribute: TDPCODE_MO
A Accepted monthly value
E Monthly value includes estimated values
I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N No analyses conducted for proportional samples taken during the month
Q Monthly value includes questionable sample values

Enumerated Domain for Attribute: TKNCODE_MO
A Accepted monthly value
* Monthly value includes one or more values measured below the detection limit
E Monthly value includes estimated values
I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N No analyses conducted for proportional samples taken during the month
Q Monthly value includes questionable sample values

Enumerated Domain for Attribute: UTKNCODE_MO
A Accepted monthly value
* Monthly value includes one or more values measured below the detection limit
E Monthly value includes estimated values
I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N No analyses conducted for proportional samples taken during the month
Q Monthly value includes questionable sample values

Enumerated Domain for Attribute: UTNCODE_MO
E Monthly value includes estimated values
I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N No analyses conducted for proportional samples taken during the month
Q Monthly value includes questionable sample values

Enumerated Domain for Attribute: UTPCODE_MO
A Accepted monthly value
E Monthly value includes estimated values
DE Monthly value based on derived values; one or more values measured below the detection limit
DE* Monthly value based on derived values; one or more values estimated
DQ Monthly value based on derived values; one or more values questionable
DQ* Monthly value based on derived values; one or more values questionable; one or more values measured below the detection limit
ID Monthly value incomplete - only 6-25 days are proportionally sampled in the month; monthly value based on derived values
ID* Monthly value incomplete - only 6-25 days are proportionally sampled in the month; monthly value based on derived values of which one or more values are estimated
IDE Monthly value incomplete - only 6-25 days are proportionally sampled in the month; monthly value based on derived values of which one or more values are estimated
N No analyses conducted for proportional samples taken during the month
Q Monthly value includes questionable sample values

Enumerated Domain for Attribute: ALKCODE
A Accepted value
DE Monthly value based on derived values; one or more values measured below the detection limit
DE* Monthly value based on derived values; one or more values estimated
Q Monthly value includes questionable sample values
E Monthly value includes estimated values
I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
I* Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary; one or more values measured below the detection limit
E* One or more values estimated; one or more values measured below the detection limit

Enumerated Domain for Attribute: UTPCODE_MO
A Accepted monthly value
E Monthly value includes estimated values
I Monthly value incomplete - at least 5 days available, but 25 or fewer days available for month summary
N No analyses conducted for proportional samples taken during the month
Q Monthly value includes questionable sample values
IE Monthly value incomplete - only 6-25 days are proportionally sampled in the month; one or more values estimated

Enumerated Domain for Attribute: ALKCODE
A Accepted value
* Value is below detection limit for analysis (used beginning in 1991)
E Estimated value
N No analytical measurement
Q Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: CACODE
* Value is below detection limit for analysis (used beginning in 1991)
A Accepted value
E Estimated value
N No analytical measurement
Q Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: CLCODE
* Value is below detection limit for analysis (used beginning in 1991)
A Accepted value
E Estimated value
N No analytical measurement
Q Value is questionable (used beginning in 1991)
C Value confirmed, contamination or experimental tracer suspected (code use begins May 2007)

Enumerated Domain for Attribute: DOCCODE
* Value is below detection limit for analysis (used beginning in 1991)
A Accepted value
E Estimated value
N No analytical measurement
Q Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: KCODE
* Value is below detection limit for analysis (used beginning in 1991)
A Accepted value
E Estimated value
N No analytical measurement
Q Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: MGCODE
* Value is below detection limit for analysis (used beginning in 1991)
A Accepted value
E Estimated value
N No analytical measurement
Q Value is questionable (used beginning in 1991)
<table>
<thead>
<tr>
<th>Attribute</th>
<th>Domain Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NACODE</strong></td>
<td>*</td>
<td>Value is below detection limit for analysis (used beginning in 1991)</td>
</tr>
<tr>
<td>A</td>
<td>Accepted value</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Estimated value</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>No analytical measurement</td>
<td></td>
</tr>
<tr>
<td>Q</td>
<td>Value is questionable (used beginning in 1991)</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Value confirmed, contamination suspected (code use begins May 2007)</td>
<td></td>
</tr>
<tr>
<td><strong>NH3NCODE</strong></td>
<td>*</td>
<td>Value is below detection limit for analysis (used beginning in 1991)</td>
</tr>
<tr>
<td>A</td>
<td>Accepted value</td>
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</tr>
<tr>
<td>E</td>
<td>Estimated value</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>No analytical measurement</td>
<td></td>
</tr>
<tr>
<td>Q</td>
<td>Value is questionable (used beginning in 1991)</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Value confirmed, contamination suspected (code use begins May 2007)</td>
<td></td>
</tr>
<tr>
<td><strong>NO3NCODE</strong></td>
<td>*</td>
<td>Value is below detection limit for analysis (used beginning in 1991)</td>
</tr>
<tr>
<td>A</td>
<td>Accepted value</td>
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</tr>
<tr>
<td>E</td>
<td>Estimated value</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>No analytical measurement</td>
<td></td>
</tr>
<tr>
<td>Q</td>
<td>Value is questionable (used beginning in 1991)</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Value confirmed, contamination suspected (code use begins May 2011)</td>
<td></td>
</tr>
<tr>
<td><strong>PO4PCODE</strong></td>
<td>*</td>
<td>Value is below detection limit for analysis (used beginning in 1991)</td>
</tr>
<tr>
<td>A</td>
<td>Accepted value</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Estimated value</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>No analytical measurement</td>
<td></td>
</tr>
<tr>
<td>Q</td>
<td>Value is questionable (used beginning in 1991)</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Value confirmed, contamination suspected (code use begins May 2011)</td>
<td></td>
</tr>
<tr>
<td><strong>DONCODE</strong></td>
<td>N</td>
<td>No derived value is calculated due to missing analytical components</td>
</tr>
<tr>
<td>D</td>
<td>Derived value - mathematically determined from other analytical measurements</td>
<td></td>
</tr>
<tr>
<td>D*</td>
<td>Derived value - mathematically determined from other analytical measurements, one or more of which were below the detection limit</td>
<td></td>
</tr>
<tr>
<td>DE</td>
<td>Derived value - mathematically determined from other analytical measurements, one or more of which were estimated values</td>
<td></td>
</tr>
<tr>
<td>DQ</td>
<td>Derived value - mathematically determined from other analytical measurements, one or more of which were questionable values</td>
<td></td>
</tr>
<tr>
<td>DC</td>
<td>Derived value confirmed, contamination suspected (code use begins May 2007)</td>
<td></td>
</tr>
</tbody>
</table>
Enumerated Domain for Attribute: PARTNCODE
N  No derived value is calculated due to missing analytical components
D  Derived value - mathematically determined from other analytical measurements
D* Derived value - mathematically determined from other analytical measurements, one or more of which were below the detection limit
DE Derived value - mathematically determined from other analytical measurements, one or more of which were estimated values
DQ Derived value - mathematically determined from other analytical measurements, one or more of which were questionable values
DC Derived value confirmed, contamination suspected (code use begins May 2007)

Enumerated Domain for Attribute: PARTPCODE
N  No derived value is calculated due to missing analytical components
D  Derived value - mathematically determined from other analytical measurements
D* Derived value - mathematically determined from other analytical measurements, one or more of which were below the detection limit
DE Derived value - mathematically determined from other analytical measurements, one or more of which were estimated values
DQ Derived value - mathematically determined from other analytical measurements, one or more of which were questionable values

Enumerated Domain for Attribute: QCODE
A  Accepted value for streamflow
N  No streamflow available for period
E  Estimated streamflow value
P  Provisional streamflow value is likely to change - used for USGS Lookout Creek streamflow
Q  Streamflow value for the period is questionable

Enumerated Domain for Attribute: SICODE
* Value is below detection limit for analysis (used beginning in 1991)
A  Accepted value
E  Estimated value
N  No analytical measurement
Q  Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: SO4SCODE
* Value is below detection limit for analysis (used beginning in 1991)
A  Accepted value
E  Estimated value
N  No analytical measurement
Q  Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: SSEDCODE
A  Accepted value
E  Estimated value
N  No analytical measurement
Q Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: STCODE
CF002 Study code CF002

Enumerated Domain for Attribute: TKNCODE
A Value is below detection limit for analysis (used beginning in 1991)
E Accepted value
E Estimated value
N No analytical measurement
Q Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: TDPCODE
A Value is below detection limit for analysis (used beginning in 1991)
E Accepted value
E Estimated value
N No analytical measurement
Q Value is questionable (used beginning in 1991)
C Value confirmed, contamination suspected (code use begins May 2011)

Enumerated Domain for Attribute: TYPE
QB Quality control samples taken below turbulence box
QS Quality control sample taken through sampler
QL Quality control sample taken through sampler and left in gage house until next collection
QA Quality control sample taken above flume
C Sample combined with preceeding saved sample(s) for analysis - not used after 1981
G Grab sample taken in lieu of proportional sample
S Sample saved to combine with following collection (type 'C') due to insufficient water (not used after 1981). Nutrient concentrations of the following stream water sample are used to determine fluxes for this period.
N No sample is collected for this period
F Complete, full sample. Sampler operational throughout sampling period.
YE Year end marker allows summary by water year - this is not a sample. Flux values are calculated from streamflow ending Sep 30 and use analyte concentrations from the following sample. "Y" markers are inserted every Sep30
A Augmented sample - grab sample added to insufficient proportional sample (rarely used after 1987)
P Partial sample - proportional sampler did not operate successfully over entire period
B Biased sample - consecutive samples are proportionally separated and combined based on streamflow - code use begins WY 2008 to approx. two 3-week sampling intervals (where one sample is for 4 wks and the next for 2 wks)

Enumerated Domain for Attribute: UTKNCODE
* Value is below detection limit for analysis (used beginning in 1991)
A Accepted value
E Estimated value
N No analytical measurement
Q Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: UTPCODE
* Value is below detection limit for analysis (used beginning in 1991)
A Accepted value
E Estimated value
N No analytical measurement
Q Value is questionable (used beginning in 1991)
C Value confirmed, contamination suspected (code use begins May 2011)

Enumerated Domain for Attribute: UTNCODE
* Value is below detection limit for analysis (used beginning in 1991)
A Accepted value
E Estimated value
Q Value is questionable (used beginning in 1991)
D Derived value - mathematically determined from other analytical measurements
D* Derived value - mathematically determined from other analytical measurements, one or more of which were below the detection limit
DE Derived value - mathematically determined from other analytical measurements, one or more of which were estimated values
DQ Derived value - mathematically determined from other analytical measurements, one or more of which were questionable values
N No analytical measurement or no derived value calculated due to missing analytical components
C Value confirmed, contamination suspected (code use begins May 2011)

Enumerated Domain for Attribute: TDNCODE
* Value is below detection limit for analysis (used beginning in 1991)
A Accepted value
E Estimated value
Q Value is questionable (used beginning in 1991)
D Derived value - mathematically determined from other analytical measurements
D* Derived value - mathematically determined from other analytical measurements, one or more of which were below the detection limit
DE Derived value - mathematically determined from other analytical measurements, one or more of which were estimated values
DQ Derived value - mathematically determined from other analytical measurements, one or more of which were questionable values
N No analytical measurement or no derived value calculated due to missing analytical components
C Value confirmed, contamination suspected (code use begins May 2007)

Enumerated Domain for Attribute: STCODE
Enumerated Domain for Attribute: TYPE
QB
Quality control samples taken below turbulence box
QS
Quality control sample taken through sampler
QL
Quality control sample taken through sampler and left in gage house until next collection
QA
Quality control sample taken above flume
C
Sample combined with preceeding saved sample(s) for analysis - not used after 1981
G
Grab sample taken in lieu of proportional sample
S
Sample saved to combine with following collection (type 'C') due to insufficient water (not used after 1981). Nutrient concentrations of the following stream water sample are used to determine fluxes for this period.
N
No sample is collected for this period
F
Complete, full sample. Sampler operational throughout sampling period.
YE
Year end marker allows summary by water year - this is not a sample. Flux values are calculated from streamflow ending Sep 30 and use analyte concentrations from the following sample. 'Y' markers are inserted every Sep 30
A
Augmented sample - grab sample added to insufficient proportional sample (rarely used after 1987)
P
Partial sample - proportional sampler did not operate successfully over entire period
B
Biased sample - consecutive samples are proportionally separated and combined based on streamflow - code use begins WY 2008 to approx. two 3-week sampling intervals (where one sample is for 4 wks and the next for 2 wks)

Enumerated Domain for Attribute: OPCODE
NA
Water sample is not a quality control sample
QA
Quality control water sample taken above the flume
QB
Quality control water sample taken below the turbulence box
QL
Quality control water sample taken through the sampler and left in the gage house until the next collection
QS
Quality control water sample taken through the sampler
QZ
Additional or miscellaneous quality control water sample

Enumerated Domain for Attribute: SAMPLER_TYPE
GR
Grab sample taken manually from the flume
RI
Instantaneous sample collected through the battery-powered proportional water sampler
RM
Proportional water sample taken through the battery-powered proportional water sampler with reed switch assembly and mechanical timer
RS
Proportional water sample taken through the battery-powered proportional water sampler with reed switch assembly and solid state time and circuit board
SG
Proportional water sample taken through Sigma sampler with timing controlled by a Campbell Scientific data logger
SI
Instantaneous water sample taken through Sigma sampler

Enumerated Domain for Attribute: LOW_VOLUME
N
Sample is of sufficient volume for laboratory analyses
Y
Sample is low volume and laboratory analyses may be limited