CUAHSI WATERML 1.0

Specification

WaterML 1.0 Schema Description

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by:

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Distribution

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Scope

Water Markup Language (WaterML) specification defines an information exchange schema, which has been used in water data services within the Hydrologic Information System (HIS) project supported by the U.S. National Science Foundation, and has been adopted by several federal agencies as a format for serving hydrologic data. The goal of the first version of WaterML was to encode the semantics of hydrologic observation discovery and retrieval and implement water data services in a way that is both generic and unambiguous across different data providers, thus creating the least barriers for adoption by the hydrologic research community. Now in version 1.1, WaterML is evolving to reflect the deployment experience at hydrologic observatory testbeds around the U.S., and U.S. federal and state agency practices of serving observational data on the web. Data sources that can be queried via WaterML-compliant water data services include many national and international repositories of water data, and a growing number of academic observation networks registered by researchers associated with the hydrologic observatories.

WaterML 1.0 specification was published as an OGC discussion paper in 2007, and is available at the OGC web site. This document is a detailed technical description of WaterML 1.0 schema.

Support and questions

Contact Dr. David Valentine, SDSC, valentin@sdsc.edu

INTRODUCTION

This schema documentation is exported from the published WaterML 1.0 schema using a DocFlex/XML XSDDoc. An online HTML version of the WaterML 1.0 documentation is found at: http://water.sdsc.edu/doc/waterMldoc/v10/default.html.

The starting point for using the WaterML schema is to examine the three response elements, and their complexType definitions:

	Element	ComplexType
Site	siteResponse	SiteResponseType
Variable	variablesResponse	VariablesResponseType
Time Series	timeSeriesResponse	TimeSeriesResponseType

XML Schema Documentation

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Namespace Summary

http://www.cuahsi.org/waterML/1.0/	*Page*
Targeting Schemas (1): cuahsiTimeSeries_v1_0.xsd **Targeting Components:** 17 global elements, 119 local elements, 31 complexTypes, 11 simpleTypes, 7 attribute groups	*6*

Schema Summary		Page
cuahsiTimeSeries_v1_0.xsd	Changes: 2006-07-10 valentine removed choice. **Target Namespace:** http://www.cuahsi.org/waterML/1.0/ **Version:** 1.01 **Defined Components:** 17 global elements, 102 local elements, 31 complexTypes, 11 simpleTypes, 7 attribute groups **Default Namespace-Qualified Form:** Local Elements: qualified; Local Attributes: unqualified **Schema Location:** https://svn.sdsc.edu/repo/WATER/CUAHSI/WebServices/BaseWofService/WofSchemas/cuahsiTimeSeries_v1_0.xsd	*23*

Namespace *"http://www.cuahsi.org/waterML/1.0/"*

Targeting Schemas (1):
cuahsiTimeSeries_v1_0.xsd

Targeting Components:
17 global elements, 119 local elements, 31 complexTypes, 11 simpleTypes, 7 attribute groups

All Element Summary		Page
Abstract (in Metadata)	Abstract of data from a specific data source. **Type:** xsi:string **Content:** simple **Defined:** locally within complexType MetaDataType [109] in cuahsiTimeSeries_v1_0.xsd, see XML source [24]	*23*
Address (in ContactInformation)	Any address element structure that can be used to communicate contact information. **Type:** xsi:anyType **Content:** any **Defined:** locally within complexType ContactInformationType [100] in cuahsiTimeSeries_v1_0.xsd, see XML source [24]	*24*
altname (in siteInfo)	Alternate name **Type:** xsi:string **Content:** simple **Defined:** locally within complexType SiteInfoType [122] in cuahsiTimeSeries_v1_0.xsd, see XML source [25]	*24*
beginDateTime (in timeParam)	The string submited as startDate to the GetValues method **Type:** xsi:string **Content:** simple **Defined:** locally within element timeParam [80] in cuahsiTimeSeries_v1_0.xsd, see XML source [25]	*25*
beginDateTime (type xsi:dateTime)	**Type:** xsi:dateTime **Content:** simple **Defined:** locally at 3 locations in cuahsiTimeSeries_v1_0.xsd	*25*
ContactInformation (type ContactInformationType)	Contact information about source. **Type:** ContactInformationType [99] **Content:** complex, 5 elements **Defined:** locally within complexType SourceType [125] in cuahsiTimeSeries_v1_0.xsd, see XML source [27]	*26*
ContactName (in ContactInformation)	name of contact, or title of organization **Type:** xsi:string **Content:** simple **Defined:** locally within complexType ContactInformationType [100] in cuahsiTimeSeries_v1_0.xsd, see XML source [27]	*27*
creationTime (in queryInfo)	When was this response originally created. **Type:** xsi:dateTime **Content:** simple **Defined:** locally within complexType QueryInfoType [116] in cuahsiTimeSeries_v1_0.xsd, see XML source [27]	*27*
criteria (in queryInfo)	The criteria are the actual parameters that are passed into the method. **Type:** anonymous complexType **Content:** complex, 3 elements **Defined:** locally within complexType QueryInfoType [116] in cuahsiTimeSeries_v1_0.xsd, see XML source [28] **Includes:** definitions of 3 elements	*28*

dataSetDescription (in datasetInfo)	Text description describing the data source. **Type:** `xsi:string` **Content:** simple **Defined:** locally within complexType `DataSetInfoType` [101] in cuahsiTimeSeries_v1_0.xsd, see XML source [29]	*29*
dataSetIdentifier (in datasetInfo)	The indentifier which the original source uses to identify this dataset. **Type:** `xsi:string` **Content:** simple **Defined:** locally within complexType `DataSetInfoType` [101] in cuahsiTimeSeries_v1_0.xsd, see XML source [29]	*29*
datasetInfo	dataSetInfo element describes time series derived from a dataset, such as a netCDF file, or a gridded model. **Type:** `DataSetInfoType` [100] **Content:** complex, 6 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [30] **Used:** never	*29*
dataSetLocation (in datasetInfo)	geolocation describing the spatial coverage of a gridded dataset. **Type:** `GeogLocationType` [102] **Content:** empty, 1 attribute **Defined:** locally within complexType `DataSetInfoType` [101] in cuahsiTimeSeries_v1_0.xsd, see XML source [30]	*30*
dataType (type dataTypeEnum)	**Type:** `dataTypeEnum` [142] **Content:** simple **Defined:** locally at 2 locations in cuahsiTimeSeries_v1_0.xsd	*30*
daylightSavingsTimeZone (in timeZoneInfo)	The daylight savings time zone for a site, specified in hours and minutes: "hh:mm" **Type:** anonymous complexType **Content:** empty, 2 attributes **Defined:** locally within element `timeZoneInfo` [84] in cuahsiTimeSeries_v1_0.xsd, see XML source [32]	*31*
defaultTimeZone (in timeZoneInfo)	The default time zone for a site, specified in hours and minutes: "hh:mm" **Type:** anonymous complexType **Content:** empty, 2 attributes **Defined:** locally within element `timeZoneInfo` [84] in cuahsiTimeSeries_v1_0.xsd, see XML source [32]	*32*
east (in latLonBox)	East longitude. **Type:** `Longitude` [145] **Content:** simple **Defined:** locally within complexType `LatLonBoxType` [106] in cuahsiTimeSeries_v1_0.xsd, see XML source [33]	*32*
elevation_m (in siteInfo)	Elevation in meters. **Type:** `xsi:double` **Content:** simple **Defined:** locally within complexType `SiteInfoType` [123] in cuahsiTimeSeries_v1_0.xsd, see XML source [33]	*33*
Email (in ContactInformation)	email address **Type:** `xsi:string` **Content:** simple **Defined:** locally within complexType `ContactInformationType` [100] in cuahsiTimeSeries_v1_0.xsd, see XML source [34]	*33*

endDateTime (in timeParam)	The string submited a startDate to the GetValues method **Type:** xsi:string **Content:** simple **Defined:** locally within element timeParam [80] in cuahsiTimeSeries_v1_0.xsd, see XML source [34]	*34*
endDateTime (type xsi:dateTime)	**Type:** xsi:dateTime **Content:** simple **Defined:** locally at 3 locations in cuahsiTimeSeries_v1_0.xsd	*34*
extension	In order to simplify comprehension, data sources are encouraged to put additional informaiton in the extension area, using thier own namespace. **Type:** xsi:anyType **Content:** any **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [36] **Used:** at 7 locations	*35*
generalCategory (type generalCategoryEnum)	**Type:** generalCategoryEnum [144] **Content:** simple **Defined:** locally at 2 locations in cuahsiTimeSeries_v1_0.xsd	*36*
geogLocation (in geoLocation)	Geographic location: A geographic location is required as part of the site information (siteInfoType or siteInfo element) At present this can be elements of GeogLocationType: LatLonPointType and LatLonBoxType. an xml schema type attribute can be used to determine which type is contained in this element (xsi:type="LatLonPointType" or xsi:type="LatLonBoxType") **Type:** GeogLocationType [102] **Content:** empty, 1 attribute **Defined:** locally within element geoLocation [38] in cuahsiTimeSeries_v1_0.xsd, see XML source [37]	*36*
geoLocation (in siteInfo)	The geoLocation speficies the details of the geographic location. **Type:** anonymous complexType **Content:** complex, 2 elements **Defined:** locally within complexType SiteInfoType [123] in cuahsiTimeSeries_v1_0.xsd, see XML source [37] **Includes:** definitions of 2 elements	*37*
LabMethod (type LabMethodType)	LabMethod is a LabMethodType containing infomration about lab methods **Type:** LabMethodType [103] **Content:** complex, 1 attribute, 5 elements **Defined:** locally within complexType SampleType [118] in cuahsiTimeSeries_v1_0.xsd, see XML source [39]	*38*
labMethodDescription (in LabMethod)	Description of the method and protocols used for sample analysis. **Type:** xsi:string **Content:** simple **Defined:** locally within complexType LabMethodType [104] in cuahsiTimeSeries_v1_0.xsd, see XML source [39]	*39*
labMethodLink (in LabMethod)	Link to additional reference material on the analysis method. **Type:** xsi:string **Content:** simple **Defined:** locally within complexType LabMethodType [105] in cuahsiTimeSeries_v1_0.xsd, see XML source [39]	*39*
LabMethodName (in LabMethod)	Name of the method and protocols used for sample analysis. **Type:** xsi:string **Content:** simple **Defined:** locally within complexType LabMethodType [105] in cuahsiTimeSeries_v1_0.xsd, see XML source [40]	*40*

labName (in LabMethod)	Name of the laboratory responsible for processing the sample. **Type:** xsi:string **Content:** simple **Defined:** locally within complexType LabMethodType [105] in cuahsiTimeSeries_v1_0.xsd, see XML source [40]	*40*
labOrganization (in LabMethod)	Organization responsible for sample analysis. **Type:** xsi:string **Content:** simple **Defined:** locally within complexType LabMethodType [105] in cuahsiTimeSeries_v1_0.xsd, see XML source [41]	*40*
labSampleCode (type xsi:string)	Code or label used to identify and track lab sample or sample container (e.g. bottle) during lab analysis. **Type:** xsi:string **Content:** simple **Defined:** locally within complexType SampleType [118] in cuahsiTimeSeries_v1_0.xsd, see XML source [41]	*41*
latitude (in latLonPoint)	The latitude of the site in a decimal degrees as calculated in terms of the given datum. **Type:** Latitude [145] **Content:** simple **Defined:** locally within complexType LatLonPointType [108] in cuahsiTimeSeries_v1_0.xsd, see XML source [42]	*41*
latLonBox	Box type describing a geographic location. **Type:** LatLonBoxType [105] **Content:** complex, 1 attribute, 4 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [42] **Used:** never	*42*
latLonPoint	Point type for describing a geographic location **Type:** LatLonPointType [107] **Content:** complex, 1 attribute, 2 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [43] **Used:** never	*42*
localSiteXY (in geoLocation)	Site information can contain one or more other locations using the localSiteXY element. **Type:** anonymous complexType **Content:** complex, 1 attribute, 4 elements **Defined:** locally within element geoLocation [38] in cuahsiTimeSeries_v1_0.xsd, see XML source [43] **Includes:** definitions of 1 attribute and 4 elements	*43*
locationParam (in criteria)	the location or site parameter passed into the site **Type:** xsi:string **Content:** simple **Defined:** locally within element criteria [28] in cuahsiTimeSeries_v1_0.xsd, see XML source [45]	*44*
longitude (in latLonPoint)	The longitude of the site in a decimal degrees as calculated in terms of the given datum. **Type:** Longitude [145] **Content:** simple **Defined:** locally within complexType LatLonPointType [108] in cuahsiTimeSeries_v1_0.xsd, see XML source [45]	*45*
Metadata (type MetaDataType)	MetadataType contains the information from the ODM table IsoMetadata. **Type:** MetaDataType [108] **Content:** complex, 5 elements **Defined:** locally within complexType SourceType [125] in cuahsiTimeSeries_v1_0.xsd, see XML source [46]	*45*

MetadataLink (in Metadata)	Link to additional metadata reference material. **Type:** xsi:anyURI **Content:** simple **Defined:** locally within complexType MetaDataType [109] in cuahsiTimeSeries_v1_0.xsd, see XML source [46]	*46*
Method (in series)	Method description. **Type:** MethodType [109] **Content:** complex, 1 attribute, 2 elements **Defined:** locally within element series [70] in cuahsiTimeSeries_v1_0.xsd, see XML source [47]	*47*
method (in values)	Multiple &amp;lt;method&amp;gt;s lists the methods used to collect the data and any additional information about the method. **Type:** MethodType [109] **Content:** complex, 1 attribute, 2 elements **Defined:** locally within complexType TsValuesSingleVariableType [133] in cuahsiTimeSeries_v1_0.xsd, see XML source [47]	*46*
MethodDescription (type xsi:string)	Text description of each method. **Type:** xsi:string **Content:** simple **Defined:** locally within complexType MethodType [110] in cuahsiTimeSeries_v1_0.xsd, see XML source [48]	*47*
MethodLink (type xsi:string)	Link to additional reference material on the method. **Type:** xsi:string **Content:** simple **Defined:** locally within complexType MethodType [110] in cuahsiTimeSeries_v1_0.xsd, see XML source [48]	*48*
NoDataValue (in variable)	Numeric value used to encode no data values for this variable. **Type:** xsi:string **Content:** simple **Defined:** locally within complexType VariableInfoType [139] in cuahsiTimeSeries_v1_0.xsd, see XML source [49]	*48*
north (in latLonBox)	North Latitude **Type:** Latitude [145] **Content:** simple **Defined:** locally within complexType LatLonBoxType [106] in cuahsiTimeSeries_v1_0.xsd, see XML source [49]	*49*
note (type NoteType)	**Type:** NoteType [111] **Content:** simple, 4 attributes **Defined:** locally at 6 locations in cuahsiTimeSeries_v1_0.xsd	*49*
offset (in values)	<offset> is of type OffsetType. offset lists full descriptive information for each of the measurement offsets. **Type:** OffsetType [112] **Content:** complex, 1 attribute, 5 elements **Defined:** locally within complexType TsValuesSingleVariableType [134] in cuahsiTimeSeries_v1_0.xsd, see XML source [51]	*51*
offsetDescription (in offset)	Full text description of the offset type. **Type:** xsi:string **Content:** simple **Defined:** locally within complexType OffsetType [113] in cuahsiTimeSeries_v1_0.xsd, see XML source [52]	*51*

offsetHorizDirectionDegrees (in offset)	if offsetIsVertical=false, then this is the direction of the offset **Type:** xsi:int **Content:** simple **Defined:** locally within complexType OffsetType [113] in cuahsiTimeSeries_v1_0.xsd, see XML source [52]	*52*
offsetIsVertical (in offset)	By default, the offset is vertical. **Type:** xsi:boolean **Content:** simple **Defined:** locally within complexType OffsetType [113] in cuahsiTimeSeries_v1_0.xsd, see XML source [53]	*52*
offsetValue (in offset)	offsetValue element is value of offset. **Type:** xsi:float **Content:** simple **Defined:** locally within complexType OffsetType [113] in cuahsiTimeSeries_v1_0.xsd, see XML source [53]	*53*
option	Option elements are key-value pair elements that control how a variable maght be utilized in a service. **Type:** anonymous (extension of xsi:string) **Content:** simple, 3 attributes **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [54] **Includes:** definitions of 3 attributes **Used:** at 2 locations	*53*
optionGroup	**Type:** anonymous complexType **Content:** complex, 1 element **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [55] **Includes:** definition of 1 element **Used:** never	*54*
options	A list of options. **Type:** anonymous complexType **Content:** complex, 1 element **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [56] **Includes:** definition of 1 element **Used:** at 1 location	*55*
Organization (type xsi:string)	Name of the organization that collected the data. **Type:** xsi:string **Content:** simple **Defined:** locally within complexType SourceType [125] in cuahsiTimeSeries_v1_0.xsd, see XML source [57]	*56*
parentID (in related)	variableCode for the parent **Type:** anonymous (extension of xsi:string) **Content:** simple, 3 attributes **Defined:** locally within element related [66] in cuahsiTimeSeries_v1_0.xsd, see XML source [57]	*57*
Phone (in ContactInformation)	phone **Type:** xsi:string **Content:** simple **Defined:** locally within complexType ContactInformationType [100] in cuahsiTimeSeries_v1_0.xsd, see XML source [58]	*57*
ProfileVersion (in Metadata)	Name of metadata profile used by the data source **Type:** xsi:string **Content:** simple **Defined:** locally within complexType MetaDataType [109] in cuahsiTimeSeries_v1_0.xsd, see XML source [58]	*58*

qualifier	qualifying comments that accompany the data **Type:** anonymous (extension of xsi:string) **Content:** simple, 7 attributes **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [59] **Includes:** definitions of 2 attributes **Used:** at 1 location	*58*
qualifier (type anonymous)	qualifying comments that accompany the data. value/@qaulifier is a space delimted list of qualifiers for a data value. **Type:** anonymous complexType **Content:** complex, 4 attributes, 1 element **Defined:** locally within complexType QualifiersType [114] in cuahsiTimeSeries_v1_0.xsd, see XML source [60] **Includes:** definitions of 1 attribute and 1 element	*60*
qualifierCode (in qualifier : anonymous)	Text code used by organization that collects the data. value/@qaulifier is a space delimted list of qualifiers for a data value. **Type:** xsi:token **Content:** simple **Defined:** locally within element qualifier [60] in cuahsiTimeSeries_v1_0.xsd, see XML source [61]	*61*
qualityControlLevel	quality control levels that are used for versioning data within the database. **Type:** anonymous complexType **Content:** complex, 6 attributes, 1 element **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [62] **Includes:** definitions of 1 attribute and 1 element **Used:** at 1 location	*61*
QualityControlLevel (in series)	Code used to identify the level of quality control to which data values have been subjected. **Type:** QualityControlLevelType [114] **Content:** simple, 1 attribute **Defined:** locally within element series [70] in cuahsiTimeSeries_v1_0.xsd, see XML source [63]	*62*
qualityControlLevelID (in qualityControlLevel)	Unique integer identifying the quality control level. **Type:** xsi:normalizedString **Content:** simple **Defined:** locally within element qualityControlLevel [62] in cuahsiTimeSeries_v1_0.xsd, see XML source [63]	*63*
queryInfo (type QueryInfoType)	**Type:** QueryInfoType [115] **Content:** complex, 6 elements **Defined:** locally at 3 locations in cuahsiTimeSeries_v1_0.xsd	*63*
querySQL (in queryInfo)	For debugging, the SQL used to generate this request may be placed in this element. **Type:** xsi:string **Content:** simple **Defined:** locally within complexType QueryInfoType [117] in cuahsiTimeSeries_v1_0.xsd, see XML source [64]	*64*
queryURL (in queryInfo)	The URL of the web page that was used as the original source for the response. **Type:** xsi:string **Content:** simple **Defined:** locally within complexType QueryInfoType [117] in cuahsiTimeSeries_v1_0.xsd, see XML source [65]	*64*
realTimeDataPeriod (type xsi:duration)	Duration Data Type The duration data type is used to specify a time interval. **Type:** xsi:duration **Content:** simple **Defined:** locally within complexType TimePeriodRealTimeType [128] in cuahsiTimeSeries_v1_0.xsd, see XML source [65]	*65*

related (in variable)	This can be used to build up relationships between variables. **Type:** anonymous complexType **Content:** complex, 2 elements **Defined:** locally within complexType `VariableInfoType` [139] in cuahsiTimeSeries_v1_0.xsd, see XML source [66] **Includes:** definitions of 2 elements	*65*
relatedID (in related)	Child or other relationships can be encoded using the related element. **Type:** anonymous (extension of `xsi:string`) **Content:** simple, 3 attributes **Defined:** locally within element `related` [67] in cuahsiTimeSeries_v1_0.xsd, see XML source [67]	*67*
sampleMedium (type SampleMediumEnum)	**Type:** `SampleMediumEnum` [147] **Content:** simple **Defined:** locally at 2 locations in cuahsiTimeSeries_v1_0.xsd	*67*
SampleType (type sampleTypeEnum)	Controlled vocabulary specifying the sample type from the SampleTypeEnum. **Type:** `sampleTypeEnum` [148] **Content:** simple **Defined:** locally within complexType `SampleType` [118] in cuahsiTimeSeries_v1_0.xsd, see XML source [69]	*68*
series (in seriesCatalog)	Separate data series are for the purposes of identifying or displaying what data are available at each site. **Type:** anonymous complexType **Content:** complex, 11 elements **Defined:** locally within complexType `seriesCatalogType` [120] in cuahsiTimeSeries_v1_0.xsd, see XML source [69] **Includes:** definitions of 11 elements	*69*
seriesCatalog (in site)	**Type:** `seriesCatalogType` [118] **Content:** complex, 2 attributes, 3 elements **Defined:** locally within element `site` [73] in cuahsiTimeSeries_v1_0.xsd, see XML source [72]	*71*
site	A site element can have two parts: siteInfo, and one or more seriesCatalogs. **Type:** anonymous complexType **Content:** complex, 3 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [73] **Includes:** definitions of 3 elements **Used:** at 1 location	*72*
siteCode (in siteInfo)	A <siteCode> is an identifier that this site is referred to as. **Type:** anonymous (extension of `xsi:string`) **Content:** simple, 5 attributes **Defined:** locally within complexType `SiteInfoType` [123] in cuahsiTimeSeries_v1_0.xsd, see XML source [74] **Includes:** definitions of 5 attributes	*73*
siteInfo (in site)	siteInfo element contains a list of information about a site. **Type:** `SiteInfoType` [121] **Content:** complex, 2 attributes, 9 elements **Defined:** locally within element `site` [73] in cuahsiTimeSeries_v1_0.xsd, see XML source [75]	*75*
siteName (in siteInfo)	Full name of the sampling site. eg "LOGAN RIVER ABOVE STATE DAM, NEAR LOGAN,UT" **Type:** `xsi:string` **Content:** simple **Defined:** locally within complexType `SiteInfoType` [123] in cuahsiTimeSeries_v1_0.xsd, see XML source [76]	*75*

sitesResponse	**Type:** SiteInfoResponseType [120] **Content:** complex, 2 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [76] **Used:** never	*76*
Source (in series)	Source of the data values and reference information to recover/discover the data from the source. **Type:** SourceType [124] **Content:** complex, 1 attribute, 5 elements **Defined:** locally within element series [71] in cuahsiTimeSeries_v1_0.xsd, see XML source [77]	*77*
source (in values)	The Sources the original sources of the data, providing information sufficient to retrieve the data value. **Type:** SourceType [124] **Content:** complex, 1 attribute, 5 elements **Defined:** locally within complexType TsValuesSingleVariableType [134] in cuahsiTimeSeries_v1_0.xsd, see XML source [77]	*76*
SourceDescription (type xsi:string)	Full text description of the source of the data. **Type:** xsi:string **Content:** simple **Defined:** locally within complexType SourceType [126] in cuahsiTimeSeries_v1_0.xsd, see XML source [78]	*77*
sourceInfo (in timeSeries)	**Type:** SourceInfoType [124] **Content:** empty **Defined:** locally within complexType TimeSeriesType [131] in cuahsiTimeSeries_v1_0.xsd, see XML source [78]	*78*
SourceLink (type xsi:anyURI)	Link that can be pointed at the original data file and/or associated metadata stored in the digital library or URL of data source. **Type:** xsi:anyURI **Content:** simple **Defined:** locally within complexType SourceType [126] in cuahsiTimeSeries_v1_0.xsd, see XML source [78]	*78*
south (in latLonBox)	South Latitude **Type:** Latitude [145] **Content:** simple **Defined:** locally within complexType LatLonBoxType [106] in cuahsiTimeSeries_v1_0.xsd, see XML source [79]	*79*
timeInterval (in timeSupport)	**Type:** xsi:int **Content:** simple **Defined:** locally within element timeSupport [83] in cuahsiTimeSeries_v1_0.xsd, see XML source [79]	*79*
timeParam (in criteria)	the begin and end time of the GetValues request used to generate a timeSeriesResponse. **Type:** anonymous complexType **Content:** complex, 2 elements **Defined:** locally within element criteria [28] in cuahsiTimeSeries_v1_0.xsd, see XML source [80] **Includes:** definitions of 2 elements	*79*
timeSeries (in timeSeriesResponse)	Contains the source of the time series, the variable, and values element which is an array of value elements and thier associated metadata (qualifiers, methods, sources, quality control level, samples) **Type:** TimeSeriesType [130] **Content:** complex, 1 attribute, 3 elements **Defined:** locally within complexType TimeSeriesResponseType [129] in cuahsiTimeSeries_v1_0.xsd, see XML source [81]	*80*

timeSeriesResponse	**Type:** TimeSeriesResponseType [129] **Content:** complex, 2 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [81] **Used:** never	*81*
timeSingle (type xsi:dateTime)	**Type:** xsi:dateTime **Content:** simple **Defined:** locally within complexType TimeSingleType [132] in cuahsiTimeSeries_v1_0.xsd, see XML source [82]	*81*
timeSupport (in variable)	Element containing the time support (or temporal footprint) of the data values. **Type:** anonymous complexType **Content:** complex, 1 attribute, 2 elements **Nillable:** *(can be declared as nil using xsi:nil attribute in instance XML documents)* **Defined:** locally within complexType VariableInfoType [139] in cuahsiTimeSeries_v1_0.xsd, see XML source [82] **Includes:** definitions of 1 attribute and 2 elements	*82*
timeZoneInfo	The default time zone for this site (+00:00) and if this site shifts to daylight savings time (attribute: usesDaylightSavingsTime) **Type:** anonymous complexType **Content:** complex, 1 attribute, 2 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [83] **Includes:** definitions of 1 attribute and 2 elements **Used:** at 2 locations	*83*
Title (in Metadata)	Title of data from a specific data source. **Type:** xsi:string **Content:** simple **Defined:** locally within complexType MetaDataType [109] in cuahsiTimeSeries_v1_0.xsd, see XML source [84]	*84*
TopicCategory (in Metadata)	Topic category keyword that gives the broad ISO19115 metadata topic category for data from this source. **Type:** xsi:string **Content:** simple **Defined:** locally within complexType MetaDataType [109] in cuahsiTimeSeries_v1_0.xsd, see XML source [85]	*84*
TypeOfContact (in ContactInformation)	Type of contact, in open terms: Project Contact Data source contact HIS Admin Data Source Admin Data Base Admin **Type:** xsi:string **Content:** simple **Defined:** locally within complexType ContactInformationType [100] in cuahsiTimeSeries_v1_0.xsd, see XML source [85]	*85*
unit (in timeSupport)	**Type:** UnitsType [134] **Content:** complex, 1 attribute, 4 elements **Defined:** locally within element timeSupport [83] in cuahsiTimeSeries_v1_0.xsd, see XML source [86]	*85*
UnitAbbreviation (in unit)	**Type:** xsi:string **Content:** simple **Defined:** locally within complexType UnitsType [135] in cuahsiTimeSeries_v1_0.xsd, see XML source [86]	*86*
UnitDescription (in unit)	**Type:** xsi:string **Content:** simple **Defined:** locally within complexType UnitsType [135] in cuahsiTimeSeries_v1_0.xsd, see XML source [87]	*86*
UnitName (in unit)	**Type:** xsi:string **Content:** simple **Defined:** locally within complexType UnitsType [135] in cuahsiTimeSeries_v1_0.xsd, see XML source [87]	*87*

units	**Type:** anonymous (extension of xsi:string) **Content:** simple, 3 attributes **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [88] **Used:** at 2 locations	*87*
UnitType (in unit)	**Type:** UnitsTypeEnum [149] **Content:** simple **Defined:** locally within complexType UnitsType [135] in cuahsiTimeSeries_v1_0.xsd, see XML source [88]	*88*
value (in values)	Multiple <value>s represent the data series. **Type:** ValueSingleVariable [135] **Content:** simple, 17 attributes **Defined:** locally within complexType TsValuesSingleVariableType [134] in cuahsiTimeSeries_v1_0.xsd, see XML source [89]	*88*
valueCount (in series)	**Type:** anonymous (extension of xsi:int) **Content:** simple, 1 attribute **Defined:** locally within element series [71] in cuahsiTimeSeries_v1_0.xsd, see XML source [90] **Includes:** definition of 1 attribute	*89*
values (in timeSeries)	A list of values and associated metadata. **Type:** TsValuesSingleVariableType [132] **Content:** complex, 6 attributes, 6 elements **Defined:** locally within complexType TimeSeriesType [131] in cuahsiTimeSeries_v1_0.xsd, see XML source [91]	*90*
valueType (type valueTypeEnum)	**Type:** valueTypeEnum [150] **Content:** simple **Defined:** locally at 2 locations in cuahsiTimeSeries_v1_0.xsd	*91*
variable (type VariableInfoType)	**Type:** VariableInfoType [137] **Content:** complex, 2 attributes, 14 elements **Defined:** locally at 3 locations in cuahsiTimeSeries_v1_0.xsd	*92*
variableCode	Text code used by the organization that collects the data to identify the variable. **Type:** anonymous (extension of xsi:token) **Content:** simple, 4 attributes **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [93] **Includes:** definition of 1 attribute **Used:** at 1 location	*93*
variableDescription (in variable)	A detailed description of the variable. **Type:** xsi:string **Content:** simple **Defined:** locally within complexType VariableInfoType [140] in cuahsiTimeSeries_v1_0.xsd, see XML source [94]	*94*
variableName (in variable)	A brief name of the variable that could be shown in a menu **Type:** xsi:string **Content:** simple **Defined:** locally within complexType VariableInfoType [140] in cuahsiTimeSeries_v1_0.xsd, see XML source [94]	*94*
variableParam (in criteria)	the variable paramter passed into the service **Type:** xsi:string **Content:** simple **Defined:** locally within element criteria [28] in cuahsiTimeSeries_v1_0.xsd, see XML source [95]	*95*

variables	variables is a list of variable elements (VariableInfoType).	*95*
	Type: anonymous complexType **Content:** complex, 1 element **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [96] **Includes:** definition of 1 element **Used:** at 1 location	
variablesResponse	**Type:** VariablesResponseType [140] **Content:** complex, 2 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [96] **Used:** never	*96*
variableTimeInterval (in series)	this describes the time period that ana variable or observed parameter are available for. **Type:** TimePeriodType [128] **Content:** empty **Defined:** locally within element series [71] in cuahsiTimeSeries_v1_0.xsd, see XML source [97]	*96*
verticalDatum (in siteInfo)	**Type:** xsi:string **Content:** simple **Defined:** locally within complexType SiteInfoType [123] in cuahsiTimeSeries_v1_0.xsd, see XML source [97]	*97*
west (in latLonBox)	West Longitude **Type:** Longitude [145] **Content:** simple **Defined:** locally within complexType LatLonBoxType [107] in cuahsiTimeSeries_v1_0.xsd, see XML source [98]	*97*
X (in localSiteXY)	**Type:** xsi:double **Content:** simple **Defined:** locally within element localSiteXY [44] in cuahsiTimeSeries_v1_0.xsd, see XML source [98]	*98*
Y (in localSiteXY)	**Type:** xsi:double **Content:** simple **Defined:** locally within element localSiteXY [44] in cuahsiTimeSeries_v1_0.xsd, see XML source [98]	*98*
Z (in localSiteXY)	**Type:** xsi:double **Content:** simple **Defined:** locally within element localSiteXY [44] in cuahsiTimeSeries_v1_0.xsd, see XML source [99]	*98*

Complex Type Summary		Page
ContactInformationType	Contains information about a contact. **Content:** complex, 5 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [99] **Includes:** definitions of 5 elements **Used:** at 1 location	*99*
DataSetInfoType	DataSetInfoType describes time series derived from a dataset, such as a netCDF file, or a gridded model. **Content:** complex, 6 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [101] **Includes:** definitions of 6 elements **Used:** at 1 location	*100*
DocumentationType	**Content:** mixed, 4 attributes **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [102] **Includes:** definition of 1 attribute **Used:** never	*102*

GeogLocationType	GeogLocationType is the base class for the two geometry types: LatLonPointType, and LatLonBoxType.	*102*
	Content: empty, 1 attribute **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [103] **Includes:** definition of 1 attribute **Used:** at 4 locations	
LabMethodType	contains descriptions of the laboratory methods used to analyze physical samples for specific constituents.	*103*
	Content: complex, 1 attribute, 5 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [104] **Includes:** definitions of 1 attribute and 5 elements **Used:** at 1 location	
LatLonBoxType	**Content:** complex, 1 attribute, 4 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [106] **Includes:** definitions of 4 elements **Used:** at 1 location	*105*
LatLonPointType	**Content:** complex, 1 attribute, 2 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [107] **Includes:** definitions of 2 elements **Used:** at 1 location	*107*
MetaDataType	MetadataType contains the information from the ODM table IsoMetadata.	*108*
	Content: complex, 5 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [109] **Includes:** definitions of 5 elements **Used:** at 1 location	
MethodType	Method used to collect the data and any additional information about the method.	*109*
	Content: complex, 1 attribute, 2 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [110] **Includes:** definitions of 1 attribute and 2 elements **Used:** at 2 locations	
NoteType	NoteType defines the note element available in many defined types. the value should the description of the note.	*111*
	Content: simple, 4 attributes **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [111] **Includes:** definition of 1 attribute **Used:** at 1 location	
OffsetType	OffsetType contains full descriptive information for each of the measurement offsets.	*112*
	Content: complex, 1 attribute, 5 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [112] **Includes:** definitions of 1 attribute and 5 elements **Used:** at 1 location	
QualifiersType	qualifying comments that accompany the data	*113*
	Content: complex, 1 element **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [114] **Includes:** definition of 1 element **Used:** never	
QualityControlLevelType	Value is the text Code used to identify the level of quality control to which data values have been subjected.	*114*
	Content: simple, 1 attribute **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [115] **Includes:** definition of 1 attribute **Used:** at 1 location	

QueryInfoType	This contains information about the request, and is used to enable the XML responses (timeSeriesResponse, variablesResponse,siteResponse) to be stored on disk.	*115*
	Content: complex, 6 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [116] **Includes:** definitions of 6 elements **Used:** at 1 location	
SampleType	information about physical samples analyzed in a laboratory.	*117*
	Content: complex, 1 attribute, 3 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [117] **Includes:** definitions of 1 attribute and 3 elements **Used:** never	
seriesCatalogType	Series catalog represents a list of series, where each separate data series are for the purposes of identifying or displaying what data are available at each site.	*118*
	Content: complex, 2 attributes, 3 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [119] **Includes:** definitions of 2 attributes and 3 elements **Used:** at 1 location	
SiteInfoResponseType	A sitesResponse contains a list of zero or more site elements.	*120*
	Content: complex, 2 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [120] **Includes:** definitions of 2 elements **Used:** at 1 location	
SiteInfoType	A sampling station is any place where data are collected.	*121*
	Content: complex, 2 attributes, 9 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [122] **Includes:** definitions of 9 elements **Used:** at 1 location	
SourceInfoType	SourceInfoType is used to describe the data source in the timeSeriesResponse.	*124*
	Content: empty **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [124] **Used:** at 3 locations	
SourceType	original sources of the data, providing information sufficient to retrieve and reconstruct the data value from the original data files if necessary	*124*
	Content: complex, 1 attribute, 5 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [125] **Includes:** definitions of 1 attribute and 5 elements **Used:** at 2 locations	
TimeIntervalType	For where a series has multiple observations, and a define beingDateTime as dateTime of the first data value in the series, and endDateTime dateTime of the last data value in the series.	*126*
	Content: complex, 2 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [126] **Includes:** definitions of 2 elements **Used:** never	
TimePeriodRealTimeType	Use where a site has an evolving period where data is available.	*127*
	Content: complex, 3 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [127] **Includes:** definitions of 3 elements **Used:** never	

TimePeriodType	time series (site-variable-observation) can have three types of time periods: 1) definite start and end time, or TimeIntervalType, 2) single observation, or TimeSingleType 3) Real Time station with moving window of data available, or TimeRealTimeType In order to simplify client development, all types now include beginDateTime, and endDateTime. **Content:** empty **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [129] **Used:** at 4 locations	*128*
TimeSeriesResponseType	**Content:** complex, 2 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [129] **Includes:** definitions of 2 elements **Used:** at 1 location	*129*
TimeSeriesType	Contains the source of the time series, the variable, and values element which is an array of value elements and thier associated metadata (qualifiers, methods, sources, quality control level, samples) **Content:** complex, 1 attribute, 3 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [130] **Includes:** definitions of 1 attribute and 3 elements **Used:** at 1 location	*130*
TimeSingleType	For where a series is a single observation. timeSingle, beginDateTime, and endDateTime will have the same value. **Content:** complex, 3 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [131] **Includes:** definitions of 3 elements **Used:** never	*131*
TsValuesSingleVariableType	TsValuesSingleVariableTypea aggregates the list of values and associated metadata. **Content:** complex, 6 attributes, 6 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [133] **Includes:** definitions of 3 attributes and 6 elements **Used:** at 1 location	*132*
UnitsType	**Content:** complex, 1 attribute, 4 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [135] **Includes:** definitions of 1 attribute and 4 elements **Used:** at 1 location	*134*
ValueSingleVariable	**Content:** simple, 17 attributes **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [136] **Used:** at 1 location	*135*
VariableInfoType	VariableInfoType is a complex type containting full descriptive information about a variable, as described by the ODM. **Content:** complex, 2 attributes, 14 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [137] **Includes:** definitions of 14 elements **Used:** at 1 location	*137*
VariablesResponseType	VariablesResponseType is object type returned by the method GetVariableInfo. **Content:** complex, 2 elements **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [141] **Includes:** definitions of 2 elements **Used:** at 1 location	*140*

Simple Type Summary		*Page*
CensorCodeEnum	**Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [142] **Used:** at 1 location	*141*
dataTypeEnum	**Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [143] **Used:** at 1 location	*142*

DocumentationEnumTypes	**Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [143] **Used:** at 1 location	*143*
generalCategoryEnum	**Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [144] **Used:** at 1 location	*144*
Latitude	The latitude of the site in a decimal degrees as calculated in terms of the given datum. **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [145] **Used:** at 3 locations	*145*
Longitude	The longitude of the site in a decimal degrees as calculated in terms of the given datum. **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [146] **Used:** at 3 locations	*145*
QualityControlLevelEnum	**Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [147] **Used:** at 1 location	*146*
SampleMediumEnum	**Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [148] **Used:** at 1 location	*147*
sampleTypeEnum	**Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [149] **Used:** at 1 location	*148*
UnitsTypeEnum	**Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [150] **Used:** at 2 locations	*149*
valueTypeEnum	**Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [151] **Used:** at 1 location	*150*

Attribute Group Summary		*Page*
DbIdentifiers	thei attribute group provides provenance information for when an object is retrieved from a database. **Content:** 2 attributes **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [152] **Includes:** definitions of 2 attributes **Used:** at 5 locations	*151*
offsetAttr	**Content:** 5 attributes **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [152] **Includes:** definitions of 5 attributes **Used:** at 1 location	*152*
timeZoneAttr	**Content:** 2 attributes **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [153] **Includes:** definitions of 2 attributes **Used:** at 2 locations	*153*
unitsAttr	**Content:** 3 attributes **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [154] **Includes:** definitions of 3 attributes **Used:** at 2 locations	*154*
ValueAttr	valueAttr contains the possible attributes that can be associated with a data value element. **Content:** 10 attributes **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [155] **Includes:** definitions of 10 attributes **Used:** at 1 location	*155*
VocabularyAttributes	Tthe attribute group vocabularyAttributes contains common attributes used to differentiate data source codes. **Content:** 3 attributes **Defined:** globally in cuahsiTimeSeries_v1_0.xsd, see XML source [157] **Includes:** definitions of 3 attributes **Used:** at 6 locations	*157*

XLinkAttr	**Content:** 3 attributes	*158*
	Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [158]	
	Includes: definitions of 3 attributes	
	Used: at 2 locations	

XML Schema *"cuahsiTimeSeries_v1_0.xsd"*

Target Namespace:
http://www.cuahsi.org/waterML/1.0/

Version:
1.01

Defined Components:
17 global elements, 102 local elements, 31 complexTypes, 11 simpleTypes, 7 attribute groups

Default Namespace-Qualified Form:
Local Elements: qualified; Local Attributes: unqualified

Schema Location:
https://svn.sdsc.edu/repo/WATER/CUAHSI/WebServices/BaseWofService/WofSchemas/cuahsiTimeSeries_v1_0.xsd

Annotation

Changes: 2006-07-10 valentine removed choice. Replaced with Types defined TimePeriodType TimeIntervalType TimeSingleType added GeogLocationType to hold the geometry redefined LatLongPoint as a type defined LatLongBox to hold defined simpleTypes Latitude and Longitude added DataSetLocation Element (type GeogLocationType) to dataset info removed xlink namespace. Just used the xlink concept (problems getting it to compile with xlink schema) 2006-08-30 valentine MANY CHANGES to: sync with the Observations Database terminolog simplify. Removed many unneeded types. (initial version was Type happy) types mostly used only when needed (Geometry, SourceInfo, TimeSeries, Notes, Enumerations). *** Element Case Standardize **** All types are PascalCase All CUAHSI elements and attributes are camelCase * All root response elements are now elements, and not types ** SitesResponse ** TimeSeriesResponse (not timeSeriesType) ** VariablesResponse * extension elements added. ** These are extension points for groups like the USGS that wish to include more information than the normal community uses. * enumerations added * unitType * censorCode (characters used because symbols make for unmaintainable source code) * lt - less than * gt - greater than * nc - no code * variable types consolidated * units element added * consistent siteID/variableID pattern (both include a XXXCode) * Remove many types ** too many to list. * values == TsValuesType renamed from TsValuesSingleVariableType ** split values element out to type ValueSingleVar (c# change tsValuesTypeValueType to ValueSingleVar). ** qualifier elements can be added after the final value element in the Values element. *** we don't know the full list of included qualifiers until we get done with the values. *** at present, qualifiers attribute in the value element is an aggregated field. element block looks like: = values == value qualifers="A" == value qualifers="Ae" == qualifier qualifierCode="A" "Approved" == qualifier qualifierCode="e" "Estimated. This value has been estimated." 2006-09-08 variableID renamed variableCode siteID renamed siteCode siteID and variableID attributes added, xxCode removed siteCode name moved into siteInfo 2006-09-15 variable/name to variable/variableName variablePeriod to variablePeriodOfObservation 2006-09-17 added QualityControlLevelEnum added attribute qualityControlLevel to valueAttribute group. (affects ValueSingleVariable) added qualityControlLevel element, and element to the TSValuesSingleVariableType namespace changed to http://www.cuahsi.org/waterML/1.0/ return to types for top level elements, without this they get named getValuesResponse added note to siteInfoElement. We need to put the URL or Retreved from DB not in this block. added TimePeriodRealTime. Need to represent real time data. 2006-0920 variablePeriodofRecorr to seriesCatalog variablePeriodOfObservation to series variableObservationCount to valueCount (to match the OD) added enumerations from the OD valueTypeEnum generalCategoryEnum sampleMediumEnum dataTypeEnum 2006-09-24 queryInfo/criteria/timeParam is now a sequence, since a start or end time can be null The community wants it to be easy, and VB and other .net have problems with some values: converted xsd:decimal to xsd:double. decimal is not well handled by VB converted tsValuesSingleVaribaleType/count from xsd:nonNegativeInteger to xsd:int. 2006-09-28 API signature has been changed to strings. queryInfo/timeInterval/... changed to strings 2007-07-09 ODM seriesCatalog table added columns. Columns now added DataValue element was missing: DataType(eg statistic), Method, Source, and QualityControlLevel. 2007-08-28 added to values method[](methodType), source[](SourceType) added "Unknown" to many enumerations. contactInformation in sourceType changed to unbounded 2007-08-29 DT/DM believes that including an offsetDescription on every element is verbose offsetTypeID attribute added to offsetAttr offsetType Type added, Designed to be a bit more extensible, and handle 2007-08-30 restored attributes that had the offset information on the values offsetAttr restored attr offsetUnitsAbbreviation offsetUnitsCode offsetDescription 2007-11-14 Many services use agency (aka EPA, and USGS) added attributes agencyCode and AgencyName to siteCode. 2007-11-29 SiteInfo/TimezoneInfo min occurs 0 max 1 Series/QualityControlLevel min occurs 0 max 1

element <Abstract>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: `xsi:string`
Content: simple
Defined: locally within complexType `MetaDataType` [109] in cuahsiTimeSeries_v1_0.xsd, see XML source [24]

XML Representation Summary

<Abstract
    Content: { xsi:string }
</Abstract>

Included in content model of elements (1):

Metadata (type MetaDataType) [45]

Annotation

Abstract of data from a specific data source. Abstract field should be populated with a more complete text description of the data that the metadata record references. This field can be populated with "Unknown" if there is no abstract for the data.

XML Source (w/o annotations (1))

<xsi:element maxOccurs="**1**" minOccurs="**0**" name="**Abstract**" type="**xsi:string**"/>

---

element <Address>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: `xsi:anyType`
Content: any
Defined: locally within complexType `ContactInformationType` [100] in cuahsiTimeSeries_v1_0.xsd, see XML source [24]

XML Representation Summary

<Address
    Content: { xsi:anyType }
</Address>

Included in content model of elements (1):

ContactInformation (type ContactInformationType) [26]

Annotation

Any address element structure that can be used to communicate contact information.

XML Source (w/o annotations (1))

<xsi:element minOccurs="**0**" name="**Address**" type="**xsi:anyType**"/>

---

element <altname>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: `xsi:string`
Content: simple
Defined: locally within complexType `SiteInfoType` [122] in cuahsiTimeSeries_v1_0.xsd, see XML source [25]

XML Representation Summary

<altname
   Content: { xsi:string }
</altname>

Included in content model of elements (1):

> siteInfo (in site) [75]

Annotation

Alternate name

XML Source (w/o annotations (1))

<xsi:element maxOccurs="**unbounded**" minOccurs="**0**" name="**altname**" type="**xsi:string**"/>

element <beginDateTime>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:string
Content: simple
Defined: locally within element timeParam [80] in cuahsiTimeSeries_v1_0.xsd, see XML source [25]

XML Representation Summary

<beginDateTime
   Content: { xsi:string }
</beginDateTime>

Included in content model of elements (1):

> timeParam (in criteria) [79]

Annotation

The string submited as startDate to the GetValues method

XML Source (w/o annotations (1))

<xsi:element maxOccurs="**1**" minOccurs="**0**" name="**beginDateTime**" type="**xsi:string**"/>

element <beginDateTime>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:dateTime
Content: simple
Defined: locally at 3 locations in cuahsiTimeSeries_v1_0.xsd

XML Representation Summary

<beginDateTime
   Content: { xsi:dateTime }
</beginDateTime>

Definition Locations

- **Within global complexTypes (3):**

  TimeIntervalType [126], TimePeriodRealTimeType [128], TimeSingleType [132]

Annotations (2) (by all definition locations)

Location:

within complexType `TimePeriodRealTimeType` [128]

Annotation:

dateTime of the first data value in the series. This should be be calculated based on the duration stored in realTimeDataPeriod The dateTime is specified in the following form "YYYY-MM-DDThh:mm:ss" where: * YYYY indicates the year * MM indicates the month * DD indicates the day * T indicates the start of the required time section * hh indicates the hour * mm indicates the minute * ss indicates the second Note: All components are required!

Locations:

within complexType `TimeIntervalType` [126], within complexType `TimeSingleType` [132]

Annotation:

dateTime of the first data value in the series. The dateTime is specified in the following form "YYYY-MM-DDThh:mm:ss" where: * YYYY indicates the year * MM indicates the month * DD indicates the day * T indicates the start of the required time section * hh indicates the hour * mm indicates the minute * ss indicates the second Note: All components are required!

element <ContactInformation>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: `ContactInformationType` [99]
Content: complex, 5 elements
Defined: locally within complexType `SourceType` [125] in cuahsiTimeSeries_v1_0.xsd, see XML source [27]

XML Representation Summary

<ContactInformation>
    Content: ContactName, TypeOfContact?, Phone?, Email?, Address?
</ContactInformation>

Content model elements (5):

Address (in ContactInformation) [24],   Phone (in ContactInformation) [57],
ContactName (in ContactInformation) [27],   TypeOfContact (in ContactInformation) [85]
Email (in ContactInformation) [33],

Included in content model of elements (2):

Source (in series) [77],   source (in values) [76]

Annotation

Contact information about source.

XML Source (w/o annotations (1))

`<xsi:element minOccurs="`**`0`**`" name="`**`ContactInformation`**`" type="`**`ContactInformationType`**`"/>`

element <ContactName>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:string
Content: simple
Defined: locally within complexType ContactInformationType [100] in cuahsiTimeSeries_v1_0.xsd, see XML source [27]

XML Representation Summary

<ContactName
   Content: { xsi:string }
</ContactName>

Included in content model of elements (1):

ContactInformation (type ContactInformationType) [26]

Annotation

name of contact, or title of organization

XML Source (w/o annotations (1))

`<xsi:element maxOccurs="`**`1`**`" minOccurs="`**`1`**`" name="`**`ContactName`**`" type="`**`xsi:string`**`"/>`

element <creationTime>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:dateTime
Content: simple
Defined: locally within complexType QueryInfoType [116] in cuahsiTimeSeries_v1_0.xsd, see XML source [27]

XML Representation Summary

<creationTime
   Content: { xsi:dateTime }
</creationTime>

Included in content model of elements (1):

queryInfo (type QueryInfoType) [63]

Annotation

When was this response originally created.

XML Source (w/o annotations (1))

`<xsi:element minOccurs="`**`0`**`" name="`**`creationTime`**`" type="`**`xsi:dateTime`**`"/>`

element <criteria>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: anonymous complexType
Content: complex, 3 elements
Defined: locally within complexType QueryInfoType [116] in cuahsiTimeSeries_v1_0.xsd, see XML source [28]
Includes: definitions of 3 elements

XML Representation Summary

<criteria>
    Content: (locationParam?, variableParam?, timeParam?)?
</criteria>

Content model elements (3):

locationParam (in criteria) [44], variableParam (in criteria) [95]
timeParam (in criteria) [79],

Included in content model of elements (1):

queryInfo (type QueryInfoType) [63]

Annotation

The criteria are the actual parameters that are passed into the method. If you are generate this without a XML helper class, be sure to properly encode these elements.

XML Source (w/o annotations (6))

```
<xsi:element minOccurs="0" name="criteria">
  <xsi:complexType>
    <xsi:sequence minOccurs="0">
      <xsi:element minOccurs="0" name="locationParam" type="xsi:string"/>
      <xsi:element minOccurs="0" name="variableParam" type="xsi:string"/>
      <xsi:element minOccurs="0" name="timeParam">
        <xsi:complexType>
          <xsi:sequence>
            <xsi:element maxOccurs="1" minOccurs="0" name="beginDateTime" type="xsi:string"/>
            <xsi:element maxOccurs="1" minOccurs="0" name="endDateTime" type="xsi:string"/>
          </xsi:sequence>
        </xsi:complexType>
      </xsi:element>
    </xsi:sequence>
  </xsi:complexType>
</xsi:element>
```

Content Element Detail (defined in this component only; 3/3)

🟢 locationParam [44]

    Type: xsi:string, predefined, simple content

    the location or site parameter passed into the site

🟢 timeParam [79]

    Type: anonymous, complex content

    the begin and end time of the GetValues request used to generate a timeSeriesResponse.

🟢 variableParam [95]

    Type: xsi:string, predefined, simple content

the variable paramter passed into the service

element <dataSetDescription>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:string
Content: simple
Defined: locally within complexType DataSetInfoType [101] in cuahsiTimeSeries_v1_0.xsd, see XML source [29]

XML Representation Summary
<dataSetDescription
   Content: { xsi:string }
</dataSetDescription>

Included in content model of elements (1):

datasetInfo [29]

Annotation

Text description describing the data source.

XML Source (w/o annotations (1))

<xsi:element maxOccurs="**1**" minOccurs="**0**" name="**dataSetDescription**" type="**xsi:string**"/>

element <dataSetIdentifier>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:string
Content: simple
Defined: locally within complexType DataSetInfoType [101] in cuahsiTimeSeries_v1_0.xsd, see XML source [29]

XML Representation Summary
<dataSetIdentifier
   Content: { xsi:string }
</dataSetIdentifier>

Included in content model of elements (1):

datasetInfo [29]

Annotation

The indentifier which the original source uses to identify this dataset. This may be a unique indentifier, or a URL from which the data source was retireved

XML Source (w/o annotations (1))

<xsi:element name="**dataSetIdentifier**" type="**xsi:string**"/>

element <datasetInfo>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: DataSetInfoType [100]
Content: complex, 6 elements
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [30]
Used: never

XML Representation Summary

<datasetInfo>
    Content: dataSetIdentifier, timeZoneInfo?, dataSetDescription?, note*, dataSetLocation?, extension?
</datasetInfo>

Content model elements (6):

dataSetDescription (in datasetInfo) [29],   extension [35],
dataSetIdentifier (in datasetInfo) [29],   note (type NoteType) [49],
dataSetLocation (in datasetInfo) [30],   timeZoneInfo [83]

Annotation

dataSetInfo element describes time series derived from a dataset, such as a netCDF file, or a gridded model.

XML Source (w/o annotations (1))

<xsi:element name="**datasetInfo**" type="**DataSetInfoType**"/>

---

element <dataSetLocation>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: GeogLocationType [102]
Content: empty, 1 attribute
Defined: locally within complexType DataSetInfoType [101] in cuahsiTimeSeries_v1_0.xsd, see XML source [30]

XML Representation Summary

<dataSetLocation
    srs = xsi:string : "EPSG:4326"
/>

Included in content model of elements (1):

datasetInfo [29]

Annotation

geolocation describing the spatial coverage of a gridded dataset.

XML Source (w/o annotations (1))

<xsi:element maxOccurs="**1**" minOccurs="**0**" name="**dataSetLocation**" type="**GeogLocationType**"/>

---

element <dataType>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: dataTypeEnum [142]
Content: simple
Defined: locally at 2 locations in cuahsiTimeSeries_v1_0.xsd

XML Representation Summary

<dataType
    Content: { *enumeration of* xsi:string }
</dataType>

Simple Content Detail:

Enumeration: "Continuous", "Instantaneous", "Cumulative", "Incremental", "Average", "Maximum", "Minimum", "Constant Over Interval", "Categorical", "Best Easy Systematic Estimator ", "Unknown", "Variance", "Median", "Mode", "Best Easy Systematic Estimator", "Standard Deviation", "Skewness", "Equivalent Mean", "Sporadic", "Unknown"

Included in content model of elements (2):

series (in seriesCatalog) [69], variable (type VariableInfoType) [92]

Definition Locations

- **Within global complexTypes (1):**

   VariableInfoType [138]

- **Within anonymous complexTypes of elements (1):**

   series (in seriesCatalog) [70]

Annotations (2) (by all definition locations)

Location:

within complexType VariableInfoType [138]

Annotation:

Text value that identifies the data values as one of several types from the dataTypeEnum A default value of "Unknown" can be used where the data type is unknown.

Location:

within element series [70]

Annotation:

Text value that identifies the data as one of several types as found ing dataTypeEnum

element <daylightSavingsTimeZone>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: anonymous complexType
Content: empty, 2 attributes
Defined: locally within element timeZoneInfo [84] in cuahsiTimeSeries_v1_0.xsd, see XML source [32]

XML Representation Summary

<daylightSavingsTimeZone
    ZoneAbbreviation = xsi:normalizedString
    ZoneOffset = xsi:string
/>

Included in content model of elements (1):

timeZoneInfo [83]

Annotation

The daylight savings time zone for a site, specified in hours and minutes: "hh:mm"

XML Source (w/o annotations (1))

```
<xsi:element maxOccurs="1" minOccurs="0" name="daylightSavingsTimeZone">
  <xsi:complexType>
    <xsi:attributeGroup ref="timeZoneAttr"/>
  </xsi:complexType>
</xsi:element>
```

element <defaultTimeZone>

Namespace:	http://www.cuahsi.org/waterML/1.0/
Type:	anonymous complexType
Content:	empty, 2 attributes
Defined:	locally within element timeZoneInfo [84] in cuahsiTimeSeries_v1_0.xsd, see XML source [32]

XML Representation Summary

```
<defaultTimeZone
    ZoneAbbreviation = xsi:normalizedString
    ZoneOffset          = xsi:string
/>
```

Included in content model of elements (1):

timeZoneInfo [83]

Annotation

The default time zone for a site, specified in hours and minutes: "hh:mm"

XML Source (w/o annotations (1))

```
<xsi:element maxOccurs="1" minOccurs="0" name="defaultTimeZone">
  <xsi:complexType>
    <xsi:attributeGroup ref="timeZoneAttr"/>
  </xsi:complexType>
</xsi:element>
```

element <east>

Namespace:	http://www.cuahsi.org/waterML/1.0/
Type:	Longitude [145]
Content:	simple
Defined:	locally within complexType LatLonBoxType [106] in cuahsiTimeSeries_v1_0.xsd, see XML source [33]

XML Representation Summary

```
<east
    Content: { xsi:double }
</east>
```

Simple Content Detail:

MaxInclusive: `180.00`
MinInclusive: `-180.00`

Included in content model of elements (1):

latLonBox [42]

Annotation

East longitude.

XML Source (w/o annotations (1))

`<xsi:element name="east" type="Longitude"/>`

---

element <elevation_m>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: `xsi:double`
Content: simple
Defined: locally within complexType `SiteInfoType` [123] in cuahsiTimeSeries_v1_0.xsd, see XML source [33]

XML Representation Summary

```
<elevation_m
    Content: { xsi:double }
</elevation_m>
```

Included in content model of elements (1):

siteInfo (in site) [75]

Annotation

Elevation in meters. A vertical datum should also be provided.

XML Source (w/o annotations (1))

`<xsi:element maxOccurs="1" minOccurs="0" name="elevation_m" type="xsi:double"/>`

---

element <Email>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: `xsi:string`
Content: simple
Defined: locally within complexType `ContactInformationType` [100] in cuahsiTimeSeries_v1_0.xsd, see XML source [34]

XML Representation Summary

```
<Email
    Content: { xsi:string }
</Email>
```

Included in content model of elements (1):

ContactInformation (type ContactInformationType) [26]

Annotation

email address

XML Source (w/o annotations (1))

```
<xsi:element minOccurs="0" name="Email" type="xsi:string"/>
```

element <endDateTime>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:string
Content: simple
Defined: locally within element timeParam [80] in cuahsiTimeSeries_v1_0.xsd, see XML source [34]

XML Representation Summary

<endDateTime
   Content: { xsi:string }
</endDateTime>

Included in content model of elements (1):

timeParam (in criteria) [79]

Annotation

The string submited a startDate to the GetValues method

XML Source (w/o annotations (1))

```
<xsi:element maxOccurs="1" minOccurs="0" name="endDateTime" type="xsi:string"/>
```

element <endDateTime>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:dateTime
Content: simple
Defined: locally at 3 locations in cuahsiTimeSeries_v1_0.xsd

XML Representation Summary

<endDateTime
   Content: { xsi:dateTime }
</endDateTime>

Definition Locations

- **Within global complexTypes (3):**

    TimeIntervalType [127], TimePeriodRealTimeType [128], TimeSingleType [132]

Annotations (2) (by all definition locations)

Locations:

within complexType <u>TimeIntervalType</u> [127], within complexType <u>TimeSingleType</u> [132]

Annotation:

Date of the last data value in the series. The dateTime is specified in the following form "YYYY-MM-DDThh:mm:ss" where: * YYYY indicates the year * MM indicates the month * DD indicates the day * T indicates the start of the required time section * hh indicates the hour * mm indicates the minute * ss indicates the second Note: All components are required!

Location:

within complexType <u>TimePeriodRealTimeType</u> [128]

Annotation:

Date of the last data value in the series. This should be be calculated based on the duration stored in realTimeDataPeriod The dateTime is specified in the following form "YYYY-MM-DDThh:mm:ss" where: * YYYY indicates the year * MM indicates the month * DD indicates the day * T indicates the start of the required time section * hh indicates the hour * mm indicates the minute * ss indicates the second Note: All components are required!

element <extension>

Namespace: <u>http://www.cuahsi.org/waterML/1.0/</u>
Type: xsi:anyType
Content: any
Defined: globally in <u>cuahsiTimeSeries_v1_0.xsd</u>, see <u>XML source</u> [36]
Used: at 7 <u>locations</u>

XML Representation Summary

<extension
   Content: { xsi:anyType }
</extension>

Included in content model of elements (7):

<u>datasetInfo</u> [29],   <u>site</u> [72],
<u>queryInfo</u> (type <u>QueryInfoType</u>) [63], <u>siteInfo</u> (in <u>site</u>) [75],
<u>series</u> (in <u>seriesCatalog</u>) [69],   <u>variable</u> (type <u>VariableInfoType</u>) [92]
<u>seriesCatalog</u> (in <u>site</u>) [71],

Known Usage Locations

- **Within global complexTypes (5):**

  <u>DataSetInfoType</u> [101], <u>QueryInfoType</u> [116], <u>SiteInfoType</u> [123], <u>VariableInfoType</u> [138], <u>seriesCatalogType</u> [119]

- **Within anonymous complexTypes of elements (2):**

  <u>series</u> (in <u>seriesCatalog</u>) [70], <u>site</u> [73]

Annotation

In order to simplify comprehension, data sources are encouraged to put additional informaiton in the extension area, using thier own namespace. Clients need not understand information in <extension?

XML Source (w/o annotations (1))

```
<xsi:element name="extension" type="xsi:anyType"/>
```

element <generalCategory>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: generalCategoryEnum [144]
Content: simple
Defined: locally at 2 locations in cuahsiTimeSeries_v1_0.xsd

XML Representation Summary
<generalCategory
    Content: { enumeration of xsi:string }
</generalCategory>

Simple Content Detail:

Enumeration: "Water Quality", "Climate", "Hydrology", "Geology", "Biota", "Unknown", "Instrumentation"

Included in content model of elements (2):

series (in seriesCatalog) [69],   variable (type VariableInfoType) [92]

Definition Locations

- **Within global complexTypes (1):**

  VariableInfoType [138]

- **Within anonymous complexTypes of elements (1):**

  series (in seriesCatalog) [70]

Annotations (2) (by all definition locations)

Location:

within element series [70]

Annotation:

General category of the variable as listed in generalCategoryEnum

Location:

within complexType VariableInfoType [138]

Annotation:

General category of the data values from the generalCategoryEnum. A default value of "Unknown" can be used where the general category is unknown.

element <geogLocation>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: GeogLocationType [102]
Content: empty, 1 attribute
Defined: locally within element geoLocation [38] in cuahsiTimeSeries_v1_0.xsd, see XML source [37]

XML Representation Summary

<geogLocation
    srs = xsi:string : "EPSG:4326"
/>

Included in content model of elements (1):

geoLocation (in siteInfo) [37]

Annotation

Geographic location: A geographic location is required as part of the site information (siteInfoType or siteInfo element) At present this can be elements of GeogLocationType: LatLonPointType and LatLonBoxType. an xml schema type attribute can be used to determine which type is contained in this element (xsi:type="LatLonPointType" or xsi:type="LatLonBoxType")

XML Source (w/o annotations (1))

<xsi:element name="**geogLocation**" type="**GeogLocationType**"/>

---

element <geoLocation>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: anonymous complexType
Content: complex, 2 elements
Defined: locally within complexType SiteInfoType [123] in cuahsiTimeSeries_v1_0.xsd, see XML source [37]
Includes: definitions of 2 elements

XML Representation Summary

<geoLocation>
    Content: geogLocation, localSiteXY*
</geoLocation>

Content model elements (2):

geogLocation (in geoLocation) [36],   localSiteXY (in geoLocation) [43]

Included in content model of elements (1):

siteInfo (in site) [75]

Annotation

The geoLocation speficies the details of the geographic location. It contains two portions, a geographic locaiton &lt;geogLocation&gt;, and a local location &lt;localSiteXY&gt;. In order to be discovered spatially, geogLocation is required. The geogLocation can be of GeogLocationType, which at present is either a latLonPoint or a latLongBox. There may be multiple localSiteXY, which might be used by data sources to provide other coordinated system information, like UTM and State Plane coordinates.

XML Source (w/o annotations (5))

<xsi:element maxOccurs="**1**" minOccurs="**0**" name="**geoLocation**">

```
  <xsi:complexType>
    <xsi:sequence>
      <xsi:element name="geogLocation" type="GeogLocationType"/>
      <xsi:element maxOccurs="unbounded" minOccurs="0" name="localSiteXY">
        <xsi:complexType>
          <xsi:sequence>
            <xsi:element name="X" type="xsi:double"/>
            <xsi:element name="Y" type="xsi:double"/>
            <xsi:element maxOccurs="1" minOccurs="0" name="Z" type="xsi:double"/>
            <xsi:element maxOccurs="unbounded" minOccurs="0" name="note" type="NoteType"/>
          </xsi:sequence>
          <xsi:attribute name="projectionInformation" type="xsi:string"/>
        </xsi:complexType>
      </xsi:element>
    </xsi:sequence>
  </xsi:complexType>
</xsi:element>
```

Content Element Detail (defined in this component only; 2/2)

🟢 geogLocation [36]

> **Type:** GeogLocationType [102], empty content
>
> Geographic location: A geographic location is required as part of the site information (siteInfoType or siteInfo element) At present this can be elements of GeogLocationType: LatLonPointType and LatLonBoxType. an xml schema type attribute can be used to determine which type is contained in this element (xsi:type="LatLonPointType" or xsi:type="LatLonBoxType")

🟢 localSiteXY [43]

> **Type:** anonymous, complex content
>
> Site information can contain one or more other locations using the localSiteXY element. The projection string should be stored in projectionInformation. Lat or Northing = Y Lon or Easting = X

element <LabMethod>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: LabMethodType [103]
Content: complex, 1 attribute, 5 elements
Defined: locally within complexType SampleType [118] in cuahsiTimeSeries_v1_0.xsd, see XML source [39]

XML Representation Summary

```
<LabMethod
    labMethodID = xsi:int
    >
    Content: labName?, labOrganization?, LabMethodName?, labMethodDescription?, labMethodLink?
</LabMethod>
```

Content model elements (5):

labMethodDescription (in LabMethod) [39], labName (in LabMethod) [40],
labMethodLink (in LabMethod) [39], labOrganization (in LabMethod) [40]
LabMethodName (in LabMethod) [40],

Annotation

LabMethod is a LabMethodType containing infomration about lab methods

XML Source (w/o annotations (1))

`<xsi:element minOccurs="`**`0`**`" name="`**`LabMethod`**`" type="`**`LabMethodType`**`"/>`

element <labMethodDescription>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: `xsi:string`
Content: simple
Defined: locally within complexType `LabMethodType` [104] in cuahsiTimeSeries_v1_0.xsd, see XML source [39]

XML Representation Summary

`<labMethodDescription`
   Content: `{ xsi:string }`
`</labMethodDescription>`

Included in content model of elements (1):

LabMethod (type `LabMethodType`) [38]

Annotation

Description of the method and protocols used for sample analysis.

XML Source (w/o annotations (1))

`<xsi:element minOccurs="`**`0`**`" name="`**`labMethodDescription`**`" type="`**`xsi:string`**`"/>`

element <labMethodLink>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: `xsi:string`
Content: simple
Defined: locally within complexType `LabMethodType` [105] in cuahsiTimeSeries_v1_0.xsd, see XML source [39]

XML Representation Summary

`<labMethodLink`
   Content: `{ xsi:string }`
`</labMethodLink>`

Included in content model of elements (1):

LabMethod (type `LabMethodType`) [38]

Annotation

Link to additional reference material on the analysis method.

XML Source (w/o annotations (1))

`<xsi:element maxOccurs="`**`1`**`" minOccurs="`**`0`**`" name="`**`labMethodLink`**`" type="`**`xsi:string`**`"/>`

element <LabMethodName>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:string
Content: simple
Defined: locally within complexType LabMethodType [105] in cuahsiTimeSeries_v1_0.xsd, see XML source [40]

XML Representation Summary

<LabMethodName
    Content: { xsi:string }
</LabMethodName>

Included in content model of elements (1):

LabMethod (type LabMethodType) [38]

Annotation

Name of the method and protocols used for sample analysis. Suggest using nemi names and codes http://www.nemi.gov/ "USEPA-365.1"

XML Source (w/o annotations (1))

<xsi:element minOccurs="**0**" name="**LabMethodName**" type="**xsi:string**"/>

element <labName>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:string
Content: simple
Defined: locally within complexType LabMethodType [105] in cuahsiTimeSeries_v1_0.xsd, see XML source [40]

XML Representation Summary

<labName
    Content: { xsi:string }
</labName>

Included in content model of elements (1):

LabMethod (type LabMethodType) [38]

Annotation

Name of the laboratory responsible for processing the sample.

XML Source (w/o annotations (1))

<xsi:element minOccurs="**0**" name="**labName**" type="**xsi:string**"/>

element <labOrganization>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:string
Content: simple
Defined: locally within complexType LabMethodType [105] in cuahsiTimeSeries_v1_0.xsd, see XML source [41]

XML Representation Summary

<labOrganization
   Content: { xsi:string }
</labOrganization>

Included in content model of elements (1):

      LabMethod (type LabMethodType) [38]

Annotation

Organization responsible for sample analysis.

XML Source (w/o annotations (1))

<xsi:element minOccurs="**0**" name="**labOrganization**" type="**xsi:string**"/>

element <labSampleCode>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:string
Content: simple
Defined: locally within complexType SampleType [118] in cuahsiTimeSeries_v1_0.xsd, see XML source [41]

XML Representation Summary

<labSampleCode
   Content: { xsi:string }
</labSampleCode>

Annotation

Code or label used to identify and track lab sample or sample container (e.g. bottle) during lab analysis.

XML Source (w/o annotations (1))

<xsi:element name="**labSampleCode**" type="**xsi:string**"/>

element <latitude>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: Latitude [145]
Content: simple
Defined: locally within complexType LatLonPointType [108] in cuahsiTimeSeries_v1_0.xsd, see XML source [42]

XML Representation Summary

<latitude
   Content: { xsi:double }
</latitude>

Simple Content Detail:

MaxInclusive: `90.00`
MinInclusive: `-90.00`

Included in content model of elements (1):

latLonPoint [42]

Annotation

The latitude of the site in a decimal degrees as calculated in terms of the given datum.

XML Source (w/o annotations (1))

`<xsi:element name="`**latitude**`" type="`**Latitude**`"/>`

element <latLonBox>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: LatLonBoxType [105]
Content: complex, 1 attribute, 4 elements
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [42]
Used: never

XML Representation Summary

`<latLonBox`
    `srs` `=` `xsi:string : "EPSG:4326"`
    `>`
    Content: south, west, north, east
`</latLonBox>`

Content model elements (4):

east (in latLonBox) [32],   south (in latLonBox) [79],
north (in latLonBox) [49],   west (in latLonBox) [97]

Annotation

Box type describing a geographic location.

XML Source (w/o annotations (1))

`<xsi:element name="`**latLonBox**`" type="`**LatLonBoxType**`"/>`

element <latLonPoint>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: LatLonPointType [107]
Content: complex, 1 attribute, 2 elements
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [43]
Used: never

XML Representation Summary

<latLonPoint
    <u>srs</u> = xsi:string : "EPSG:4326"
    >
    Content: <u>latitude</u>, <u>longitude</u>
</latLonPoint>

Content model elements (2):

<u>latitude</u> (in <u>latLonPoint</u>) [41], <u>longitude</u> (in <u>latLonPoint</u>) [45]

Annotation

Point type for describing a geographic location

XML Source (w/o annotations (1))

<xsi:element name="**latLonPoint**" type="**LatLonPointType**"/>

element <localSiteXY>

Namespace: <u>http://www.cuahsi.org/waterML/1.0/</u>
Type: anonymous complexType
Content: complex, 1 <u>attribute</u>, 4 <u>elements</u>
Defined: <u>locally</u> within element <u>geoLocation</u> [38] in <u>cuahsiTimeSeries_v1_0.xsd</u>, see <u>XML source</u> [43]
Includes: definitions of 1 <u>attribute</u> and 4 <u>elements</u>

XML Representation Summary

<localSiteXY
    <u>projectionInformation</u> = xsi:string
    >
    Content: <u>X</u>, <u>Y</u>, <u>Z</u>?, <u>note</u>*
</localSiteXY>

Content model elements (4):

<u>note</u> (type <u>NoteType</u>) [49], <u>Y</u> (in <u>localSiteXY</u>) [98],
<u>X</u> (in <u>localSiteXY</u>) [98], <u>Z</u> (in <u>localSiteXY</u>) [98]

Included in content model of elements (1):

<u>geoLocation</u> (in <u>siteInfo</u>) [37]

Annotation

Site information can contain one or more other locations using the localSiteXY element. The projection string should be stored in projectionInformation. Lat or Northing = Y Lon or Easting = X

XML Source (w/o annotations (3))

<xsi:element maxOccurs="**unbounded**" minOccurs="**0**" name="**localSiteXY**">
  <xsi:complexType>
    <xsi:sequence>
      <xsi:element name="**X**" type="**xsi:double**"/>
      <xsi:element name="**Y**" type="**xsi:double**"/>
      <xsi:element maxOccurs="**1**" minOccurs="**0**" name="**Z**" type="**xsi:double**"/>
      <xsi:element maxOccurs="**unbounded**" minOccurs="**0**" name="**note**" type="**NoteType**"/>

```
      </xsi:sequence>
      <xsi:attribute name="projectionInformation" type="xsi:string"/>
   </xsi:complexType>
</xsi:element>
```

Attribute Detail (defined in this component only; 1/1)

🟨 projectionInformation

> **Type:** xsi:string, predefined
> **Use:** optional
>
> Spatial Reference System of the local coordinates. This should use the PROJ4 projection string standard

Content Element Detail (defined in this component only; 4/4)

🟢 note [49]

> **Type:** NoteType [111], simple content
>
> Additional information should be encoded in zero or more note elmements. The name of the property should be @title, and the value should be inside the note value. Attribute @type is provided so that notes can be grouped.
>
> ***Simple Content***
>
> xsi:string

🟢 X [98]

> **Type:** xsi:double, predefined, simple content

🟢 Y [98]

> **Type:** xsi:double, predefined, simple content

🟢 Z [98]

> **Type:** xsi:double, predefined, simple content

element <locationParam>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:string
Content: simple
Defined: locally within element criteria [28] in cuahsiTimeSeries_v1_0.xsd, see XML source [45]

XML Representation Summary

<locationParam
    Content: { xsi:string }
</locationParam>

Included in content model of elements (1):

> criteria (in queryInfo) [28]

Annotation

the location or site parameter passed into the site

XML Source (w/o annotations (1))

```
<xsi:element minOccurs="0" name="locationParam" type="xsi:string"/>
```

element <longitude>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: Longitude [145]
Content: simple
Defined: locally within complexType LatLonPointType [108] in cuahsiTimeSeries_v1_0.xsd, see XML source [45]

XML Representation Summary

<longitude
   Content: { xsi:double }
</longitude>

Simple Content Detail:

MaxInclusive: 180.00
MinInclusive: −180.00

Included in content model of elements (1):

     latLonPoint [42]

Annotation

The longitude of the site in a decimal degrees as calculated in terms of the given datum.

XML Source (w/o annotations (1))

```
<xsi:element name="longitude" type="Longitude"/>
```

element <Metadata>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: MetaDataType [108]
Content: complex, 5 elements
Defined: locally within complexType SourceType [125] in cuahsiTimeSeries_v1_0.xsd, see XML source [46]

XML Representation Summary

<Metadata>
   Content: TopicCategory?, Title?, Abstract?, ProfileVersion?, MetadataLink?
</Metadata>

Content model elements (5):

     Abstract (in Metadata) [23],   Title (in Metadata) [84],
     MetadataLink (in Metadata) [46],   TopicCategory (in Metadata) [84]
     ProfileVersion (in Metadata) [58],

Included in content model of elements (2):

     Source (in series) [77],   source (in values) [76]

Annotation

MetadataType contains the information from the ODM table IsoMetadata. It is anticpated that many data sources may not have this fully available.

XML Source (w/o annotations (1))

`<xsi:element minOccurs="`**`0`**`" name="`**`Metadata`**`" type="`**`MetaDataType`**`"/>`

element <MetadataLink>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:anyURI
Content: simple
Defined: locally within complexType MetaDataType [109] in cuahsiTimeSeries_v1_0.xsd, see XML source [46]

XML Representation Summary

```
<MetadataLink
    Content: { xsi:anyURI }
</MetadataLink>
```

Included in content model of elements (1):

Metadata (type MetaDataType) [45]

Annotation

Link to additional metadata reference material.

XML Source (w/o annotations (1))

`<xsi:element maxOccurs="`**`1`**`" minOccurs="`**`0`**`" name="`**`MetadataLink`**`" type="`**`xsi:anyURI`**`"/>`

element <method>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: MethodType [109]
Content: complex, 1 attribute, 2 elements
Defined: locally within complexType TsValuesSingleVariableType [133] in cuahsiTimeSeries_v1_0.xsd, see XML source [47]

XML Representation Summary

```
<method
    methodID = xsi:int
    >
    Content: MethodDescription, MethodLink?
</method>
```

Content model elements (2):

MethodDescription (type xsi:string) [47],   MethodLink (type xsi:string) [48]

Included in content model of elements (1):

values (in timeSeries) [90]

Annotation

Multiple &amp;lt;method&amp;gt;s lists the methods used to collect the data and any additional information about the method. @methodID is the link between the values, and method. Different instruments should be represented as different methods, according to ODM best practices

XML Source (w/o annotations (1))

```
<xsi:element maxOccurs="unbounded" minOccurs="0" name="method" type="MethodType"/>
```

element <Method>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: MethodType [109]
Content: complex, 1 attribute, 2 elements
Defined: locally within element series [70] in cuahsiTimeSeries_v1_0.xsd, see XML source [47]

XML Representation Summary

```
<Method
   methodID = xsi:int
   >
   Content: MethodDescription, MethodLink?
</Method>
```

Content model elements (2):

MethodDescription (type xsi:string) [47],   MethodLink (type xsi:string) [48]

Included in content model of elements (1):

series (in seriesCatalog) [69]

Annotation

Method description. Optional, since many sources do not have detailed methods. ODM datasources require methods.

XML Source (w/o annotations (1))

```
<xsi:element maxOccurs="1" minOccurs="0" name="Method" type="MethodType"/>
```

element <MethodDescription>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:string
Content: simple
Defined: locally within complexType MethodType [110] in cuahsiTimeSeries_v1_0.xsd, see XML source [48]

XML Representation Summary

```
<MethodDescription
   Content: { xsi:string }
</MethodDescription>
```

Included in content model of elements (2):

Method (in series) [47], method (in values) [46]

Annotation

Text description of each method.

XML Source (w/o annotations (1))

```
<xsi:element name="MethodDescription" type="xsi:string"/>
```

element <MethodLink>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:string
Content: simple
Defined: locally within complexType MethodType [110] in cuahsiTimeSeries_v1_0.xsd, see XML source [48]

XML Representation Summary
```
<MethodLink
    Content: { xsi:string }
</MethodLink>
```

Included in content model of elements (2):

Method (in series) [47], method (in values) [46]

Annotation

Link to additional reference material on the method.

XML Source (w/o annotations (1))

```
<xsi:element maxOccurs="1" minOccurs="0" name="MethodLink" type="xsi:string"/>
```

element <NoDataValue>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:string
Content: simple
Defined: locally within complexType VariableInfoType [139] in cuahsiTimeSeries_v1_0.xsd, see XML source [49]

XML Representation Summary
```
<NoDataValue
    Content: { xsi:string }
</NoDataValue>
```

Included in content model of elements (1):

variable (type VariableInfoType) [92]

Annotation

Numeric value used to encode no data values for this variable.

XML Source (w/o annotations (1))

```
<xsi:element minOccurs="0" name="NoDataValue" type="xsi:string"/>
```

element <north>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: Latitude [145]
Content: simple
Defined: locally within complexType LatLonBoxType [106] in cuahsiTimeSeries_v1_0.xsd, see XML source [49]

XML Representation Summary

```
<north
    Content: { xsi:double }
</north>
```

Simple Content Detail:

MaxInclusive: 90.00
MinInclusive: -90.00

Included in content model of elements (1):

latLonBox [42]

Annotation

North Latitude

XML Source (w/o annotations (1))

```
<xsi:element name="north" type="Latitude"/>
```

element <note>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: NoteType [111]
Content: simple, 4 attributes
Defined: locally at 6 locations in cuahsiTimeSeries_v1_0.xsd

XML Representation Summary

```
<note
    href = xsi:string
    show = xsi:string
    title = xsi:string
    type = xsi:string
    >
    Content: { xsi:string }
</note>
```

Included in content model of elements (6):

datasetInfo [29],   seriesCatalog (in site) [71],
localSiteXY (in geoLocation) [43],   siteInfo (in site) [75],

queryInfo (type QueryInfoType) [63], variable (type VariableInfoType) [92]

Definition Locations

- **Within global complexTypes (5):**

  DataSetInfoType [102], QueryInfoType [116], SiteInfoType [123], VariableInfoType [139], seriesCatalogType [120]

- **Within anonymous complexTypes of elements (1):**

  localSiteXY (in geoLocation) [44]

Annotations (5) (by all definition locations)

Location:

within complexType SiteInfoType [123]

Annotation:

Additional information, like state, county, or other properties like HUC codes should be encoded in zero or more <note> elmements. The name of the property should be @title, and the value should be inside the <note>value</note>. Attribute @type is provided so that notes can be grouped.

Location:

within element localSiteXY [44]

Annotation:

Additional information should be encoded in zero or more note elmements. The name of the property should be @title, and the value should be inside the note value. Attribute @type is provided so that notes can be grouped.

Location:

within complexType seriesCatalogType [120]

Annotation:

Additional information, properties like should be encoded in zero or more In seriesCatalog note elements are placed at the top, to simplify human identification, since there can be tens, or hundred of series for a location. The name of the property should be @title, and the value should be inside the note element. Attribute @type is provided so that notes can be grouped.

Locations:

within complexType VariableInfoType [139], within complexType QueryInfoType [116]

Annotation:

Additional information, properties like should be encoded in zero or more &lt;note&gt; elmements. The name of the property should be @title, and the value should be inside the <note>value</note>. Attribute @type is provided so that notes can be grouped.

Location:

within complexType DataSetInfoType [102]

Annotation:

Additional information, about a dataset, or other properties should be encoded in zero or more &lt;note&gt; elmements. The name of the property should be @title, and the value should be inside the <note>value</note>. Attribute @type is provided so that notes can be grouped.

element <offset>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: OffsetType [112]
Content: complex, 1 attribute, 5 elements
Defined: locally within complexType TsValuesSingleVariableType [134] in cuahsiTimeSeries_v1_0.xsd, see XML source [51]

XML Representation Summary

<offset
   offsetTypeID = xsi:int
   >
   Content: offsetValue, offsetDescription, units, offsetIsVertical?, offsetHorizDirectionDegrees?
</offset>

Content model elements (5):

offsetDescription (in offset) [51],   offsetValue (in offset) [53],
offsetHorizDirectionDegrees (in offset) [52],   units [87]
offsetIsVertical (in offset) [52],

Included in content model of elements (1):

values (in timeSeries) [90]

Annotation

<offset> is of type OffsetType. offset lists full descriptive information for each of the measurement offsets. @offsetID is the link between offset, and values.

XML Source (w/o annotations (1))

<xsi:element maxOccurs="**unbounded**" minOccurs="**0**" name="**offset**" type="**OffsetType**"/>

element <offsetDescription>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:string
Content: simple
Defined: locally within complexType OffsetType [113] in cuahsiTimeSeries_v1_0.xsd, see XML source [52]

XML Representation Summary

<offsetDescription
   Content: { xsi:string }
</offsetDescription>

Included in content model of elements (1):

offset (in values) [51]

Annotation

Full text description of the offset type. Field should be filled in with a complete text description of the offset that provides enough information to interpret the type of offset being used. For example, "Distance from stream bank" is ambiguous because it is not known which bank is being referred to.

XML Source (w/o annotations (1))

```
<xsi:element maxOccurs="1" minOccurs="1" name="offsetDescription" type="xsi:string"/>
```

element <offsetHorizDirectionDegrees>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:int
Content: simple
Defined: locally within complexType OffsetType [113] in cuahsiTimeSeries_v1_0.xsd, see XML source [52]

XML Representation Summary

<offsetHorizDirectionDegrees
    Content: { xsi:int }
</offsetHorizDirectionDegrees>

Included in content model of elements (1):

      offset (in values) [51]

Annotation

if offsetIsVertical=false, then this is the direction of the offset

XML Source (w/o annotations (1))

```
<xsi:element maxOccurs="1" minOccurs="0" name="offsetHorizDirectionDegrees" type="xsi:int"/>
```

element <offsetIsVertical>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:boolean
Content: simple
Defined: locally within complexType OffsetType [113] in cuahsiTimeSeries_v1_0.xsd, see XML source [53]

XML Representation Summary

<offsetIsVertical
    Content: { xsi:boolean }
</offsetIsVertical>

Simple Content Detail:

Default: "true"

Included in content model of elements (1):

      offset (in values) [51]

Annotation

By default, the offset is vertical. If the offset is horizontal, then this becomes a direction, and distance from the observation point

XML Source (w/o annotations (1))

<xsi:element default="**true**" maxOccurs="**1**" minOccurs="**0**" name="**offsetIsVertical**" type="**xsi:boolean**"/>

element <offsetValue>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:float
Content: simple
Defined: locally within complexType OffsetType [113] in cuahsiTimeSeries_v1_0.xsd, see XML source [53]

XML Representation Summary

```
<offsetValue
    Content: { xsi:float }
</offsetValue>
```

Included in content model of elements (1):

offset (in values) [51]

Annotation

offsetValue element is value of offset. If 0, then offset is not needed, and offsetTypeId should not be included on the dataValue

XML Source (w/o annotations (1))

<xsi:element maxOccurs="**1**" minOccurs="**1**" name="**offsetValue**" type="**xsi:float**"/>

element <option>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: anonymous (extension of xsi:string)
Content: simple, 3 attributes
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [54]
Includes: definitions of 3 attributes
Used: at 2 locations

XML Representation Summary

```
<option
    name        = xsi:normalizedString
    optionCode  = xsi:token
    optionID    = xsi:integer
    >
    Content: { xsi:string }
</option>
```

Included in content model of elements (2):

optionGroup [54], options [55]

Known Usage Locations

- **Within anonymous complexTypes of elements (2):**

  optionGroup [55], options [56]

Annotation

Option elements are key-value pair elements that control how a variable maght be utilized in a service. Examples: MODIS web service. Information is aggreated over land or ocean or both. The plotarea option can include: plotarea=land, plotarea=land, plotarea=landocean USGS uses a statistic code, 0003, to repesent a value type of 'Average'. The USGS statistic codes also several options that do not fit the ODM data model.

Anonymous Type Detail

Type Derivation Tree

```
xsi:string
   └─complexType (extension)
```

Derivation: extension of xsi:string

XML Source (w/o annotations (1))

```xml
<xsi:element name="option">
  <xsi:complexType>
    <xsi:simpleContent>
      <xsi:extension base="xsi:string">
        <xsi:attribute name="name" type="xsi:normalizedString"/>
        <xsi:attribute name="optionID" type="xsi:integer"/>
        <xsi:attribute name="optionCode" type="xsi:token"/>
      </xsi:extension>
    </xsi:simpleContent>
  </xsi:complexType>
</xsi:element>
```

Attribute Detail (defined in this component only; 3/3)

🔸 name

> **Type:** xsi:normalizedString, predefined
> **Use:** optional

🔸 optionCode

> **Type:** xsi:token, predefined
> **Use:** optional

🔸 optionID

> **Type:** xsi:integer, predefined
> **Use:** optional

element <optionGroup>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: anonymous complexType
Content: complex, 1 element
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [55]
Includes: definition of 1 element
Used: never

XML Representation Summary

<optionGroup>
   Content: option+
</optionGroup>

Content model elements (1):

option [53]

XML Source

```
<xsi:element name="optionGroup">
  <xsi:complexType>
    <xsi:sequence>
      <xsi:element maxOccurs="unbounded" ref="option"/>
    </xsi:sequence>
  </xsi:complexType>
</xsi:element>
```

Content Element Detail (defined in this component only; 1/1)

🟢 option [53]

Type: anonymous (extension of xsi:string), simple content

Simple Content

```
xsi:string
```

element <options>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: anonymous complexType
Content: complex, 1 element
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [56]
Includes: definition of 1 element
Used: at 1 location

XML Representation Summary

<options>
   Content: option*
</options>

Content model elements (1):

option [53]

Included in content model of elements (1):

variable (type VariableInfoType) [92]

Known Usage Locations

- **Within global complexTypes (1):**

  VariableInfoType [139]

Annotation

A list of options. Option elements are key-value pair elements that control how a variable maght be utilized in a service. Examples: MODIS web service. Information is aggreated over land or ocean or both. The plotarea option can include: plotarea=land, plotarea=land, plotarea=landocean USGS uses a statistic code, 0003, to repesent a value type of 'Average'. The USGS statistic codes also several options that do not fit the ODM data model.

XML Source (w/o annotations (2))

```xml
<xsi:element name="options">
  <xsi:complexType>
    <xsi:sequence>
      <xsi:element maxOccurs="unbounded" minOccurs="0" ref="option"/>
    </xsi:sequence>
  </xsi:complexType>
</xsi:element>
```

Content Element Detail (defined in this component only; 1/1)

🟢 option [53]

> **Type:** anonymous (extension of xsi:string), simple content
>
> Option elements are key-value pair elements that control how a variable maght be utilized in a service. Examples: MODIS web service. Information is aggreated over land or ocean or both. The plotarea option can include: plotarea=land, plotarea=land, plotarea=landocean USGS uses a statistic code, 0003, to repesent a value type of 'Average'. The USGS statistic codes also several options that do not fit the ODM data model.
>
> **Simple Content**
>
> ```
> xsi:string
> ```

element <Organization>

Namespace:	http://www.cuahsi.org/waterML/1.0/
Type:	xsi:string
Content:	simple
Defined:	locally within complexType SourceType [125] in cuahsiTimeSeries_v1_0.xsd, see XML source [57]

XML Representation Summary

```
<Organization
    Content: { xsi:string }
</Organization>
```

Included in content model of elements (2):

Source (in series) [77], source (in values) [76]

Annotation

Name of the organization that collected the data. This should be the agency or organization that collected the data, even if it came out of a database consolidated from many sources such as STORET. "Utah Division of Water Quality"

XML Source (w/o annotations (1))

```
<xsi:element maxOccurs="1" minOccurs="0" name="Organization" type="xsi:string"/>
```

element <parentID>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: anonymous (extension of xsi:string)
Content: simple, 3 attributes
Defined: locally within element related [66] in cuahsiTimeSeries_v1_0.xsd, see XML source [57]

XML Representation Summary

<parentID
   default   = xsi:boolean
   network   = xsi:string
   vocabulary = xsi:string
   >
   Content: { xsi:string }
</parentID>

Included in content model of elements (1):

related (in variable) [65]

Annotation

variableCode for the parent

Anonymous Type Detail

Type Derivation Tree

```
xsi:string
   └─complexType (extension)
```

Derivation: extension of xsi:string

XML Source (w/o annotations (1))

```
<xsi:element name="parentID">
  <xsi:complexType>
    <xsi:simpleContent>
      <xsi:extension base="xsi:string">
        <xsi:attributeGroup ref="VocabularyAttributes"/>
      </xsi:extension>
    </xsi:simpleContent>
  </xsi:complexType>
</xsi:element>
```

element <Phone>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:string
Content: simple
Defined: locally within complexType ContactInformationType [100] in cuahsiTimeSeries_v1_0.xsd, see XML source [58]

XML Representation Summary

<Phone
   Content: { xsi:string }
</Phone>

Included in content model of elements (1):

ContactInformation (type ContactInformationType) [26]

Annotation

phone

XML Source (w/o annotations (1))

<xsi:element minOccurs="**0**" name="**Phone**" type="**xsi:string**"/>

element <ProfileVersion>

Namespace:	http://www.cuahsi.org/waterML/1.0/
Type:	xsi:string
Content:	simple
Defined:	locally within complexType MetaDataType [109] in cuahsiTimeSeries_v1_0.xsd, see XML source [58]

XML Representation Summary

<ProfileVersion
   Content: { xsi:string }
</ProfileVersion>

Included in content model of elements (1):

Metadata (type MetaDataType) [45]

Annotation

Name of metadata profile used by the data source

XML Source (w/o annotations (1))

<xsi:element maxOccurs="**1**" minOccurs="**0**" name="**ProfileVersion**" type="**xsi:string**"/>

element <qualifier>

Namespace:	http://www.cuahsi.org/waterML/1.0/
Type:	anonymous (extension of xsi:string)
Content:	simple, 7 attributes
Defined:	globally in cuahsiTimeSeries_v1_0.xsd, see XML source [59]
Includes:	definitions of 2 attributes
Used:	at 1 location

XML Representation Summary

```
<qualifier
    default              = xsi:boolean
    metadataDateTime     = xsi:dateTime
    network              = xsi:string
    oid                  = xsi:normalizedString
    qualifierCode        = xsi:token
    qualifierID          = xsi:integer
    vocabulary           = xsi:string
    >
    Content: { xsi:string }
</qualifier>
```

Included in content model of elements (1):

> values (in timeSeries) [90]

Known Usage Locations

- **Within global complexTypes (1):**

  TsValuesSingleVariableType [134]

Annotation

qualifying comments that accompany the data

Anonymous Type Detail

Type Derivation Tree

```
xsi:string
    └─complexType (extension)
```

Derivation: extension of xsi:string

XML Source (w/o annotations (1))

```
<xsi:element name="qualifier">
  <xsi:complexType>
    <xsi:simpleContent>
      <xsi:extension base="xsi:string">
        <xsi:attribute name="qualifierCode" type="xsi:token"/>
        <xsi:attribute name="qualifierID" type="xsi:integer"/>
        <xsi:attributeGroup ref="DbIdentifiers"/>
        <xsi:attributeGroup ref="VocabularyAttributes"/>
      </xsi:extension>
    </xsi:simpleContent>
  </xsi:complexType>
</xsi:element>
```

Attribute Detail (defined in this component only; 2/7)

🟨 qualifierCode

> **Type:** xsi:token, predefined
> **Use:** optional

🟨 qualifierID

      Type: `xsi:integer`, predefined
      Use: optional

element <qualifier>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: anonymous complexType
Content: complex, 4 attributes, 1 element
Defined: locally within complexType `QualifiersType` [114] in cuahsiTimeSeries_v1_0.xsd, see XML source [60]
Includes: definitions of 1 attribute and 1 element

XML Representation Summary

<qualifier
   default   = `xsi:boolean`
   network   = `xsi:string`
   qualifierID = `xsi:int`
   vocabulary = `xsi:string`
   >
   Content: qualifierCode
</qualifier>

Content model elements (1):

       qualifierCode (in qualifier : anonymous) [61]

Annotation

qualifying comments that accompany the data. value/@qaulifier is a space delimted list of qualifiers for a data value. @qualifierCode is the link to the value/@qualifier for a single value The value inside provides the textual description. @qualifierCode is the reference code. @qualifierCode=A qualifier value=Approved @vocabulary and @network are suggested. For example a value from the USGS may qualifiers from multiple vocabularies, and the network would be the data service.

XML Source (w/o annotations (2))

```
<xsi:element name="qualifier">
  <xsi:complexType>
    <xsi:sequence>
      <xsi:element name="qualifierCode" type="xsi:token"/>
    </xsi:sequence>
    <xsi:attribute name="qualifierID" type="xsi:int"/>
    <xsi:attributeGroup ref="VocabularyAttributes"/>
  </xsi:complexType>
</xsi:element>
```

Attribute Detail (defined in this component only; 1/4)

🟨 qualifierID

      Type: `xsi:int`, predefined
      Use: optional

Content Element Detail (defined in this component only; 1/1)

🟢 qualifierCode [61]

      Type: `xsi:token`, predefined, simple content

Text code used by organization that collects the data. value/@qaulifier is a space delimted list of qualifiers for a data value. @qualifierCode is the link to the value/@qualifier for a single value

element <qualifierCode>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:token
Content: simple
Defined: locally within element qualifier [60] in cuahsiTimeSeries_v1_0.xsd, see XML source [61]

XML Representation Summary

<qualifierCode
   Content: { xsi:token }
</qualifierCode>

Included in content model of elements (1):

qualifier (type anonymous) [60]

Annotation

Text code used by organization that collects the data. value/@qaulifier is a space delimted list of qualifiers for a data value. @qualifierCode is the link to the value/@qualifier for a single value

XML Source (w/o annotations (1))

<xsi:element name="**qualifierCode**" type="**xsi:token**"/>

element <qualityControlLevel>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: anonymous complexType
Content: complex, 6 attributes, 1 element
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [62]
Includes: definitions of 1 attribute and 1 element
Used: at 1 location

XML Representation Summary

<qualityControlLevel
   default   **=** xsi:boolean
   metadataDateTime   **=** xsi:dateTime
   network   **=** xsi:string
   oid   **=** xsi:normalizedString
   qualityControlLevelCode **=** xsi:string
   vocabulary   **=** xsi:string
   >
   Content: qualityControlLevelID
</qualityControlLevel>

Content model elements (1):

qualityControlLevelID (in qualityControlLevel) [63]

Included in content model of elements (1):

values (in timeSeries) [90]

Known Usage Locations

- **Within global complexTypes (1):**

  TsValuesSingleVariableType [134]

Annotation

quality control levels that are used for versioning data within the database.

XML Source (w/o annotations (3))

```
<xsi:element name="qualityControlLevel">
  <xsi:complexType>
    <xsi:sequence>
      <xsi:element name="qualityControlLevelID" type="xsi:normalizedString"/>
    </xsi:sequence>
    <xsi:attribute name="qualityControlLevelCode" type="xsi:string"/>
    <xsi:attributeGroup ref="DbIdentifiers"/>
    <xsi:attributeGroup ref="VocabularyAttributes"/>
  </xsi:complexType>
</xsi:element>
```

Attribute Detail (defined in this component only; 1/6)

🟨 qualityControlLevelCode

> **Type:** xsi:string, predefined
> **Use:** optional
>
> Code used to identify the level of quality control to which data values have been subjected.

Content Element Detail (defined in this component only; 1/1)

🟢 qualityControlLevelID [63]

> **Type:** xsi:normalizedString, predefined, simple content
>
> Unique integer identifying the quality control level.

element <QualityControlLevel>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: QualityControlLevelType [114]
Content: simple, 1 attribute
Defined: locally within element series [70] in cuahsiTimeSeries_v1_0.xsd, see XML source [63]

XML Representation Summary

```
<QualityControlLevel
    qualityControlLevelID = xsi:int
    >
    Content: { xsi:string }
</QualityControlLevel>
```

Included in content model of elements (1):

> series (in seriesCatalog) [69]

Annotation

Code used to identify the level of quality control to which data values have been subjected.

XML Source (w/o annotations (1))

`<xsi:element maxOccurs="`**1**`" minOccurs="`**0**`" name="`**QualityControlLevel**`" type="`**QualityControlLevelType**`"/>`

element <qualityControlLevelID>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: `xsi:normalizedString`
Content: simple
Defined: locally within element `qualityControlLevel` [62] in cuahsiTimeSeries_v1_0.xsd, see XML source [63]

XML Representation Summary

`<qualityControlLevelID`
   Content: `{ xsi:normalizedString }`
`</qualityControlLevelID>`

Included in content model of elements (1):

   qualityControlLevel [61]

Annotation

Unique integer identifying the quality control level.

XML Source (w/o annotations (1))

`<xsi:element name="`**qualityControlLevelID**`" type="`**xsi:normalizedString**`"/>`

element <queryInfo>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: QueryInfoType [115]
Content: complex, 6 elements
Defined: locally at 3 locations in cuahsiTimeSeries_v1_0.xsd

XML Representation Summary

`<queryInfo>`
   Content: creationTime?, queryURL?, querySQL?, criteria?, note*, extension?
`</queryInfo>`

Content model elements (6):

   creationTime (in queryInfo) [27],   note (type NoteType) [49],
   criteria (in queryInfo) [28],   querySQL (in queryInfo) [64],
   extension [35],   queryURL (in queryInfo) [64]

Included in content model of elements (3):

   sitesResponse [76], timeSeriesResponse [81], variablesResponse [96]

Definition Locations

- **Within global complexTypes (3):**

   SiteInfoResponseType [121], TimeSeriesResponseType [129], VariablesResponseType [141]

Annotations (3) (by all definition locations)

Location:

within complexType SiteInfoResponseType [121]

Annotation:

The parameter information passed to GetSiteInfo(site) or GetSites(site[]) should be placed in QueryInfoType/criteria/locationParam See QueryInfoType for more details.

Location:

within complexType VariablesResponseType [141]

Annotation:

the parameter information passed to GetVariableInfo(variable) should be placed in QueryInfoType/criteria/variableParam See QueryInfoType for more details.

Location:

within complexType TimeSeriesResponseType [129]

Annotation:

the parameter information passed to Getvalues(location,variable,beginDate,endDate) should be placed in QueryInfoType/criteria/ See QueryInfoType for more details.

element <querySQL>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:string
Content: simple
Defined: locally within complexType QueryInfoType [117] in cuahsiTimeSeries_v1_0.xsd, see XML source [64]

XML Representation Summary

<querySQL
    Content: { xsi:string }
</querySQL>

Included in content model of elements (1):

queryInfo (type QueryInfoType) [63]

Annotation

For debugging, the SQL used to generate this request may be placed in this element.

XML Source (w/o annotations (1))

```
<xsi:element minOccurs="0" name="querySQL" type="xsi:string"/>
```

element <queryURL>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: `xsi:string`
Content: simple
Defined: locally within complexType `QueryInfoType` [117] in cuahsiTimeSeries_v1_0.xsd, see XML source [65]

XML Representation Summary

<queryURL
   Content: { xsi:string }
</queryURL>

Included in content model of elements (1):

       queryInfo (type QueryInfoType) [63]

Annotation

The URL of the web page that was used as the original source for the response. Often requests scrap HTML pages. This should be the URL of that page. If the response is retreive from a rest URL. This is also a the location for the URL.

XML Source (w/o annotations (1))

`<xsi:element minOccurs="0" name="queryURL" type="xsi:string"/>`

---

element <realTimeDataPeriod>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: `xsi:duration`
Content: simple
Defined: locally within complexType `TimePeriodRealTimeType` [128] in cuahsiTimeSeries_v1_0.xsd, see XML source [65]

XML Representation Summary

<realTimeDataPeriod
   Content: { xsi:duration }
</realTimeDataPeriod>

Annotation

Duration Data Type The duration data type is used to specify a time interval. The time interval is specified in the following form "PnYnMnDTnHnMnS" where: * P indicates the period (required) * nY indicates the number of years * nM indicates the number of months * nD indicates the number of days * T indicates the start of a time section (required if you are going to specify hours, minutes, or seconds) * nH indicates the number of hours * nM indicates the number of minutes * nS indicates the number of seconds

---

XML Source (w/o annotations (1))

`<xsi:element name="realTimeDataPeriod" type="xsi:duration"/>`

---

element <related>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: anonymous complexType
Content: complex, 2 elements
Defined: locally within complexType VariableInfoType [139] in cuahsiTimeSeries_v1_0.xsd, see XML source [66]
Includes: definitions of 2 elements

XML Representation Summary

<related>
    Content: (parentID, relatedID)+
</related>

Content model elements (2):

parentID (in related) [57],   relatedID (in related) [67]

Included in content model of elements (1):

variable (type VariableInfoType) [92]

Annotation

This can be used to build up relationships between variables.

XML Source (w/o annotations (3))

```
<xsi:element minOccurs="0" name="related">
  <xsi:complexType>
    <xsi:sequence maxOccurs="unbounded">
      <xsi:element name="parentID">
        <xsi:complexType>
          <xsi:simpleContent>
            <xsi:extension base="xsi:string">
              <xsi:attributeGroup ref="VocabularyAttributes"/>
            </xsi:extension>
          </xsi:simpleContent>
        </xsi:complexType>
      </xsi:element>
      <xsi:element name="relatedID">
        <xsi:complexType>
          <xsi:simpleContent>
            <xsi:extension base="xsi:string">
              <xsi:attributeGroup ref="VocabularyAttributes"/>
            </xsi:extension>
          </xsi:simpleContent>
        </xsi:complexType>
      </xsi:element>
    </xsi:sequence>
  </xsi:complexType>
</xsi:element>
```

Content Element Detail (defined in this component only; 2/2)

🟢 parentID [57]

    Type: anonymous (extension of xsi:string), simple content

    variableCode for the parent

    Simple Content

    ```
xsi:string
```

🟢 relatedID [67]

> **Type:** anonymous (extension of xsi:string), simple content
>
> Child or other relationships can be encoded using the related element.
>
> ***Simple Content***
>
> ```
> xsi:string
> ```

element <relatedID>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: anonymous (extension of xsi:string)
Content: simple, 3 attributes
Defined: locally within element related [67] in cuahsiTimeSeries_v1_0.xsd, see XML source [67]

XML Representation Summary

<relatedID
    default   = xsi:boolean
    network   = xsi:string
    vocabulary = xsi:string
    >
    Content: { xsi:string }
</relatedID>

Included in content model of elements (1):

> related (in variable) [65]

Annotation

Child or other relationships can be encoded using the related element.

Anonymous Type Detail

Type Derivation Tree

xsi:string
    └ **complexType** (extension)

Derivation: extension of xsi:string

XML Source (w/o annotations (1))

```
<xsi:element name="relatedID">
   <xsi:complexType>
      <xsi:simpleContent>
         <xsi:extension base="xsi:string">
            <xsi:attributeGroup ref="VocabularyAttributes"/>
         </xsi:extension>
      </xsi:simpleContent>
   </xsi:complexType>
</xsi:element>
```

element <sampleMedium>

element <sampleMedium> (type SampleMediumEnum)

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: SampleMediumEnum [147]
Content: simple
Defined: locally at 2 locations in cuahsiTimeSeries_v1_0.xsd

XML Representation Summary

<sampleMedium
    Content: { *enumeration of* xsi:string }
</sampleMedium>

Simple Content Detail:

Enumeration: "Surface Water", "Ground Water", "Sediment", "Soil", "Air", "Tissue", "Precipitation", "Unknown", "Other", "Snow", "Not Relevant"

Included in content model of elements (2):

series (in seriesCatalog) [69], variable (type VariableInfoType) [92]

Definition Locations

- **Within global complexTypes (1):**

  VariableInfoType [139]

- **Within anonymous complexTypes of elements (1):**

  series (in seriesCatalog) [71]

Annotations (2) (by all definition locations)

Location:

within element series [71]

Annotation:

The medium of the sample as listed in SampleTypeEnum

Location:

within complexType VariableInfoType [139]

Annotation:

Only terms from the SampleMediumEnume can be used to populate the sampleMedium element. A default value of "Unknown" is used where the sample medium is unknown.

element <SampleType>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: sampleTypeEnum [148]
Content: simple
Defined: locally within complexType SampleType [118] in cuahsiTimeSeries_v1_0.xsd, see XML source [69]

XML Representation Summary

<SampleType
    Content: { *enumeration of* xsi:string }
</SampleType>

Simple Content Detail:

Enumeration: "FD", "FF", "FL", "LF", "GW", "PB", "PD", "PE", "PI", "PW", "RE", "SE", "SR", "SS", "SW", "TE", "TI", "TW", "VE", "VI", "VW", "Grab", "Unknown", "No Sample"

Annotation

Controlled vocabulary specifying the sample type from the SampleTypeEnum.

XML Source (w/o annotations (1))

```
<xsi:element name="SampleType" type="sampleTypeEnum"/>
```

element <series>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: anonymous complexType
Content: complex, 11 elements
Defined: locally within complexType seriesCatalogType [120] in cuahsiTimeSeries_v1_0.xsd, see XML source [69]
Includes: definitions of 11 elements

XML Representation Summary

<series>
    Content: dataType?, variable, valueCount, variableTimeInterval, valueType?, generalCategory?,
                sampleMedium?, Method?, Source?, QualityControlLevel?, extension?
</series>

Content model elements (11):

dataType (type dataTypeEnum) [30],
extension [35],
generalCategory (type generalCategoryEnum) [36],
Method (in series) [47],
QualityControlLevel (in series) [62],
sampleMedium (type SampleMediumEnum) [67],

Source (in series) [77],
valueCount (in series) [89],
valueType (type valueTypeEnum) [91],
variable (type VariableInfoType) [92],
variableTimeInterval (in series) [96]

Included in content model of elements (1):

seriesCatalog (in site) [71]

Annotation

Separate data series are for the purposes of identifying or displaying what data are available at each site. Site information is a parent of the series so that it does not need to be repeated (difference from the ODM.). A Site contains one or more seriesCatalogs which contain one or more series. Assotiated with site, a series is a unique combination of the textual repesentation of ODM series: Variable,Method,Source,QualityControlLevel. An ODM series is a unique site/variable combinations are defined by unique combinations of SiteID, VariableID, MethodID, SourceID, and QualityControlLevelID.

XML Source (w/o annotations (9))

```
<xsi:element maxOccurs="unbounded" minOccurs="0" name="series">
  <xsi:complexType>
    <xsi:sequence>
      <xsi:element maxOccurs="1" minOccurs="0" name="dataType" type="dataTypeEnum"/>
      <xsi:element name="variable" type="VariableInfoType"/>
      <xsi:element name="valueCount">
        <xsi:complexType>
          <xsi:simpleContent>
            <xsi:extension base="xsi:int">
```

```xml
                        <xsi:attribute name="countIsEstimated" type="xsi:boolean"/>
                   </xsi:extension>
                </xsi:simpleContent>
             </xsi:complexType>
          </xsi:element>
          <xsi:element name="variableTimeInterval" type="TimePeriodType"/>
          <xsi:element maxOccurs="1" minOccurs="0" name="valueType" type="valueTypeEnum"/>
          <xsi:element maxOccurs="1" minOccurs="0" name="generalCategory" type="generalCategoryEnum"/>
          <xsi:element maxOccurs="1" minOccurs="0" name="sampleMedium" type="SampleMediumEnum"/>
          <xsi:element maxOccurs="1" minOccurs="0" name="Method" type="MethodType"/>
          <xsi:element maxOccurs="1" minOccurs="0" name="Source" type="SourceType"/>
          <xsi:element maxOccurs="1" minOccurs="0" name="QualityControlLevel" type="QualityControlLevelType"/>
          <xsi:element maxOccurs="1" minOccurs="0" ref="extension"/>
       </xsi:sequence>
    </xsi:complexType>
</xsi:element>
```

Content Element Detail (defined in this component only; 11/11)

🟢 dataType [30]

Type: dataTypeEnum [142], simple content

Text value that identifies the data as one of several types as found ing dataTypeEnum

Simple Content

```
enumeration of xsi:string
```

Enumeration: "Continuous", "Instantaneous", "Cumulative", "Incremental", "Average", "Maximum", "Minimum", "Constant Over Interval", "Categorical", "Best Easy Systematic Estimator ", "Unknown", "Variance", "Median", "Mode", "Best Easy Systematic Estimator", "Standard Deviation", "Skewness", "Equivalent Mean", "Sporadic", "Unknown"

🟢 extension [35]

Type: xsi:anyType, any content

🟢 generalCategory [36]

Type: generalCategoryEnum [144], simple content

General category of the variable as listed in generalCategoryEnum

Simple Content

```
enumeration of xsi:string
```

Enumeration: "Water Quality", "Climate", "Hydrology", "Geology", "Biota", "Unknown", "Instrumentation"

🟢 Method [47]

Type: MethodType [109], complex content

Method description. Optional, since many sources do not have detailed methods. ODM datasources require methods.

🟢 QualityControlLevel [62]

Type: QualityControlLevelType [114], simple content

Code used to identify the level of quality control to which data values have been subjected.

Simple Content

```
xsi:string
```

🔵 sampleMedium [67]

Type: SampleMediumEnum [147], simple content

The medium of the sample as listed in SampleTypeEnum

Simple Content

> *enumeration of* xsi:string

Enumeration: "Surface Water", "Ground Water", "Sediment", "Soil", "Air", "Tissue", "Precipitation", "Unknown", "Other", "Snow", "Not Relevant"

- -

🔵 Source [77]

Type: SourceType [124], complex content

Source of the data values and reference information to recover/discover the data from the source.

- -

🔵 valueCount [89]

Type: anonymous (extension of xsi:int), simple content

Simple Content

> xsi:int

- -

🔵 valueType [91]

Type: valueTypeEnum [150], simple content

Text value indicating what type of data value is being recorded as listed in valueTypeEnum

Simple Content

> *enumeration of* xsi:string

Enumeration: "Field Observation", "Sample", "Model Simulation Result", "Derived Value", "Unknown"

- -

🔵 variable [92]

Type: VariableInfoType [137], complex content

- -

🔵 variableTimeInterval [96]

Type: TimePeriodType [128], empty content

this describes the time period that ana variable or observed parameter are available for. This is of TimePeriodType, which is presently: TimeIntervalType - definite begin and end TimeSingleType - single observation/datavalue TimePeriodRealTime - a floating time period for when data is available. This will have a xml schema type attribute: xsi:type="TimeIntervalType" xsi:type="TimeSingleType" xsi:type="TimePeriodRealTime"

element <seriesCatalog>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: seriesCatalogType [118]
Content: complex, 2 attributes, 3 elements
Defined: locally within element site [73] in cuahsiTimeSeries_v1_0.xsd, see XML source [72]

XML Representation Summary

<seriesCatalog
   <u>menuGroupName</u> = xsi:string
   <u>serviceWsdl</u>   = xsi:anyURI
   >
   Content: <u>note</u>*, <u>series</u>*, <u>extension</u>?
</seriesCatalog>

Content model elements (3):

<u>extension</u> [35],   <u>series</u> (in <u>seriesCatalog</u>) [69]
<u>note</u> (type <u>NoteType</u>) [49],

Included in content model of elements (1):

<u>site</u> [72]

XML Source

<xsi:element maxOccurs="**unbounded**" minOccurs="**0**" name="**seriesCatalog**" type="**seriesCatalogType**"/>

element <site>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: anonymous complexType
Content: complex, 3 <u>elements</u>
Defined: globally in <u>cuahsiTimeSeries_v1_0.xsd</u>, see <u>XML source</u> [73]
Includes: definitions of 3 <u>elements</u>
Used: at 1 <u>location</u>

XML Representation Summary

<site>
   Content: <u>siteInfo</u>, <u>seriesCatalog</u>*, <u>extension</u>?
</site>

Content model elements (3):

<u>extension</u> [35],   <u>siteInfo</u> (in <u>site</u>) [75]
<u>seriesCatalog</u> (in <u>site</u>) [71],

Included in content model of elements (1):

<u>sitesResponse</u> [76]

Known Usage Locations

- **Within global complexTypes (1):**

  <u>SiteInfoResponseType</u> [121]

Annotation

A site element can have two parts: siteInfo, and one or more seriesCatalogs. The siteInfo element contains the basic site information, siteName, location, siteCodes, properties. The seriesCatalog contains the list of observation series conducted at a site. Rules: GetSites(site[]) or GetSites(null), return no seriesCatalogs elements GetSiteInfo(site) return all information about a site, including the seriesCatalog.

XML Source (w/o annotations (3))

```xml
<xsi:element name="site">
  <xsi:complexType>
    <xsi:sequence>
      <xsi:element name="siteInfo" type="SiteInfoType"/>
      <xsi:element maxOccurs="unbounded" minOccurs="0" name="seriesCatalog" type="seriesCatalogType"/>
      <xsi:element maxOccurs="1" minOccurs="0" ref="extension"/>
    </xsi:sequence>
  </xsi:complexType>
</xsi:element>
```

Content Element Detail (defined in this component only; 3/3)

🟢 extension [35]

> **Type:** `xsi:anyType`, any content
>
> In order to simplify comprehension, data sources are encouraged to put additional informaiton in the extension area, using thier own namespace. Clients need not understand information in extension element

----

🟢 seriesCatalog [71]

> **Type:** seriesCatalogType [118], complex content

🟢 siteInfo [75]

> **Type:** SiteInfoType [121], complex content
>
> siteInfo element contains a list of information about a site. See SiteInfoType

element <siteCode>

Namespace:	http://www.cuahsi.org/waterML/1.0/
Type:	anonymous (extension of xsi:string)
Content:	simple, 5 attributes
Defined:	locally within complexType SiteInfoType [123] in cuahsiTimeSeries_v1_0.xsd, see XML source [74]
Includes:	definitions of 5 attributes

XML Representation Summary

```
<siteCode
    agencyCode = xsi:normalizedString
    agencyName = xsi:normalizedString
    defaultId  = xsi:boolean
    network    = xsi:normalizedString
    siteID     = xsi:normalizedString
    >
    Content: { xsi:string }
</siteCode>
```

Included in content model of elements (1):

> siteInfo (in site) [75]

Annotation

A <siteCode> is an identifier that this site is referred to as. This Code used by organization that collects the data to identify the site. A siteCode has a reference to it's source or network as the @network. For waterWebServices, a site/location is the network plus the value of the sitecode, eg '@network:siteCode' siteCode identifiers often change, so multiple siteCode elements are allowed There may be multiple siteCode elements. Only

one should be labeled as the default using @defaultID (set attribute defaultID=true) Multiple siteCode elements can utilize different observation networks may refer to the same site with different identifiers.

Anonymous Type Detail

Type Derivation Tree

```
xsi:string
    └─complexType (extension)
```

Derivation: extension of xsi:string

XML Source (w/o annotations (6))

```xml
<xsi:element maxOccurs="unbounded" name="siteCode">
   <xsi:complexType>
      <xsi:simpleContent>
         <xsi:extension base="xsi:string">
            <xsi:attribute name="defaultId" type="xsi:boolean"/>
            <xsi:attribute name="network" type="xsi:normalizedString" use="required"/>
            <xsi:attribute name="siteID" type="xsi:normalizedString"/>
            <xsi:attribute name="agencyCode" type="xsi:normalizedString"/>
            <xsi:attribute name="agencyName" type="xsi:normalizedString"/>
         </xsi:extension>
      </xsi:simpleContent>
   </xsi:complexType>
</xsi:element>
```

Attribute Detail (defined in this component only; 5/5)

🟨 agencyCode

> **Type:** xsi:normalizedString, predefined
> **Use:** optional
>
> Code used to differentiate sites in a datasource. Agency codes are specific to a data source, and are not required nor do they need to be understood by a web service client.

🟨 agencyName

> **Type:** xsi:normalizedString, predefined
> **Use:** optional
>
> optional name to provide more detail about an agency code

🟨 defaultId

> **Type:** xsi:boolean, predefined
> **Use:** optional
>
> True if this is the main identifier that this service uses to access this site. default value is false.

🟨 network

> **Type:** xsi:normalizedString, predefined
> **Use:** required
>
> The abbreviation for the datasource or observation network that this site code is associated with. A siteCode has a reference to it's source or network as the @network. For waterWebServices, a site/location is the network plus the value of the sitecode, eg '@network:siteCode'

🟨 siteID

> **Type:** xsi:normalizedString, predefined
> **Use:** optional

An internal numeric identifier of the site.

element <siteInfo>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: SiteInfoType [121]
Content: complex, 2 attributes, 9 elements
Defined: locally within element site [73] in cuahsiTimeSeries_v1_0.xsd, see XML source [75]

XML Representation Summary

<siteInfo
   metadataDateTime = xsi:dateTime
   oid   = xsi:normalizedString
   >
   Content: siteName, siteCode+, timeZoneInfo?, geoLocation?, elevation_m?, verticalDatum?, note*,
          extension?, altname*
</siteInfo>

Content model elements (9):

altname (in siteInfo) [24],   siteCode (in siteInfo) [73],
elevation_m (in siteInfo) [33],   siteName (in siteInfo) [75],
extension [35],   timeZoneInfo [83],
geoLocation (in siteInfo) [37],   verticalDatum (in siteInfo) [97]
note (type NoteType) [49],

Included in content model of elements (1):

site [72]

Annotation

siteInfo element contains a list of information about a site. See SiteInfoType

XML Source (w/o annotations (1))

<xsi:element name="**siteInfo**" type="**SiteInfoType**"/>

element <siteName>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:string
Content: simple
Defined: locally within complexType SiteInfoType [123] in cuahsiTimeSeries_v1_0.xsd, see XML source [76]

XML Representation Summary

<siteName
   Content: { xsi:string }
</siteName>

Included in content model of elements (1):

siteInfo (in site) [75]

Annotation

Full name of the sampling site. eg "LOGAN RIVER ABOVE STATE DAM, NEAR LOGAN,UT"

```
<xsi:element name="siteName" type="xsi:string"/>
```

element <sitesResponse>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: SiteInfoResponseType [120]
Content: complex, 2 elements
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [76]
Used: never

XML Representation Summary

```
<sitesResponse>
    Content: queryInfo?, site*
</sitesResponse>
```

Content model elements (2):

queryInfo (type QueryInfoType) [63],   site [72]

XML Source

```
<xsi:element name="sitesResponse" type="SiteInfoResponseType"/>
```

element <source>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: SourceType [124]
Content: complex, 1 attribute, 5 elements
Defined: locally within complexType TsValuesSingleVariableType [134] in cuahsiTimeSeries_v1_0.xsd, see XML source [77]

XML Representation Summary

```
<source
    sourceID = xsi:int
    >
    Content: Organization?, SourceDescription?, Metadata?, ContactInformation?, SourceLink?
</source>
```

Content model elements (5):

ContactInformation (type ContactInformationType) [26],   SourceDescription (type xsi:string) [77],
Metadata (type MetaDataType) [45],   SourceLink (type xsi:anyURI) [78]
Organization (type xsi:string) [56],

Included in content model of elements (1):

values (in timeSeries) [90]

Annotation

The Sources the original sources of the data, providing information sufficient to retrieve the data value. @sourceID is the link bewteen source the values.

XML Source (w/o annotations (1))

```
<xsi:element maxOccurs="unbounded" minOccurs="0" name="source" type="SourceType"/>
```

element <Source>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: SourceType [124]
Content: complex, 1 attribute, 5 elements
Defined: locally within element series [71] in cuahsiTimeSeries_v1_0.xsd, see XML source [77]

XML Representation Summary

```
<Source
   sourceID = xsi:int
   >
   Content: Organization?, SourceDescription?, Metadata?, ContactInformation?, SourceLink?
</Source>
```

Content model elements (5):

ContactInformation (type ContactInformationType) [26],   SourceDescription (type xsi:string) [77],
Metadata (type MetaDataType) [45],   SourceLink (type xsi:anyURI) [78]
Organization (type xsi:string) [56],

Included in content model of elements (1):

series (in seriesCatalog) [69]

Annotation

Source of the data values and reference information to recover/discover the data from the source.

XML Source (w/o annotations (1))

```
<xsi:element maxOccurs="1" minOccurs="0" name="Source" type="SourceType"/>
```

element <SourceDescription>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:string
Content: simple
Defined: locally within complexType SourceType [126] in cuahsiTimeSeries_v1_0.xsd, see XML source [78]

XML Representation Summary

```
<SourceDescription
   Content: { xsi:string }
</SourceDescription>
```

Included in content model of elements (2):

Source (in series) [77],   source (in values) [76]

Annotation

Full text description of the source of the data. "Text file retrieved from the EPA STORET system indicating data originally from Utah Division of Water Quality"

XML Source (w/o annotations (1))

```
<xsi:element maxOccurs="1" minOccurs="0" name="SourceDescription" type="xsi:string"/>
```

element <sourceInfo>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: SourceInfoType [124]
Content: empty
Defined: locally within complexType TimeSeriesType [131] in cuahsiTimeSeries_v1_0.xsd, see XML source [78]

XML Representation Summary

Included in content model of elements (1):

timeSeries (in timeSeriesResponse) [80]

XML Source

```
<xsi:element name="sourceInfo" type="SourceInfoType"/>
```

element <SourceLink>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:anyURI
Content: simple
Defined: locally within complexType SourceType [126] in cuahsiTimeSeries_v1_0.xsd, see XML source [78]

XML Representation Summary

<SourceLink
    Content: { xsi:anyURI }
</SourceLink>

Included in content model of elements (2):

Source (in series) [77],   source (in values) [76]

Annotation

Link that can be pointed at the original data file and/or associated metadata stored in the digital library or URL of data source.

XML Source (w/o annotations (1))

```
<xsi:element minOccurs="0" name="SourceLink" type="xsi:anyURI"/>
```

element <south>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: Latitude [145]
Content: simple
Defined: locally within complexType LatLonBoxType [106] in cuahsiTimeSeries_v1_0.xsd, see XML source [79]

XML Representation Summary

<south
   Content: { xsi:double }
</south>

Simple Content Detail:

MaxInclusive: 90.00
MinInclusive: -90.00

Included in content model of elements (1):

latLonBox [42]

Annotation

South Latitude

XML Source (w/o annotations (1))

<xsi:element name="**south**" type="**Latitude**"/>

element <timeInterval>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:int
Content: simple
Defined: locally within element timeSupport [83] in cuahsiTimeSeries_v1_0.xsd, see XML source [79]

XML Representation Summary

<timeInterval
   Content: { xsi:int }
</timeInterval>

Included in content model of elements (1):

timeSupport (in variable) [82]

XML Source

<xsi:element maxOccurs="**1**" minOccurs="**0**" name="**timeInterval**" type="**xsi:int**"/>

element <timeParam>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: anonymous complexType
Content: complex, 2 elements
Defined: locally within element criteria [28] in cuahsiTimeSeries_v1_0.xsd, see XML source [80]
Includes: definitions of 2 elements

XML Representation Summary

<timeParam>
    Content: beginDateTime?, endDateTime?
</timeParam>

Content model elements (2):

beginDateTime (in timeParam) [25], endDateTime (in timeParam) [34]

Included in content model of elements (1):

criteria (in queryInfo) [28]

Annotation

the begin and end time of the GetValues request used to generate a timeSeriesResponse.

XML Source (w/o annotations (3))

```xml
<xsi:element minOccurs="0" name="timeParam">
  <xsi:complexType>
    <xsi:sequence>
      <xsi:element maxOccurs="1" minOccurs="0" name="beginDateTime" type="xsi:string"/>
      <xsi:element maxOccurs="1" minOccurs="0" name="endDateTime" type="xsi:string"/>
    </xsi:sequence>
  </xsi:complexType>
</xsi:element>
```

Content Element Detail (defined in this component only; 2/2)

🔵 beginDateTime [25]

    Type: xsi:string, predefined, simple content

    The string submited as startDate to the GetValues method

🔵 endDateTime [34]

    Type: xsi:string, predefined, simple content

    The string submited a startDate to the GetValues method

---

element <timeSeries>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: TimeSeriesType [130]
Content: complex, 1 attribute, 3 elements
Defined: locally within complexType TimeSeriesResponseType [129] in cuahsiTimeSeries_v1_0.xsd, see XML source [81]

XML Representation Summary

<timeSeries
   name = xsi:string
   >
   Content: sourceInfo, variable, values
</timeSeries>

Content model elements (3):

sourceInfo (in timeSeries) [78],   variable (type VariableInfoType) [92]
values (in timeSeries) [90],

Included in content model of elements (1):

timeSeriesResponse [81]

Annotation

Contains the source of the time series, the variable, and values element which is an array of value elements and thier associated metadata (qualifiers, methods, sources, quality control level, samples)

XML Source (w/o annotations (1))

<xsi:element name="**timeSeries**" type="**TimeSeriesType**"/>

element <timeSeriesResponse>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: TimeSeriesResponseType [129]
Content: complex, 2 elements
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [81]
Used: never

XML Representation Summary

<timeSeriesResponse>
   Content: queryInfo?, timeSeries
</timeSeriesResponse>

Content model elements (2):

queryInfo (type QueryInfoType) [63],   timeSeries (in timeSeriesResponse) [80]

XML Source

<xsi:element name="**timeSeriesResponse**" type="**TimeSeriesResponseType**"/>

element <timeSingle>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:dateTime
Content: simple
Defined: locally within complexType TimeSingleType [132] in cuahsiTimeSeries_v1_0.xsd, see XML source [82]

XML Representation Summary

<timeSingle
   Content: { xsi:dateTime }
</timeSingle>

XML Source

<xsi:element name="**timeSingle**" type="**xsi:dateTime**"/>

element <timeSupport>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: anonymous complexType
Content: complex, 1 attribute, 2 elements
Nillable: *(can be declared as nil using xsi:nil attribute in instance XML documents)*
Defined: locally within complexType VariableInfoType [139] in cuahsiTimeSeries_v1_0.xsd, see XML source [82]
Includes: definitions of 1 attribute and 2 elements

XML Representation Summary

<timeSupport
   isRegular = xsi:boolean
   >
   Content: unit?, timeInterval?
</timeSupport>

Content model elements (2):

     timeInterval (in timeSupport) [79],   unit (in timeSupport) [85]

Included in content model of elements (1):

     variable (type VariableInfoType) [92]

Annotation

Element containing the time support (or temporal footprint) of the data values. @isRegular indicates if the spacing is regular. In waterML 1.0, there is a divergence of mean between ODM, and WaterML. WaterML only communcates the regularity, and the spacing of the observations (timeInterval). Whereas timesupport in the ODM is associated with the dataType, and time support. This will be addressed in 1.1

XML Source *(w/o annotations (2))*

```
<xsi:element minOccurs="0" name="timeSupport" nillable="true">
  <xsi:complexType>
    <xsi:sequence>
      <xsi:element maxOccurs="1" minOccurs="0" name="unit" type="UnitsType"/>
      <xsi:element maxOccurs="1" minOccurs="0" name="timeInterval" type="xsi:int"/>
    </xsi:sequence>
    <xsi:attribute name="isRegular" type="xsi:boolean"/>
  </xsi:complexType>
</xsi:element>
```

Attribute Detail *(defined in this component only; 1/1)*

◻ isRegular

    Type: xsi:boolean, predefined

Use: optional

Content Element Detail *(defined in this component only; 2/2)*

🟢 timeInterval [79]

Type: `xsi:int`, predefined, simple content

🟢 unit [85]

Type: UnitsType [134], complex content

element <timeZoneInfo>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: anonymous complexType
Content: complex, 1 attribute, 2 elements
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [83]
Includes: definitions of 1 attribute and 2 elements
Used: at 2 locations

XML Representation Summary

\<timeZoneInfo
   siteUsesDaylightSavingsTime = xsi:boolean : "false"
   >
   Content: defaultTimeZone?, daylightSavingsTimeZone?
\</timeZoneInfo>

Content model elements (2):

daylightSavingsTimeZone (in timeZoneInfo) [31],   defaultTimeZone (in timeZoneInfo) [32]

Included in content model of elements (2):

datasetInfo [29],   siteInfo (in site) [75]

Known Usage Locations

- **Within global complexTypes (2):**

  DataSetInfoType [102], SiteInfoType [123]

Annotation

The default time zone for this site (+00:00) and if this site shifts to daylight savings time (attribute: usesDaylightSavingsTime)

XML Source *(w/o annotations (4))*

```
<xsi:element name="timeZoneInfo">
  <xsi:complexType>
    <xsi:sequence>
      <xsi:element maxOccurs="1" minOccurs="0" name="defaultTimeZone">
        <xsi:complexType>
          <xsi:attributeGroup ref="timeZoneAttr"/>
        </xsi:complexType>
      </xsi:element>
      <xsi:element maxOccurs="1" minOccurs="0" name="daylightSavingsTimeZone">
        <xsi:complexType>
          <xsi:attributeGroup ref="timeZoneAttr"/>
        </xsi:complexType>
```

```
        </xsi:element>
      </xsi:sequence>
      <xsi:attribute default="false" name="siteUsesDaylightSavingsTime" type="xsi:boolean" use="optional"/>
    </xsi:complexType>
</xsi:element>
```

Attribute Detail (defined in this component only; 1/1)

🟨 siteUsesDaylightSavingsTime

Type: xsi:boolean, predefined
Use: optional

If the location shifts it's data sources to Daylight Savings Time, this flag should be true.

Attribute Value

Default: "false"

Content Element Detail (defined in this component only; 2/2)

🟢 daylightSavingsTimeZone [31]

Type: anonymous, empty content

The daylight savings time zone for a site, specified in hours and minutes: "hh:mm"

🟢 defaultTimeZone [32]

Type: anonymous, empty content

The default time zone for a site, specified in hours and minutes: "hh:mm"

element <Title>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:string
Content: simple
Defined: locally within complexType MetaDataType [109] in cuahsiTimeSeries_v1_0.xsd, see XML source [84]

XML Representation Summary

```
<Title
    Content: { xsi:string }
</Title>
```

Included in content model of elements (1):

Metadata (type MetaDataType) [45]

Annotation

Title of data from a specific data source. Title field should be populated with a brief text description of what the referenced data represent. This field can be populated with "Unknown" if there is no title for the data.

XML Source (w/o annotations (1))

```
<xsi:element maxOccurs="1" minOccurs="0" name="Title" type="xsi:string"/>
```

element <TopicCategory>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:string
Content: simple
Defined: locally within complexType MetaDataType [109] in cuahsiTimeSeries_v1_0.xsd, see XML source [85]

XML Representation Summary

<TopicCategory
   Content: { xsi:string }
</TopicCategory>

Included in content model of elements (1):

> Metadata (type MetaDataType) [45]

Annotation

Topic category keyword that gives the broad ISO19115 metadata topic category for data from this source. The controlled vocabulary of topic category keywords is given in the TopicCategoryCV table.

XML Source (w/o annotations (1))

<xsi:element maxOccurs="**1**" minOccurs="**0**" name="**TopicCategory**" type="**xsi:string**"/>

---

element <TypeOfContact>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:string
Content: simple
Defined: locally within complexType ContactInformationType [100] in cuahsiTimeSeries_v1_0.xsd, see XML source [85]

XML Representation Summary

<TypeOfContact
   Content: { xsi:string }
</TypeOfContact>

Included in content model of elements (1):

> ContactInformation (type ContactInformationType) [26]

Annotation

Type of contact, in open terms: Project Contact Data source contact HIS Admin Data Source Admin Data Base Admin

XML Source (w/o annotations (1))

<xsi:element maxOccurs="**1**" minOccurs="**0**" name="**TypeOfContact**" type="**xsi:string**"/>

---

element <unit>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: UnitsType [134]
Content: complex, 1 attribute, 4 elements
Defined: locally within element timeSupport [83] in cuahsiTimeSeries_v1_0.xsd, see XML source [86]

XML Representation Summary

<unit
   <u>UnitID</u> = `xsi:int`
   >
   Content: <u>UnitName</u>?, <u>UnitDescription</u>?, <u>UnitType</u>?, <u>UnitAbbreviation</u>?
</unit>

Content model elements (4):

> <u>UnitAbbreviation</u> (in <u>unit</u>) [86], <u>UnitName</u> (in <u>unit</u>) [87],
> <u>UnitDescription</u> (in <u>unit</u>) [86], <u>UnitType</u> (in <u>unit</u>) [88]

Included in content model of elements (1):

> <u>timeSupport</u> (in <u>variable</u>) [82]

XML Source

<xsi:element maxOccurs="**1**" minOccurs="**0**" name="<u>**unit**</u>" type="<u>**UnitsType**</u>"/>

element <UnitAbbreviation>

Namespace: <u>http://www.cuahsi.org/waterML/1.0/</u>
Type: `xsi:string`
Content: simple
Defined: <u>locally</u> within complexType <u>UnitsType</u> [135] in <u>cuahsiTimeSeries_v1_0.xsd</u>, see <u>XML source</u> [86]

XML Representation Summary

<UnitAbbreviation
   Content: { `xsi:string` }
</UnitAbbreviation>

Included in content model of elements (1):

> <u>unit</u> (in <u>timeSupport</u>) [85]

XML Source

<xsi:element maxOccurs="**1**" minOccurs="**0**" name="<u>**UnitAbbreviation**</u>" type="**xsi:string**"/>

element <UnitDescription>

Namespace: <u>http://www.cuahsi.org/waterML/1.0/</u>
Type: `xsi:string`
Content: simple
Defined: <u>locally</u> within complexType <u>UnitsType</u> [135] in <u>cuahsiTimeSeries_v1_0.xsd</u>, see <u>XML source</u> [87]

XML Representation Summary

<UnitDescription
   Content: { `xsi:string` }
</UnitDescription>

Included in content model of elements (1):

---

unit (in timeSupport) [85]

XML Source

`<xsi:element maxOccurs="1" minOccurs="0" name="UnitDescription" type="xsi:string"/>`

element <UnitName>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:string
Content: simple
Defined: locally within complexType UnitsType [135] in cuahsiTimeSeries_v1_0.xsd, see XML source [87]

XML Representation Summary
<UnitName
    Content: { xsi:string }
</UnitName>

Included in content model of elements (1):

unit (in timeSupport) [85]

XML Source

`<xsi:element maxOccurs="1" minOccurs="0" name="UnitName" type="xsi:string"/>`

element <units>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: anonymous (extension of xsi:string)
Content: simple, 3 attributes
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [88]
Used: at 2 locations

XML Representation Summary
<units
    unitsAbbreviation = xsi:normalizedString
    unitsCode   = xsi:token
    unitsType   = ("Angle" | "Area" | "Dimensionless" | "Energy" | "Energy Flux" | "Flow" |
                        "Force" | "Frequency" | "Length" | "Light" | "Mass" | "Permeability" | "Power"
                        | "Pressure/Stress" | "Resolution" | "Scale" | "Temperature" | "Time" |
                        "Velocity" | "Volume")
    >
    Content: { xsi:string }
</units>

Included in content model of elements (2):

offset (in values) [51],   variable (type VariableInfoType) [92]

Known Usage Locations

- **Within global complexTypes (2):**

OffsetType [113], VariableInfoType [139]

Anonymous Type Detail

Type Derivation Tree

```
xsi:string
   └─complexType (extension)
```

Derivation: extension of `xsi:string`

XML Source

```xml
<xsi:element name="units">
   <xsi:complexType>
      <xsi:simpleContent>
         <xsi:extension base="xsi:string">
            <xsi:attributeGroup ref="unitsAttr"/>
         </xsi:extension>
      </xsi:simpleContent>
   </xsi:complexType>
</xsi:element>
```

element <UnitType>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: UnitsTypeEnum [149]
Content: simple
Defined: locally within complexType UnitsType [135] in cuahsiTimeSeries_v1_0.xsd, see XML source [88]

XML Representation Summary

```
<UnitType
   Content: { enumeration of xsi:string }
</UnitType>
```

Simple Content Detail:

Enumeration: "Angle", "Area", "Dimensionless", "Energy", "Energy Flux", "Flow", "Force", "Frequency", "Length", "Light", "Mass", "Permeability", "Power", "Pressure/Stress", "Resolution", "Scale", "Temperature", "Time", "Velocity", "Volume"

Included in content model of elements (1):

unit (in timeSupport) [85]

XML Source

```xml
<xsi:element maxOccurs="1" minOccurs="0" name="UnitType" type="UnitsTypeEnum"/>
```

element <value>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: ValueSingleVariable [135]
Content: simple, 17 attributes
Defined: locally within complexType TsValuesSingleVariableType [134] in cuahsiTimeSeries_v1_0.xsd, see XML source [89]

XML Representation Summary

```
<value
    accuracyStdDev            = xsi:double
    censorCode                = ("lt" | "gt" | "nc" | "nd" | "pnq")
    codedVocabulary           = xsi:boolean
    codedVocabularyTerm       = xsi:string
    dateTime                  = xsi:dateTime
    metadataDateTime          = xsi:dateTime
    methodID                  = xsi:int
    offsetDescription         = xsi:string
    offsetTypeID              = xsi:int
    offsetUnitsAbbreviation   = xsi:string
    offsetUnitsCode           = xsi:string
    offsetValue               = xsi:double
    oid                       = xsi:normalizedString
    qualifiers                = xsi:string
    qualityControlLevel       = ("Raw data" | "Quality controlled data" | "Derived products" |
                                 "Interpreted products" | "Knowledge products" | "Unknown")
    sampleID                  = xsi:int
    sourceID                  = xsi:int
    >
    Content: { xsi:decimal }
</value>
```

Included in content model of elements (1):

> values (in timeSeries) [90]

Annotation

Multiple <value>s represent the data series.

XML Source (w/o annotations (1))

```
<xsi:element maxOccurs="unbounded" minOccurs="1" name="value" type="ValueSingleVariable"/>
```

element <valueCount>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: anonymous (extension of xsi:int)
Content: simple, 1 attribute
Defined: locally within element series [71] in cuahsiTimeSeries_v1_0.xsd, see XML source [90]
Includes: definition of 1 attribute

XML Representation Summary

```
<valueCount
    countIsEstimated = xsi:boolean
    >
    Content: { xsi:int }
</valueCount>
```

Included in content model of elements (1):

> series (in seriesCatalog) [69]

Anonymous Type Detail

Type Derivation Tree

```
xsi:int
   └─complexType (extension)
```

Derivation: extension of `xsi:int`

XML Source

```xml
<xsi:element name="valueCount">
  <xsi:complexType>
    <xsi:simpleContent>
      <xsi:extension base="xsi:int">
        <xsi:attribute name="countIsEstimated" type="xsi:boolean"/>
      </xsi:extension>
    </xsi:simpleContent>
  </xsi:complexType>
</xsi:element>
```

Attribute Detail (defined in this component only; 1/1)

☐ countIsEstimated

> **Type:** `xsi:boolean`, predefined
> **Use:** optional

element <values>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: TsValuesSingleVariableType [132]
Content: complex, 6 attributes, 6 elements
Defined: locally within complexType TimeSeriesType [131] in cuahsiTimeSeries_v1_0.xsd, see XML source [91]

XML Representation Summary

```
<values
    count               = xsi:nonNegativeInteger
    timeZoneShiftApplied = xsi:boolean
    unitsAbbreviation    = xsi:normalizedString
    unitsAreConverted    = xsi:boolean : "false"
    unitsCode            = xsi:token
    unitsType            = ("Angle" | "Area" | "Dimensionless" | "Energy" | "Energy Flux" | "Flow" |
                            "Force" | "Frequency" | "Length" | "Light" | "Mass" | "Permeability" |
                            "Power" | "Pressure/Stress" | "Resolution" | "Scale" | "Temperature" |
                            "Time" | "Velocity" | "Volume")
    >
    Content: value+, qualifier*, qualityControlLevel*, method*, source*, offset*
</values>
```

Content model elements (6):

> method (in values) [46],   qualityControlLevel [61],
> offset (in values) [51],   source (in values) [76],
> qualifier [58],   value (in values) [88]

Included in content model of elements (1):

> timeSeries (in timeSeriesResponse) [80]

Annotation

A list of values and associated metadata. It is the values element in the timeSerissResponse

XML Source (w/o annotations (1))

`<xsi:element name="values" type="TsValuesSingleVariableType"/>`

element <valueType>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: valueTypeEnum [150]
Content: simple
Defined: locally at 2 locations in cuahsiTimeSeries_v1_0.xsd

XML Representation Summary

<valueType
    Content: { enumeration of xsi:string }
</valueType>

Simple Content Detail:

Enumeration: "Field Observation", "Sample", "Model Simulation Result", "Derived Value", "Unknown"

Included in content model of elements (2):

series (in seriesCatalog) [69],   variable (type VariableInfoType) [92]

Definition Locations

- **Within global complexTypes (1):**

  VariableInfoType [140]

- **Within anonymous complexTypes of elements (1):**

  series (in seriesCatalog) [71]

Annotations (2) (by all definition locations)

Location:

within complexType `VariableInfoType` [140]

Annotation:

Text value indicating what type of data value is being recorded. For 1.0 this must be from the valueTypeEnum type. A default value of "Unknown" can be used where the value type is unknown.

Location:

within element `series` [71]

Annotation:

Text value indicating what type of data value is being recorded as listed in valueTypeEnum

---

element <variable>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: VariableInfoType [137]
Content: complex, 2 attributes, 14 elements
Defined: locally at 3 locations in cuahsiTimeSeries_v1_0.xsd

XML Representation Summary

<variable
 metadataDateTime = xsi:dateTime
 oid = xsi:normalizedString
 >
 Content: variableCode+, variableName?, variableDescription?, valueType?, dataType?, generalCategory?,
     sampleMedium?, units?, options?, note*, related?, extension?, NoDataValue?, timeSupport?
</variable>

Content model elements (14):

dataType (type dataTypeEnum) [30],	sampleMedium (type SampleMediumEnum) [67],
extension [35],	timeSupport (in variable) [82],
generalCategory (type generalCategoryEnum) [36],	units [87],
NoDataValue (in variable) [48],	valueType (type valueTypeEnum) [91],
note (type NoteType) [49],	variableCode [93],
options [55],	variableDescription (in variable) [94],
related (in variable) [65],	variableName (in variable) [94]

Included in content model of elements (3):

series (in seriesCatalog) [69],   variables [95]
timeSeries (in timeSeriesResponse) [80],

Definition Locations

- **Within global complexTypes (1):**

  TimeSeriesType [131]

- **Within anonymous complexTypes of elements (2):**

  series (in seriesCatalog) [71], variables [96]

Annotations (2) (by all definition locations)

Location:

within element variables [96]

Annotation:

zero or more variable elements are contained in a variables element. See VariableInfoType for more
details on the information in the variable element

Location:

within complexType TimeSeriesType [131]

Annotation:

Contains full descriptive information about a variable, as described by the ODM. This includes one or more
variable codes, the short variable name, a detailed variable description, and suggest. See
VariableInforType for full details.

---

element <variableCode>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: anonymous (extension of xsi:token)
Content: simple, 4 attributes
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [93]
Includes: definition of 1 attribute
Used: at 1 location

XML Representation Summary

<variableCode
    default   = xsi:boolean
    network   = xsi:string
    variableID = xsi:integer
    vocabulary = xsi:string
    >
    Content: { xsi:token }
</variableCode>

Included in content model of elements (1):

variable (type VariableInfoType) [92]

Known Usage Locations

- **Within global complexTypes (1):**

  VariableInfoType [140]

Annotation

Text code used by the organization that collects the data to identify the variable. The attribute @vocabulary must be set to the data source name, so the clients can subbumit variable requests to a web service (net USGS discharge variableCode @vocabularyk=NWISDV @default=true "00060"

Anonymous Type Detail

Type Derivation Tree

```
xsi:token
   └─complexType (extension)
```

Derivation: extension of xsi:token

XML Source (w/o annotations (1))

```xml
<xsi:element name="variableCode">
  <xsi:complexType>
    <xsi:simpleContent>
      <xsi:extension base="xsi:token">
        <xsi:attributeGroup ref="VocabularyAttributes"/>
        <xsi:attribute name="variableID" type="xsi:integer"/>
      </xsi:extension>
    </xsi:simpleContent>
  </xsi:complexType>
</xsi:element>
```

Attribute Detail (defined in this component only; 1/4)

🟨 `variableID`

> **Type:** `xsi:integer`, predefined
> **Use:** optional

element <variableDescription>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: `xsi:string`
Content: simple
Defined: locally within complexType `VariableInfoType` [140] in cuahsiTimeSeries_v1_0.xsd, see XML source [94]

XML Representation Summary

<variableDescription
   Content: { xsi:string }
</variableDescription>

Included in content model of elements (1):

> variable (type VariableInfoType) [92]

Annotation

A detailed description of the variable. May include processing information and other details.

XML Source (w/o annotations (1))

`<xsi:element minOccurs="0" name="variableDescription" type="xsi:string"/>`

element <variableName>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: `xsi:string`
Content: simple
Defined: locally within complexType `VariableInfoType` [140] in cuahsiTimeSeries_v1_0.xsd, see XML source [94]

XML Representation Summary

<variableName
   Content: { xsi:string }
</variableName>

Included in content model of elements (1):

> variable (type VariableInfoType) [92]

Annotation

A brief name of the variable that could be shown in a menu

XML Source (w/o annotations (1))

`<xsi:element minOccurs="0" name="variableName" type="xsi:string"/>`

element <variableParam>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:string
Content: simple
Defined: locally within element criteria [28] in cuahsiTimeSeries_v1_0.xsd, see XML source [95]

XML Representation Summary

<variableParam
    Content: { xsi:string }
</variableParam>

Included in content model of elements (1):

criteria (in queryInfo) [28]

Annotation

the variable paramter passed into the service

XML Source (w/o annotations (1))

<xsi:element minOccurs="**0**" name="**variableParam**" type="**xsi:string**"/>

element <variables>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: anonymous complexType
Content: complex, 1 element
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [96]
Includes: definition of 1 element
Used: at 1 location

XML Representation Summary

<variables>
    Content: variable*
</variables>

Content model elements (1):

variable (type VariableInfoType) [92]

Included in content model of elements (1):

variablesResponse [96]

Known Usage Locations

- **Within global complexTypes (1):**

VariablesResponseType [141]

Annotation

variables is a list of variable elements (VariableInfoType).

XML Source (w/o annotations (2))

```xml
<xsi:element name="variables">
  <xsi:complexType>
    <xsi:sequence>
      <xsi:element maxOccurs="unbounded" minOccurs="0" name="variable" type="VariableInfoType"/>
    </xsi:sequence>
  </xsi:complexType>
</xsi:element>
```

Content Element Detail (defined in this component only; 1/1)

🟢 variable [92]

> **Type:** VariableInfoType [137], complex content
>
> zero or more variable elements are contained in a variables element. See VariableInfoType for more details on the information in the variable element

element <variablesResponse>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: VariablesResponseType [140]
Content: complex, 2 elements
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [96]
Used: never

XML Representation Summary

```xml
<variablesResponse>
   Content: queryInfo?, variables
</variablesResponse>
```

Content model elements (2):

queryInfo (type QueryInfoType) [63],   variables [95]

XML Source

```xml
<xsi:element name="variablesResponse" type="VariablesResponseType"/>
```

element <variableTimeInterval>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: TimePeriodType [128]
Content: empty
Defined: locally within element series [71] in cuahsiTimeSeries_v1_0.xsd, see XML source [97]

XML Representation Summary

```xml
<variableTimeInterval/>
```

Included in content model of elements (1):

series (in seriesCatalog) [69]

Annotation

this describes the time period that ana variable or observed parameter are available for. This is of TimePeriodType, which is presently: TimeIntervalType - definite begin and end TimeSingleType - single observation/datavalue TimePeriodRealTime - a floating time period for when data is available. This will have a xml schema type attribute: xsi:type="TimeIntervalType" xsi:type="TimeSingleType" xsi:type="TimePeriodRealTime"

XML Source (w/o annotations (1))

<xsi:element name="**variableTimeInterval**" type="**TimePeriodType**"/>

element <verticalDatum>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:string
Content: simple
Defined: locally within complexType SiteInfoType [123] in cuahsiTimeSeries_v1_0.xsd, see XML source [97]

XML Representation Summary

<verticalDatum
    Content: { xsi:string }
</verticalDatum>

Included in content model of elements (1):

siteInfo (in site) [75]

XML Source

<xsi:element maxOccurs="**1**" minOccurs="**0**" name="**verticalDatum**" type="**xsi:string**"/>

element <west>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: Longitude [145]
Content: simple
Defined: locally within complexType LatLonBoxType [107] in cuahsiTimeSeries_v1_0.xsd, see XML source [98]

XML Representation Summary

<west
    Content: { xsi:double }
</west>

Simple Content Detail:

MaxInclusive: 180.00
MinInclusive: -180.00

Included in content model of elements (1):

latLonBox [42]

Annotation

West Longitude

XML Source (w/o annotations (1))

```
<xsi:element name="west" type="Longitude"/>
```

element <X>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:double
Content: simple
Defined: locally within element `localSiteXY` [44] in cuahsiTimeSeries_v1_0.xsd, see XML source [98]

XML Representation Summary
```
<X
   Content: { xsi:double }
</X>
```

Included in content model of elements (1):

localSiteXY (in geoLocation) [43]

XML Source

```
<xsi:element name="X" type="xsi:double"/>
```

element <Y>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:double
Content: simple
Defined: locally within element `localSiteXY` [44] in cuahsiTimeSeries_v1_0.xsd, see XML source [98]

XML Representation Summary
```
<Y
   Content: { xsi:double }
</Y>
```

Included in content model of elements (1):

localSiteXY (in geoLocation) [43]

XML Source

```
<xsi:element name="Y" type="xsi:double"/>
```

element <Z>

Namespace: http://www.cuahsi.org/waterML/1.0/
Type: xsi:double
Content: simple
Defined: locally within element localSiteXY [44] in cuahsiTimeSeries_v1_0.xsd, see XML source [99]

XML Representation Summary

<Z
    Content: { xsi:double }
</Z>

Included in content model of elements (1):

> localSiteXY (in geoLocation) [43]

XML Source

<xsi:element maxOccurs="**1**" minOccurs="**0**" name="**Z**" type="**xsi:double**"/>

complexType *"ContactInformationType"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: complex, 5 elements
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [99]
Includes: definitions of 5 elements
Used: at 1 location

XML Representation Summary

<...>
    Content: ContactName, TypeOfContact?, Phone?, Email?, Address?
</...>

Content Model Elements (5):

> Address (in ContactInformation) [24],   Phone (in ContactInformation) [57],
> ContactName (in ContactInformation) [27],   TypeOfContact (in ContactInformation) [85]
> Email (in ContactInformation) [33],

All Direct / Indirect Based Elements (1):

> ContactInformation (type ContactInformationType) [26]

Known Usage Locations

- **As direct type of elements (1):**

  ContactInformation (type ContactInformationType) [26]

Annotation

Contains information about a contact. A contact can be a person or an agency. The name of the contact is required. And address, email or phone is suggested. (in 1.1 one of these will be required.

XML Source (w/o annotations (6))

<xsi:complexType name="**ContactInformationType**">
  <xsi:sequence>
    <xsi:element maxOccurs="**1**" minOccurs="**1**" name="**ContactName**" type="**xsi:string**"/>

```
      <xsi:element maxOccurs="1" minOccurs="0" name="TypeOfContact" type="xsi:string"/>
      <xsi:element minOccurs="0" name="Phone" type="xsi:string"/>
      <xsi:element minOccurs="0" name="Email" type="xsi:string"/>
      <xsi:element minOccurs="0" name="Address" type="xsi:anyType"/>
   </xsi:sequence>
</xsi:complexType>
```

Content Element Detail (defined in this component only; 5/5)

Address [24]

    Type: `xsi:anyType`, any content

    Any address element structure that can be used to communicate contact information.

ContactName [27]

    Type: `xsi:string`, predefined, simple content

    name of contact, or title of organization

Email [33]

    Type: `xsi:string`, predefined, simple content

    email address

Phone [57]

    Type: `xsi:string`, predefined, simple content

    phone

TypeOfContact [85]

    Type: `xsi:string`, predefined, simple content

    Type of contact, in open terms: Project Contact Data source contact HIS Admin Data Source Admin Data Base Admin

complexType *"DataSetInfoType"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: complex, 6 elements
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [101]
Includes: definitions of 6 elements
Used: at 1 location

XML Representation Summary

```
<...>
   Content: dataSetIdentifier, timeZoneInfo?, dataSetDescription?, note*, dataSetLocation?, extension?
</...>
```

Content Model Elements (6):

dataSetDescription (in datasetInfo) [29],   extension [35],
dataSetIdentifier (in datasetInfo) [29],   note (type NoteType) [49],
dataSetLocation (in datasetInfo) [30],   timeZoneInfo [83]

All Direct / Indirect Based Elements (1):

datasetInfo [29]

complexType "DataSetInfoType"

Known Usage Locations

- **As direct type of elements (1):**

  datasetInfo [29]

Annotation

DataSetInfoType describes time series derived from a dataset, such as a netCDF file, or a gridded model.

Type Definition Detail

Type Derivation Tree

SourceInfoType [124]
   └─**DataSetInfoType** (extension)

XML Source (w/o annotations (7))

```xml
<xsi:complexType name="DataSetInfoType">
  <xsi:complexContent mixed="false">
    <xsi:extension base="SourceInfoType">
      <xsi:sequence>
        <xsi:element name="dataSetIdentifier" type="xsi:string"/>
        <xsi:element maxOccurs="1" minOccurs="0" ref="timeZoneInfo"/>
        <xsi:element maxOccurs="1" minOccurs="0" name="dataSetDescription" type="xsi:string"/>
        <xsi:element maxOccurs="unbounded" minOccurs="0" name="note" type="NoteType"/>
        <xsi:element maxOccurs="1" minOccurs="0" name="dataSetLocation" type="GeogLocationType"/>
        <xsi:element maxOccurs="1" minOccurs="0" ref="extension"/>
      </xsi:sequence>
    </xsi:extension>
  </xsi:complexContent>
</xsi:complexType>
```

Content Element Detail (defined in this component only; 6/6)

🟢 dataSetDescription [29]

Type: `xsi:string`, predefined, simple content

Text description describing the data source.

🟢 dataSetIdentifier [29]

Type: `xsi:string`, predefined, simple content

The indentifier which the original source uses to identify this dataset. This may be a unique indentifier, or a URL from which the data source was retireved

---

🟢 dataSetLocation [30]

Type: GeogLocationType [102], empty content

geolocation describing the spatial coverage of a gridded dataset.

🟢 extension [35]

Type: `xsi:anyType`, any content

In order to simplify comprehension, data sources are encouraged to put additional informaiton in the extension area, using thier own namespace. Clients need not understand information in extension element

---

🟢 <u>note</u> [49]

Type: <u>NoteType</u> [111], simple content

Additional information, about a dataset, or other properties should be encoded in zero or more &lt;note&gt; elmements. The name of the property should be @title, and the value should be inside the <note>value</note>. Attribute @type is provided so that notes can be grouped.

Simple Content

```
xsi:string
```

🟢 <u>timeZoneInfo</u> [83]

Type: anonymous, complex content

the default time zone for this site (+00:00) and if this site shifts to daylight savings time (attribute: usesDaylightSavingsTime)

complexType *"DocumentationType"*

Namespace: <u>http://www.cuahsi.org/waterML/1.0/</u>
Content: mixed, 4 <u>attributes</u>
Defined: globally in <u>cuahsiTimeSeries_v1_0.xsd</u>, see <u>XML source</u> [102]
Includes: definition of 1 <u>attribute</u>
Used: never

XML Representation Summary

```
<...
    href  = xsi:string
    show  = xsi:string
    title = xsi:string
    type  = (xsi:token | ("funding" | "history" | "processing_level" | "rights" | "summary"))
    >
    Content: {text}
</...>
```

XML Source

```
<xsi:complexType mixed="true" name="DocumentationType">
    <xsi:attribute name="type" type="DocumentationEnumTypes"/>
    <xsi:attributeGroup ref="XLinkAttr"/>
</xsi:complexType>
```

Attribute Detail (defined in <u>this</u> component only; 1/4)

🟨 type

Type: <u>DocumentationEnumTypes</u> [143]
Use: optional

Attribute Value

```
xsi:token | ("funding" | "history" | "processing_level" | "rights" | "summary")
```

complexType *"GeogLocationType"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: empty, 1 attribute
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [103]
Includes: definition of 1 attribute
Used: at 4 locations

XML Representation Summary

```
<...
    srs = xsi:string : "EPSG:4326"
/>
```

Known Direct Subtypes (2):

>   LatLonBoxType [105], LatLonPointType [107]

All Direct / Indirect Based Elements (4):

>   dataSetLocation (in datasetInfo) [30],   latLonBox [42],
>   geogLocation (in geoLocation) [36],   latLonPoint [42]

Known Usage Locations

- **In derivations of other global types (2):**

    LatLonBoxType [105] (as extension base),   LatLonPointType [107] (as extension base)

- **As direct type of elements (2):**

    dataSetLocation (in datasetInfo) [30],   geogLocation (in geoLocation) [36]

Annotation

GeogLocationType is the base class for the two geometry types: LatLonPointType, and LatLonBoxType. Any additional types should derive from this type. The default spatial reference system is @srs is EPSG:4326 or Geographic lat long.

XML Source (w/o annotations (1))

```xml
<xsi:complexType name="GeogLocationType">
   <xsi:sequence/>
   <xsi:attribute default="EPSG:4326" name="srs" type="xsi:string" use="optional"/>
</xsi:complexType>
```

Attribute Detail (defined in this component only; 1/1)

🟨 srs

>   **Type:** xsi:string, predefined
>   **Use:** optional
>
>   *Attribute Value*
>
>   **Default:** "EPSG:4326"

---

complexType *"LabMethodType"*

Namespace:	http://www.cuahsi.org/waterML/1.0/
Content:	complex, 1 attribute, 5 elements
Defined:	globally in cuahsiTimeSeries_v1_0.xsd, see XML source [104]
Includes:	definitions of 1 attribute and 5 elements
Used:	at 1 location

XML Representation Summary

```
<...
    labMethodID = xsi:int
    >
    Content: labName?, labOrganization?, LabMethodName?, labMethodDescription?, labMethodLink?
</...>
```

Content Model Elements (5):

labMethodDescription (in LabMethod) [39],   labName (in LabMethod) [40],
labMethodLink (in LabMethod) [39],   labOrganization (in LabMethod) [40]
LabMethodName (in LabMethod) [40],

All Direct / Indirect Based Elements (1):

LabMethod (type LabMethodType) [38]

Known Usage Locations

- **As direct type of elements (1):**

    LabMethod (type LabMethodType) [38]

Annotation

contains descriptions of the laboratory methods used to analyze physical samples for specific constituents.

XML Source (w/o annotations (7))

```xml
<xsi:complexType name="LabMethodType">
  <xsi:sequence>
    <xsi:element minOccurs="0" name="labName" type="xsi:string"/>
    <xsi:element minOccurs="0" name="labOrganization" type="xsi:string"/>
    <xsi:element minOccurs="0" name="LabMethodName" type="xsi:string"/>
    <xsi:element minOccurs="0" name="labMethodDescription" type="xsi:string"/>
    <xsi:element maxOccurs="1" minOccurs="0" name="labMethodLink" type="xsi:string"/>
  </xsi:sequence>
  <xsi:attribute name="labMethodID" type="xsi:int"/>
</xsi:complexType>
```

Attribute Detail (defined in this component only; 1/1)

🟨 labMethodID

> **Type:** xsi:int, predefined
> **Use:** optional
>
> Unique integer identifier for each laboratory method. This is the key used by the Samples table to reference a laboratory method.

Content Element Detail (defined in this component only; 5/5)

🟢 labMethodDescription [39]

> **Type:** xsi:string, predefined, simple content
>
> Description of the method and protocols used for sample analysis.

🌀 `labMethodLink` [39]

> **Type:** `xsi:string`, predefined, simple content

> Link to additional reference material on the analysis method.

🌀 `LabMethodName` [40]

> **Type:** `xsi:string`, predefined, simple content

> Name of the method and protocols used for sample analysis. Suggest using nemi names and codes http://www.nemi.gov/ "USEPA-365.1"

🌀 `labName` [40]

> **Type:** `xsi:string`, predefined, simple content

> Name of the laboratory responsible for processing the sample.

🌀 `labOrganization` [40]

> **Type:** `xsi:string`, predefined, simple content

> Organization responsible for sample analysis.

complexType *"LatLonBoxType"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: complex, 1 attribute, 4 elements
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [106]
Includes: definitions of 4 elements
Used: at 1 location

XML Representation Summary

```
<...
    srs = xsi:string : "EPSG:4326"
    >
    Content: south, west, north, east
</...>
```

Content Model Elements (4):

> east (in latLonBox) [32],   south (in latLonBox) [79],
> north (in latLonBox) [49],   west (in latLonBox) [97]

All Direct / Indirect Based Elements (1):

> latLonBox [42]

Known Usage Locations

- **As direct type of elements (1):**

latLonBox [42]

Type Definition Detail

Type Derivation Tree

GeogLocationType [102]
   └─**LatLonBoxType** (extension)

XML Source (w/o annotations (4))

```
<xsi:complexType name="LatLonBoxType">
  <xsi:complexContent mixed="false">
    <xsi:extension base="GeogLocationType">
      <xsi:sequence>
        <xsi:element name="south" type="Latitude"/>
        <xsi:element name="west" type="Longitude"/>
        <xsi:element name="north" type="Latitude"/>
        <xsi:element name="east" type="Longitude"/>
      </xsi:sequence>
    </xsi:extension>
  </xsi:complexContent>
</xsi:complexType>
```

Content Element Detail (defined in this component only; 4/4)

🟢 east [32]

Type: Longitude [145], simple content

East longitude.

Simple Content

```
xsi:double
```

maxInclusive: 180.00
minInclusive: −180.00

🟢 north [49]

Type: Latitude [145], simple content

North Latitude

Simple Content

```
xsi:double
```

maxInclusive: 90.00
minInclusive: −90.00

🟢 south [79]

Type: Latitude [145], simple content

South Latitude

Simple Content

```
xsi:double
```

maxInclusive: 90.00
minInclusive: −90.00

🟢 <u>west</u> [97]

> **Type:** <u>Longitude</u> [145], simple content
>
> West Longitude
>
> ### Simple Content
>
> ```
> xsi:double
> ```
>
> **maxInclusive:** 180.00
> **minInclusive:** -180.00

complexType *"LatLonPointType"*

Namespace: <u>http://www.cuahsi.org/waterML/1.0/</u>
Content: complex, 1 attribute, 2 <u>elements</u>
Defined: globally in <u>cuahsiTimeSeries_v1_0.xsd</u>, see <u>XML source</u> [107]
Includes: definitions of 2 <u>elements</u>
Used: at 1 <u>location</u>

XML Representation Summary

```
<...
    srs = xsi:string : "EPSG:4326"
    >
    Content: latitude, longitude
</...>
```

Content Model Elements (2):

<u>latitude</u> (in <u>latLonPoint</u>) [41], <u>longitude</u> (in <u>latLonPoint</u>) [45]

All Direct / Indirect Based Elements (1):

<u>latLonPoint</u> [42]

Known Usage Locations

- **As direct type of elements (1):**

<u>latLonPoint</u> [42]

Type Definition Detail

Type Derivation Tree

<u>GeogLocationType</u> [102]
  └**LatLonPointType** (extension)

XML Source (w/o annotations (2))

```xml
<xsi:complexType name="LatLonPointType">
  <xsi:complexContent mixed="false">
    <xsi:extension base="GeogLocationType">
      <xsi:sequence>
        <xsi:element name="latitude" type="Latitude"/>
        <xsi:element name="longitude" type="Longitude"/>
      </xsi:sequence>
    </xsi:extension>
  </xsi:complexContent>
</xsi:complexType>
```

Content Element Detail (defined in this component only; 2/2)

🔵 latitude [41]

    Type: Latitude [145], simple content

    The latitude of the site in a decimal degrees as calculated in terms of the given datum.

    Simple Content

    ```
xsi:double
```

    maxInclusive: 90.00
    minInclusive: -90.00

🔵 longitude [45]

    Type: Longitude [145], simple content

    The longitude of the site in a decimal degrees as calculated in terms of the given datum.

    Simple Content

    ```
xsi:double
```

    maxInclusive: 180.00
    minInclusive: -180.00

complexType *"MetaDataType"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: complex, 5 elements
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [109]
Includes: definitions of 5 elements
Used: at 1 location

XML Representation Summary

```
<...>
    Content:  TopicCategory?, Title?, Abstract?, ProfileVersion?, MetadataLink?
</...>
```

Content Model Elements (5):

Abstract (in Metadata) [23],   Title (in Metadata) [84],
MetadataLink (in Metadata) [46],   TopicCategory (in Metadata) [84]
ProfileVersion (in Metadata) [58],

All Direct / Indirect Based Elements (1):

Metadata (type MetaDataType) [45]

Known Usage Locations

- **As direct type of elements (1):**

Metadata (type MetaDataType) [45]

Annotation

MetadataType contains the information from the ODM table IsoMetadata. It is anticpated that many data sources may not have this fully available. IsoMetadata table contains dataset and project level metadata required by the CUAHSI HIS metadata system (http://www.cuahsi.org/his/documentation.html) for compliance with standards such

as the draft ISO 19115 or ISO 8601. The mandatory fields in this table must be populated to provide a complete set of ISO compliant metadata in the database.

XML Source (w/o annotations (6))

```
<xsi:complexType name="MetaDataType">
  <xsi:sequence>
    <xsi:element maxOccurs="1" minOccurs="0" name="TopicCategory" type="xsi:string"/>
    <xsi:element maxOccurs="1" minOccurs="0" name="Title" type="xsi:string"/>
    <xsi:element maxOccurs="1" minOccurs="0" name="Abstract" type="xsi:string"/>
    <xsi:element maxOccurs="1" minOccurs="0" name="ProfileVersion" type="xsi:string"/>
    <xsi:element maxOccurs="1" minOccurs="0" name="MetadataLink" type="xsi:anyURI"/>
  </xsi:sequence>
</xsi:complexType>
```

Content Element Detail (defined in this component only; 5/5)

🌀 Abstract [23]

    Type: xsi:string, predefined, simple content

    Abstract of data from a specific data source. Abstract field should be populated with a more complete text description of the data that the metadata record references. This field can be populated with "Unknown" if there is no abstract for the data.

🌀 MetadataLink [46]

    Type: xsi:anyURI, predefined, simple content

    Link to additional metadata reference material.

🌀 ProfileVersion [58]

    Type: xsi:string, predefined, simple content

    Name of metadata profile used by the data source

🌀 Title [84]

    Type: xsi:string, predefined, simple content

    Title of data from a specific data source. Title field should be populated with a brief text description of what the referenced data represent. This field can be populated with "Unknown" if there is no title for the data.

🌀 TopicCategory [84]

    Type: xsi:string, predefined, simple content

    Topic category keyword that gives the broad ISO19115 metadata topic category for data from this source. The controlled vocabulary of topic category keywords is given in the TopicCategoryCV table.

complexType *"MethodType"*

Namespace:	http://www.cuahsi.org/waterML/1.0/
Content:	complex, 1 attribute, 2 elements
Defined:	globally in cuahsiTimeSeries_v1_0.xsd, see XML source [110]
Includes:	definitions of 1 attribute and 2 elements
Used:	at 2 locations

XML Representation Summary

```
<...
    methodID = xsi:int
    >
    Content: MethodDescription, MethodLink?
</...>
```

Content Model Elements (2):

>   MethodDescription (type xsi:string) [47],   MethodLink (type xsi:string) [48]

All Direct / Indirect Based Elements (2):

>   Method (in series) [47],   method (in values) [46]

Known Usage Locations

- **As direct type of elements (2):**

>   Method (in series) [47],   method (in values) [46]

Annotation

Method used to collect the data and any additional information about the method. @methodId is the link to value/@method As per communication from the ODM designers, multiple instruments observing the same variable, should be different methods. Methods should describe the manner in which the observation was collected (i.e., collected manually, or collected using an automated sampler) or measured (i.e., measured using a temperature sensor or measured using a turbidity sensor). Details about the specific sensor models and manufacturers can be included in the MethodDescription

XML Source (w/o annotations (3))
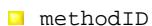
```
<xsi:complexType name="MethodType">
  <xsi:sequence>
    <xsi:element name="MethodDescription" type="xsi:string"/>
    <xsi:element maxOccurs="1" minOccurs="0" name="MethodLink" type="xsi:string"/>
  </xsi:sequence>
  <xsi:attribute name="methodID" type="xsi:int"/>
</xsi:complexType>
```

Attribute Detail (defined in this component only; 1/1)

🔲 methodID

>   **Type:** xsi:int, predefined
>   **Use:** optional

Content Element Detail (defined in this component only; 2/2)

🟢 MethodDescription [47]

>   **Type:** xsi:string, predefined, simple content

>   Text description of each method.

🟢 MethodLink [48]

>   **Type:** xsi:string, predefined, simple content

>   Link to additional reference material on the method.

complexType *"NoteType"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: simple, 4 attributes
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [111]
Includes: definition of 1 attribute
Used: at 1 location

XML Representation Summary

```
<...
   href = xsi:string
   show = xsi:string
   title = xsi:string
   type = xsi:string
   >
   Content: { xsi:string }
</...>
```

All Direct / Indirect Based Elements (1):

note (type NoteType) [49]

Known Usage Locations

- **As direct type of elements (1):**

  note (type NoteType) [49]

Annotation

NoteType defines the note element available in many defined types. the value should the description of the note. @title should be the brief name that might be displayed as a lable @type can be used to allow for grouping of elements.

Type Definition Detail

Type Derivation Tree

```
xsi:string
   └─NoteType (extension)
```

Derivation: extension of xsi:string

XML Source (w/o annotations (1))

```xml
<xsi:complexType name="NoteType">
  <xsi:simpleContent>
    <xsi:extension base="xsi:string">
      <xsi:attribute name="type" type="xsi:string"/>
      <xsi:attributeGroup ref="XLinkAttr"/>
    </xsi:extension>
  </xsi:simpleContent>
</xsi:complexType>
```

Attribute Detail (defined in this component only; 1/4)

🟨 type

Type: xsi:string, predefined
Use: optional

complexType *"OffsetType"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: complex, 1 attribute, 5 elements
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [112]
Includes: definitions of 1 attribute and 5 elements
Used: at 1 location

XML Representation Summary

```
<...
   offsetTypeID = xsi:int
   >
   Content: offsetValue, offsetDescription, units, offsetIsVertical?, offsetHorizDirectionDegrees?
</...>
```

Content Model Elements (5):

offsetDescription (in offset) [51],   offsetValue (in offset) [53],
offsetHorizDirectionDegrees (in offset) [52],   units [87]
offsetIsVertical (in offset) [52],

All Direct / Indirect Based Elements (1):

offset (in values) [51]

Known Usage Locations

- **As direct type of elements (1):**

offset (in values) [51]

Annotation

OffsetType contains full descriptive information for each of the measurement offsets. A set of observations may be done at an offset for the central location. offsetTypeID links to dataValue/@offsetTypeId

XML Source (w/o annotations (7))

```xml
<xsi:complexType name="OffsetType">
  <xsi:sequence>
    <xsi:element maxOccurs="1" minOccurs="1" name="offsetValue" type="xsi:float"/>
    <xsi:element maxOccurs="1" minOccurs="1" name="offsetDescription" type="xsi:string"/>
    <xsi:element ref="units"/>
    <xsi:element default="true" maxOccurs="1" minOccurs="0" name="offsetIsVertical" type="xsi:boolean"/>
    <xsi:element maxOccurs="1" minOccurs="0" name="offsetHorizDirectionDegrees" type="xsi:int"/>
  </xsi:sequence>
  <xsi:attribute name="offsetTypeID" type="xsi:int"/>
</xsi:complexType>
```

Attribute Detail (defined in this component only; 1/1)

🟨 offsetTypeID

> **Type:** `xsi:int`, predefined
> **Use:** optional

> Unique integer identifier that identifies the type of measurement offset. Suggested that this is offsetType from ODM database.

Content Element Detail (defined in this component only; 5/5)

🟢 offsetDescription [51]

> **Type:** `xsi:string`, predefined, simple content

> Full text description of the offset type. Field should be filled in with a complete text description of the offset that provides enough information to interpret the type of offset being used. For example, "Distance from stream bank" is ambiguous because it is not known which bank is being referred to.

🟢 offsetHorizDirectionDegrees [52]

> **Type:** `xsi:int`, predefined, simple content

> if offsetIsVertical=false, then this is the direction of the offset

-----

🟢 offsetIsVertical [52]

> **Type:** `xsi:boolean`, predefined, simple content

> By default, the offset is vertical. If the offset is horizontal, then this becomes a direction, and distance from the observation point

> **Simple Content**

> **Default:** `"true"`

🟢 offsetValue [53]

> **Type:** `xsi:float`, predefined, simple content

> offsetValue element is value of offset. If 0, then offset is not needed, and offsetTypeId should not be included on the dataValue

-----

🟢 units [87]

> **Type:** anonymous (extension of `xsi:string`), simple content

> Units of the offsetValue

> **Simple Content**

> ```
> xsi:string
> ```

complexType *"QualifiersType"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: complex, 1 element
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [114]
Includes: definition of 1 element
Used: never

XML Representation Summary

```
<...>
    Content: qualifier
</...>
```

Content Model Elements (1):

> **qualifier** (type anonymous) [60]

Annotation

qualifying comments that accompany the data

XML Source (w/o annotations (3))

```
<xsi:complexType name="QualifiersType">
  <xsi:sequence>
    <xsi:element name="qualifier">
      <xsi:complexType>
        <xsi:sequence>
          <xsi:element name="qualifierCode" type="xsi:token"/>
        </xsi:sequence>
        <xsi:attribute name="qualifierID" type="xsi:int"/>
        <xsi:attributeGroup ref="VocabularyAttributes"/>
      </xsi:complexType>
    </xsi:element>
  </xsi:sequence>
</xsi:complexType>
```

Content Element Detail (defined in this component only; 1/1)

🔵 qualifier [60]

> **Type:** anonymous, complex content
>
> qualifying comments that accompany the data. value/@qaulifier is a space delimted list of qualifiers for a data value. @qualifierCode is the link to the value/@qualifier for a single value The value inside provides the textual description. @qualifierCode is the reference code. @qualifierCode=A qualifier value=Approved @vocabulary and @network are suggested. For example a value from the USGS may qualifiers from multiple vocabularies, and the network would be the data service.

complexType *"QualityControlLevelType"*

Namespace:	http://www.cuahsi.org/waterML/1.0/
Content:	simple, 1 attribute
Defined:	globally in cuahsiTimeSeries_v1_0.xsd, see XML source [115]
Includes:	definition of 1 attribute
Used:	at 1 location

XML Representation Summary

```
<...
    qualityControlLevelID = xsi:int
    >
    Content: { xsi:string }
</...>
```

All Direct / Indirect Based Elements (1):

> **QualityControlLevel** (in series) [62]

Known Usage Locations

- **As direct type of elements (1):**

    QualityControlLevel (in series) [62]

Annotation

Value is the text Code used to identify the level of quality control to which data values have been subjected.

Type Definition Detail

Type Derivation Tree

```
xsi:string
   └─QualityControlLevelType (extension)
```

Derivation: extension of xsi:string

XML Source (w/o annotations (2))

```
<xsi:complexType name="QualityControlLevelType">
   <xsi:simpleContent>
      <xsi:extension base="xsi:string">
         <xsi:attribute name="qualityControlLevelID" type="xsi:int"/>
      </xsi:extension>
   </xsi:simpleContent>
</xsi:complexType>
```

Attribute Detail (defined in this component only; 1/1)

🔸 qualityControlLevelID

> **Type:** xsi:int, predefined
> **Use:** optional
>
> Integer identifier that indicates the level of quality control that the data values have been subjected to.

---

complexType *"QueryInfoType"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: complex, 6 elements
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [116]
Includes: definitions of 6 elements
Used: at 1 location

XML Representation Summary

```
<...>
   Content: creationTime?, queryURL?, querySQL?, criteria?, note*, extension?
</...>
```

Content Model Elements (6):

creationTime (in queryInfo) [27], note (type NoteType) [49],
criteria (in queryInfo) [28], querySQL (in queryInfo) [64],
extension [35], queryURL (in queryInfo) [64]

All Direct / Indirect Based Elements (1):

---

queryInfo (type QueryInfoType) [63]

Known Usage Locations

- **As direct type of elements (1):**

    queryInfo (type QueryInfoType) [63]

Annotation

This contains information about the request, and is used to enable the XML responses (timeSeriesResponse, variablesResponse,siteResponse) to be stored on disk.

XML Source (w/o annotations (12))

```xml
<xsi:complexType name="QueryInfoType">
  <xsi:sequence>
    <xsi:element minOccurs="0" name="creationTime" type="xsi:dateTime"/>
    <xsi:element minOccurs="0" name="queryURL" type="xsi:string"/>
    <xsi:element minOccurs="0" name="querySQL" type="xsi:string"/>
    <xsi:element minOccurs="0" name="criteria">
      <xsi:complexType>
        <xsi:sequence minOccurs="0">
          <xsi:element minOccurs="0" name="locationParam" type="xsi:string"/>
          <xsi:element minOccurs="0" name="variableParam" type="xsi:string"/>
          <xsi:element minOccurs="0" name="timeParam">
            <xsi:complexType>
              <xsi:sequence>
                <xsi:element maxOccurs="1" minOccurs="0" name="beginDateTime" type="xsi:string"/>
                <xsi:element maxOccurs="1" minOccurs="0" name="endDateTime" type="xsi:string"/>
              </xsi:sequence>
            </xsi:complexType>
          </xsi:element>
        </xsi:sequence>
      </xsi:complexType>
    </xsi:element>
    <xsi:element maxOccurs="unbounded" minOccurs="0" name="note" type="NoteType"/>
    <xsi:element maxOccurs="1" minOccurs="0" ref="extension"/>
  </xsi:sequence>
</xsi:complexType>
```

Content Element Detail (defined in this component only; 6/6)

creationTime [27]

> **Type:** xsi:dateTime, predefined, simple content

> When was this response originally created.

---

criteria [28]

> **Type:** anonymous, complex content

> The criteria are the actual parameters that are passed into the method. If you are generate this without a XML helper class, be sure to properly encode these elements.

---

extension [35]

> **Type:** xsi:anyType, any content

> In order to simplify comprehension, data sources are encouraged to put additional informaiton in the extension area, using thier own namespace. Clients need not understand information in <extension?

---

note [49]

> **Type:** NoteType [111], simple content

Additional information, properties like should be encoded in zero or more &lt;note&gt; elmements. The name of the property should be @title, and the value should be inside the <note>value</note>. Attribute @type is provided so that notes can be grouped.

Simple Content

```
xsi:string
```

🟢 <u>querySQL</u> [64]

> **Type:** `xsi:string`, predefined, simple content

For debugging, the SQL used to generate this request may be placed in this element.

🟢 <u>queryURL</u> [64]

> **Type:** `xsi:string`, predefined, simple content

The URL of the web page that was used as the original source for the response. Often requests scrap HTML pages. This should be the URL of that page. If the response is retreive from a rest URL. This is also a the location for the URL.

complexType *"SampleType"*

Namespace:	http://www.cuahsi.org/waterML/1.0/
Content:	complex, 1 <u>attribute</u>, 3 <u>elements</u>
Defined:	globally in <u>cuahsiTimeSeries_v1_0.xsd</u>, see <u>XML source</u> [117]
Includes:	definitions of 1 <u>attribute</u> and 3 <u>elements</u>
Used:	never

XML Representation Summary

```
<...
   sampleID = xsi:int
   >
   Content: labSampleCode, SampleType, LabMethod?
</...>
```

Content Model Elements (3):

> <u>LabMethod</u> (type <u>LabMethodType</u>) [38], <u>SampleType</u> (type <u>sampleTypeEnum</u>) [68]
> <u>labSampleCode</u> (type <u>xsi:string</u>) [41],

Annotation

information about physical samples analyzed in a laboratory. @sampleID is the link to the datavalues/@sampleID LabSampleCode is the sample code. In WaterML 1.1 this will be the link to the dataValue SampleType describes the the sample type LabMethod is a LabMethodType containing infomration about lab methods

XML Source (w/o annotations (4))

```xml
<xsi:complexType name="SampleType">
  <xsi:sequence>
    <xsi:element name="labSampleCode" type="xsi:string"/>
    <xsi:element name="SampleType" type="sampleTypeEnum"/>
    <xsi:element minOccurs="0" name="LabMethod" type="LabMethodType"/>
  </xsi:sequence>
  <xsi:attribute name="sampleID" type="xsi:int"/>
</xsi:complexType>
```

Attribute Detail (defined in this component only; 1/1)

🟨 sampleID

> **Type:** xsi:int, predefined
> **Use:** optional

Content Element Detail (defined in this component only; 3/3)

🟢 LabMethod [38]

> **Type:** LabMethodType [103], complex content
>
> LabMethod is a LabMethodType containing infomration about lab methods

----

🟢 labSampleCode [41]

> **Type:** xsi:string, predefined, simple content
>
> Code or label used to identify and track lab sample or sample container (e.g. bottle) during lab analysis.

🟢 SampleType [68]

> **Type:** sampleTypeEnum [148], simple content
>
> Controlled vocabulary specifying the sample type from the SampleTypeEnum.
>
> ### Simple Content
>
> > *enumeration of* xsi:string
>
> **Enumeration:** "FD", "FF", "FL", "LF", "GW", "PB", "PD", "PE", "PI", "PW", "RE", "SE", "SR", "SS", "SW", "TE", "TI", "TW", "VE", "VI", "VW", "Grab", "Unknown", "No Sample"

complexType *"seriesCatalogType"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: complex, 2 attributes, 3 elements
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [119]
Includes: definitions of 2 attributes and 3 elements
Used: at 1 location

XML Representation Summary

```
<...
   menuGroupName = xsi:string
   serviceWsdl   = xsi:anyURI
   >
   Content: note*, series*, extension?
</...>
```

Content Model Elements (3):

> extension [35],   series (in seriesCatalog) [69]
> note (type NoteType) [49],

All Direct / Indirect Based Elements (1):

> seriesCatalog (in site) [71]

Known Usage Locations

- **As direct type of elements (1):**

seriesCatalog (in site) [71]

Annotation

Series catalog represents a list of series, where each separate data series are for the purposes of identifying or displaying what data are available at each site.

XML Source (w/o annotations (13))

```
<xsi:complexType name="seriesCatalogType">
  <xsi:sequence>
    <xsi:element maxOccurs="unbounded" minOccurs="0" name="note" type="NoteType"/>
    <xsi:element maxOccurs="unbounded" minOccurs="0" name="series">
      <xsi:complexType>
        <xsi:sequence>
          <xsi:element maxOccurs="1" minOccurs="0" name="dataType" type="dataTypeEnum"/>
          <xsi:element name="variable" type="VariableInfoType"/>
          <xsi:element name="valueCount">
            <xsi:complexType>
              <xsi:simpleContent>
                <xsi:extension base="xsi:int">
                  <xsi:attribute name="countIsEstimated" type="xsi:boolean"/>
                </xsi:extension>
              </xsi:simpleContent>
            </xsi:complexType>
          </xsi:element>
          <xsi:element name="variableTimeInterval" type="TimePeriodType"/>
          <xsi:element maxOccurs="1" minOccurs="0" name="valueType" type="valueTypeEnum"/>
          <xsi:element maxOccurs="1" minOccurs="0" name="generalCategory" type="generalCategoryEnum"/>
          <xsi:element maxOccurs="1" minOccurs="0" name="sampleMedium" type="SampleMediumEnum"/>
          <xsi:element maxOccurs="1" minOccurs="0" name="Method" type="MethodType"/>
          <xsi:element maxOccurs="1" minOccurs="0" name="Source" type="SourceType"/>
          <xsi:element maxOccurs="1" minOccurs="0" name="QualityControlLevel" type="QualityControlLevelType"/>
          <xsi:element maxOccurs="1" minOccurs="0" ref="extension"/>
        </xsi:sequence>
      </xsi:complexType>
    </xsi:element>
    <xsi:element maxOccurs="1" minOccurs="0" ref="extension"/>
  </xsi:sequence>
  <xsi:attribute name="menuGroupName" type="xsi:string"/>
  <xsi:attribute name="serviceWsdl" type="xsi:anyURI"/>
</xsi:complexType>
```

Attribute Detail (defined in this component only; 2/2)

🟨 menuGroupName

> **Type:** `xsi:string`, predefined
> **Use:** optional
>
> For clients, this is the list of the html select group element. This would allow for groups or seriesCatalogs to appear in an HTML select menu.

🟨 serviceWsdl

> **Type:** `xsi:anyURI`, predefined
> **Use:** optional
>
> (depreciated) location of the WaterOneFlow service that the client should execute GetValues call on. All services now proxy getValues methods from other sources.

Content Element Detail (defined in this component only; 3/3)

🟢 extension [35]

> **Type:** `xsi:anyType`, any content

🟢 note [49]

> **Type:** NoteType [111], simple content
>
> Additional information, properties like should be encoded in zero or more In seriesCatalog note elements are placed at the top, to simplify human identification, since there can be tens, or hundred of series for a location. The name of the property should be @title, and the value should be inside the note element. Attribute @type is provided so that notes can be grouped.
>
> ***Simple Content***
>
> ```
> xsi:string
> ```

🟢 series [69]

> **Type:** anonymous, complex content
>
> Separate data series are for the purposes of identifying or displaying what data are available at each site. Site information is a parent of the series so that it does not need to be repeated (difference from the ODM.). A Site contains one or more seriesCatalogs which contain one or more series. Assotiated with site, a series is a unique combination of the textual repesentation of ODM series: Variable,Method,Source,QualityControlLevel. An ODM series is a unique site/variable combinations are defined by unique combinations of SiteID, VariableID, MethodID, SourceID, and QualityControlLevelID.

complexType *"SiteInfoResponseType"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: complex, 2 elements
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [120]
Includes: definitions of 2 elements
Used: at 1 location

XML Representation Summary

```
<...>
   Content: queryInfo?, site*
</...>
```

Content Model Elements (2):

> queryInfo (type QueryInfoType) [63], site [72]

All Direct / Indirect Based Elements (1):

> sitesResponse [76]

Known Usage Locations

- **As direct type of elements (1):**

> sitesResponse [76]

Annotation

A sitesResponse contains a list of zero or more site elements. The siteInfo element contains the basic site information, siteName, location, siteCodes, properties. The seriesCatalog contains the list of observation series conducted at a site. A site element can have two parts: siteInfo, and one or more seriesCatalogs. Rules: GetSites(site[]) or GetSites(null), return no seriesCatalogs elements GetSiteInfo(site) return all information about a site, including the seriesCatalog.

XML Source (w/o annotations (3))

```
<xsi:complexType name="SiteInfoResponseType">
```

```
<xsi:sequence>
    <xsi:element minOccurs="0" name="queryInfo" type="QueryInfoType"/>
    <xsi:element maxOccurs="unbounded" minOccurs="0" ref="site"/>
</xsi:sequence>
</xsi:complexType>
```

Content Element Detail (defined in this component only; 2/2)

🔵 queryInfo [63]

> **Type:** QueryInfoType [115], complex content
>
> The parameter information passed to GetSiteInfo(site) or GetSites(site[]) should be placed in QueryInfoType/criteria/locationParam See QueryInfoType for more details.

- -

🔵 site [72]

> **Type:** anonymous, complex content
>
> A sitesResponse contains a list of zero or more site elements. A site element is

complexType *"SiteInfoType"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: complex, 2 attributes, 9 elements
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [122]
Includes: definitions of 9 elements
Used: at 1 location

XML Representation Summary

```
<...
    metadataDateTime = xsi:dateTime
    oid              = xsi:normalizedString
    >
    Content:  siteName, siteCode+, timeZoneInfo?, geoLocation?, elevation_m?, verticalDatum?, note*,
              extension?, altname*
</...>
```

Content Model Elements (9):

altname (in siteInfo) [24],   siteCode (in siteInfo) [73],
elevation_m (in siteInfo) [33],   siteName (in siteInfo) [75],
extension [35],   timeZoneInfo [83],
geoLocation (in siteInfo) [37],   verticalDatum (in siteInfo) [97]
note (type NoteType) [49],

All Direct / Indirect Based Elements (1):

siteInfo (in site) [75]

Known Usage Locations

- **As direct type of elements (1):**

siteInfo (in site) [75]

Annotation

A sampling station is any place where data are collected. SiteInfoType is the Element that for the core information about a point sampling location. The core information includes SiteName, SiteCode(s), location, elevation, timeZone information and note(s). SiteInfoType is <siteInfo> in a <site> of a <sitesResponse>. It is derived from

SourceType so that other geographic location descriptions can be utilized in the <sourceInfo> of the <timeSeriesResponse>

Type Definition Detail

Type Derivation Tree

```
SourceInfoType [124]
   └─SiteInfoType (extension)
```

XML Source (w/o annotations (18))

```xml
<xsi:complexType name="SiteInfoType">
  <xsi:complexContent mixed="false">
    <xsi:extension base="SourceInfoType">
      <xsi:sequence>
        <xsi:element name="siteName" type="xsi:string"/>
        <xsi:element maxOccurs="unbounded" name="siteCode">
          <xsi:complexType>
            <xsi:simpleContent>
              <xsi:extension base="xsi:string">
                <xsi:attribute name="defaultId" type="xsi:boolean"/>
                <xsi:attribute name="network" type="xsi:normalizedString" use="required"/>
                <xsi:attribute name="siteID" type="xsi:normalizedString"/>
                <xsi:attribute name="agencyCode" type="xsi:normalizedString"/>
                <xsi:attribute name="agencyName" type="xsi:normalizedString"/>
              </xsi:extension>
            </xsi:simpleContent>
          </xsi:complexType>
        </xsi:element>
        <xsi:element minOccurs="0" ref="timeZoneInfo"/>
        <xsi:element maxOccurs="1" minOccurs="0" name="geoLocation">
          <xsi:complexType>
            <xsi:sequence>
              <xsi:element name="geogLocation" type="GeogLocationType"/>
              <xsi:element maxOccurs="unbounded" minOccurs="0" name="localSiteXY">
                <xsi:complexType>
                  <xsi:sequence>
                    <xsi:element name="X" type="xsi:double"/>
                    <xsi:element name="Y" type="xsi:double"/>
                    <xsi:element maxOccurs="1" minOccurs="0" name="Z" type="xsi:double"/>
                    <xsi:element maxOccurs="unbounded" minOccurs="0" name="note" type="NoteType"/>
                  </xsi:sequence>
                  <xsi:attribute name="projectionInformation" type="xsi:string"/>
                </xsi:complexType>
              </xsi:element>
            </xsi:sequence>
          </xsi:complexType>
        </xsi:element>
        <xsi:element maxOccurs="1" minOccurs="0" name="elevation_m" type="xsi:double"/>
        <xsi:element maxOccurs="1" minOccurs="0" name="verticalDatum" type="xsi:string"/>
        <xsi:element maxOccurs="unbounded" minOccurs="0" name="note" type="NoteType"/>
        <xsi:element maxOccurs="1" minOccurs="0" ref="extension"/>
        <xsi:element maxOccurs="unbounded" minOccurs="0" name="altname" type="xsi:string"/>
      </xsi:sequence>
      <xsi:attributeGroup ref="DbIdentifiers"/>
    </xsi:extension>
  </xsi:complexContent>
</xsi:complexType>
```

Content Element Detail (defined in this component only; 9/9)

🟢 altname [24]

Type: `xsi:string`, predefined, simple content

Alternate name

complexType "SiteInfoType"

- **elevation_m** [33]

    Type: `xsi:double`, predefined, simple content

    Elevation in meters. A vertical datum should also be provided.

- **extension** [35]

    Type: `xsi:anyType`, any content

    In order to simplify comprehension, data sources are encouraged to put additional informaiton in the extension area, using thier own namespace. Clients need not understand information in <extension?

- **geoLocation** [37]

    Type: anonymous, complex content

    The geoLocation speficies the details of the geographic location. It contains two portions, a geographic locaiton &lt;geogLocation&gt;, and a local location &lt;localSiteXY&gt;. In order to be discovered spatially, geogLocation is required. The geogLocation can be of GeogLocationType, which at present is either a latLonPoint or a latLongBox. There may be multiple localSiteXY, which might be used by data sources to provide other coordinated system information, like UTM and State Plane coordinates.

- **note** [49]

    Type: NoteType [111], simple content

    Additional information, like state, county, or other properties like HUC codes should be encoded in zero or more <note> elmements. The name of the property should be @title, and the value should be inside the <note>value</note>. Attribute @type is provided so that notes can be grouped.

    Simple Content

    ```
    xsi:string
    ```

- **siteCode** [73]

    Type: anonymous (extension of `xsi:string`), simple content

    A <siteCode> is an identifier that this site is referred to as. This Code used by organization that collects the data to identify the site. A siteCode has a reference to it's source or network as the @network. For waterWebServices, a site/location is the network plus the value of the sitecode, eg '@network:siteCode' siteCode identifiers often change, so multiple siteCode elements are allowed There may be multiple siteCode elements. Only one should be labeled as the default using @defaultID (set attribute defaultID=true) Multiple siteCode elements can utilize different observation networks may refer to the same site with different identifiers.

    Simple Content

    ```
    xsi:string
    ```

- **siteName** [75]

    Type: `xsi:string`, predefined, simple content

    Full name of the sampling site. eg "LOGAN RIVER ABOVE STATE DAM, NEAR LOGAN,UT"

- **timeZoneInfo** [83]

    Type: anonymous, complex content

    Specifies the time zone information about a site. The default time zone for this site (+00:00) and if this site shifts to daylight savings time (attribute: usesDaylightSavingsTime)

- **verticalDatum** [97]

    Type: `xsi:string`, predefined, simple content

complexType *"SourceInfoType"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: empty
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [124]
Used: at 3 locations

XML Representation Summary

<.../>

Known Direct Subtypes (2):

DataSetInfoType [100], SiteInfoType [121]

All Direct / Indirect Based Elements (3):

datasetInfo [29],   sourceInfo (in timeSeries) [78]
siteInfo (in site) [75],

Known Usage Locations

- **In derivations of other global types (2):**

  DataSetInfoType [100] (as extension base),   SiteInfoType [121] (as extension base)

- **As direct type of elements (1):**

  sourceInfo (in timeSeries) [78]

Annotation

SourceInfoType is used to describe the data source in the timeSeriesResponse. SourceInfoType is the base type for data source information. At present, two types are derived from SourceInfoType: SiteInfoType, and DataSetInfoType. SiteInfoType describes tlocation for a timeseries where that time series is located at a site or a DataSetInfoType describes time series derived from a dataset, such as a netCDF file, or a gridded model.

XML Source (w/o annotations (1))

```
<xsi:complexType name="SourceInfoType"/>
```

complexType *"SourceType"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: complex, 1 attribute, 5 elements
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [125]
Includes: definitions of 1 attribute and 5 elements
Used: at 2 locations

XML Representation Summary

```
<...
   sourceID = xsi:int
   >
   Content: Organization?, SourceDescription?, Metadata?, ContactInformation?, SourceLink?
</...>
```

Content Model Elements (5):

ContactInformation (type ContactInformationType) [26],   SourceDescription (type xsi:string) [77],
Metadata (type MetaDataType) [45],   SourceLink (type xsi:anyURI) [78]
Organization (type xsi:string) [56],

All Direct / Indirect Based Elements (2):

Source (in series) [77],   source (in values) [76]

Known Usage Locations

- **As direct type of elements (2):**

Source (in series) [77],   source (in values) [76]

Annotation

original sources of the data, providing information sufficient to retrieve and reconstruct the data value from the original data files if necessary

XML Source (w/o annotations (7))

```xml
<xsi:complexType name="SourceType">
  <xsi:sequence>
    <xsi:element maxOccurs="1" minOccurs="0" name="Organization" type="xsi:string"/>
    <xsi:element maxOccurs="1" minOccurs="0" name="SourceDescription" type="xsi:string"/>
    <xsi:element minOccurs="0" name="Metadata" type="MetaDataType"/>
    <xsi:element minOccurs="0" name="ContactInformation" type="ContactInformationType"/>
    <xsi:element minOccurs="0" name="SourceLink" type="xsi:anyURI"/>
  </xsi:sequence>
  <xsi:attribute name="sourceID" type="xsi:int"/>
</xsi:complexType>
```

Attribute Detail (defined in this component only; 1/1)

🟨 sourceID

> **Type:** xsi:int, predefined
> **Use:** optional
>
> Unique integer identifier that identifies each data source. link to datavalues/@sourceID

Content Element Detail (defined in this component only; 5/5)

🟢 ContactInformation [26]

> **Type:** ContactInformationType [99], complex content
>
> Contact information about source.

🟢 Metadata [45]

> **Type:** MetaDataType [108], complex content
>
> MetadataType contains the information from the ODM table IsoMetadata. It is anticpated that many data sources may not have this fully available.

🟢 Organization [56]

> **Type:** xsi:string, predefined, simple content
>
> Name of the organization that collected the data. This should be the agency or organization that collected the data, even if it came out of a database consolidated from many sources such as STORET. "Utah Division of Water Quality"

🟢 <u>SourceDescription</u> [77]

> **Type:** `xsi:string`, predefined, simple content

> Full text description of the source of the data. "Text file retrieved from the EPA STORET system indicating data originally from Utah Division of Water Quality"

🟢 <u>SourceLink</u> [78]

> **Type:** `xsi:anyURI`, predefined, simple content

> Link that can be pointed at the original data file and/or associated metadata stored in the digital library or URL of data source.

---

complexType *"TimeIntervalType"*

Namespace: <u>http://www.cuahsi.org/waterML/1.0/</u>
Content: complex, 2 <u>elements</u>
Defined: globally in <u>cuahsiTimeSeries_v1_0.xsd</u>, see <u>XML source</u> [126]
Includes: definitions of 2 <u>elements</u>
Used: never

XML Representation Summary

```
<...>
   Content: beginDateTime, endDateTime
</...>
```

Content Model Elements (2):

> <u>beginDateTime</u> (type <u>xsi:dateTime</u>) [25], <u>endDateTime</u> (type <u>xsi:dateTime</u>) [34]

Annotation

For where a series has multiple observations, and a define beingDateTime as dateTime of the first data value in the series, and endDateTime dateTime of the last data value in the series.

Type Definition Detail

Type Derivation Tree

<u>TimePeriodType</u> [128]
　　└**TimeIntervalType** (extension)

XML Source (w/o annotations (3))

```xml
<xsi:complexType name="TimeIntervalType">
  <xsi:complexContent mixed="false">
    <xsi:extension base="TimePeriodType">
      <xsi:sequence>
        <xsi:element name="beginDateTime" type="xsi:dateTime"/>
        <xsi:element name="endDateTime" type="xsi:dateTime"/>
      </xsi:sequence>
    </xsi:extension>
  </xsi:complexContent>
</xsi:complexType>
```

Content Element Detail (defined in <u>this</u> component only; 2/2)

🟢 <u>beginDateTime</u> [25]

> **Type:** `xsi:dateTime`, predefined, simple content

---

dateTime of the first data value in the series. The dateTime is specified in the following form "YYYY-MM-DDThh:mm:ss" where: * YYYY indicates the year * MM indicates the month * DD indicates the day * T indicates the start of the required time section * hh indicates the hour * mm indicates the minute * ss indicates the second Note: All components are required!

⬤ endDateTime [34]

Type: xsi:dateTime, predefined, simple content

Date of the last data value in the series. The dateTime is specified in the following form "YYYY-MM-DDThh:mm:ss" where: * YYYY indicates the year * MM indicates the month * DD indicates the day * T indicates the start of the required time section * hh indicates the hour * mm indicates the minute * ss indicates the second Note: All components are required!

complexType *"TimePeriodRealTimeType"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: complex, 3 elements
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [127]
Includes: definitions of 3 elements
Used: never

XML Representation Summary

```
<...>
   Content: realTimeDataPeriod, beginDateTime, endDateTime
</...>
```

Content Model Elements (3):

beginDateTime (type xsi:dateTime) [25],   realTimeDataPeriod (type xsi:duration) [65]
endDateTime (type xsi:dateTime) [34],

Annotation

Use where a site has an evolving period where data is available. The US Geological Survey real time data is available for 30 days, the realTimeDataPeriod element is an XML duration and woudl be "30d" The beginDateTime and endDateTime are provided to simplify usage by clients.They should be be calculated based on the duration stored in realTimeDataPeriod

Type Definition Detail

Type Derivation Tree

TimePeriodType [128]
    └─**TimePeriodRealTimeType** (extension)

XML Source (w/o annotations (4))

```xml
<xsi:complexType name="TimePeriodRealTimeType">
  <xsi:complexContent mixed="false">
    <xsi:extension base="TimePeriodType">
      <xsi:sequence>
        <xsi:element name="realTimeDataPeriod" type="xsi:duration"/>
        <xsi:element name="beginDateTime" type="xsi:dateTime"/>
        <xsi:element name="endDateTime" type="xsi:dateTime"/>
      </xsi:sequence>
    </xsi:extension>
  </xsi:complexContent>
</xsi:complexType>
```

Content Element Detail (defined in this component only; 3/3)

🟢 beginDateTime [25]

Type: `xsi:dateTime`, predefined, simple content

dateTime of the first data value in the series. This should be be calculated based on the duration stored in realTimeDataPeriod The dateTime is specified in the following form "YYYY-MM-DDThh:mm:ss" where: * YYYY indicates the year * MM indicates the month * DD indicates the day * T indicates the start of the required time section * hh indicates the hour * mm indicates the minute * ss indicates the second Note: All components are required!

- -

🟢 endDateTime [34]

Type: `xsi:dateTime`, predefined, simple content

Date of the last data value in the series. This should be be calculated based on the duration stored in realTimeDataPeriod The dateTime is specified in the following form "YYYY-MM-DDThh:mm:ss" where: * YYYY indicates the year * MM indicates the month * DD indicates the day * T indicates the start of the required time section * hh indicates the hour * mm indicates the minute * ss indicates the second Note: All components are required!

- -

🟢 realTimeDataPeriod [65]

Type: `xsi:duration`, predefined, simple content

Duration Data Type The duration data type is used to specify a time interval. The time interval is specified in the following form "PnYnMnDTnHnMnS" where: * P indicates the period (required) * nY indicates the number of years * nM indicates the number of months * nD indicates the number of days * T indicates the start of a time section (required if you are going to specify hours, minutes, or seconds) * nH indicates the number of hours * nM indicates the number of minutes * nS indicates the number of seconds

complexType *"TimePeriodType"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: empty
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [129]
Used: at 4 locations

XML Representation Summary

<.../>

Known Direct Subtypes (3):

TimeIntervalType [126], TimePeriodRealTimeType [127], TimeSingleType [131]

All Direct / Indirect Based Elements (1):

variableTimeInterval (in series) [96]

Known Usage Locations

- **In derivations of other global types (3):**

  TimeIntervalType [126] (as extension base), TimeSingleType [131] (as extension base)
  TimePeriodRealTimeType [127] (as extension base),

- **As direct type of elements (1):**

  variableTimeInterval (in series) [96]

Annotation

time series (site-variable-observation) can have three types of time periods: 1) definite start and end time, or TimeIntervalType, 2) single observation, or TimeSingleType 3) Real Time station with moving window of data

available, or TimeRealTimeType In order to simplify client development, all types now include beginDateTime, and endDateTime. A fourth type should be added: 4) continuing site, where start is known, and site is still collecting data. This could be a realTimeType, or rename the real time type to TimeDefinedPeriodType.

XML Source (w/o annotations (1))

```
<xsi:complexType name="TimePeriodType">
   <xsi:sequence/>
</xsi:complexType>
```

complexType *"TimeSeriesResponseType"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: complex, 2 elements
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [129]
Includes: definitions of 2 elements
Used: at 1 location

XML Representation Summary

```
<...>
   Content: queryInfo?, timeSeries
</...>
```

Content Model Elements (2):

queryInfo (type QueryInfoType) [63],   timeSeries (in timeSeriesResponse) [80]

All Direct / Indirect Based Elements (1):

timeSeriesResponse [81]

Known Usage Locations

- **As direct type of elements (1):**

timeSeriesResponse [81]

XML Source (w/o annotations (2))

```
<xsi:complexType name="TimeSeriesResponseType">
   <xsi:sequence>
      <xsi:element minOccurs="0" name="queryInfo" type="QueryInfoType"/>
      <xsi:element name="timeSeries" type="TimeSeriesType"/>
   </xsi:sequence>
</xsi:complexType>
```

Content Element Detail (defined in this component only; 2/2)

queryInfo [63]

Type: QueryInfoType [115], complex content

the parameter information passed to Getvalues(location,variable,beginDate,endDate) should be placed in QueryInfoType/criteria/ See QueryInfoType for more details.

timeSeries [80]

Type: TimeSeriesType [130], complex content

Contains the source of the time series, the variable, and values element which is an array of value elements and thier associated metadata (qualifiers, methods, sources, quality control level, samples)

complexType *"TimeSeriesType"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: complex, 1 attribute, 3 elements
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [130]
Includes: definitions of 1 attribute and 3 elements
Used: at 1 location

XML Representation Summary

```
<...
    name = xsi:string
    >
    Content: sourceInfo, variable, values
</...>
```

Content Model Elements (3):

sourceInfo (in timeSeries) [78], variable (type VariableInfoType) [92]
values (in timeSeries) [90],

All Direct / Indirect Based Elements (1):

timeSeries (in timeSeriesResponse) [80]

Known Usage Locations

- **As direct type of elements (1):**

  timeSeries (in timeSeriesResponse) [80]

Annotation

Contains the source of the time series, the variable, and values element which is an array of value elements and thier associated metadata (qualifiers, methods, sources, quality control level, samples)

XML Source (w/o annotations (4))

```xml
<xsi:complexType name="TimeSeriesType">
  <xsi:sequence>
    <xsi:element name="sourceInfo" type="SourceInfoType"/>
    <xsi:element name="variable" type="VariableInfoType"/>
    <xsi:element name="values" type="TsValuesSingleVariableType"/>
  </xsi:sequence>
  <xsi:attribute name="name" type="xsi:string" use="required"/>
</xsi:complexType>
```

Attribute Detail (defined in this component only; 1/1)

🟨 name

> **Type:** xsi:string, predefined
> **Use:** required
>
> Name of the time series. optional.

Content Element Detail (defined in this component only; 3/3)

🟢 sourceInfo [78]

> **Type:** SourceInfoType [124], empty content

....

🟢 values [90]

> **Type:** TsValuesSingleVariableType [132], complex content

> A list of values and associated metadata. It is the values element in the timeSerissResponse

....

🟢 variable [92]

> **Type:** VariableInfoType [137], complex content

> Contains full descriptive information about a variable, as described by the ODM. This includes one or more variable codes, the short variable name, a detailed variable description, and suggest. See VariableInforType for full details.

complexType *"TimeSingleType"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: complex, 3 elements
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [131]
Includes: definitions of 3 elements
Used: never

XML Representation Summary

```
<...>
   Content:  timeSingle, beginDateTime, endDateTime
</...>
```

Content Model Elements (3):

> beginDateTime (type xsi:dateTime) [25], timeSingle (type xsi:dateTime) [81]
> endDateTime (type xsi:dateTime) [34],

Annotation

For where a series is a single observation. timeSingle, beginDateTime, and endDateTime will have the same value. The beginDateTime and endDateTime are provided to simplify usage by clients.They should be be calculated based on the duration stored in realTimeDataPeriod

Type Definition Detail

Type Derivation Tree

TimePeriodType [128]
　└**TimeSingleType** (extension)

XML Source (w/o annotations (3))

```xml
<xsi:complexType name="TimeSingleType">
  <xsi:complexContent mixed="false">
    <xsi:extension base="TimePeriodType">
      <xsi:sequence>
        <xsi:element name="timeSingle" type="xsi:dateTime"/>
        <xsi:element name="beginDateTime" type="xsi:dateTime"/>
        <xsi:element name="endDateTime" type="xsi:dateTime"/>
      </xsi:sequence>
    </xsi:extension>
```

```
    </xsi:complexContent>
</xsi:complexType>
```

Content Element Detail (defined in <u>this</u> component only; 3/3)

🟢 <u>beginDateTime</u> [25]

Type: `xsi:dateTime`, predefined, simple content

dateTime of the first data value in the series. The dateTime is specified in the following form "YYYY-MM-DDThh:mm:ss" where: * YYYY indicates the year * MM indicates the month * DD indicates the day * T indicates the start of the required time section * hh indicates the hour * mm indicates the minute * ss indicates the second Note: All components are required!

···

🟢 <u>endDateTime</u> [34]

Type: `xsi:dateTime`, predefined, simple content

Date of the last data value in the series. The dateTime is specified in the following form "YYYY-MM-DDThh:mm:ss" where: * YYYY indicates the year * MM indicates the month * DD indicates the day * T indicates the start of the required time section * hh indicates the hour * mm indicates the minute * ss indicates the second Note: All components are required!

···

🟢 <u>timeSingle</u> [81]

Type: `xsi:dateTime`, predefined, simple content

complexType *"TsValuesSingleVariableType"*

Namespace: <u>http://www.cuahsi.org/waterML/1.0/</u>
Content: complex, 6 <u>attributes</u>, 6 <u>elements</u>
Defined: globally in <u>cuahsiTimeSeries_v1_0.xsd</u>, see <u>XML source</u> [133]
Includes: definitions of 3 <u>attributes</u> and 6 <u>elements</u>
Used: at 1 <u>location</u>

XML Representation Summary

```
<...
    count                      = xsi:nonNegativeInteger
    timeZoneShiftApplied       = xsi:boolean
    unitsAbbreviation          = xsi:normalizedString
    unitsAreConverted          = xsi:boolean : "false"
    unitsCode                  = xsi:token
    unitsType                  = ("Angle" | "Area" | "Dimensionless" | "Energy" | "Energy Flux" | "Flow" |
                                  "Force" | "Frequency" | "Length" | "Light" | "Mass" | "Permeability" |
                                  "Power" | "Pressure/Stress" | "Resolution" | "Scale" | "Temperature" |
                                  "Time" | "Velocity" | "Volume")
    >
    Content: value+, qualifier*, qualityControlLevel*, method*, source*, offset*
</...>
```

Content Model Elements (6):

method (in values) [46],   qualityControlLevel [61],
offset (in values) [51],   source (in values) [76],
qualifier [58],   value (in values) [88]

All Direct / Indirect Based Elements (1):

values (in timeSeries) [90]

Known Usage Locations

- **As direct type of elements (1):**

  values (in timeSeries) [90]

Annotation

TsValuesSingleVariableTypea aggregates the list of values and associated metadata. It is the values element in the timeSereisResponse Attributes are optional, but use @count is encouraged. The atrributes @unitsAreConverted, @untsCode,@unitsAbbreviation, and @unitsType were originally included to allow for translation from orignal variable units. Thier use is not encouraged. Get unit information from the Variable element.

XML Source (w/o annotations (11))

```xml
<xsi:complexType name="TsValuesSingleVariableType">
  <xsi:sequence>
    <xsi:element maxOccurs="unbounded" minOccurs="1" name="value" type="ValueSingleVariable"/>
    <xsi:element maxOccurs="unbounded" minOccurs="0" ref="qualifier"/>
    <xsi:element maxOccurs="unbounded" minOccurs="0" ref="qualityControlLevel"/>
    <xsi:element maxOccurs="unbounded" minOccurs="0" name="method" type="MethodType"/>
    <xsi:element maxOccurs="unbounded" minOccurs="0" name="source" type="SourceType"/>
    <xsi:element maxOccurs="unbounded" minOccurs="0" name="offset" type="OffsetType"/>
  </xsi:sequence>
  <xsi:attribute name="timeZoneShiftApplied" type="xsi:boolean" use="optional"/>
  <xsi:attributeGroup ref="unitsAttr"/>
  <xsi:attribute name="count" type="xsi:nonNegativeInteger"/>
  <xsi:attribute default="false" name="unitsAreConverted" type="xsi:boolean"/>
</xsi:complexType>
```

Attribute Detail (defined in this component only; 3/6)

🟨 count

> **Type:** xsi:nonNegativeInteger, predefined
> **Use:** optional

🟨 timeZoneShiftApplied

> **Type:** xsi:boolean, predefined
> **Use:** optional
>
> If a webservice has transformed the time zone from the original data.

🟨 unitsAreConverted

> **Type:** xsi:boolean, predefined
> **Use:** optional
>
> True if a webservice has transformed the data from the original units.
>
> ***Attribute Value***
>
> **Default:** "false"

Content Element Detail (defined in this component only; 6/6)

🟢 method [46]

> **Type:** MethodType [109], complex content
>
> Multiple &amp;lt;method&amp;gt;s lists the methods used to collect the data and any additional information about the method. @methodID is the link between the values, and method. Different instruments should be represented as different methods, according to ODM best practices

---

🟢 <u>offset</u> [51]

    Type: <u>OffsetType</u> [112], complex content

    <offset> is of type OffsetType. offset lists full descriptive information for each of the measurement offsets. @offsetID is the link between offset, and values.

🟢 <u>qualifier</u> [58]

    Type: <u>anonymous</u> (extension of xsi:string), simple content

    multiple <qualifier>s containg the data qualifying comments that accompany the data.

    Simple Content

xsi:string

🟢 <u>qualityControlLevel</u> [61]

    Type: anonymous, complex content

    <qualityControlLevel> contains the quality control levels that are used for versioning data within the data values

---

🟢 <u>source</u> [76]

    Type: <u>SourceType</u> [124], complex content

    The Sources the original sources of the data, providing information sufficient to retrieve the data value. @sourceID is the link bewteen source the values.

🟢 <u>value</u> [88]

    Type: <u>ValueSingleVariable</u> [135], simple content

    Multiple <value>s represent the data series.

    Simple Content

xsi:decimal

complexType *"UnitsType"*

Namespace: <u>http://www.cuahsi.org/waterML/1.0/</u>
Content: complex, 1 <u>attribute</u>, 4 <u>elements</u>
Defined: globally in <u>cuahsiTimeSeries_v1_0.xsd</u>, see <u>XML source</u> [135]
Includes: definitions of 1 <u>attribute</u> and 4 <u>elements</u>
Used: at 1 <u>location</u>

XML Representation Summary

```
<...
    UnitID = xsi:int
    >
    Content: UnitName?, UnitDescription?, UnitType?, UnitAbbreviation?
</...>
```

Content Model Elements (4):

    <u>UnitAbbreviation</u> (in <u>unit</u>) [86],   <u>UnitName</u> (in <u>unit</u>) [87],
    <u>UnitDescription</u> (in <u>unit</u>) [86],   <u>UnitType</u> (in <u>unit</u>) [88]

All Direct / Indirect Based Elements (1):

    <u>unit</u> (in <u>timeSupport</u>) [85]

Known Usage Locations

- **As direct type of elements (1):**

    unit (in timeSupport) [85]

XML Source

```
<xsi:complexType name="UnitsType">
  <xsi:sequence>
    <xsi:element maxOccurs="1" minOccurs="0" name="UnitName" type="xsi:string"/>
    <xsi:element maxOccurs="1" minOccurs="0" name="UnitDescription" type="xsi:string"/>
    <xsi:element maxOccurs="1" minOccurs="0" name="UnitType" type="UnitsTypeEnum"/>
    <xsi:element maxOccurs="1" minOccurs="0" name="UnitAbbreviation" type="xsi:string"/>
  </xsi:sequence>
  <xsi:attribute name="UnitID" type="xsi:int"/>
</xsi:complexType>
```

Attribute Detail (defined in this component only; 1/1)

🟨 UnitID

> **Type:** `xsi:int`, predefined
> **Use:** optional

Content Element Detail (defined in this component only; 4/4)

🟢 UnitAbbreviation [86]

> **Type:** `xsi:string`, predefined, simple content

🟢 UnitDescription [86]

> **Type:** `xsi:string`, predefined, simple content

🟢 UnitName [87]

> **Type:** `xsi:string`, predefined, simple content

🟢 UnitType [88]

> **Type:** UnitsTypeEnum [149], simple content

> ***Simple Content***

> ```
> enumeration of xsi:string
> ```

> **Enumeration:** `"Angle"`, `"Area"`, `"Dimensionless"`, `"Energy"`, `"Energy Flux"`, `"Flow"`, `"Force"`,
> `"Frequency"`, `"Length"`, `"Light"`, `"Mass"`, `"Permeability"`, `"Power"`, `"Pressure/Stress"`,
> `"Resolution"`, `"Scale"`, `"Temperature"`, `"Time"`, `"Velocity"`, `"Volume"`

complexType *"ValueSingleVariable"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: simple, 17 attributes
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [136]
Used: at 1 location

XML Representation Summary

```
<...
    accuracyStdDev              = xsi:double
    censorCode                  = ("lt" | "gt" | "nc" | "nd" | "pnq")
    codedVocabulary             = xsi:boolean
    codedVocabularyTerm         = xsi:string
    dateTime                    = xsi:dateTime
    metadataDateTime            = xsi:dateTime
    methodID                    = xsi:int
    offsetDescription           = xsi:string
    offsetTypeID                = xsi:int
    offsetUnitsAbbreviation     = xsi:string
    offsetUnitsCode             = xsi:string
    offsetValue                 = xsi:double
    oid                         = xsi:normalizedString
    qualifiers                  = xsi:string
    qualityControlLevel         = ("Raw data" | "Quality controlled data" | "Derived products" |
                                   "Interpreted products" | "Knowledge products" | "Unknown")
    sampleID                    = xsi:int
    sourceID                    = xsi:int
    >
    Content: { xsi:decimal }
</...>
```

All Direct / Indirect Based Elements (1):

value (in values) [88]

Known Usage Locations

- **As direct type of elements (1):**

value (in values) [88]

Type Definition Detail

Type Derivation Tree

```
xsi:decimal
    └ValueSingleVariable (extension)
```

Derivation: extension of xsi:decimal

XML Source

```
<xsi:complexType name="ValueSingleVariable">
  <xsi:simpleContent>
    <xsi:extension base="xsi:decimal">
      <xsi:attributeGroup ref="ValueAttr"/>
      <xsi:attributeGroup ref="offsetAttr"/>
      <xsi:attributeGroup ref="DbIdentifiers"/>
    </xsi:extension>
  </xsi:simpleContent>
</xsi:complexType>
```

complexType *"VariableInfoType"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: complex, 2 attributes, 14 elements
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [137]
Includes: definitions of 14 elements
Used: at 1 location

XML Representation Summary

```
<...
    metadataDateTime = xsi:dateTime
    oid                = xsi:normalizedString
    >
    Content:  variableCode+, variableName?, variableDescription?, valueType?, dataType?, generalCategory?,
              sampleMedium?, units?, options?, note*, related?, extension?, NoDataValue?, timeSupport?
</...>
```

Content Model Elements (14):

dataType (type dataTypeEnum) [30],
extension [35],
generalCategory (type generalCategoryEnum) [36],
NoDataValue (in variable) [48],
note (type NoteType) [49],
options [55],
related (in variable) [65],

sampleMedium (type SampleMediumEnum) [67],
timeSupport (in variable) [82],
units [87],
valueType (type valueTypeEnum) [91],
variableCode [93],
variableDescription (in variable) [94],
variableName (in variable) [94]

All Direct / Indirect Based Elements (1):

variable (type VariableInfoType) [92]

Known Usage Locations

- **As direct type of elements (1):**

  variable (type VariableInfoType) [92]

Annotation

VariableInfoType is a complex type containting full descriptive information about a variable, as described by the ODM. This includes one or more variable codes, the short variable name, a detailed variable description, and suggest It also extends the ODM model, in several methods: - options contain extended reuqest information. - note(s) are for generic extenstion. - extension is an element where additional namespace information should be placed. - related allows for parent and child relationships between variables to be communicated.

XML Source (w/o annotations (18))

```xml
<xsi:complexType name="VariableInfoType">
  <xsi:sequence>
    <xsi:sequence>
      <xsi:element maxOccurs="unbounded" minOccurs="1" ref="variableCode"/>
      <xsi:element minOccurs="0" name="variableName" type="xsi:string"/>
      <xsi:element minOccurs="0" name="variableDescription" type="xsi:string"/>
      <xsi:element maxOccurs="1" minOccurs="0" name="valueType" type="valueTypeEnum"/>
      <xsi:element minOccurs="0" name="dataType" type="dataTypeEnum"/>
      <xsi:element minOccurs="0" name="generalCategory" type="generalCategoryEnum"/>
      <xsi:element maxOccurs="1" minOccurs="0" name="sampleMedium" type="SampleMediumEnum"/>
      <xsi:element minOccurs="0" ref="units"/>
      <xsi:element maxOccurs="1" minOccurs="0" ref="options"/>
      <xsi:element maxOccurs="unbounded" minOccurs="0" name="note" type="NoteType"/>
      <xsi:element minOccurs="0" name="related">
        <xsi:complexType>
```

```
                    <xsi:sequence maxOccurs="unbounded">
                      <xsi:element name="parentID">
                        <xsi:complexType>
                          <xsi:simpleContent>
                            <xsi:extension base="xsi:string">
                              <xsi:attributeGroup ref="VocabularyAttributes"/>
                            </xsi:extension>
                          </xsi:simpleContent>
                        </xsi:complexType>
                      </xsi:element>
                      <xsi:element name="relatedID">
                        <xsi:complexType>
                          <xsi:simpleContent>
                            <xsi:extension base="xsi:string">
                              <xsi:attributeGroup ref="VocabularyAttributes"/>
                            </xsi:extension>
                          </xsi:simpleContent>
                        </xsi:complexType>
                      </xsi:element>
                    </xsi:sequence>
                  </xsi:complexType>
                </xsi:element>
                <xsi:element minOccurs="0" ref="extension"/>
                <xsi:element minOccurs="0" name="NoDataValue" type="xsi:string"/>
                <xsi:element minOccurs="0" name="timeSupport" nillable="true">
                  <xsi:complexType>
                    <xsi:sequence>
                      <xsi:element maxOccurs="1" minOccurs="0" name="unit" type="UnitsType"/>
                      <xsi:element maxOccurs="1" minOccurs="0" name="timeInterval" type="xsi:int"/>
                    </xsi:sequence>
                    <xsi:attribute name="isRegular" type="xsi:boolean"/>
                  </xsi:complexType>
                </xsi:element>
              </xsi:sequence>
            </xsi:sequence>
            <xsi:attributeGroup ref="DbIdentifiers"/>
          </xsi:complexType>
```

Content Element Detail (defined in this component only; 14/14)

🟢 dataType [30]

> **Type:** dataTypeEnum [142], simple content
>
> Text value that identifies the data values as one of several types from the dataTypeEnum A default value of "Unknown" can be used where the data type is unknown.
>
> **Simple Content**
>
> ```
> enumeration of xsi:string
> ```
>
> **Enumeration:** "Continuous", "Instantaneous", "Cumulative", "Incremental", "Average", "Maximum", "Minimum", "Constant Over Interval", "Categorical", "Best Easy Systematic Estimator ", "Unknown", "Variance", "Median", "Mode", "Best Easy Systematic Estimator", "Standard Deviation", "Skewness", "Equivalent Mean", "Sporadic", "Unknown"

🟢 extension [35]

> **Type:** xsi:anyType, any content
>
> In order to simplify comprehension, data sources are encouraged to put additional informaiton in the extension area, using thier own namespace. Clients need not understand information in <extension?

🟢 generalCategory [36]

> **Type:** generalCategoryEnum [144], simple content
>
> General category of the data values from the generalCategoryEnum. A default value of "Unknown" can be used where the general category is unknown.

Simple Content

```
enumeration of xsi:string
```

Enumeration: "Water Quality", "Climate", "Hydrology", "Geology", "Biota", "Unknown",
"Instrumentation"

🟢 NoDataValue [48]

Type: xsi:string, predefined, simple content

Numeric value used to encode no data values for this variable.

🟢 note [49]

Type: NoteType [111], simple content

Additional information, properties like should be encoded in zero or more &lt;note&gt; elmements. The name of the property should be @title, and the value should be inside the <note>value</note>. Attribute @type is provided so that notes can be grouped.

Simple Content

```
xsi:string
```

🟢 options [55]

Type: anonymous, complex content

A list of options. Option elements are key-value pair elements that control how a variable maght be utilized in a service. Examples: MODIS web service. Information is aggreated over land or ocean or both. The plotarea option can include: plotarea=land, plotarea=land, plotarea=landocean USGS uses a statistic code, 0003, to repesent a value type of 'Average'. The USGS statistic codes also several options that do not fit the ODM data model.

🟢 related [65]

Type: anonymous, complex content

This can be used to build up relationships between variables.

🟢 sampleMedium [67]

Type: SampleMediumEnum [147], simple content

Only terms from the SampleMediumEnume can be used to populate the sampleMedium element. A default value of "Unknown" is used where the sample medium is unknown.

Simple Content

```
enumeration of xsi:string
```

Enumeration: "Surface Water", "Ground Water", "Sediment", "Soil", "Air", "Tissue", "Precipitation", "Unknown", "Other", "Snow", "Not Relevant"

🟢 timeSupport [82]

Type: anonymous, complex content
Nillable: *(can be declared as nil using xsi:nil attribute in instance XML documents)*

Element containing the time support (or temporal footprint) of the data values. @isRegular indicates if the spacing is regular. In waterML 1.0, there is a divergence of mean between ODM, and WaterML. WaterML only communcates the regularity, and the spacing of the observations (timeInterval). Whereas timesupport in the ODM is associated with the dataType, and time support. This will be addressed in 1.1

🟢 units [87]

Type: anonymous (extension of xsi:string), simple content

The units of the measurements asociated withthe variable. This will be changed to UnitsType in WaterML 1.1

Simple Content

```
xsi:string
```

⊙ <u>valueType</u> [91]

Type: <u>valueTypeEnum</u> [150], simple content

Text value indicating what type of data value is being recorded. For 1.0 this must be from the valueTypeEnum type. A default value of "Unknown" can be used where the value type is unknown.

Simple Content

```
enumeration of xsi:string
```

Enumeration: "Field Observation", "Sample", "Model Simulation Result", "Derived Value", "Unknown"

⊙ <u>variableCode</u> [93]

Type: <u>anonymous</u> (extension of xsi:token), simple content

One of more elements representing the Text code used by the organization that collects the data to identify the variable.

Simple Content

```
xsi:token
```

⊙ <u>variableDescription</u> [94]

Type: xsi:string, predefined, simple content

A detailed description of the variable. May include processing information and other details.

⊙ <u>variableName</u> [94]

Type: xsi:string, predefined, simple content

A brief name of the variable that could be shown in a menu

complexType *"VariablesResponseType"*

Namespace: <u>http://www.cuahsi.org/waterML/1.0/</u>
Content: complex, 2 <u>elements</u>
Defined: globally in <u>cuahsiTimeSeries_v1_0.xsd</u>, see <u>XML source</u> [141]
Includes: definitions of 2 <u>elements</u>
Used: at 1 <u>location</u>

XML Representation Summary

<...>
   Content: <u>queryInfo</u>?, <u>variables</u>
</...>

Content Model Elements (2):

<u>queryInfo</u> (type <u>QueryInfoType</u>) [63], <u>variables</u> [95]

All Direct / Indirect Based Elements (1):

<u>variablesResponse</u> [96]

Known Usage Locations

- **As direct type of elements (1):**

  variablesResponse [96]

Annotation

VariablesResponseType is object type returned by the method GetVariableInfo. The elemnt name is variablesResponse. The request will contain a variables element containing a list of variable elements.

XML Source (w/o annotations (3))

```xml
<xsi:complexType name="VariablesResponseType">
  <xsi:sequence>
    <xsi:element minOccurs="0" name="queryInfo" type="QueryInfoType"/>
    <xsi:element minOccurs="1" ref="variables"/>
  </xsi:sequence>
</xsi:complexType>
```

Content Element Detail (defined in this component only; 2/2)

🟢 queryInfo [63]

    Type: QueryInfoType [115], complex content

    the parameter information passed to GetVariableInfo(variable) should be placed in QueryInfoType/criteria/variableParam See QueryInfoType for more details.

🟢 variables [95]

    Type: anonymous, complex content

    variables element contains a list of variable elements

simpleType *"CensorCodeEnum"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [142]
Used: at 1 location

Simple Content Model

enumeration of xsi:string

Simple Content Restrictions:

Enumeration: "lt", "gt", "nc", "nd", "pnq"

All Direct / Indirect Based Attributes (1):

    ValueAttr/@censorCode [156]

Known Usage Locations

- **As direct type of attributes within attributeGroups (1):**

  ValueAttr/@censorCode [156]

Type Definition Detail

Type Derivation Tree

```
xsi:string
   └CensorCodeEnum (restriction)
```

Derivation: restriction of xsi:string

Facets: **enumeration:** "lt", "gt", "nc", "nd", "pnq"

XML Source

```xml
<xsi:simpleType name="CensorCodeEnum">
   <xsi:restriction base="xsi:string">
      <xsi:enumeration value="lt"/>
      <xsi:enumeration value="gt"/>
      <xsi:enumeration value="nc"/>
      <xsi:enumeration value="nd"/>
      <xsi:enumeration value="pnq"/>
   </xsi:restriction>
</xsi:simpleType>
```

simpleType *"dataTypeEnum"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [143]
Used: at 1 location

Simple Content Model

```
enumeration of xsi:string
```

Simple Content Restrictions:

Enumeration: "Continuous", "Instantaneous", "Cumulative", "Incremental", "Average", "Maximum", "Minimum", "Constant Over Interval", "Categorical", "Best Easy Systematic Estimator ", "Unknown", "Variance", "Median", "Mode", "Best Easy Systematic Estimator", "Standard Deviation", "Skewness", "Equivalent Mean", "Sporadic", "Unknown"

All Direct / Indirect Based Elements (1):

dataType (type dataTypeEnum) [30]

Known Usage Locations

- **As direct type of elements (1):**

  dataType (type dataTypeEnum) [30]

Type Definition Detail

Type Derivation Tree

```
xsi:string
   └dataTypeEnum (restriction)
```

Derivation: restriction of xsi:string

Facets: **enumeration:** "Continuous", "Instantaneous", "Cumulative", "Incremental", "Average", "Maximum", "Minimum", "Constant Over Interval", "Categorical", "Best Easy Systematic Estimator ", "Unknown", "Variance", "Median", "Mode",

```
                       "Best Easy Systematic Estimator", "Standard Deviation", "Skewness",
                       "Equivalent Mean", "Sporadic", "Unknown"
```

XML Source

```xml
<xsi:simpleType name="dataTypeEnum">
   <xsi:restriction base="xsi:string">
      <xsi:enumeration value="Continuous"/>
      <xsi:enumeration value="Instantaneous"/>
      <xsi:enumeration value="Cumulative"/>
      <xsi:enumeration value="Incremental"/>
      <xsi:enumeration value="Average"/>
      <xsi:enumeration value="Maximum"/>
      <xsi:enumeration value="Minimum"/>
      <xsi:enumeration value="Constant Over Interval"/>
      <xsi:enumeration value="Categorical"/>
      <xsi:enumeration value="Best Easy Systematic Estimator "/>
      <xsi:enumeration value="Unknown"/>
      <xsi:enumeration value="Variance"/>
      <xsi:enumeration value="Median"/>
      <xsi:enumeration value="Mode"/>
      <xsi:enumeration value="Best Easy Systematic Estimator"/>
      <xsi:enumeration value="Standard Deviation"/>
      <xsi:enumeration value="Skewness"/>
      <xsi:enumeration value="Equivalent Mean"/>
      <xsi:enumeration value="Sporadic"/>
      <xsi:enumeration value="Unknown"/>
   </xsi:restriction>
</xsi:simpleType>
```

simpleType *"DocumentationEnumTypes"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [143]
Used: at 1 location

Simple Content Model

```
xsi:token | ("funding" | "history" | "processing_level" | "rights" | "summary")
```

All Direct / Indirect Based Attributes (1):

DocumentationType/@type [102]

Known Usage Locations

- **As direct type of attributes within complexTypes (1):**

  DocumentationType/@type [102]

Type Definition Detail

Type Derivation Tree

```
union of (xsi:token | restriction of xsi:token)
   └─DocumentationEnumTypes
```

XML Source

```xml
<xsi:simpleType name="DocumentationEnumTypes">
   <xsi:union memberTypes="xsi:token">
      <xsi:simpleType>
         <xsi:restriction base="xsi:token">
```

```
                <xsi:enumeration value="funding"/>
                <xsi:enumeration value="history"/>
                <xsi:enumeration value="processing_level"/>
                <xsi:enumeration value="rights"/>
                <xsi:enumeration value="summary"/>
            </xsi:restriction>
        </xsi:simpleType>
    </xsi:union>
</xsi:simpleType>
```

simpleType *"generalCategoryEnum"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [144]
Used: at 1 location

Simple Content Model

enumeration of xsi:string

Simple Content Restrictions:

Enumeration: "Water Quality", "Climate", "Hydrology", "Geology", "Biota", "Unknown", "Instrumentation"

All Direct / Indirect Based Elements (1):

generalCategory (type generalCategoryEnum) [36]

Known Usage Locations

- **As direct type of elements (1):**

  generalCategory (type generalCategoryEnum) [36]

Type Definition Detail

Type Derivation Tree

```
xsi:string
  └─generalCategoryEnum (restriction)
```

Derivation: restriction of xsi:string
Facets: **enumeration:** "Water Quality", "Climate", "Hydrology", "Geology", "Biota", "Unknown", "Instrumentation"

XML Source

```
<xsi:simpleType name="generalCategoryEnum">
  <xsi:restriction base="xsi:string">
    <xsi:enumeration value="Water Quality"/>
    <xsi:enumeration value="Climate"/>
    <xsi:enumeration value="Hydrology"/>
    <xsi:enumeration value="Geology"/>
    <xsi:enumeration value="Biota"/>
    <xsi:enumeration value="Unknown"/>
    <xsi:enumeration value="Instrumentation"/>
  </xsi:restriction>
</xsi:simpleType>
```

simpleType *"Latitude"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [145]
Used: at 3 locations

Simple Content Model

```
xsi:double
```

Simple Content Restrictions:

MaxInclusive: 90.00
MinInclusive: -90.00

All Direct / Indirect Based Elements (3):

latitude (in latLonPoint) [41], south (in latLonBox) [79]
north (in latLonBox) [49],

Known Usage Locations

- **As direct type of elements (3):**

  latitude (in latLonPoint) [41], south (in latLonBox) [79]
  north (in latLonBox) [49],

Annotation

The latitude of the site in a decimal degrees as calculated in terms of the given datum.

Type Definition Detail

Type Derivation Tree

```
xsi:double
   └─Latitude (restriction)
```

Derivation: restriction of xsi:double
Facets: maxInclusive: 90.00
minInclusive: -90.00

XML Source (w/o annotations (1))

```xml
<xsi:simpleType name="Latitude">
  <xsi:restriction base="xsi:double">
    <xsi:minInclusive value="-90.00"/>
    <xsi:maxInclusive value="90.00"/>
  </xsi:restriction>
</xsi:simpleType>
```

simpleType *"Longitude"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [146]
Used: at 3 locations

Simple Content Model

```
xsi:double
```

Simple Content Restrictions:

MaxInclusive: `180.00`
MinInclusive: `-180.00`

All Direct / Indirect Based Elements (3):

east (in latLonBox) `[32]`,   west (in latLonBox) `[97]`
longitude (in latLonPoint) `[45]`,

Known Usage Locations

- **As direct type of elements (3):**

    east (in latLonBox) `[32]`,   west (in latLonBox) `[97]`
    longitude (in latLonPoint) `[45]`,

Annotation

The longitude of the site in a decimal degrees as calculated in terms of the given datum.

Type Definition Detail

Type Derivation Tree

```
xsi:double
   └─Longitude (restriction)
```

Derivation: restriction of `xsi:double`
Facets: **maxInclusive:** `180.00`
          minInclusive: `-180.00`

XML Source (w/o annotations (1))

```xml
<xsi:simpleType name="Longitude">
   <xsi:restriction base="xsi:double">
      <xsi:minInclusive value="-180.00"/>
      <xsi:maxInclusive value="180.00"/>
   </xsi:restriction>
</xsi:simpleType>
```

simpleType *"QualityControlLevelEnum"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source `[147]`
Used: at 1 location

Simple Content Model

```
enumeration of xsi:string
```

Simple Content Restrictions:

Enumeration: `"Raw data"`, `"Quality controlled data"`, `"Derived products"`, `"Interpreted products"`,
          `"Knowledge products"`, `"Unknown"`

All Direct / Indirect Based Attributes (1):

ValueAttr/@qualityControlLevel [157]

Known Usage Locations

- **As direct type of attributes within attributeGroups (1):**

ValueAttr/@qualityControlLevel [157]

Type Definition Detail

Type Derivation Tree

```
xsi:string
   QualityControlLevelEnum (restriction)
```

Derivation: restriction of xsi:string

Facets: **enumeration:** "Raw data", "Quality controlled data", "Derived products", "Interpreted products", "Knowledge products", "Unknown"

XML Source

```
<xsi:simpleType name="QualityControlLevelEnum">
   <xsi:restriction base="xsi:string">
      <xsi:enumeration value="Raw data"/>
      <xsi:enumeration value="Quality controlled data"/>
      <xsi:enumeration value="Derived products"/>
      <xsi:enumeration value="Interpreted products"/>
      <xsi:enumeration value="Knowledge products"/>
      <xsi:enumeration value="Unknown"/>
   </xsi:restriction>
</xsi:simpleType>
```

simpleType *"SampleMediumEnum"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [148]
Used: at 1 location

Simple Content Model

enumeration of xsi:string

Simple Content Restrictions:

Enumeration: "Surface Water", "Ground Water", "Sediment", "Soil", "Air", "Tissue", "Precipitation", "Unknown", "Other", "Snow", "Not Relevant"

All Direct / Indirect Based Elements (1):

sampleMedium (type SampleMediumEnum) [67]

Known Usage Locations

- **As direct type of elements (1):**

sampleMedium (type SampleMediumEnum) [67]

Type Definition Detail

Type Derivation Tree

```
xsi:string
  └─SampleMediumEnum (restriction)
```

Derivation: restriction of `xsi:string`

Facets: **enumeration:** `"Surface Water"`, `"Ground Water"`, `"Sediment"`, `"Soil"`, `"Air"`, `"Tissue"`, `"Precipitation"`, `"Unknown"`, `"Other"`, `"Snow"`, `"Not Relevant"`

XML Source

```xml
<xsi:simpleType name="SampleMediumEnum">
  <xsi:restriction base="xsi:string">
    <xsi:enumeration value="Surface Water"/>
    <xsi:enumeration value="Ground Water"/>
    <xsi:enumeration value="Sediment"/>
    <xsi:enumeration value="Soil"/>
    <xsi:enumeration value="Air"/>
    <xsi:enumeration value="Tissue"/>
    <xsi:enumeration value="Precipitation"/>
    <xsi:enumeration value="Unknown"/>
    <xsi:enumeration value="Other"/>
    <xsi:enumeration value="Snow"/>
    <xsi:enumeration value="Not Relevant"/>
  </xsi:restriction>
</xsi:simpleType>
```

simpleType *"sampleTypeEnum"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [149]
Used: at 1 location

Simple Content Model

enumeration of `xsi:string`

Simple Content Restrictions:

Enumeration: `"FD"`, `"FF"`, `"FL"`, `"LF"`, `"GW"`, `"PB"`, `"PD"`, `"PE"`, `"PI"`, `"PW"`, `"RE"`, `"SE"`, `"SR"`, `"SS"`, `"SW"`, `"TE"`, `"TI"`, `"TW"`, `"VE"`, `"VI"`, `"VW"`, `"Grab"`, `"Unknown"`, `"No Sample"`

All Direct / Indirect Based Elements (1):

SampleType (type sampleTypeEnum) [68]

Known Usage Locations

- **As direct type of elements (1):**

  SampleType (type sampleTypeEnum) [68]

Type Definition Detail

Type Derivation Tree

```
xsi:string
   └─sampleTypeEnum (restriction)
```

Derivation: restriction of xsi:string

Facets: **enumeration:** "FD", "FF", "FL", "LF", "GW", "PB", "PD", "PE", "PI", "PW", "RE", "SE", "SR", "SS", "SW", "TE", "TI", "TW", "VE", "VI", "VW", "Grab", "Unknown", "No Sample"

XML Source

```xml
<xsi:simpleType name="sampleTypeEnum">
   <xsi:restriction base="xsi:string">
      <xsi:enumeration value="FD"/>
      <xsi:enumeration value="FF"/>
      <xsi:enumeration value="FL"/>
      <xsi:enumeration value="LF"/>
      <xsi:enumeration value="GW"/>
      <xsi:enumeration value="PB"/>
      <xsi:enumeration value="PD"/>
      <xsi:enumeration value="PE"/>
      <xsi:enumeration value="PI"/>
      <xsi:enumeration value="PW"/>
      <xsi:enumeration value="RE"/>
      <xsi:enumeration value="SE"/>
      <xsi:enumeration value="SR"/>
      <xsi:enumeration value="SS"/>
      <xsi:enumeration value="SW"/>
      <xsi:enumeration value="TE"/>
      <xsi:enumeration value="TI"/>
      <xsi:enumeration value="TW"/>
      <xsi:enumeration value="VE"/>
      <xsi:enumeration value="VI"/>
      <xsi:enumeration value="VW"/>
      <xsi:enumeration value="Grab"/>
      <xsi:enumeration value="Unknown"/>
      <xsi:enumeration value="No Sample"/>
   </xsi:restriction>
</xsi:simpleType>
```

simpleType *"UnitsTypeEnum"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [150]
Used: at 2 locations

Simple Content Model

enumeration of xsi:string

Simple Content Restrictions:

Enumeration: "Angle", "Area", "Dimensionless", "Energy", "Energy Flux", "Flow", "Force", "Frequency", "Length", "Light", "Mass", "Permeability", "Power", "Pressure/Stress", "Resolution", "Scale", "Temperature", "Time", "Velocity", "Volume"

All Direct / Indirect Based Elements (1):

UnitType (in unit) [88]

All Direct / Indirect Based Attributes (1):

unitsAttr/@unitsType [155]

Known Usage Locations

- **As direct type of elements (1):**

  UnitType (in unit) [88]

- **As direct type of attributes within attributeGroups (1):**

  unitsAttr/@unitsType [155]

Type Definition Detail

Type Derivation Tree

```
xsi:string
   └─UnitsTypeEnum (restriction)
```

Derivation: restriction of xsi:string

Facets: **enumeration:** "Angle", "Area", "Dimensionless", "Energy", "Energy Flux", "Flow", "Force", "Frequency", "Length", "Light", "Mass", "Permeability", "Power", "Pressure/Stress", "Resolution", "Scale", "Temperature", "Time", "Velocity", "Volume"

XML Source

```xml
<xsi:simpleType name="UnitsTypeEnum">
  <xsi:restriction base="xsi:string">
    <xsi:enumeration value="Angle"/>
    <xsi:enumeration value="Area"/>
    <xsi:enumeration value="Dimensionless"/>
    <xsi:enumeration value="Energy"/>
    <xsi:enumeration value="Energy Flux"/>
    <xsi:enumeration value="Flow"/>
    <xsi:enumeration value="Force"/>
    <xsi:enumeration value="Frequency"/>
    <xsi:enumeration value="Length"/>
    <xsi:enumeration value="Light"/>
    <xsi:enumeration value="Mass"/>
    <xsi:enumeration value="Permeability"/>
    <xsi:enumeration value="Power"/>
    <xsi:enumeration value="Pressure/Stress"/>
    <xsi:enumeration value="Resolution"/>
    <xsi:enumeration value="Scale"/>
    <xsi:enumeration value="Temperature"/>
    <xsi:enumeration value="Time"/>
    <xsi:enumeration value="Velocity"/>
    <xsi:enumeration value="Volume"/>
  </xsi:restriction>
</xsi:simpleType>
```

simpleType *"valueTypeEnum"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [151]
Used: at 1 location

Simple Content Model

enumeration of xsi:string

Simple Content Restrictions:

Enumeration: "Field Observation", "Sample", "Model Simulation Result", "Derived Value", "Unknown"

All Direct / Indirect Based Elements (1):

valueType (type valueTypeEnum) [91]

Known Usage Locations

- **As direct type of elements (1):**

  valueType (type valueTypeEnum) [91]

Type Definition Detail

Type Derivation Tree

```
xsi:string
   └─valueTypeEnum (restriction)
```

Derivation: restriction of xsi:string

Facets: enumeration: "Field Observation", "Sample", "Model Simulation Result", "Derived Value", "Unknown"

XML Source

```xml
<xsi:simpleType name="valueTypeEnum">
   <xsi:restriction base="xsi:string">
      <xsi:enumeration value="Field Observation"/>
      <xsi:enumeration value="Sample"/>
      <xsi:enumeration value="Model Simulation Result"/>
      <xsi:enumeration value="Derived Value"/>
      <xsi:enumeration value="Unknown"/>
   </xsi:restriction>
</xsi:simpleType>
```

---

attributeGroup *"DbIdentifiers"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: 2 attributes
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [152]
Includes: definitions of 2 attributes
Used: at 5 locations

XML Representation Summary

```
<...
   metadataDateTime = xsi:dateTime
   oid              = xsi:normalizedString
...>
```

Annotation

thei attribute group provides provenance information for when an object is retrieved from a database.

Known Usage Locations

- **In definitions of global complexTypes (3):**

  SiteInfoType [121], ValueSingleVariable [135], VariableInfoType [137]

- **In definitions of anonymous complexTypes of elements (2):**

---

qualifier [58], qualityControlLevel [61]

XML Source (w/o annotations (3))

```
<xsi:attributeGroup name="DbIdentifiers">
    <xsi:attribute name="oid" type="xsi:normalizedString"/>
    <xsi:attribute name="metadataDateTime" type="xsi:dateTime"/>
</xsi:attributeGroup>
```

Attribute Detail (defined in this component only; 2/2)

🔲 metadataDateTime

> **Type:** xsi:dateTime, predefined
> **Use:** optional
>
> time object was created in the database.

- -

🔲 oid

> **Type:** xsi:normalizedString, predefined
> **Use:** optional
>
> object identifier, or guid for an object

attributeGroup *"offsetAttr"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: 5 attributes
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [152]
Includes: definitions of 5 attributes
Used: at 1 location

XML Representation Summary

```
<...
    offsetDescription          = xsi:string
    offsetTypeID               = xsi:int
    offsetUnitsAbbreviation    = xsi:string
    offsetUnitsCode            = xsi:string
    offsetValue                = xsi:double
...>
```

Known Usage Locations

- **In definitions of global complexTypes (1):**

    ValueSingleVariable [135]

XML Source

```
<xsi:attributeGroup name="offsetAttr">
    <xsi:attribute name="offsetValue" type="xsi:double"/>
    <xsi:attribute name="offsetTypeID" type="xsi:int"/>
    <xsi:attribute name="offsetDescription" type="xsi:string"/>
    <xsi:attribute name="offsetUnitsAbbreviation" type="xsi:string"/>
    <xsi:attribute name="offsetUnitsCode" type="xsi:string"/>
</xsi:attributeGroup>
```

Attribute Detail (defined in this component only; 5/5)

🔶 offsetDescription

     Type: `xsi:string`, predefined
     Use: optional

- -

🔶 offsetTypeID

     Type: `xsi:int`, predefined
     Use: optional

- -

🔶 offsetUnitsAbbreviation

     Type: `xsi:string`, predefined
     Use: optional

- -

🔶 offsetUnitsCode

     Type: `xsi:string`, predefined
     Use: optional

- -

🔶 offsetValue

     Type: `xsi:double`, predefined
     Use: optional

attributeGroup *"timeZoneAttr"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: 2 attributes
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [153]
Includes: definitions of 2 attributes
Used: at 2 locations

XML Representation Summary

```
<...
    ZoneAbbreviation = xsi:normalizedString
    ZoneOffset          = xsi:string
...>
```

Known Usage Locations

- **In definitions of anonymous complexTypes of elements (2):**

    daylightSavingsTimeZone (in timeZoneInfo) [31], defaultTimeZone (in timeZoneInfo) [32]

XML Source (w/o annotations (2))

```xml
<xsi:attributeGroup name="timeZoneAttr">
  <xsi:attribute name="ZoneAbbreviation" type="xsi:normalizedString" use="optional"/>
  <xsi:attribute name="ZoneOffset" type="xsi:string" use="required"/>
</xsi:attributeGroup>
```

Attribute Detail (defined in this component only; 2/2)

🔲 ZoneAbbreviation

>   **Type:** `xsi:normalizedString`, predefined
>   **Use:** optional
>
>   the standard abbreviation for this time zone (GMT; EST)

🔲 ZoneOffset

>   **Type:** `xsi:string`, predefined
>   **Use:** required
>
>   Hours and minutes offset for this time zone (+00:00).

attributeGroup *"unitsAttr"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: 3 attributes
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [154]
Includes: definitions of 3 attributes
Used: at 2 locations

XML Representation Summary

```
<...
   unitsAbbreviation = xsi:normalizedString
   unitsCode         = xsi:token
   unitsType         = ("Angle" | "Area" | "Dimensionless" | "Energy" | "Energy Flux" | "Flow" |
                        "Force" | "Frequency" | "Length" | "Light" | "Mass" | "Permeability" | "Power"
                        | "Pressure/Stress" | "Resolution" | "Scale" | "Temperature" | "Time" |
                        "Velocity" | "Volume")
...>
```

Known Usage Locations

- **In definitions of global complexTypes (1):**

  TsValuesSingleVariableType [132]

- **In definitions of anonymous complexTypes of elements (1):**

  units [87]

XML Source

```
<xsi:attributeGroup name="unitsAttr">
   <xsi:attribute name="unitsAbbreviation" type="xsi:normalizedString"/>
   <xsi:attribute name="unitsCode" type="xsi:token"/>
   <xsi:attribute name="unitsType" type="UnitsTypeEnum"/>
</xsi:attributeGroup>
```

Attribute Detail (defined in this component only; 3/3)

🔲 unitsAbbreviation

>   **Type:** `xsi:normalizedString`, predefined
>   **Use:** optional

🔶 unitsCode

> **Type:** `xsi:token`, predefined
> **Use:** optional

🔶 unitsType

> **Type:** [UnitsTypeEnum](#) `[149]`
> **Use:** optional

> ### *Attribute Value*
>
> | *enumeration of* `xsi:string` |
> |---|
>
> **Enumeration:** "Angle", "Area", "Dimensionless", "Energy", "Energy Flux", "Flow", "Force", "Frequency", "Length", "Light", "Mass", "Permeability", "Power", "Pressure/Stress", "Resolution", "Scale", "Temperature", "Time", "Velocity", "Volume"

attributeGroup *"ValueAttr"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: 10 [attributes](#)
Defined: globally in [cuahsiTimeSeries_v1_0.xsd](#), see [XML source](#) `[155]`
Includes: definitions of 10 [attributes](#)
Used: at 1 [location](#)

XML Representation Summary

```
<...
    accuracyStdDev    = xsi:double
    censorCode        = ("lt" | "gt" | "nc" | "nd" | "pnq")
    codedVocabulary   = xsi:boolean
    codedVocabularyTerm = xsi:string
    dateTime          = xsi:dateTime
    methodID          = xsi:int
    qualifiers        = xsi:string
    qualityControlLevel = ("Raw data" | "Quality controlled data" | "Derived products" |
                           "Interpreted products" | "Knowledge products" | "Unknown")
    sampleID          = xsi:int
    sourceID          = xsi:int
...>
```

Annotation

valueAttr contains the possible attributes that can be associated with a data value element.

Known Usage Locations

- **In definitions of global complexTypes (1):**

  [ValueSingleVariable](#) `[135]`

XML Source (w/o annotations (10))

```
<xsi:attributeGroup name="ValueAttr">
  <xsi:attribute name="qualifiers" type="xsi:string"/>
  <xsi:attribute name="censorCode" type="CensorCodeEnum"/>
  <xsi:attribute name="dateTime" type="xsi:dateTime" use="required"/>
  <xsi:attribute name="qualityControlLevel" type="QualityControlLevelEnum"/>
  <xsi:attribute name="methodID" type="xsi:int"/>
  <xsi:attribute name="sourceID" type="xsi:int"/>
```

```xml
    <xsi:attribute name="accuracyStdDev" type="xsi:double"/>
    <xsi:attribute name="codedVocabulary" type="xsi:boolean"/>
    <xsi:attribute name="codedVocabularyTerm" type="xsi:string"/>
    <xsi:attribute name="sampleID" type="xsi:int"/>
</xsi:attributeGroup>
```

Attribute Detail (defined in <u>this</u> component only; 10/10)

🟨 accuracyStdDev

> **Type:** xsi:double, predefined
> **Use:** optional
>
> Numeric value that describes the measurement accuracy of the data value. If not given, it is interpreted as unknown.

🟨 censorCode

> **Type:** <u>CensorCodeEnum</u> [141]
> **Use:** optional
>
> indication of whether the data value is censored @censorCode codelist is censorCodeEnum.
>
> ### *Attribute Value*
>
> > *enumeration of* xsi:string
>
> **Enumeration:** "lt", "gt", "nc", "nd", "pnq"

🟨 codedVocabulary

> **Type:** xsi:boolean, predefined
> **Use:** optional
>
> If a value is categorical, then @codedVocabulary is set to true, and the categorical term is placed in@codedVocabularyTerm, and a numeric value put in the value. While not a good practice, allows for categorical and numeric values to be intermixed.

🟨 codedVocabularyTerm

> **Type:** xsi:string, predefined
> **Use:** optional

🟨 dateTime

> **Type:** xsi:dateTime, predefined
> **Use:** required
>
> XML date and time at which the data value was observed. This is an ISO specified string, that can contain a time zone offset, if apprpriate. If no time offset is specificed, the data is in the local time zone of the station.

🟨 methodID

> **Type:** xsi:int, predefined
> **Use:** optional
>
> @qualifier contains a identifier whose details are described in the values/method element(s)

🟨 qualifiers

> **Type:** xsi:string, predefined
> **Use:** optional
>
> @qualifier contains a qualifier code whose details are described in the values/ qualifier element(s) Space delimit multiple qualifier codes.

🔲 qualityControlLevel

    Type: <u>QualityControlLevelEnum</u> [146]
    Use: optional

    text string giving the level of quality control that the value has been subjected to. Codelist is from qualityControlLevelEnum.

    Attribute Value

enumeration of xsi:string

    Enumeration: "Raw data", "Quality controlled data", "Derived products", "Interpreted products", "Knowledge products", "Unknown"

🔲 sampleID

    Type: xsi:int, predefined
    Use: optional

    @sampleId contains a n identifier whose details are described in the values/samples element(s) This is required only if the data value resulted from a physical sample processed in a lab.

🔲 sourceID

    Type: xsi:int, predefined
    Use: optional

    @methodID contains an identifier whose details are described in the values/method element(s)

attributeGroup *"VocabularyAttributes"*

Namespace: <u>http://www.cuahsi.org/waterML/1.0/</u>
Content: 3 <u>attributes</u>
Defined: globally in <u>cuahsiTimeSeries_v1_0.xsd</u>, see <u>XML source</u> [157]
Includes: definitions of 3 <u>attributes</u>
Used: at 6 <u>locations</u>

XML Representation Summary

```
<...
   default    = xsi:boolean
   network    = xsi:string
   vocabulary = xsi:string
...>
```

Annotation

Tthe attribute group vocabularyAttributes contains common attributes used to differentiate data source codes. A network should be provided with a siteCode, and a vocabular should be provided with a variableCode. If there is more than one code, one code should be provided as the default code for the service.

Known Usage Locations

- **In definitions of anonymous complexTypes of elements (6):**

  <u>parentID</u> (in <u>related</u>) [57], <u>qualifier</u> [58], <u>qualifier</u> (type anonymous) [60], <u>qualityControlLevel</u> [61], <u>relatedID</u> (in <u>related</u>) [67], <u>variableCode</u> [93]

XML Source (w/o annotations (3))

```
<xsi:attributeGroup name="VocabularyAttributes">
   <xsi:attribute name="network" type="xsi:string"/>
```

```
   <xsi:attribute name="vocabulary" type="xsi:string"/>
   <xsi:attribute name="default" type="xsi:boolean"/>
</xsi:attributeGroup>
```

Attribute Detail (defined in this component only; 3/3)

🔶 `default`

Type: `xsi:boolean`, predefined
Use: optional

🔶 `network`

Type: `xsi:string`, predefined
Use: optional

@netowrk codespace for the siteCode datasource. Submitted to webservice as 'network:sitecode'

🔶 `vocabulary`

Type: `xsi:string`, predefined
Use: optional

@vocabulary codespace for the variableCode for a datasource. Submitted to webservice as 'vocabulary:vocabularyCode'

attributeGroup *"XLinkAttr"*

Namespace: http://www.cuahsi.org/waterML/1.0/
Content: 3 attributes
Defined: globally in cuahsiTimeSeries_v1_0.xsd, see XML source [158]
Includes: definitions of 3 attributes
Used: at 2 locations

XML Representation Summary

```
<...
   href  = xsi:string
   show  = xsi:string
   title = xsi:string
...>
```

Known Usage Locations

- **In definitions of global complexTypes (2):**

  DocumentationType [102], NoteType [111]

XML Source

```
<xsi:attributeGroup name="XLinkAttr">
   <xsi:attribute name="href" type="xsi:string"/>
   <xsi:attribute name="title" type="xsi:string"/>
   <xsi:attribute name="show" type="xsi:string"/>
</xsi:attributeGroup>
```

Attribute Detail (defined in this component only; 3/3)

🔶 `href`

Type: `xsi:string`, predefined

Use: optional

🟨 show

    Type: `xsi:string`, predefined
    Use: optional

🟨 title

    Type: `xsi:string`, predefined
    Use: optional

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