



NWRFC XML Requirements



- Web Access to Observed and Forecasted Streamflow Data
- Provide Regional Input From Multiple Offices to Support a Central Web Page
- Provide a Snapshot of Current Service Status



Why XML



- Current Formats, such as SHEF, do not provide all meta data users require to describe the information
- Provides a Standard Markup Language Which Can be Decoded by Many Popular Applications and Browsers
- Provides a Process for Immediate Notification



Process



1. XML Chosen after considering, Comma Delimited, SHEF or Text File
2. Choose XML Standard (version 1.0)
3. Pattern First XML Model After SHEF Format
4. Goal to Produce an Unambiguous Representation of Observations and Forecasts
5. Review and Publish Schema Documenting the XML Model.



NWRFC Example XML



Sample Code

File:

NWRFC_XML.xml

```
1 <?xml version="1.0"?>
2 <HydroMetData xmlns="http://www.nwrfc.noaa.gov/xml/schemas/2004/03/hydromet_data">
3   <SiteData id="CBAO3">
4     <description>COLUMBIA - AT BEAVER ARMY TERMINAL</description>
5     <county>COLUMBIA</county>
6     <state>OREGON</state>
7     <elevation units="feet">1</elevation>
8     <latitude units="decimal degrees">46.180000</latitude>
9     <longitude units="decimal degrees">123.180000</longitude>
10    <observedData>
11      <observedValue petype="HG" durCode="0" tsCode="RP" extremumCode="Z">
12        <dataDateTime>2006-03-02T21:00:00Z</dataDateTime>
13        <stage units="feet">3.99</stage>
14      </observedValue>
15      <observedValue petype="HG" durCode="0" tsCode="RP" extremumCode="Z">
16        <dataDateTime>2006-03-02T20:45:00Z</dataDateTime>
17        <stage units="feet">3.81</stage>
18      </observedValue>
19      <observedValue petype="HG" durCode="0" tsCode="RP" extremumCode="Z">
20        <dataDateTime>2006-03-02T20:30:00Z</dataDateTime>
21        <stage units="feet">3.75</stage>
22      </observedValue>
23    </observedData>
24  </SiteData>
25  ...
4343 <observedValue petype="HG" durCode="0" tsCode="RP" extremumCode="Z">
4344   <dataDateTime>2006-02-19T03:15:00Z</dataDateTime>
4345   <stage units="feet">4.89</stage>
4346 </observedValue>
4347 <observedValue petype="HG" durCode="0" tsCode="RP" extremumCode="Z">
4348   <dataDateTime>2006-02-19T03:00:00Z</dataDateTime>
4349   <stage units="feet">5.02</stage>
4350 </observedValue>
4351 </observedData>
4352 </SiteData>
4353 </HydroMetData>
```



NWRFC Example XML Schema



Sample Code

File:

NWRFC_XML_Schema.xsd

```
1 <?xml version="1.0" ?>
2 <!-- XML Schema - NWRFC schema for ia subset of SHEF codes -->
3 <!-- Version 1.0 -->
4 <!-- March 2004 -->
5 <xs:schema
6   xmlns:xs="http://www.w3.org/2001/XMLSchema"
7   targetNamespace="http://www.nwrfc.noaa.gov/xml/schemas/2004/03/hydromet_data"
8   xmlns:tns="http://www.nwrfc.noaa.gov/xml/schemas/2004/03/hydromet_data"
9   elementFormDefault="qualified" >
10
11   <xs:element name="hydroMetData">
12     <xs:complexType>
13       <xs:sequence>
14         <xs:element ref="tns:siteData" minOccurs="1" maxOccurs="unbounded" />
15       </xs:sequence>
16       <xs:anyAttribute namespace="##other" processContents="lax" />
17     </xs:complexType>
18   </xs:element>
19
20   <xs:element name="siteData">
21     <xs:complexType>
22       <xs:sequence>
23         <xs:element ref="tns:description" />
24         <xs:element ref="tns:county" />
25         <xs:element ref="tns:state" />
26         <xs:element ref="tns:elevation" />
27         <xs:element ref="tns:latitude" />
28         <xs:element ref="tns:longitude" />
29         <xs:element ref="tns:bankfullStage" minOccurs="0" />
30         <xs:element ref="tns:floodStage" minOccurs="0" />
31         <xs:element ref="tns:observedData" minOccurs="0" />
32         <xs:element ref="tns:processedData" minOccurs="0" />
33         <xs:element ref="tns:forecastData" minOccurs="0" />
34       </xs:sequence>
35       <xs:attribute name="id" type="xs:string" use="required" />
36     </xs:complexType>
37   </xs:element>
38
39   <xs:element name="description" type="xs:string" />
40   <xs:element name="county" type="xs:string" />
41   <xs:element name="state" type="xs:string" />
```



NWRFC Example XML Mapped to HydroXC



Sample Code

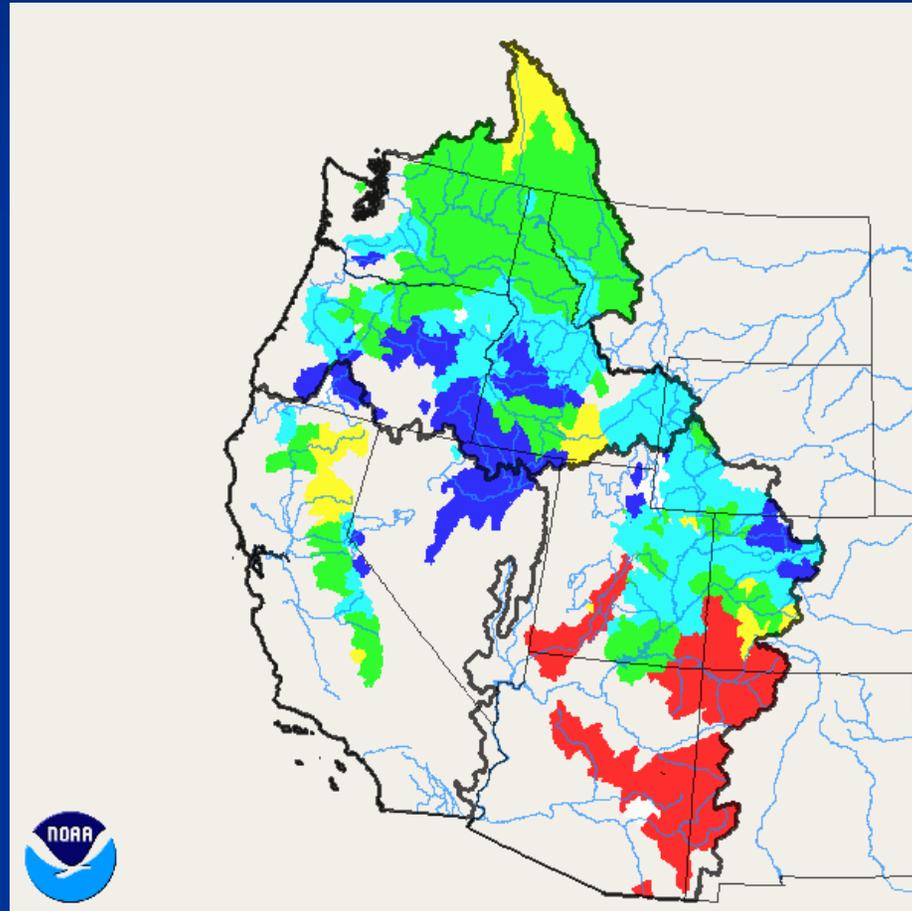
File:

NWRFC_XML_Mapping.xml

```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <Dataset DatasetID="NWRFC Observed and Forecast Sample 1" Schema="http://nwrfc.noaa.gov/nwrfc_sample1">
3   <Header>
4     <DatasetType Code="S" Name="Sample"/>
5     <MeasurementSystem Code="E" Name="ENGLISH"/>
6     <TimeZone Code="UTC" Name="Universal Time Constant"/>
7     <Comment>This is a sample 1 from NWRFC for HydroXC Workshop</Comment>
8   </Header>
9   <Report>
10    <Creator LocationCode="NWRFC" LocationName="Northwest RiverForecastCenter" />
11    <TimeStampCreatedDate="2006-03-03T08:15:00" />
12    <TimeStampTransmittedDate="2006-03-03T08:16:34" />
13    <CoverageSet Count="1">
14      <Coverage Number="1" ID="111111" Name="Sample">
15        <LocationSet Count="1">
16          <Location Number="1" TypeCode="ST" Typename="SITE">
17            <LocationArrayDefinition ID="2" Code="H" Name="HEIGHT">
18              <ArrayDimension Item="Val1" Name="SiteAgency" DataType="String"/>
19              <ArrayDimension Item="Val2" Name="AgencyNumber" DataType="String"/>
20              <ArrayDimension Item="Val3" Name="SiteName" DataType="String"/>
21              <ArrayDimension Item="Val4" Name="State" DataType="String"/>
22              <ArrayDimension Item="Val5" Name="County" DataType="String"/>
23              <ArrayDimension Item="Val6" Name="Latitude" DataType="Number"/>
24              <ArrayDimension Item="Val7" Name="Longitude" DataType="Number"/>
25            </LocationArrayDefinition>
26            <LocationDataArray Count="1">
27              <LocationDataElement Number="1" Val1="USGS" Val2="14246900" Val3="Columbia River at Beaver Army Terminal" />
28            </LocationDataArray>
29          </Location>
30          <ParameterSet Count="3" Code="ST" Name="RiverHeight">
31            <Parameter Number="1" DataCode="RiverStage" DurationCode="Instantaneous"
32              TypeSourceCode="ObservedPhone">
33              <DataElementSet Count="1">
34                <DataElement Number="1" Name="Observed">
35                  <DataElementArrayDefinition ID="OBS" Name="Observed">
36                    <ArrayDimension Item="Val1" Name="DateTime" DataType="Date" Description="DateTime of Observation"/>
37                    <ArrayDimension Item="Val2" Name="Height" DataType="Number" Description="River Stage"/>
38                  </DataElementArrayDefinition>
39                  <DataElementArray Count="12">
40                    <DataElement Number="1" Val1="2006-03-02T21:00:00Z" Val2="3.99"/>
41                    <DataElement Number="2" Val1="2006-03-02T20:45:00Z" Val2="3.81"/>
```



Regional XML





Regional XML Sample XML



Sample Code

File:

nwrfc.20060222.xml

```
1 <xml>
2 <watersupplyfcsts id='ABBM8' shefpc='QCMFZZZ' units='KAF'>
3   <location lat='465300' lon='1134959' des='CLARK FORK-CLARK FORK R ABV BLACKFOOT R'></location>
4   <hist_period begwymon='4' endwymon='12'>
5     <begwyyear>1971</begwyyear>
6     <endwyyear>2000</endwyyear>
7     <mean>878</mean>
8     <max>1643</max>
9     <min>412</min>
10  </hist_period>
11  <forecast issue_date='20051201' fcsttype='mid_month'>
12    <period_begwymon>4</period_begwymon>
13    <period_endwymon>12</period_endwymon>
14    <method>statistical</method>
15    <p05>351.200</p05>
16    <p50>750.000</p50>
17    <p95>1148.800</p95>
18  </forecast>
19  <forecast issue_date='20060101' fcsttype='early_bird'>
27  <forecast issue_date='20060101' fcsttype='final'>
35  <forecast issue_date='20060101' fcsttype='mid_month'>
43  <forecast issue_date='20060201' fcsttype='early_bird'>
51  <forecast issue_date='20060201' fcsttype='final'>
59  <forecast issue_date='20060201' fcsttype='mid_month'>
67  <month_data>
68  <mean>
69    <jan>52.352</jan>
70    <feb>52.606</feb>
71    <mar>69.638</mar>
72    <apr>95.016</apr>
73    <may>198.359</may>
74    <jun>216.526</jun>
75    <jul>96.810</jul>
76    <aug>47.376</aug>
77    <sep>49.403</sep>
78    <oct>60.407</oct>
79    <nov>56.700</nov>
80    <dec>52.489</dec>
81  </mean>
82  <obs pc='QCMRZZZ' wvyr='2006'>
83    <oct>51.000</oct>
84    <nov>48.200</nov>
```



RSS



RSS means Real Simple Syndication.

This is a service performed using XML. Site information and content is formatted in a headline or simple description form for quick distribution across networks. As changes are made at the source web site, small headlines, descriptions and links to actual products are produced and added to a channel on the web site.

This is a fixed standard with a specific Schema.



RSS



Sample Code File: RSS_NWRFC.xml

```
1 <?xml version="1.0" encoding="ISO-8859-1" ?>
2 <rss version="2.0">
3
4 <channel>
5 <title>NWRFC: River Forecasts</title>
6 <link>http://www.nwrfc.noaa.gov</link>
7 <description>NWRFC: River Forecasts</description>
8 <lastBuildDate>Mon, 06 Mar 2006 10:20 PST</lastBuildDate>
9 <ttl>5</ttl>
10
11 <item>
12 <title>River Forecast - Skagit</title>
13 <link>http://www.nwrfc.noaa.gov/river/riverlist.cgi?ss=SKAGIT</link>
14 <description>River Forecast for Skagit Issued: Mon 06 Mar 2006 10:11 PST</description>
15 </item>
16
17 <item>
18 <title>River Forecast - Lewis</title>
19 <link>http://www.nwrfc.noaa.gov/river/riverlist.cgi?ss=LEWIS</link>
20 <description>River Forecast for Lewis Issued: Mon 06 Mar 2006 10:01 PST</description>
21 </item>
22
23 <item>
24 <title>River Forecast - Walla Walla.. Umatilla.. John Day.. Klickitat.. Hood.. White Salmon</title>
25 <link>http://www.nwrfc.noaa.gov/</link>
26 <description>River Forecast for Walla Walla.. Umatilla.. John Day.. Klickitat.. Hood.. White Salmon Issued: Mon 06 Mar 2006 10:01 PST</description>
27 </item>
28
29 <item>
30 <title>River Forecast - Carbon.. Prairie.. Puyallup.. Nisqually.. and Deschutes</title>
31 <link>http://www.nwrfc.noaa.gov/</link>
32 <description>River Forecast for Carbon.. Prairie.. Puyallup.. Nisqually.. and Deschutes Issued: Mon 06 Mar 2006 10:01 PST</description>
33 </item>
```