

Database Code: CP002

Title: Precipitation and dry deposition chemistry concentrations and fluxes, Andrews Experimental Forest, 1969 to present

Abstract:

Collection and analyses of precipitation chemistry were initiated in 1969 at the low-elevation Primary Met site, and in 1973 at a mid-elevation Hi-15 site. Rain collection samples accumulate from one week to three weeks in bulk and NADP type collectors and then are transported to Cooperative Chemical Analytical Laboratory (CCAL) for analysis. Analytes include nitrogen, phosphorus, carbon, and cations and anions as well as pH, conductivity, alkalinity and particulate sediment. Concentration and volume of precipitation are combined for inflow. Dry deposition chemistry concentrations began in 1989 and are analyzed 2-4 times per year at one site. The original objectives were to evaluate precipitation chemistry inputs versus chemistry outputs in streamflow from forested watersheds. The study has evolved into a general monitoring effort for precipitation chemistry that is among the least contaminated of any within the USA. This study is conducted in conjunction with Andrews streamflow chemistry (CF002) and the U.S. National Atmospheric Deposition Program (NADP).

Keywords: Chemical analysis; Hydrology/Water; Nutrients; Precipitation; Solution transport; Timber harvesting; Water chemistry; Inorganic nutrients; hydrology; water chemistry; precipitation; chemical properties; concentration; suspended solids; timber harvest; inorganic nutrients; nutrients; water;

Date data commenced: 1968-10-01

Date data terminated: 2019-05-22

Principal Investigator: Sherri L. Johnson

List of Entities:

1. Precipitation water sample nutrient concentrations
2. Precipitation water nutrient inflow in kg/ha
3. Precipitation water nutrient mean annual concentrations
6. Precipitation water sample log sheet: field and laboratory comments

1. Precipitation water sample nutrient concentrations

Precipitation samples are collected and analyzed on a 3-week basis for nutrient concentrations. Precipitation amounts for each sampling period are provided.

Attribute List:

STCODE	N	N	char(5)	enum			
ENTITY	N	N	numeric(1,0)	range	1.0000	1.0000	number
SITECODE	Y	N	char(6)	place			
WATERYEAR	N	Y	numeric(4,0)	range	1969.0000	2019.0000	number
DATE_TIME	Y	N	datetime	range	10/9/1968	5/22/2019	YYYY-MM-DD hh:mm:ss
LABNO	N	Y	char(4)	freetext			
TYPE	N	N	char(2)	enum			
PRECIP_CM	N	Y	numeric(7,2)	range	0.0000	61.8700	cm
PCODE	N	Y	char(1)	enum			
PH	N	Y	numeric(5,1)	range	3.0000	7.4000	ph
PHCODE	N	Y	char(1)	enum			
COND	N	Y	numeric(6,1)	range	0.0000	576.4000	uS/cm
CONDCODE	N	Y	char(1)	enum			

ALK	N	Y	numeric(6,2)	range	0.0000	15.3700	mg/l
ALKCODE	N	Y	char(1)	enum			
SSED	N	Y	numeric(7,2)	range	0.0000	796.0000	mg/l
SSEDCODE	N	Y	char(1)	enum			
SI	N	Y	numeric(6,2)	range	0.0000	8.9100	mg/l
SICODE	N	Y	char(1)	enum			
UTP	N	Y	numeric(8,3)	range	0.0000	1483.0000	mg/l
UTPCODE	N	Y	char(1)	enum			
TDP	N	Y	numeric(6,3)	range	0.0000	6.0500	mg/l
TDPCODE	N	Y	char(1)	enum			
PARTP	N	Y	numeric(8,3)	range	0.0000	1482.6000	mg/l
PARTPCODE	N	Y	char(2)	enum			
PO4P	N	Y	numeric(6,3)	range	0.0000	5.9930	mg/l
PO4PCODE	N	Y	char(1)	enum			
UTN	N	Y	numeric(6,2)	range	0.0000	15.9900	mg/l
UTNCODE	N	Y	char(2)	enum			
TDN	N	Y	numeric(6,2)	range	0.0000	14.3700	mg/l
TDNCODE	N	Y	char(2)	enum			
DON	N	Y	numeric(6,2)	range	0.0000	10.8700	mg/l
DONCODE	N	Y	char(2)	enum			
PARTN	N	Y	numeric(6,2)	range	0.0000	5.1000	mg/l
PARTNCODE	N	Y	char(2)	enum			
UTKN	N	Y	numeric(6,2)	range	0.0000	2.6700	mg/l
UTKNCODE	N	Y	char(1)	enum			
TKN	N	Y	numeric(6,2)	range	0.0000	14.3100	mg/l
TKNCODE	N	Y	char(1)	enum			
NH3N	N	Y	numeric(6,3)	range	0.0000	3.9160	mg/l
NH3NCODE	N	Y	char(1)	enum			
NO3N	N	Y	numeric(6,3)	range	0.0000	1.8800	mg/l
NO3NCODE	N	Y	char(1)	enum			
NA	N	Y	numeric(6,2)	range	0.0000	18.2300	mg/l
NACODE	N	Y	char(1)	enum			
K	N	Y	numeric(6,2)	range	0.0000	18.2000	mg/l
KCODE	N	Y	char(1)	enum			

CA	N	Y	numeric(6,2)	range	0.0000	5.5600	mg/l
CACODE	N	Y	char(1)	enum			
MG	N	Y	numeric(6,2)	range	0.0000	15.9500	mg/l
MGCODE	N	Y	char(1)	enum			
SO4S	N	Y	numeric(6,2)	range	0.0000	4.8900	mg/l
SO4SCODE	N	Y	char(1)	enum			
CL	N	Y	numeric(6,2)	range	0.0000	47.2000	mg/l
CLCODE	N	Y	char(1)	enum			
DOC	N	Y	numeric(6,2)	range	0.0000	26.8000	mg/l
DOCCODE	N	Y	char(1)	enum			
PVOL	N	Y	numeric(7,3)	range	0.0080	19.9800	kg
PVOLCODE	N	Y	char(1)	enum			
ANCA	N	Y	numeric(5,2)	range	0.1200	6.9500	number
ANCACODE	N	Y	char(2)	enum			

2. Precipitation water nutrient inflow in kg/ha

Derived nutrient inputs based on precipitation nutrient concentration data (Entity 1) and actual precipitation for the sampling period.

Attribute List:

STCODE	N	N	char(5)	enum			
ENTITY	N	N	numeric(1,0)	range	2.0000	2.0000	number
SITECODE	Y	N	char(6)	place			
WATERYEAR	N	Y	numeric(4,0)	range	1969.0000	2018.0000	number
DATE_TIME	Y	N	datetime	range	10/21/1968	10/1/2018	YYYY-MM-DD hh:mm:ss
LABNO	N	Y	char(4)	freetext	10:45:00	12:00:00	
TYPE	N	N	char(2)	enum	AM	AM	
PRECIP_CM	N	Y	numeric(6,2)	range	0.0000	140.8900	cm
PCODE	N	Y	char(1)	enum			
ALK_INPUT	N	Y	numeric(6,2)	range	0.0000	19.4600	kg/ha
ALKCODE	N	Y	char(1)	enum			
SSED_INPUT	N	Y	numeric(7,2)	range	0.0000	54.8300	kg/ha
SSEDCODE	N	Y	char(1)	enum			
SI_INPUT	N	Y	numeric(6,2)	range	0.0000	9.9800	kg/ha
SICODE	N	Y	char(1)	enum			
UTP_INPUT	N	Y	numeric(5,3)	range	0.0000	0.4720	kg/ha
UTPCODE	N	Y	char(1)	enum			

TDP_INPUT	N	Y	numeric(5,3)	range	0.0000	0.4270	kg/ha
TDPCODE	N	Y	char(1)	enum			
PARTP_INPUT	N	Y	numeric(5,3)	range	0.0000	0.2590	kg/ha
PARTPCODE	N	Y	char(2)	enum			
PO4P_INPUT	N	Y	numeric(5,3)	range	0.0000	0.4760	kg/ha
PO4PCODE	N	Y	char(1)	enum			
UTN_INPUT	N	Y	numeric(5,2)	range	0.0000	1.4000	kg/ha
UTNCODE	N	Y	char(2)	enum			
TDN_INPUT	N	Y	numeric(5,2)	range	0.0000	5.0000	kg/ha
TDNCODE	N	Y	char(2)	enum			
DON_INPUT	N	Y	numeric(5,2)	range	0.0000	3.7800	kg/ha
DONCODE	N	Y	char(2)	enum			
PARTN_INPUT	N	Y	numeric(5,2)	range	0.0000	1.1900	kg/ha
PARTNCODE	N	Y	char(2)	enum			
UTKN_INPUT	N	Y	numeric(5,2)	range	0.0000	1.3500	kg/ha
UTKNCODE	N	Y	char(1)	enum			
TKN_INPUT	N	Y	numeric(5,2)	range	0.0000	4.9800	kg/ha
TKNCODE	N	Y	char(1)	enum			
NH3N_INPUT	N	Y	numeric(5,3)	range	0.0000	1.1960	kg/ha
NH3NCODE	N	Y	char(1)	enum			
NO3N_INPUT	N	Y	numeric(5,3)	range	0.0000	0.3940	kg/ha
NO3NCODE	N	Y	char(1)	enum			
NA_INPUT	N	Y	numeric(5,2)	range	0.0000	2.8400	kg/ha
NACODE	N	Y	char(1)	enum			
K_INPUT	N	Y	numeric(5,2)	range	0.0000	1.4100	kg/ha
KCODE	N	Y	char(1)	enum			
CA_INPUT	N	Y	numeric(5,2)	range	0.0000	3.6300	kg/ha
CACODE	N	Y	char(1)	enum			
MG_INPUT	N	Y	numeric(5,2)	range	0.0000	1.1600	kg/ha
MGCODE	N	Y	char(1)	enum			
SO4S_INPUT	N	Y	numeric(6,2)	range	0.0000	4.3800	kg/ha
SO4SCODE	N	Y	char(1)	enum			
CL_INPUT	N	Y	numeric(6,2)	range	0.0000	5.9700	kg/ha
CLCODE	N	Y	char(1)	enum			

DOC_INPUT	N	Y	numeric(5,2)	range	0.0000	7.4800	kg/ha
DOCCODE	N	Y	char(1)	enum			

3. Precipitation water nutrient mean annual concentrations

Mean annual precipitation nutrient concentrations are calculated from the concentration data (Entity 1).

Attribute List:

STCODE	N	N	char(5)	enum			
ENTITY	N	N	numeric(1,0)	range	3.0000	3.0000	number
SITECODE	Y	N	char(6)	place			
WATERYEAR	Y	N	numeric(4,0)	range	1969.0000	2018.0000	number
PRECIP_YR	N	Y	numeric(6,2)	range	126.5900	331.0400	cm
PCODE_YR	N	Y	char(1)	enum			
PH_YR	N	Y	numeric(5,1)	range	4.6000	6.0000	ph
PHCODE_YR	N	Y	char(2)	enum			
COND_YR	N	Y	numeric(6,1)	range	2.9000	15.2000	uS/cm
CONDCODE_YR	N	Y	char(2)	enum			
ALK_YR	N	Y	numeric(6,2)	range	0.2100	2.5000	mg/l
ALKCODE_YR	N	Y	char(2)	enum			
SSED_YR	N	Y	numeric(6,2)	range	0.0900	4.9400	mg/l
SSEDCODE_YR	N	Y	char(2)	enum			
SI_YR	N	Y	numeric(6,2)	range	0.0000	0.5200	mg/l
SICODE_YR	N	Y	char(2)	enum			
UTP_YR	N	Y	numeric(6,3)	range	0.0000	0.0250	mg/l
UTPCODE_YR	N	Y	char(2)	enum			
TDP_YR	N	Y	numeric(6,3)	range	0.0000	0.0210	mg/l
TDPCODE_YR	N	Y	char(2)	enum			
PARTP_YR	N	Y	numeric(6,3)	range	0.0000	0.0140	mg/l
PARTPCODE_YR	N	Y	char(3)	enum			
PO4P_YR	N	Y	numeric(6,3)	range	0.0000	0.0170	mg/l
PO4PCODE_YR	N	Y	char(2)	enum			
UTN_YR	N	Y	numeric(6,2)	range	0.0300	0.3500	mg/l
UTNCODE_YR	N	Y	char(3)	enum			
TDN_YR	N	Y	numeric(6,2)	range	0.0200	0.2200	mg/l
TDNCODE_YR	N	Y	char(3)	enum			
DON_YR	N	Y	numeric(6,2)	range	0.0000	0.1600	mg/l
DONCODE_YR	N	Y	char(3)	enum			

PARTN_YR	N	Y	numeric(6,2)	range	0.0000	0.1300	mg/l
PARTNCODE_YR	N	Y	char(3)	enum			
UTKN_YR	N	Y	numeric(6,2)	range	0.0200	0.3300	mg/l
UTKNCODE_YR	N	Y	char(2)	enum			
TKN_YR	N	Y	numeric(6,2)	range	0.0100	0.2000	mg/l
TKNCODE_YR	N	Y	char(2)	enum			
NH3N_YR	N	Y	numeric(6,3)	range	0.0000	0.0520	mg/l
NH3NCODE_YR	N	Y	char(2)	enum			
NO3N_YR	N	Y	numeric(6,3)	range	0.0030	0.0520	mg/l
NO3NCODE_YR	N	Y	char(2)	enum			
NA_YR	N	Y	numeric(6,2)	range	0.0600	0.6400	mg/l
NACODE_YR	N	Y	char(2)	enum			
K_YR	N	Y	numeric(6,2)	range	0.0100	0.2500	mg/l
KCODE_YR	N	Y	char(2)	enum			
CA_YR	N	Y	numeric(6,2)	range	0.0200	0.3700	mg/l
CACODE_YR	N	Y	char(2)	enum			
MG_YR	N	Y	numeric(6,2)	range	0.0200	0.1000	mg/l
MGCODE_YR	N	Y	char(2)	enum			
SO4S_YR	N	Y	numeric(6,2)	range	0.0200	0.4200	mg/l
SO4SCODE_YR	N	Y	char(2)	enum			
CL_YR	N	Y	numeric(6,2)	range	0.2000	1.6600	mg/l
CLCODE_YR	N	Y	char(2)	enum			
DOC_YR	N	Y	numeric(6,2)	range	0.1000	1.4400	mg/l
DOCCODE_YR	N	Y	char(2)	enum			

6. Precipitation water sample log sheet: field and laboratory comments

Attribute List:

STCODE	N	N	char(5)	enum			
ENTITY	N	N	numeric(1,0)	range	6.0000	6.0000	number
SITECODE	Y	N	char(6)	place			
WATERYEAR	N	N	numeric(4,0)	range	1969.0000	2019.0000	number
DATE_TIME	Y	N	datetime	range	10/9/1968	5/22/2019	YYYY-MM-DD hh:mm:ss
LABNO	N	Y	char(4)	freetext	9:52:00 AM	4:10:00 PM	
TYPE	N	N	char(2)	enum			
QCCODE	N	N	char(2)	enum			

QA_SAMPLE	N	Y	char(6)	freetext			
SAMPLER_TYPE	N	N	char(2)	enum			
LOW_VOLUME	N	N	char(1)	enum			
FIELD_COMMENTS	N	Y	char(254)	freetext			
LAB_COMMENTS	N	Y	char(254)	freetext			
SEQ_INDEX	N	N	numeric(5,0)	range	1.0000	9112.0000	number

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_INPUT

Alkalinity inflow as CaCO₃ (units have been converted for all values from bicarbonate (HCO₃-C) to calcium carbonate)

ALK_YR

Mean annual alkalinity concentration as CaCO₃ (calcium carbonate) - all values have been converted from HCO₃-C (bi-carbonate)

ALKCODE

Alkalinity value qualifier 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_INPUT

Calcium inflow

CA_YR

Mean annual calcium concentration

CACODE

Ca value qualifier code

CACODE_YR

Annual Ca value qualifier code

CL

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

CL_INPUT

Chloride inflow

CL_YR

Mean annual chloride concentration

CLCODE

Cl value qualifier code

CLCODE_YR

Annual Cl value qualifier code

COND

Specific conductance; method: wheatstone bridge

COND_YR

Mean annual specific conductivity concentration

CONDCODE

Conductivity value qualifier code

CONDCODE_YR

Annual conductivity value qualifier code

DATE_TIME

Collection date and time (PST) of the precipitation sample - sample represents deposition 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_INPUT

Dissolved organic carbon inflow

DOC_YR

Mean annual dissolved organic carbon concentration

DOCCODE

DOC 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_INPUT

Dissolved organic N inflow - 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_YR

Annual dissolved organic N value qualifier code

ENTITY

Entity number

FIELD_COMMENTS

Field comments related to the collection of the water sample

K

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

K_INPUT

Potassium inflow

K_YR

Mean annual potassium concentration

KCODE

K 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

MG

Mg, dissolved magnesium (filtrable) concentration; method flame atomic absorption spectroscopy

MG_INPUT

Magnesium inflow

MG_YR

Mean annual magnesium concentration

MGCODE

Mg value qualifier code

MGCODE_YR

Annual Mg value qualifier code

NA

Na, dissolved sodium (filtrable) concentration; method flame atomic absorption spectroscopy

NA_INPUT

Sodium inflow

NA_YR

Mean annual sodium concentration

NACODE

Na value qualifier code

NACODE_YR

Annual Na value qualifier code

NH3N

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

NH3N_INPUT

Ammonia-nitrogen (NH3-N) inflow

NH3N_YR

Mean annual ammonia (NH3-N) concentration

NH3NCODE

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_INPUT

Nitrate-nitrogen (NO3-N) inflow

NO3N_YR

Mean annual nitrate-nitrogen (NO3-N) concentration

NO3NCODE

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_INPUT

Particulate N inflow - 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_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_INPUT

Particulate P inflow - 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_YR

Annual particulate P value qualifier code

PCODE

Precipitation value qualifier code

PCODE_YR

Annual precipitation value qualifier code

PH

pH (hydrogen concentration); method: glass electrode

PH_YR

Mean annual pH

PHCODE

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_INPUT

Ortho phosphorus (PO4-P) inflow

PO4P_YR

Mean annual ortho phosphorus (PO4-P) concentration

PO4PCODE

Ortho phosphorus value qualifier code

PO4PCODE_YR

Annual ortho phosphorus value qualifier code

PRECIP_CM

Precipitation in centimeters for the exact sample period. Based on precipitation stations CS2MET or PRIMET (beginning WY 2003) for collector RCADMN and H15MET or CENMET (beginning WY 2006) for collectors RCHIF7, RCHIR7 and RCHI15.

PRECIP_CM

Precipitation in centimeters for the exact sample period. Based on CS2MET (RCADMN) or H15MET (RCHIR7, RCHI15) meteorological station precipitation.

PRECIP_YR

Total annual precipitation for the wateryear

PVOL

Sample volume from precipitation collector; for dry deposition sample - includes any precipitation collected and DI water added to sample for analysis

PVOLCODE

Sample volume qualifier code

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

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_INPUT

Silica inflow

SI_YR

Mean annual silica concentration

SICODE

Silica value qualifier code

SICODE_YR

Annual silica value qualifier code

SITECODE

Precipitation or dry deposition collector site code

SO4S

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

SO4S_INPUT

SO4-S (sulfate-sulfur) inflow

SO4S_YR

Mean annual SO4-S (sulfate-sulfur) concentration

SO4SCODE

SO4-S value qualifier code

SO4SCODE_YR

Annual SO4-S value qualifier code

SSED

Suspended sediment concentration; method: nonfiltrable residue, gravimetric

SSED_INPUT

Suspended sediment inflow

SSED_YR

Mean annual suspended sediment concentration

SSEDCODE

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_INPUT

Total dissolved nitrogen inflow (filtered sample)

TDN_YR

Mean annual total dissolved nitrogen concentration

TDNCODE

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_INPUT

Total dissolved phosphorus inflow

TDP_YR

Mean annual total dissolved phosphorus concentration

TDPCODE

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_INPUT

Total Kjeldahl nitrogen (dissolved) inflow

TKN_YR

Mean annual total Kjeldahl nitrogen concentration (dissolved)

TKNCODE

Total Kjeldahl nitrogen value qualifier code

TKNCODE_YR

Annual total Kjeldahl nitrogen value qualifier code

TYPE

Sample type indicator - indicates dry deposition samples and other qualifying information

UTKN

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

UTKN_INPUT

Unfiltered total Kjeldahl nitrogen inflow

UTKN_YR

Mean annual unfiltered total Kjeldahl nitrogen concentration

UTKNCODE

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_INPUT

Total nitrogen inflow (unfiltered sample)

UTN_YR

Mean annual total nitrogen concentration (unfiltered samples)

UTNCODE

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_INPUT

Unfiltered total phosphorus inflow

UTP_YR

Mean annual unfiltered total phosphorus concentration

UTPCODE

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)

Enumerated Domains:

Enumerated Domain for Attribute: ALKCODE

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

Enumerated Domain for Attribute: ANCACODE

N	No anion-cation ratio calculation determined due to missing analytical components
D	Derived anion-cation ratio value is based on the full set of anions and cations
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

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

Enumerated Domain for Attribute: CLCODE

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

Enumerated Domain for Attribute: CONDCODE

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

Enumerated Domain for Attribute: DOCCODE

A	Accepted value
E	Estimated value

- N No analytical measurement
- * Value is below detection limit for analysis (used beginning in 1991)
- Q Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: KCODE

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

Enumerated Domain for Attribute: MGCODE

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

Enumerated Domain for Attribute: NACODE

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

Enumerated Domain for Attribute: NH3NCODE

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

Enumerated Domain for Attribute: NO3NCODE

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

C Value confirmed, contamination suspected (code use begins May 2007)

Enumerated Domain for Attribute: PO4PCODE

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

Enumerated Domain for Attribute: PCODE

N No precipitation recorded for period. For saved sample (type='S'), precipitation for this period is included in the following period.
E Estimated precipitation
A Accepted value for precipitation
Q Precipitation value is questionable
M Missing value

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: PVOLCODE

Q Sample volume value is questionable - typically implies volume is measured correctly, but volume does not represent the entire collection period
N No sample volume value available
A Accepted value
K Volume is precipitation plus added DIW (usually 250 ml). concentration values are based on this volume.
L Volume of lab water (DIW) added to dry bucket (usually 250 ml). concentration values are based on this volume.
M Volume is precipitation in dry bucket (liters). Concentration values are based on this volume. No DIW added to the precipitation water.

Enumerated Domain for Attribute: SICODE

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

Enumerated Domain for Attribute: SO4SCODE

A Accepted value
E Estimated value
N No analytical measurement

- * Value is below detection limit for analysis (used beginning in 1991)
- Q Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: SSEDPCODE

- A Accepted value
- E Estimated value
- N No analytical measurement
- Q Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: STCODE

- CP002 Study code CP002

Enumerated Domain for Attribute: TKNCODE

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

Enumerated Domain for Attribute: TDPCODE

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

Enumerated Domain for Attribute: TYPE

- S Sample saved and combined with the following collection due to insufficient water for analyses - samples were no longer saved and combined after 1981
- P Partial sample - precipitation was not collected successfully over the entire period (includes problems with NADP-style collector motor or samples that may have overflowed)
- YE Year end marker allows summary by water year - this is not a sample. Flux values are calculated from precip ending Sep 30 and use analyte concentrations from the following sample. 'YE' markers are inserted every Sep 30.
- C Sample is combined with preceding saved sample(s) for analysis. Combined samples of this type are not used after 1981.
- DW Dry deposition sample - dry bucket contains rain water
- F Sample is successfully collected over the entire period - a "Full" sample.
- N No sample is collected - generally indicates periods of little or no rain, but can be a lost sample.
- DF Dry deposition sample - sample is dry and not contaminated with precipitation water
- B Biased sample - Lid on NADP sampler malfunctions and sample includes dry deposition
- DC Dry deposition sample - dry bucket contains rain water and other insects/contaminants

Enumerated Domain for Attribute: UTKNCODE

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

Enumerated Domain for Attribute: UTPCODE

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

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: UTNCODE

A	Accepted value
E	Estimated value
*	Value is below detection limit for analysis (used beginning in 1991)
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

Enumerated Domain for Attribute: TDNCODE

A	Accepted value
E	Estimated value
*	Value is below detection limit for analysis (used beginning in 1991)
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

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

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

Enumerated Domain for Attribute: ALKCODE

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

Enumerated Domain for Attribute: CACODE

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

Enumerated Domain for Attribute: CLCODE

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

Enumerated Domain for Attribute: DOCCODE

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

Enumerated Domain for Attribute: KCODE

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

Enumerated Domain for Attribute: MGCODE

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

Enumerated Domain for Attribute: NACODE

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

Enumerated Domain for Attribute: NH3NCODE

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

Enumerated Domain for Attribute: NO3NCODE

A	Accepted value
E	Estimated value
N	No analytical measurement
*	Value is below detection limit for analysis (used beginning in 1991)

- Q Value is questionable (used beginning in 1991)
- C Value confirmed, contamination suspected (code use begins May 2007)

Enumerated Domain for Attribute: PO4PCODE

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

Enumerated Domain for Attribute: PCODE

- N No precipitation recorded for period. For saved sample (type='S'), precipitation for this period is included in the following period.
- E Estimated precipitation
- A Accepted value for precipitation
- Q Precipitation value is questionable
- M Missing value

Enumerated Domain for Attribute: SICODE

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

Enumerated Domain for Attribute: SO4SCODE

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

Enumerated Domain for Attribute: SSED CODE

- A Accepted value
- E Estimated value
- N No analytical measurement
- Q Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: STCODE

- CP002 Study code CP002

Enumerated Domain for Attribute: TKNCODE

- A Accepted value

E	Estimated value
N	No analytical measurement
*	Value is below detection limit for analysis (used beginning in 1991)
Q	Value is questionable (used beginning in 1991)

Enumerated Domain for Attribute: TDPCODE

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

Enumerated Domain for Attribute: TYPE

S	Sample saved and combined with the following collection due to insufficient water for analyses - samples were no longer saved and combined after 1981
P	Partial sample - precipitation was not collected successfully over the entire period (includes problems with NADP-style collector motor or samples that may have overflowed)
YE	Year end marker allows summary by water year - this is not a sample. Flux values are calculated from precip ending Sep 30 and use analyte concentrations from the following sample. 'YE' markers are inserted every Sep 30.
C	Sample is combined with preceding saved sample(s) for analysis. Combined samples of this type are not used after 1981.
DW	Dry deposition sample - dry bucket contains rain water
F	Sample is successfully collected over the entire period - a "Full" sample.
N	No sample is collected - generally indicates periods of little or no rain, but can be a lost sample.
DF	Dry deposition sample - sample is dry and not contaminated with precipitation water
B	Biased sample - Lid on NADP sampler malfunctions and sample includes dry deposition
DC	Dry deposition sample - dry bucket contains rain water and other insects/contaminants

Enumerated Domain for Attribute: UTKNCODE

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

Enumerated Domain for Attribute: UTPCODE

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

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: UTNCODE

A	Accepted value
E	Estimated value
*	Value is below detection limit for analysis (used beginning in 1991)
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

Enumerated Domain for Attribute: TDNCODE

A	Accepted value
E	Estimated value
*	Value is below detection limit for analysis (used beginning in 1991)
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

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

Enumerated Domain for Attribute: PARTNCODE

N	No derived value is calculated due to missing analytical components
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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: ALKCODE_YR

Q	Annual value includes questionable values
N	No analyses conducted in water year
A	Annual value is accepted
E	Annual value includes estimated values
I	Annual value incomplete; one or more values are missing for part of the year
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
*	Annual value includes one or more values measured below the detection limit

Enumerated Domain for Attribute: CACODE_YR

Q	Annual value includes questionable values
N	No analyses conducted in water year
A	Annual value is accepted
E	Annual value includes estimated values
I	Annual value incomplete; one or more values are missing for part of the year
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
*	Annual value includes one or more values measured below the detection limit

Enumerated Domain for Attribute: CLCODE_YR

Q	Annual value includes questionable values
N	No analyses conducted in water year
A	Annual value is accepted
E	Annual value includes estimated values
I	Annual value incomplete; one or more values are missing for part of the year
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
*	Annual value includes one or more values measured below the detection limit

Enumerated Domain for Attribute: CONDCODE_YR

Q	Annual value includes questionable values
N	No analyses conducted in water year
A	Annual value is accepted
E	Annual value includes estimated values
I	Annual value incomplete; one or more values are missing for part of the year
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
*	Annual value includes one or more values measured below the detection limit

Enumerated Domain for Attribute: DOCCODE_YR

Q	Annual value includes questionable values
N	No analyses conducted in water year
A	Annual value is accepted
E	Annual value includes estimated values
I	Annual value incomplete; one or more values are missing for part of the year
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
*	Annual value includes one or more values measured below the detection limit

Enumerated Domain for Attribute: KCODE_YR

Q	Annual value includes questionable values
N	No analyses conducted in water year
A	Annual value is accepted
E	Annual value includes estimated values
I	Annual value incomplete; one or more values are missing for part of the year
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
*	Annual value includes one or more values measured below the detection limit

Enumerated Domain for Attribute: MGCODE_YR

Q	Annual value includes questionable values
N	No analyses conducted in water year
A	Annual value is accepted

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

Enumerated Domain for Attribute: NACODE_YR

Q	Annual value includes questionable values
N	No analyses conducted in water year
A	Annual value is accepted
E	Annual value includes estimated values
I	Annual value incomplete; one or more values are missing for part of the year
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
*	Annual value includes one or more values measured below the detection limit

Enumerated Domain for Attribute: NH3NCODE_YR

Q	Annual value includes questionable values
N	No analyses conducted in water year
A	Annual value is accepted
E	Annual value includes estimated values
I	Annual value incomplete; one or more values are missing for part of the year
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
*	Annual value includes one or more values measured below the detection limit

Enumerated Domain for Attribute: NO3NCODE_YR

Q	Annual value includes questionable values
N	No analyses conducted in water year
A	Annual value is accepted
E	Annual value includes estimated values
I	Annual value incomplete; one or more values are missing for part of the year
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
*	Annual value includes one or more values measured below the detection limit

Enumerated Domain for Attribute: PO4PCODE_YR

Q	Annual value includes questionable values
N	No analyses conducted in water year
A	Annual value is accepted
E	Annual value includes estimated values
I	Annual value incomplete; one or more values are missing for part of the year
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
*	Annual value includes one or more values measured below the detection limit

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: PPCODE_YR

I	Incomplete, parts of year missing from annual summary
A	All precipitation is included and not estimated for the wateryear
E	Total includes estimated precipitation values
Q	Precipitation total may be questionable for some periods of the wateryear

Enumerated Domain for Attribute: PHCODE_YR

Q	Annual value includes questionable values
N	No analyses conducted in water year
A	Annual value is accepted
E	Annual value includes estimated values
I	Annual value incomplete; one or more values are missing for part of the year

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

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: SICODE_YR

Q	Annual value includes questionable values
N	No analyses conducted in water year
A	Annual value is accepted
E	Annual value includes estimated values
I	Annual value incomplete; one or more values are missing for part of the year
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

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

Enumerated Domain for Attribute: SO4SCODE_YR

- Q Annual value includes questionable values
- N No analyses conducted in water year
- A Annual value is accepted
- E Annual value includes estimated values
- I Annual value incomplete; one or more values are missing for part of the year
- 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
- * Annual value includes one or more values measured below the detection limit

Enumerated Domain for Attribute: SSED_CODE_YR

- Q Annual value includes questionable values
- N No analyses conducted in water year
- A Annual value is accepted
- E Annual value includes estimated values
- I Annual value incomplete; one or more values are missing for part of the year
- 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

- CP002 Study code CP002

Enumerated Domain for Attribute: TKNCODE_YR

- Q Annual value includes questionable values
- N No analyses conducted in water year
- A Annual value is accepted
- E Annual value includes estimated values
- I Annual value incomplete; one or more values are missing for part of the year
- 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
- * Annual value includes one or more values measured below the detection limit

Enumerated Domain for Attribute: TDPCODE_YR

- Q Annual value includes questionable values
- N No analyses conducted in water year

A	Annual value is accepted
E	Annual value includes estimated values
I	Annual value incomplete; one or more values are missing for part of the year
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
*	Annual value includes one or more values measured below the detection limit

Enumerated Domain for Attribute: UTKNCODE_YR

Q	Annual value includes questionable values
N	No analyses conducted in water year
A	Annual value is accepted
E	Annual value includes estimated values
I	Annual value incomplete; one or more values are missing for part of the year
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
*	Annual value includes one or more values measured below the detection limit

Enumerated Domain for Attribute: UTPCODE_YR

Q	Annual value includes questionable values
N	No analyses conducted in water year
A	Annual value is accepted
E	Annual value includes estimated values
I	Annual value incomplete; one or more values are missing for part of the year
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
*	Annual value includes one or more values measured below the detection limit

Enumerated Domain for Attribute: UTNCODE_YR

Q	Annual value includes questionable values
N	No analyses conducted in water year
A	Annual value is accepted
E	Annual value includes estimated values
I	Annual value incomplete; one or more values are missing for part of the year
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
*	Annual value includes one or more values measured below the detection limit
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: TDNCODE_YR

Q	Annual value includes questionable values
N	No analyses conducted in water year
A	Annual value is accepted
E	Annual value includes estimated values
I	Annual value incomplete; one or more values are missing for part of the year
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
*	Annual value includes one or more values measured below the detection limit
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: STCODE

CP002	Study code CP002
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Enumerated Domain for Attribute: TYPE

- S Sample saved and combined with the following collection due to insufficient water for analyses - samples were no longer saved and combined after 1981
- P Partial sample - precipitation was not collected successfully over the entire period (includes problems with NADP-style collector motor or samples that may have overflowed)
- YE Year end marker allows summary by water year - this is not a sample. Flux values are calculated from precip ending Sep 30 and use analyte concentrations from the following sample. 'YE' markers are inserted every Sep 30.
- C Sample is combined with preceeding saved sample(s) for analysis. Combined samples of this type are not used after 1981.
- DW Dry deposition sample - dry bucket contains rain water
- F Sample is successfully collected over the entire period - a "Full" sample.
- N No sample is collected - generally indicates periods of little or no rain, but can be a lost sample.
- DF Dry deposition sample - sample is dry and not contaminated with precipitation water
- B Biased sample - Lid on NADP sampler malfunctions and sample includes dry deposition
- DC Dry deposition sample - dry bucket contains rain water and other insects/contaminants

Enumerated Domain for Attribute: QCCODE

- NA Water sample is not a quality control sample
- QZ Miscellaneous quality control water sample

Enumerated Domain for Attribute: SAMPLER_TYPE

- BC Bulk collection includes both wet and dry deposition
- NP NADP-type sampler that separates wet deposition from dry deposition
- RC Bulk samples from original, locally-designed rain collectors that includes both wet and dry deposition

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