



Using XML in a Rating Curve Application

National Weather Service

North Central River Forecast Center

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Discussion Objectives

- Rating Curve Application Overview
- Role of XML in Application
- Rating Curve Data Exchange
- Rating Curve Schema Development

Rating Curve Application Overview

- Program requirements established through a team involving most NWS River Forecast Centers.
- Application is in early stage of development.
- Import and export rating curves.
- Manage data exchange between servers.
- Detects changes between rating curves documents. Evaluates differences between documents and content.
- Forecasters are alerted to changes based on content sensitivity.
- Rating curve versioning and archiving.
- Users can visually compare and manage rating curve functions from GUI.

Role of XML in Application

- Most important role is common inter-agency data exchange format.
- Provides validation of external data.
- Minimize unique format parsing through application.

Rating Curve Data Exchange

- USGS currently provides access to rating curves through an internet server.
- USGS Rating curve is in text format. This text is parsed and an XML file is generated representing the USGS exchange format.
- The Rating Curve application applies its own unique schema representing the USGS exchange format. **This schema does NOT comply with any hydrologic data exchange standards.**
- Data exchange between other agencies will eventually follow a standardized Rating Curve Schema.

USGS Rating Curve Data File Example

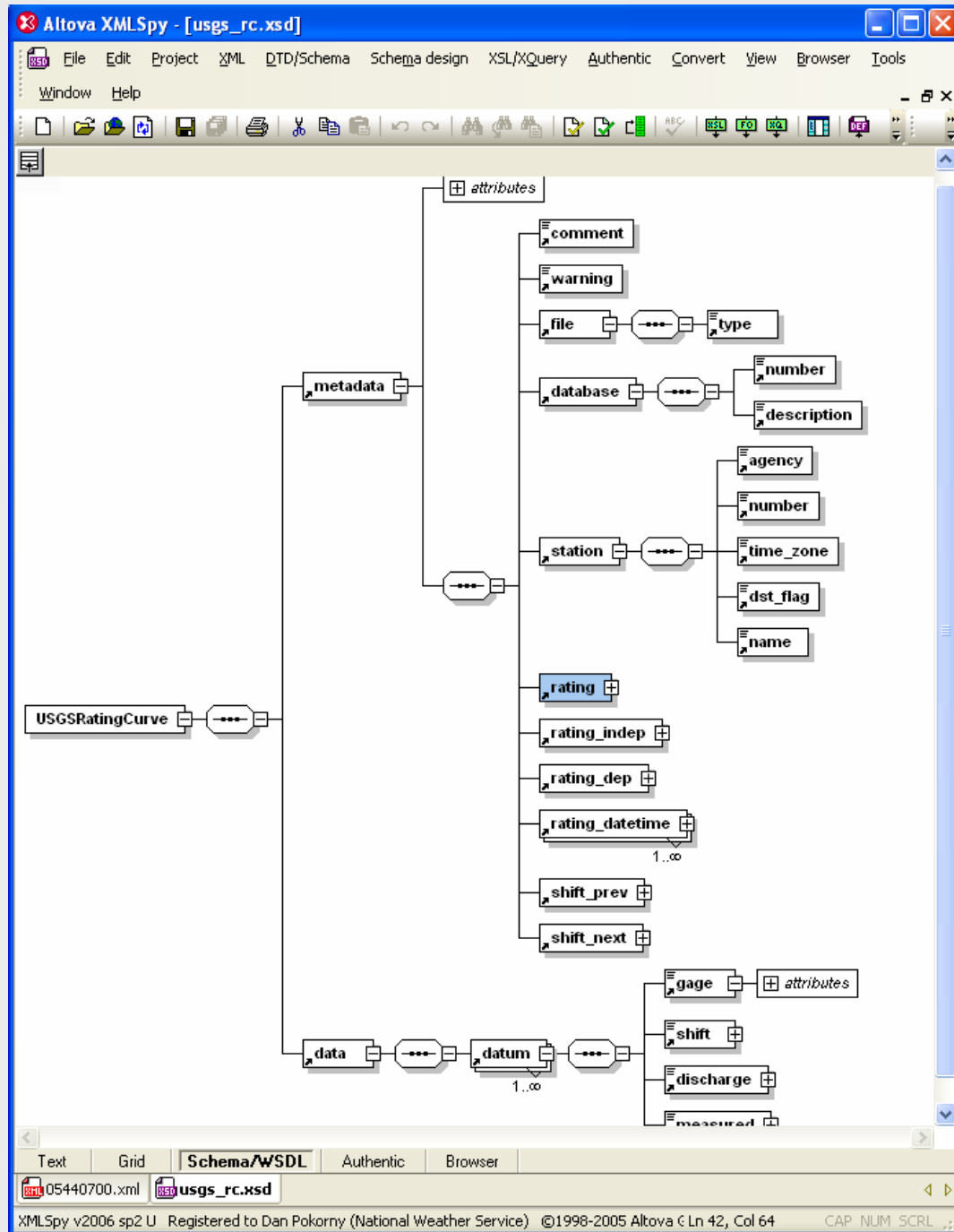
```
TextPad - [Document1 *]
File Edit Search View Tools Macros Configure Window Help
Document1 *
# //UNITED STATES GEOLOGICAL SURVEY      http://water.usgs.gov/
# //NATIONAL WATER INFORMATION SYSTEM    http://water.usgs.gov/data.html
# //DATA ARE PROVISIONAL AND SUBJECT TO CHANGE UNTIL PUBLISHED BY USGS
# //RETRIEVED: 2006-03-22 20:46:40
# //WARNING
# //WARNING The stage-discharge rating provided in this file should be
# //WARNING considered provisional and subject to change. Stage-discharge
# //WARNING ratings change over time as the channel features that control
# //WARNING the relation between stage and discharge vary. Users are
# //WARNING cautioned to consider carefully the applicability of this
# //WARNING rating before using it for decisions that concern personal or
# //WARNING public safety or operational consequences.
# //WARNING
# //FILE TYPE="NWIS RATING"
# //DATABASE NUMBER=1 DESCRIPTION=" Standard data base for this site."
# //STATION AGENCY="USGS " NUMBER="05419000 " TIME_ZONE="CST" DST_FLAG=N
# //STATION NAME="APPLE RIVER NEAR HANOVER, IL"
# //DD NUMBER=" 4" LABEL="Discharge, in cfs"
# //PARAMETER CODE="00060"
# //RATING SHIFTED="20060322200000 CST"
# //RATING ID="20.0" TYPE="STGQ" NAME="stage-discharge"
# //RATING REMARKS="EXTENSION OF RATING 19"
# //RATING EXPANSION="logarithmic"
# //RATING OFFSET1=1.50
# //RATING_INDEP ROUNDING="2223456782" PARAMETER="Gage height IN feet"
# //RATING_DEP ROUNDING="2222233332" PARAMETER="Discharge IN cfs"
# //RATING_DATETIME BEGIN=20020603233000 BZONE=CST END=20050930235959 EZONE=CST
# //RATING_DATETIME BEGIN=20051001000000 BZONE=CST END=23821230180000 EZONE=CST
# //SHIFT_PREV BEGIN="20051101104500" BZONE="CST" END="-----" EZONE="----"
# //SHIFT_PREV STAGE1="1.87" SHIFT1="-0.04" STAGE2="8.04" SHIFT2="-1.34" STAGE3="16.00" SHIFT3="0.00"
# //SHIFT_PREV COMMENT=" "
# //SHIFT_NEXT BEGIN="-----" BZONE="----" END="-----" EZONE="----"
# //SHIFT_NEXT STAGE1="----" SHIFT1="----" STAGE2="----" SHIFT2="----" STAGE3="----" SHIFT3="----"
# //SHIFT_NEXT COMMENT=" "
INDEP  SHIFT  DEP  STOR
16N    16N    16N    1S
1.59   -0.04   0.99
1.60   -0.04   2.2
1.61   -0.04   3.5
1.62   -0.04   4.7
1.63   -0.04   5.9
```

42 1 Read|Ovr|Block|Sync|Rec|Caps

Rating Curve Application

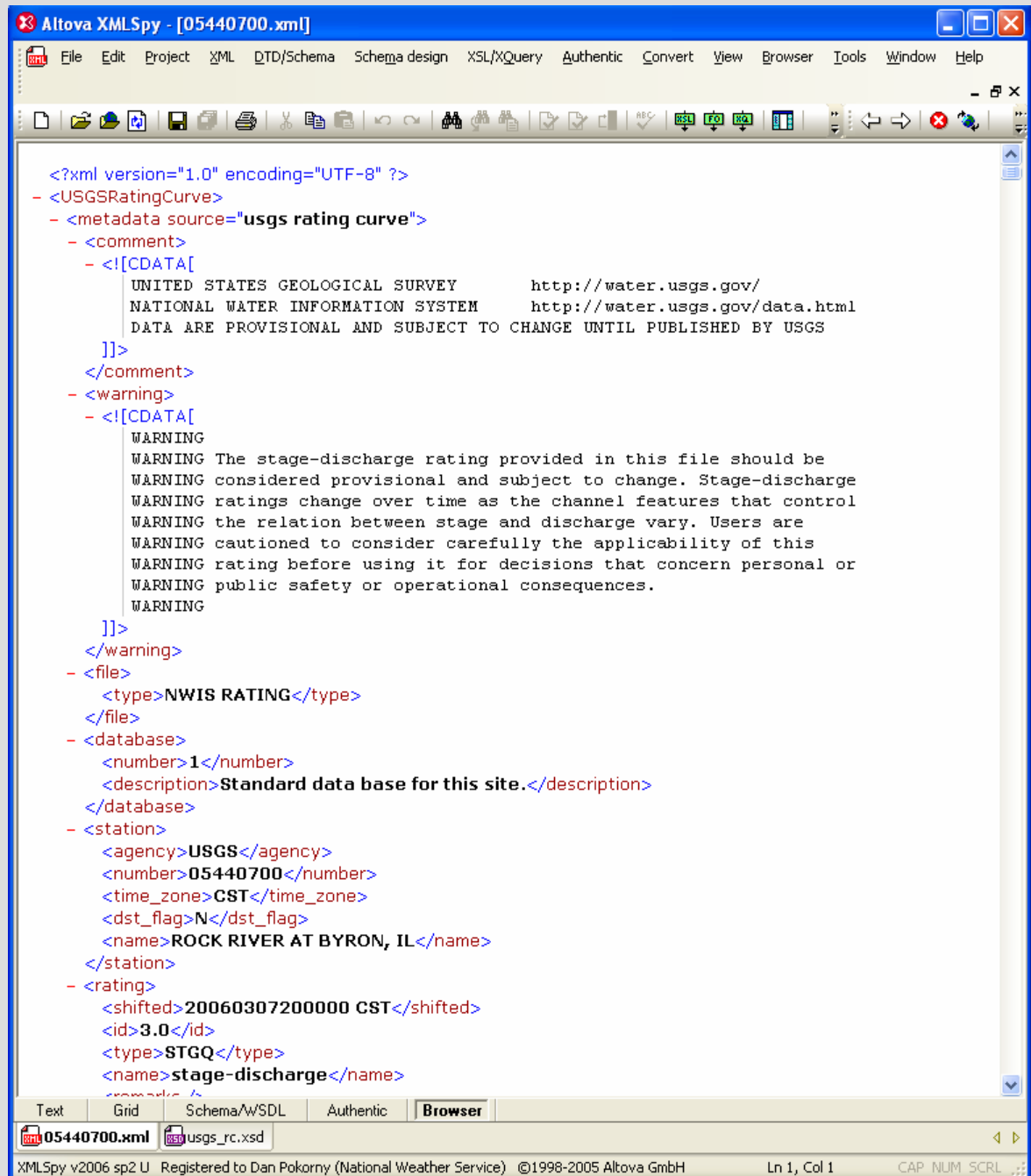
Schema represents USGS rating curve data format as used in Rating Curve application.

Work in progress!



Rating Curve Application

Text data converted to XML format as used in Rating Curve Application



```
<?xml version="1.0" encoding="UTF-8" ?>
- <USGSRatingCurve>
  - <metadata source="usgs rating curve">
    - <comment>
      - <![CDATA[
        UNITED STATES GEOLOGICAL SURVEY      http://water.usgs.gov/
        NATIONAL WATER INFORMATION SYSTEM    http://water.usgs.gov/data.html
        DATA ARE PROVISIONAL AND SUBJECT TO CHANGE UNTIL PUBLISHED BY USGS
      ]]>
    </comment>
    - <warning>
      - <![CDATA[
        WARNING
        WARNING The stage-discharge rating provided in this file should be
        WARNING considered provisional and subject to change. Stage-discharge
        WARNING ratings change over time as the channel features that control
        WARNING the relation between stage and discharge vary. Users are
        WARNING cautioned to consider carefully the applicability of this
        WARNING rating before using it for decisions that concern personal or
        WARNING public safety or operational consequences.
        WARNING
      ]]>
    </warning>
  - <file>
    <type>NWIS RATING</type>
  </file>
  - <database>
    <number>1</number>
    <description>Standard data base for this site.</description>
  </database>
  - <station>
    <agency>USGS</agency>
    <number>05440700</number>
    <time_zone>CST</time_zone>
    <dst_flag>N</dst_flag>
    <name>ROCK RIVER AT BYRON, IL</name>
  </station>
  - <rating>
    <shifted>20060307200000 CST</shifted>
    <id>3.0</id>
    <type>STGQ</type>
    <name>stage-discharge</name>
  </rating>
</USGSRatingCurve>
```

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Rating Curve Schema Development

- It is our goal to use a Rating Curve schema that is agreed upon between agencies and others.
- Initial objective is to develop a simplified data exchange format and then eventually conform to a standard schema.
- Does a Rating Curve schema/dtd currently exist? Or, do we take the lead at developing one????
- This is work in progress!!!!