Synchronizing Tribal, State, and Federal Hydrology

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Spokane Tribe of Indians

“Preserve, Protect, Manage and Enhance the long-term sustainability of the natural resources for present and future generations through an interdisciplinary process by developing and implementing best management practices.”

(“Department of Natural Resources | Spokane Tribe,”)
Spokane Tribe’s Data Issues!

• Comprehensive hydrological feature dataset for the reservation
  • Better Managing Hydrological data
    • Streams/ Rivers
    • Lakes
    • Fishes
  • **No** universal standards of **Local, State**, and **Federal** Hydrology
The Washington State DNR developed the hydrology data to support agency programs. Needs include state base maps; landscape analyses and modeling; fire protection; landslide mapping; water typing, fish passage; the sustainable harvest calculation.

Spokane Tribe of Indians

The Different Agencies with Different Goals

Spokane Tribe Collects Information on Streams and Rivers to Preserve Cultural Resources such as Fish and Water

The NHD is a partnered effort between federal, state, and local government organizations. The goal of the adoption was to maintain on copy of the GIS map layers of hydrology. They would share data and resources to develop the nationwide coverage.

USGS science for a changing world
### Tribe

<table>
<thead>
<tr>
<th>Stream Name</th>
<th>Flow Type</th>
<th>Fish Habitat Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chehalis River</td>
<td>101</td>
<td>200</td>
</tr>
<tr>
<td>Columbia River</td>
<td>103</td>
<td>201</td>
</tr>
<tr>
<td>Cowlitz River</td>
<td>NONE</td>
<td>200</td>
</tr>
</tbody>
</table>

### State

<table>
<thead>
<tr>
<th>Stream Name</th>
<th>Stream PERIOD</th>
<th>Water Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chehalis River</td>
<td>PER</td>
<td>S</td>
</tr>
<tr>
<td>Columbia River</td>
<td>INT</td>
<td>F</td>
</tr>
<tr>
<td>Cowlitz River</td>
<td>UNK</td>
<td>S</td>
</tr>
</tbody>
</table>

### Federal

<table>
<thead>
<tr>
<th>Stream Name</th>
<th>Flow Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chehalis River</td>
<td>46006</td>
</tr>
<tr>
<td>Columbia River</td>
<td>46003</td>
</tr>
<tr>
<td>Cowlitz River</td>
<td>46000</td>
</tr>
</tbody>
</table>
Geometry

At about 1:6400 you can see that the geometry of the lines between wc and NHD are close and overall match well.

Zooming in to about 1:1000 (area of the red box above) the upper line (blue) is from the NHD and has vertices where the wc (orange) does not. In this case distance at gap extremes is about 5 ft.
Spokane Tribes Multi-Purpose Hydrology database

Create/Share Reports
Manage Biological Resources
Maps and Web Applications
Workflow

**Geodatabase**
- Tribe – Feature Dataset
  - Streams
- State – Feature Dataset
  - WcHydro
- Federal – Feature Dataset
  - NHD_MajorStreams
  - NHD_Flowline

**Data Storage**
- Spokane Tribe Server
- ArcGIS Online
- ArcGIS Server
- ArcGIS Enterprise

**User Interface**
- ArcMap
- ArcPro
- Hydro Toolbox
Modify Data

• Resource Manager has found that the geometry and attributes of the Columbia River.
Add New Data

Resource Manger has collected new data on fish in the Columbia River.
New Data was released from the State

Resource Manager has new data from the state with different geometry and attributes than what is found in the database
Spokane Tribes Mutli-Purpose Hydrology database

Create/ Share Reports
Mange Biological Resources
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