

HydroXC-compliant Data Exchange Interface for NWS OHD Applications FLDWAV and FLDVIEW

February 17, 2006

This document illustrates a design for implementing a data exchange interface between two NWS OHD applications using the HydroXC 2.0 draft schema. It includes a diagram of the proposed XML structure to be used for communication between the applications, as well as example fragments of a hypothetical data exchange XML document.

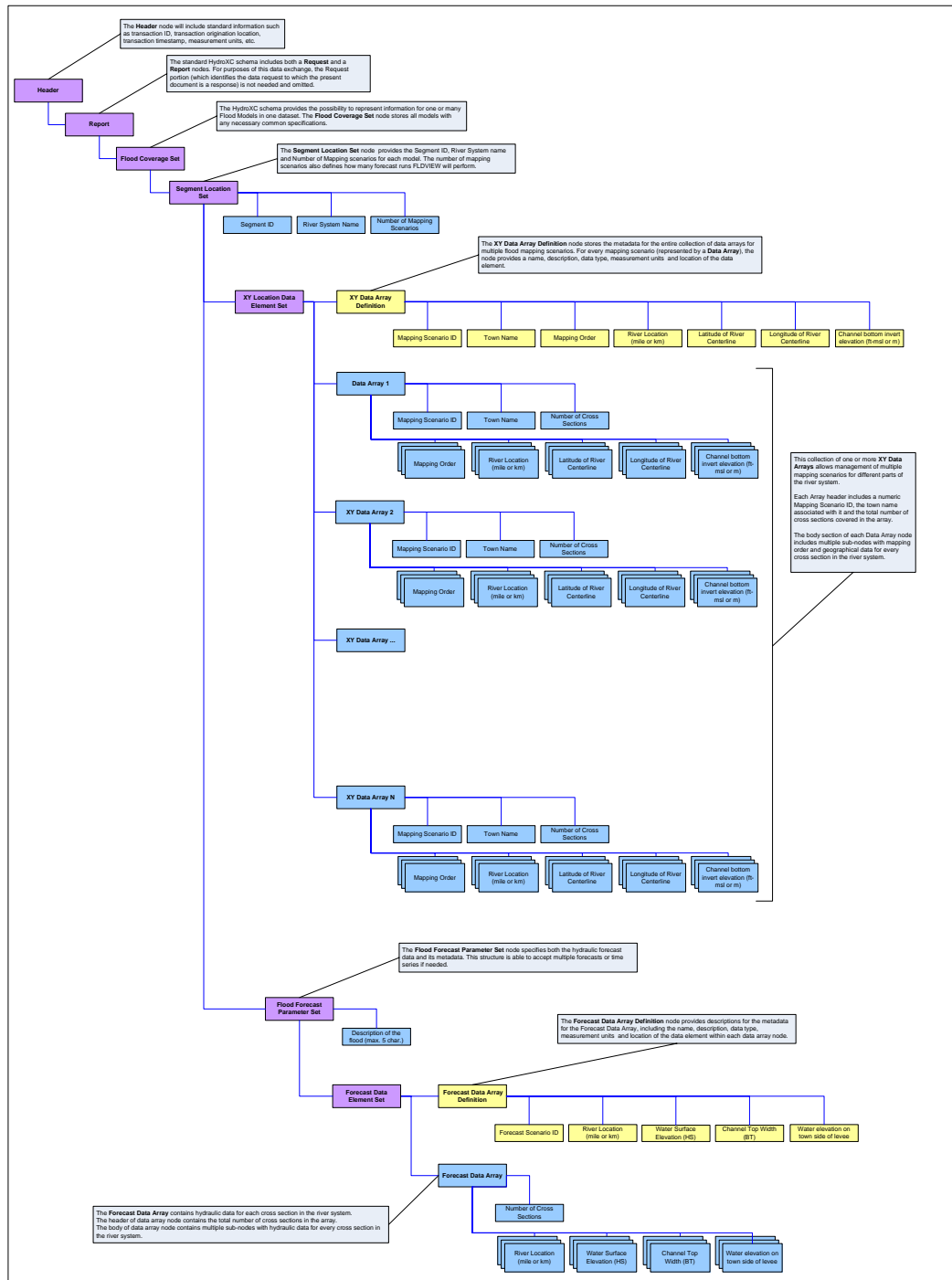
The two applications, FLDWAV and FLDVIEW currently exchange information via a number of text files containing data in a comma-separated, proprietary format. The objective of this design is to replace the various comma-separated files with one HydroXC 2.0 draft compliant XML document which should be both **more stable** (only one file as opposed to many), and **clearer** (HydroXC schema-based documents are self-documenting). With this design, human readers and other, potentially non-OHD application will be able to consume the data more accurately and quickly.

In addition to reducing the number of files and making the data more readable, the HydroXC XML format will also enable applications to encapsulate standard metadata and specification data within each forecast data file. Further, the single XML structure can easily be stored in a database for retention and further processing.

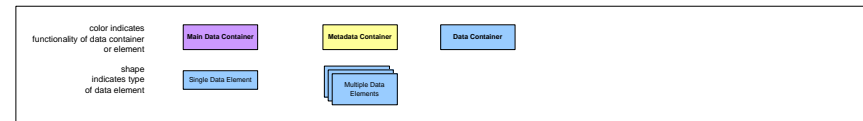
The National Weather Service currently uses FLDWAV and FLDVIEW to generate flood forecast data and to produce maps of the forecasted floods.



Data Set Schema For FLDWAV – FLDVIEW Data Interface



Legend



Example XML Fragments

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<?xml version="1.0" encoding="UTF-8" >
<Header DataElementName="Header" Comment="Header" Description="Header" >
  <TransactionID DataElementName="TransactionID" Data Type="Number" Units="1" Location="Header" Description="Transaction ID" />
  <OriginatorLocation DataElementName="OriginatorLocation" Data Type="Text" Units="1" Location="Header" Description="Originator Location" />
  <Timestamp DataElementName="Timestamp" Data Type="Text" Units="1" Location="Header" Description="Timestamp" />
</Header>
<Report DataElementName="Report" Comment="Report" Description="Report" >
  <RequestCode DataElementName="RequestCode" Data Type="Text" Units="1" Location="Report" Description="Request Code" />
  <ReportCode DataElementName="ReportCode" Data Type="Text" Units="1" Location="Report" Description="Report Code" />
</Report>
<FloodCoverageSet DataElementName="FloodCoverageSet" Comment="Flood Coverage Set" Description="Flood Coverage Set" >
  <FloodModelID DataElementName="FloodModelID" Data Type="Text" Units="1" Location="FloodCoverageSet" Description="Flood Model ID" />
  <FloodModelName DataElementName="FloodModelName" Data Type="Text" Units="1" Location="FloodCoverageSet" Description="Flood Model Name" />
  <FloodModelUnits DataElementName="FloodModelUnits" Data Type="Text" Units="1" Location="FloodCoverageSet" Description="Flood Model Units" />
  <FloodModelDescription DataElementName="FloodModelDescription" Data Type="Text" Units="1" Location="FloodCoverageSet" Description="Flood Model Description" />
</FloodCoverageSet>
<SegmentLocationSet DataElementName="SegmentLocationSet" Comment="Segment Location Set" Description="Segment Location Set" >
  <SegmentID DataElementName="SegmentID" Data Type="Text" Units="1" Location="SegmentLocationSet" Description="Segment ID" />
  <RiverSystemName DataElementName="RiverSystemName" Data Type="Text" Units="1" Location="SegmentLocationSet" Description="River System Name" />
  <NumberOfMappingScenarios DataElementName="NumberOfMappingScenarios" Data Type="Text" Units="1" Location="SegmentLocationSet" Description="Number of Mapping Scenarios" />
</SegmentLocationSet>
<XYLocationDataElementSet DataElementName="XYLocationDataElementSet" Comment="XY Location Data Element Set" Description="XY Location Data Element Set" >
  <XYDataArrayDefinition DataElementName="XY" Comment="Cross Section Geographic Data Array Definition" >
    <ArrayDimensionItem DataElementName="MappingScenarioID" Data Type="Number" Units="1" Location="Header" Description="Mapping Scenario ID" />
    <ArrayDimensionItem DataElementName="TownName" Data Type="Text" Units="1" Location="Header" Description="Town Name" />
    <ArrayDimensionItem DataElementName="MappingOrder" Data Type="Number" Units="1" Location="Body" Description="Mapping Order" />
    <ArrayDimensionItem DataElementName="RiverLocation" Data Type="Text" Units="1" Location="Body" Description="River Location (mile or km)" />
    <ArrayDimensionItem DataElementName="Latitude" Data Type="Text" Units="1" Location="Body" Description="Latitude of River Centerline" />
    <ArrayDimensionItem DataElementName="Longitude" Data Type="Text" Units="1" Location="Body" Description="Longitude of River Centerline" />
    <ArrayDimensionItem DataElementName="ChannelElevation" Data Type="Text" Units="1" Location="Body" Description="Channel bottom elevation (ft, msl or m)" />
  </XYDataArrayDefinition>
  <XYDataArray Definition="Data Array 1" >
    <XYDataArrayHeader MappingScenarioID="1" TownName="Lewisburg" Count="31" >
      <CrossSection MappingOrder="0" RiverLocation="10.0000" Latitude="36.9816" Longitude="40.3622" ChannelElevation="314.6300" />
      <CrossSection MappingOrder="0" RiverLocation="5.9778" Latitude="36.9816" Longitude="40.3622" ChannelElevation="311.7267" />
      <CrossSection MappingOrder="0" RiverLocation="7.9556" Latitude="36.9816" Longitude="40.3622" ChannelElevation="308.8233" />
      <CrossSection MappingOrder="0" RiverLocation="6.9333" Latitude="36.9816" Longitude="40.3622" ChannelElevation="305.9200" />
      <CrossSection MappingOrder="0" RiverLocation="5.9111" Latitude="36.9816" Longitude="40.3622" ChannelElevation="303.0167" />
    </XYDataArrayHeader>
  </XYDataArray>
  <XYDataArray Definition="Data Array 2" >
    <XYDataArrayHeader MappingScenarioID="2" TownName="Hartsburg" Count="31" >
      <CrossSection MappingOrder="1" RiverLocation="10.0000" Latitude="36.9816" Longitude="40.3622" ChannelElevation="314.6300" />
      <CrossSection MappingOrder="1" RiverLocation="8.9778" Latitude="36.9816" Longitude="40.3622" ChannelElevation="311.7267" />
      <CrossSection MappingOrder="1" RiverLocation="7.9556" Latitude="36.9816" Longitude="40.3622" ChannelElevation="308.8233" />
      <CrossSection MappingOrder="1" RiverLocation="6.9333" Latitude="36.9816" Longitude="40.3622" ChannelElevation="305.9200" />
      <CrossSection MappingOrder="1" RiverLocation="5.9111" Latitude="36.9816" Longitude="40.3622" ChannelElevation="303.0167" />
    </XYDataArrayHeader>
  </XYDataArray>
  <XYDataArray Definition="Data Array N" >
    <XYDataArrayHeader MappingScenarioID="4" TownName="Wholesystem" Count="31" >
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      <CrossSection MappingOrder="1" RiverLocation="7.9556" Latitude="36.9816" Longitude="40.3622" ChannelElevation="308.8233" />
      <CrossSection MappingOrder="1" RiverLocation="6.9333" Latitude="36.9816" Longitude="40.3622" ChannelElevation="305.9200" />
      <CrossSection MappingOrder="1" RiverLocation="5.9111" Latitude="36.9816" Longitude="40.3622" ChannelElevation="303.0167" />
    </XYDataArrayHeader>
  </XYDataArray>
</XYLocationDataElementSet>
<FloodForecastParameterSet DataElementName="FloodForecastParameterSet" Comment="Flood Forecast Parameter Set" Description="Flood Forecast Parameter Set" >
  <ForecastScenarioID DataElementName="ForecastScenarioID" Data Type="Text" Units="1" Location="ForecastForecastParameterSet" Description="Forecast Scenario ID" />
  <ForecastScenarioName DataElementName="ForecastScenarioName" Data Type="Text" Units="1" Location="ForecastForecastParameterSet" Description="Forecast Scenario Name" />
  <ForecastScenarioUnits DataElementName="ForecastScenarioUnits" Data Type="Text" Units="1" Location="ForecastForecastParameterSet" Description="Forecast Scenario Units" />
  <ForecastScenarioDescription DataElementName="ForecastScenarioDescription" Data Type="Text" Units="1" Location="ForecastForecastParameterSet" Description="Forecast Scenario Description" />
</FloodForecastParameterSet>
<ForecastDataArrayDefinition DataElementName="ForecastDataArrayDefinition" Comment="Forecast Data Array Definition" Description="Forecast Data Array Definition" >
  <ForecastDataArrayHeader CrossSectionsCount="31" >
    <ForecastDataArrayItem WaterSurfaceElevation="314.63" ChannelTopWidth="1000.00" LeveeWaterElevation="999" />
    <ForecastDataArrayItem WaterSurfaceElevation="311.73" ChannelTopWidth="1000.00" LeveeWaterElevation="999" />
    <ForecastDataArrayItem WaterSurfaceElevation="308.82" ChannelTopWidth="1000.00" LeveeWaterElevation="999" />
    <ForecastDataArrayItem WaterSurfaceElevation="305.92" ChannelTopWidth="1000.00" LeveeWaterElevation="999" />
    <ForecastDataArrayItem WaterSurfaceElevation="303.02" ChannelTopWidth="1000.00" LeveeWaterElevation="999" />
  </ForecastDataArrayHeader>
</ForecastDataArrayDefinition>
<ForecastDataArray Definition="Forecast Data Array" >
  <ForecastDataArrayHeader CrossSectionsCount="31" >
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    <ForecastDataArrayItem RiverLocation="8.9778" WaterSurfaceElevation="311.73" ChannelTopWidth="1000.00" LeveeWaterElevation="999" />
    <ForecastDataArrayItem RiverLocation="7.9556" WaterSurfaceElevation="308.82" ChannelTopWidth="1000.00" LeveeWaterElevation="999" />
    <ForecastDataArrayItem RiverLocation="6.9333" WaterSurfaceElevation="305.92" ChannelTopWidth="1000.00" LeveeWaterElevation="999" />
    <ForecastDataArrayItem RiverLocation="5.9111" WaterSurfaceElevation="303.02" ChannelTopWidth="1000.00" LeveeWaterElevation="999" />
  </ForecastDataArrayHeader>
</ForecastDataArray>

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