

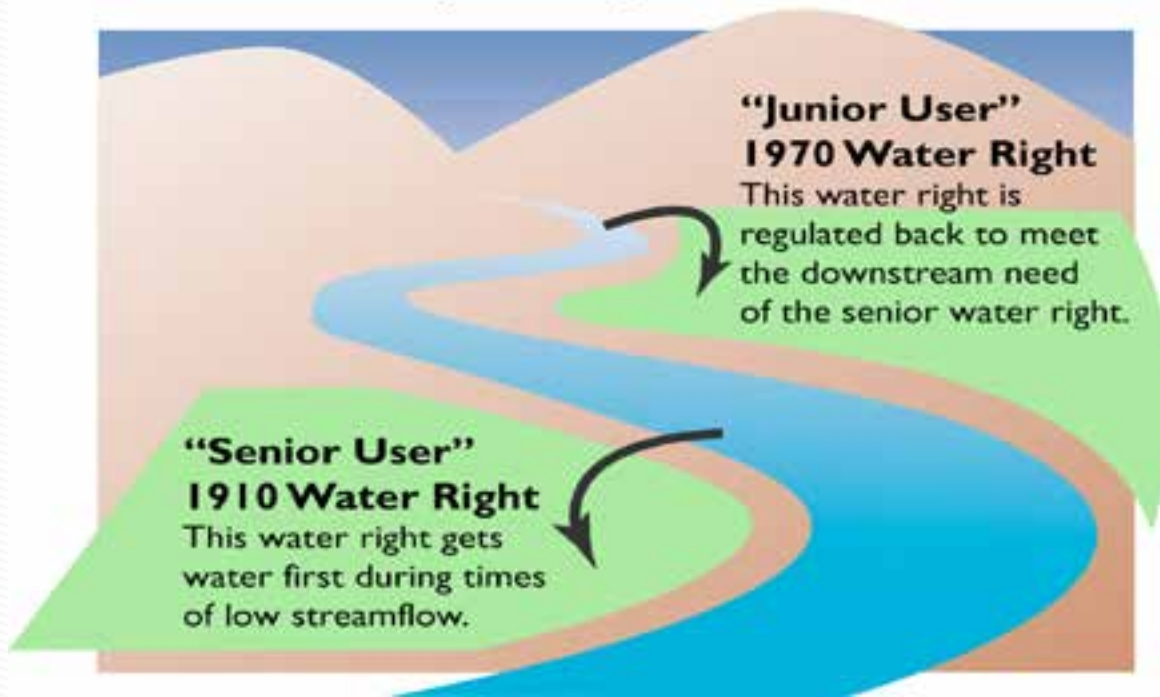
# Improving Oregon's Water Distribution Reporting System

Robert Harmon, GISP  
GIS Coordinator, Oregon Water Resources Dept.  
NHD State Steward for Oregon

July 15, 2014  
Esri International User Conference



# The 1909 Water Code



**Priority**  
Junior water rights are regulated to meet the entitlement of senior water rights.

*prior appropriation:  
“first in time, first in right”*



# Current Situation

14009050100230270040 – Fort Creek

14009050100230270050 - Annie Creek

14009050100230270 – Wood River

- PODs are coded to the stream code
- stream codes are associated with the whole stream
- We do not know the direction of flow
- We can only select rights for entire stream, not part of the stream



# Goal

- Provide a tool that would allow field staff to identify water rights based upon a point along a stream network.
  - Phase 1 – Create a pilot in the Klamath Basin
  - Phase 2 – Develop a Distribution Research Reporting tool
  - Phase 3 – Roll out to the entire State







Sources: Esri, DeLorme, USGS, NPS, Sources: Esri, USGS, NOAA



### CONFLATION PROCESS



Carry once out for each HU basin (6-digit, 15 in OR)

### BUILD ROUTED OWRD STREAM CODES FROM HEM EVENTS



Carry out each time HEM events edited or synched with new version of NHD flow lines

### OBTAIN INDEXES ON ROUTED OWRD STREAM CODES

Point feature classes:



Carry out each time point feature classes or routed stream codes are updated



# OWRD Stream Codes

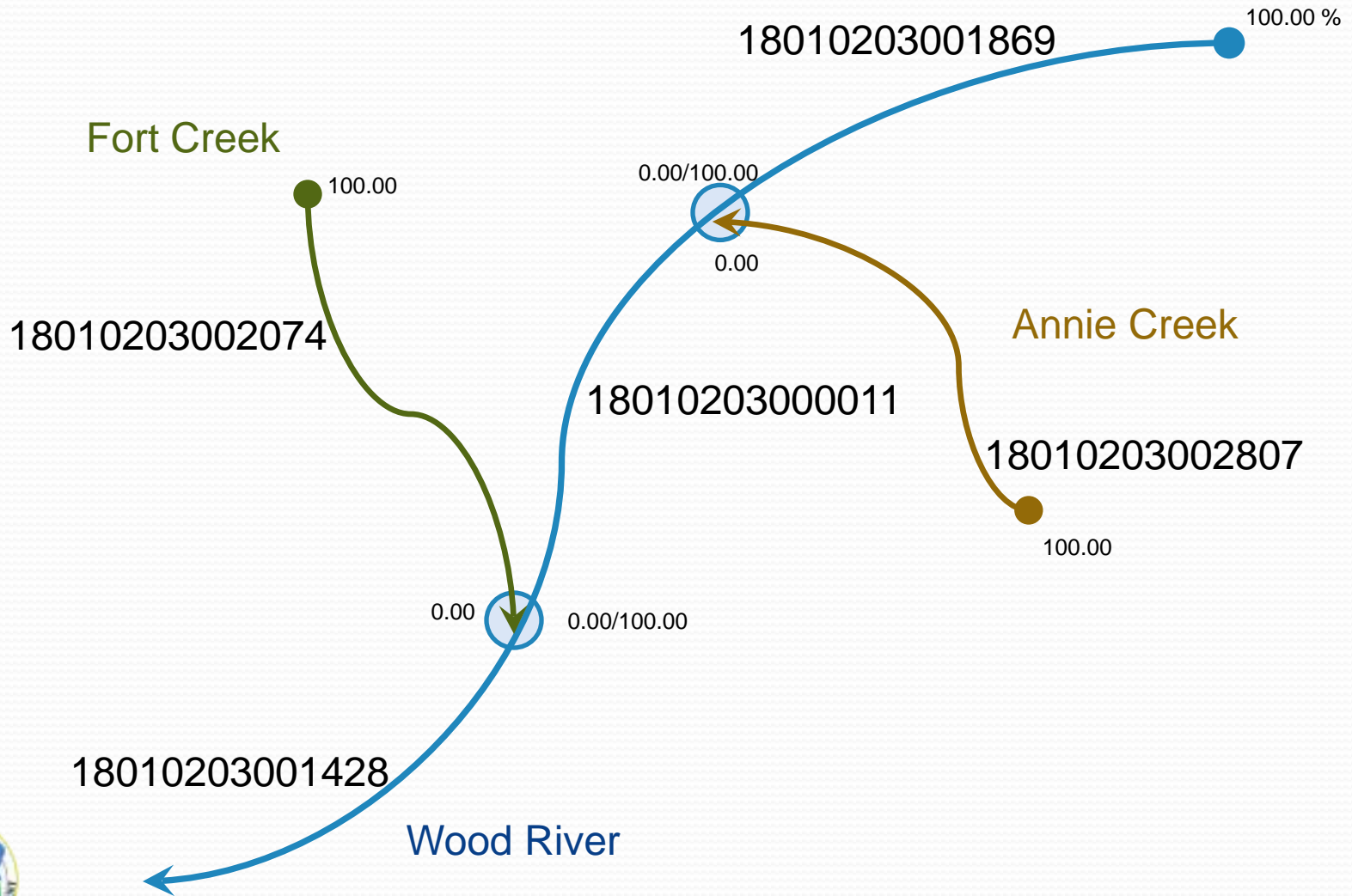
14009050100230270040 – Fort Creek

14009050100230270050 - Annie Creek

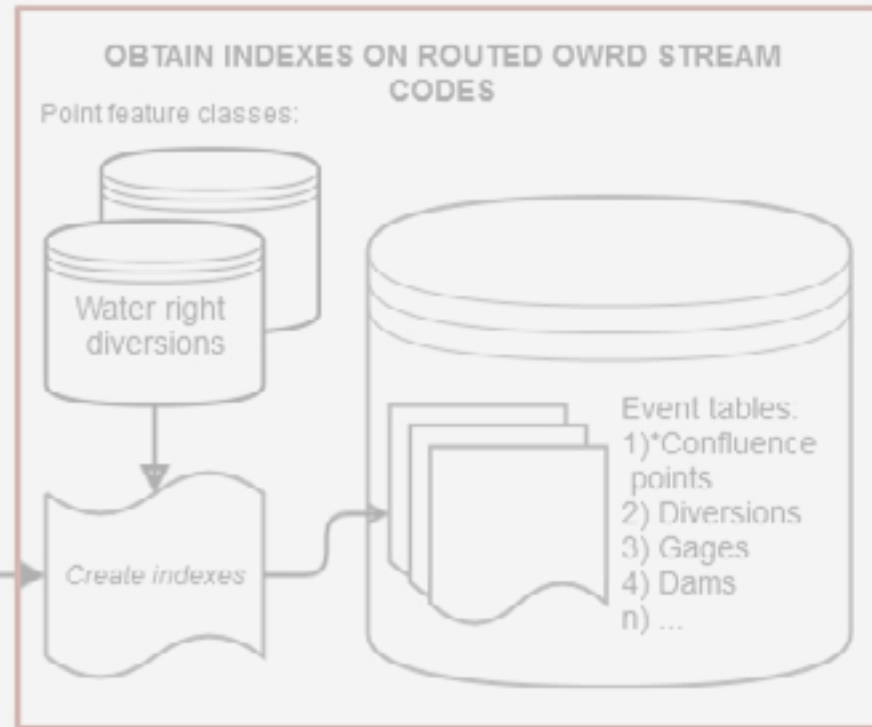
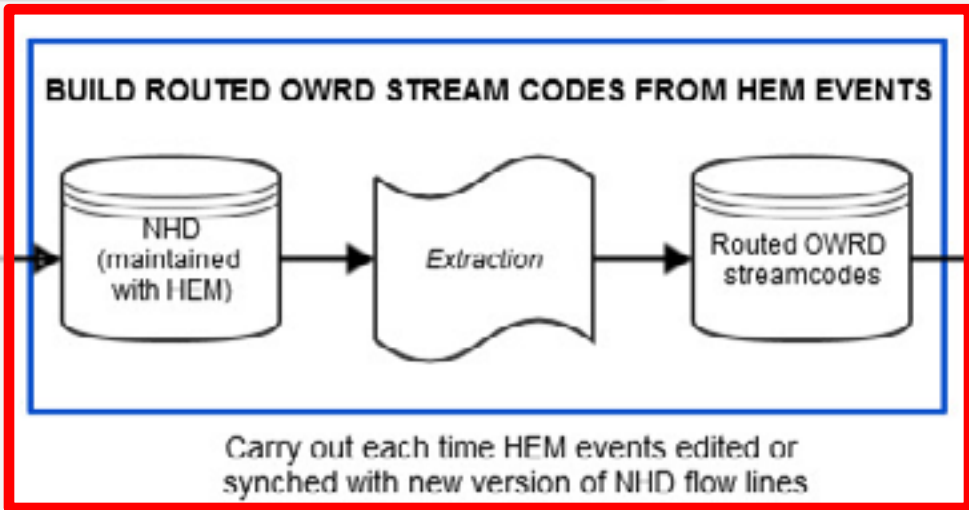
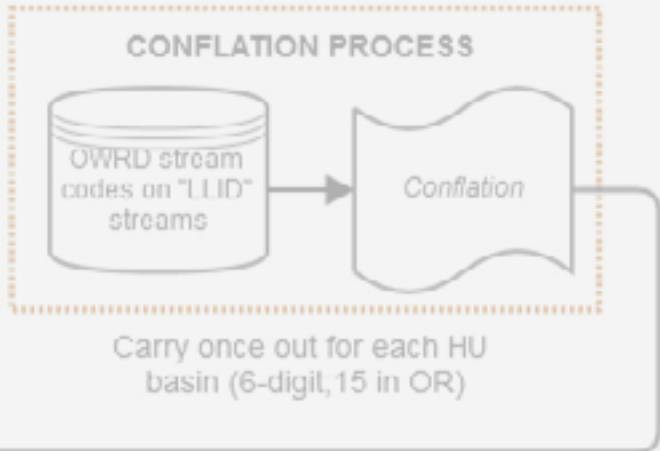
14009050100230270 – Wood River



# NHD Routes



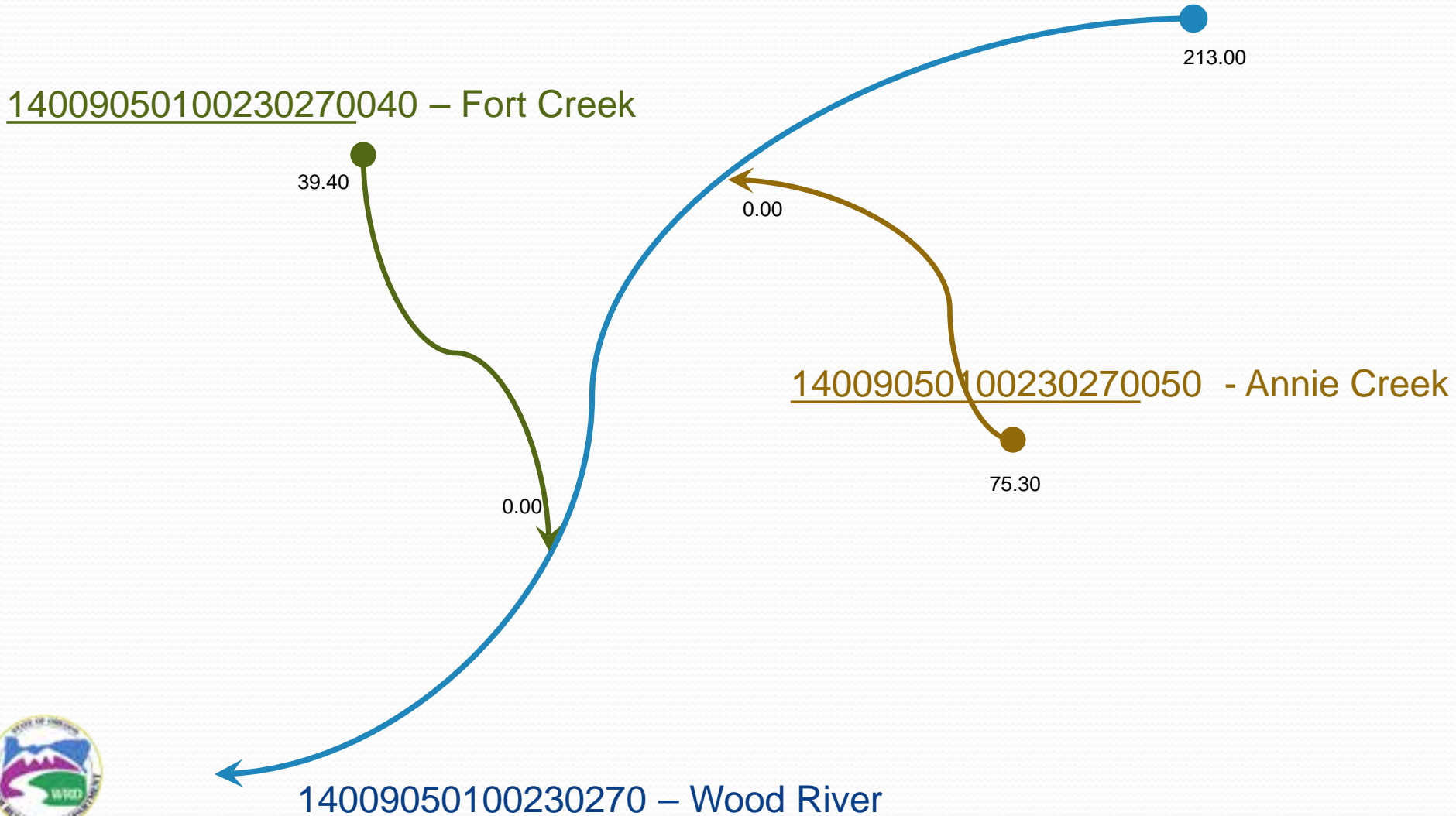


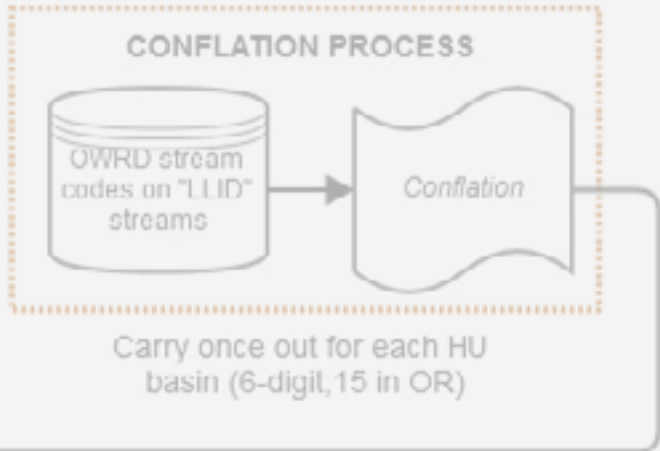


Carry out each time point feature classes or routed stream codes are updated

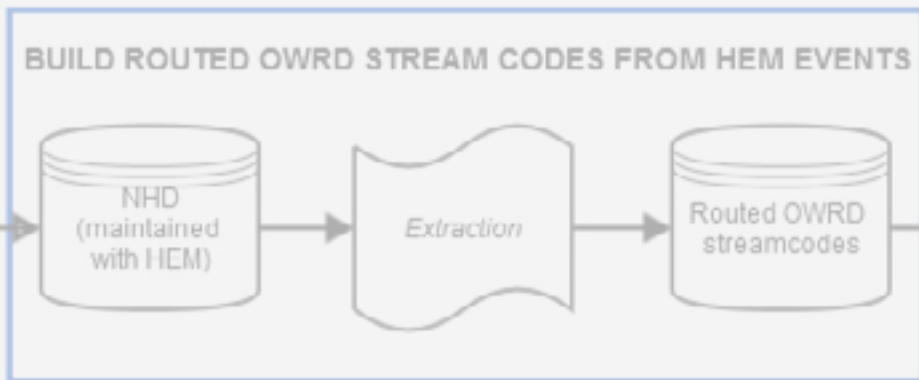


# OWRD Stream Codes

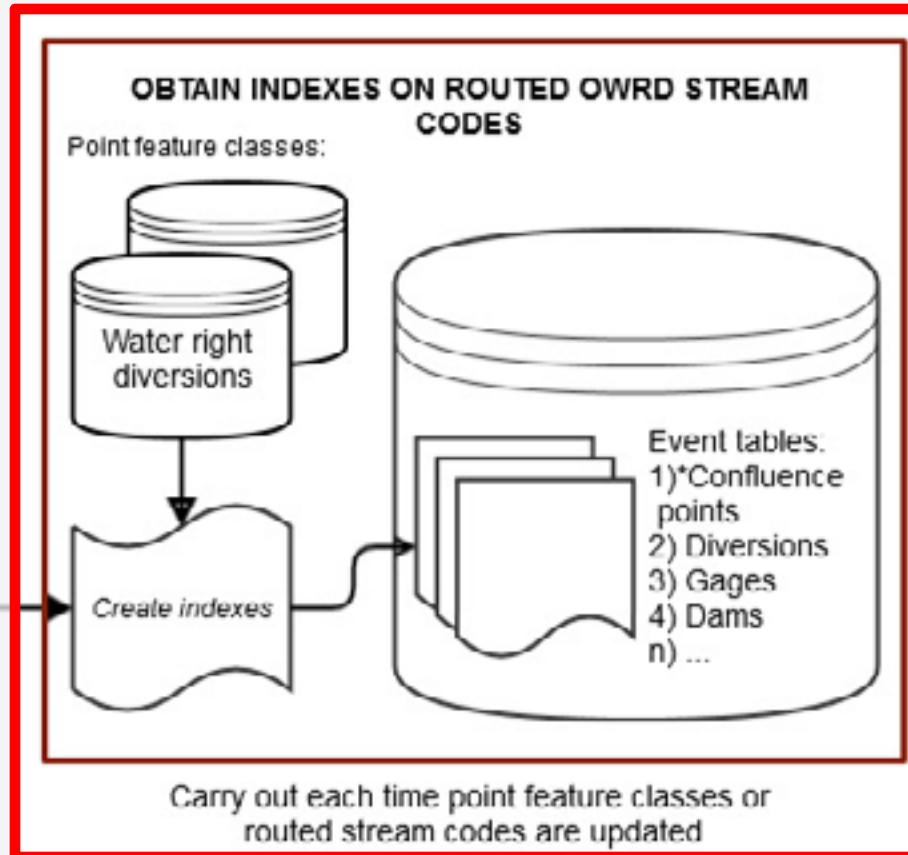




Carry once out for each HU basin (6-digit, 15 in OR)



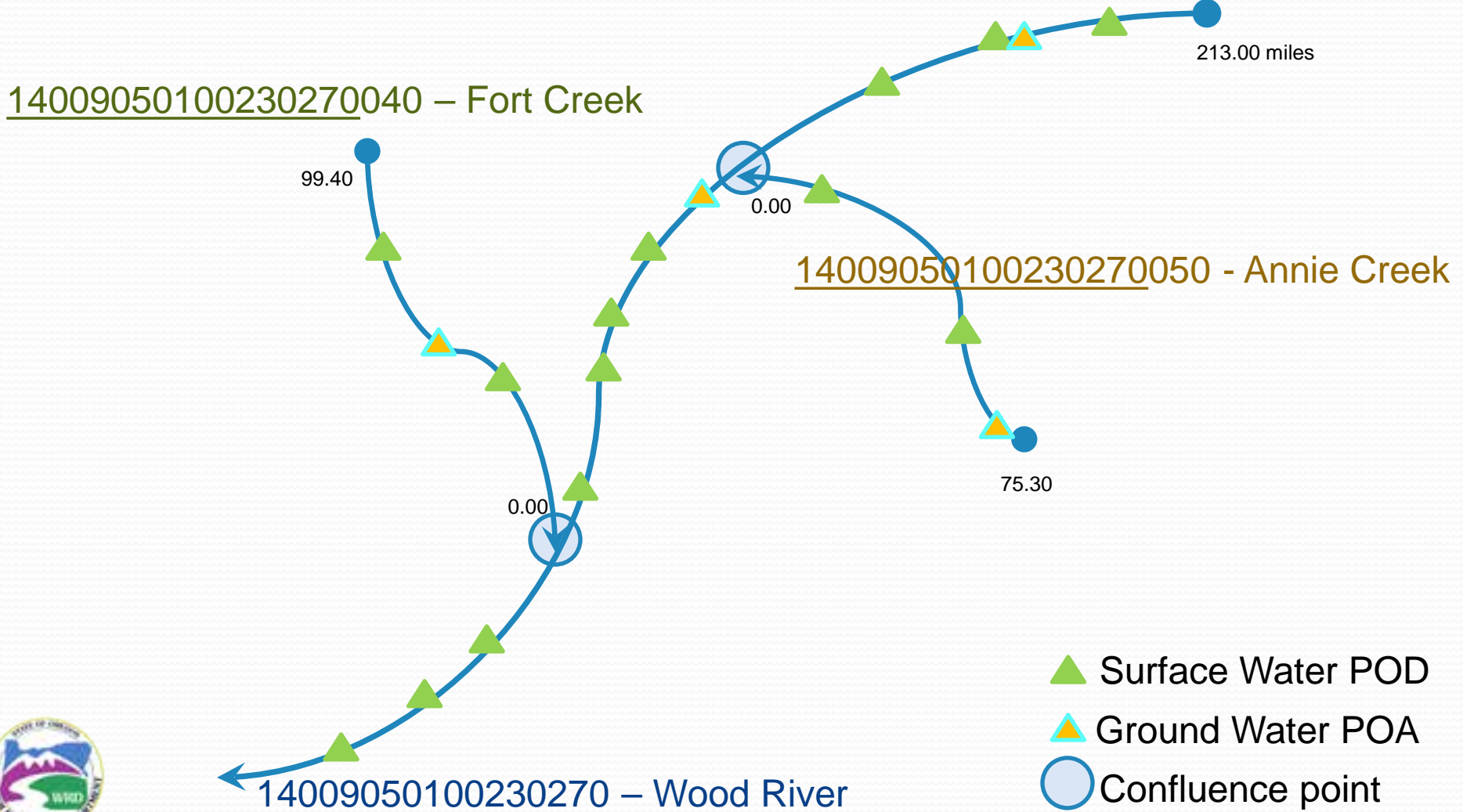
Carry out each time HEM events edited or synched with new version of NHD flow lines



Carry out each time point feature classes or routed stream codes are updated



# POD Indexes are Created on the Routed Stream Code Network



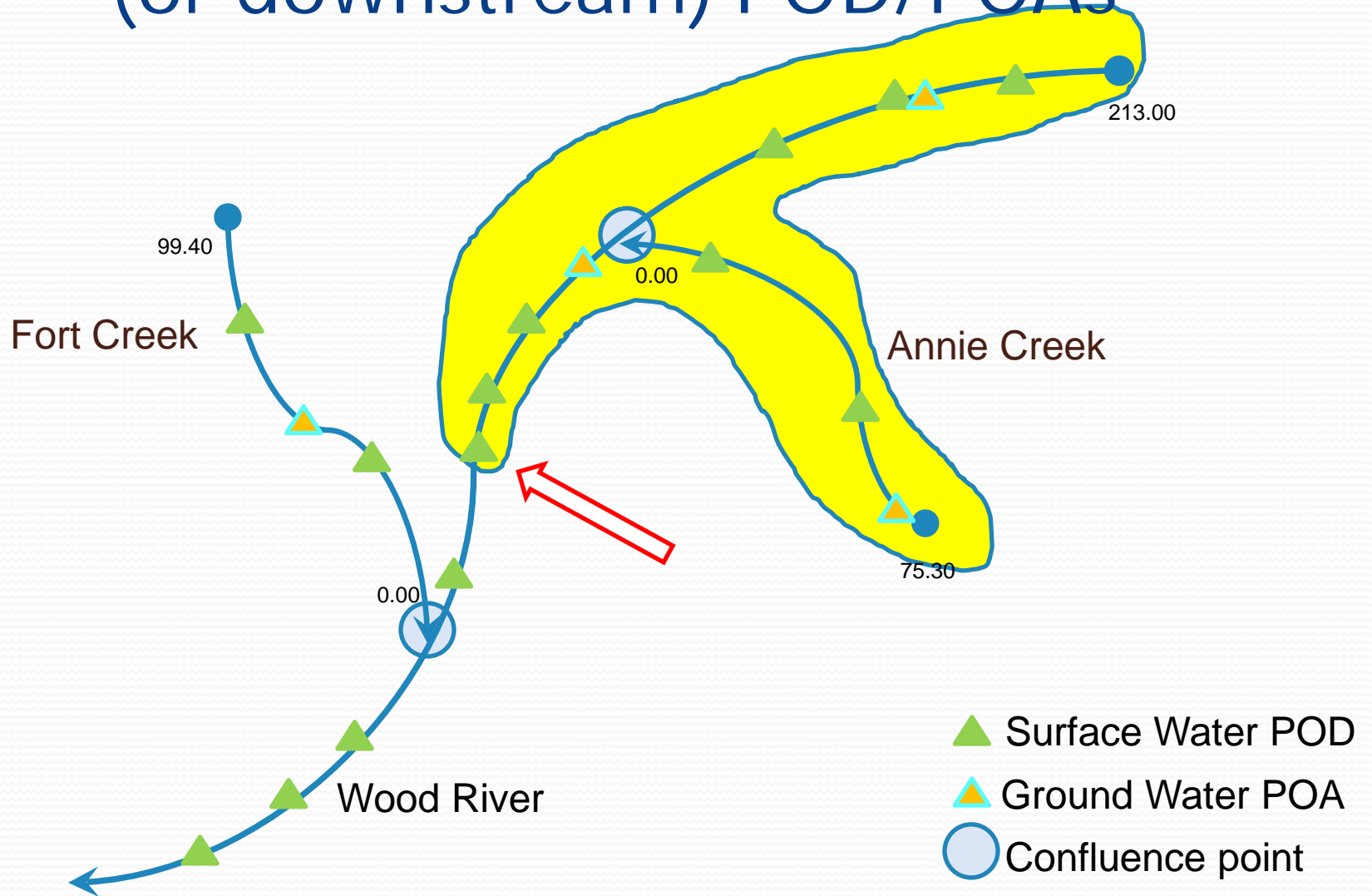
# Populate event tables in SQL Server

- **Water right diversions (PODs):**
  - Diversion water right ID (links back to the Water Rights database)
  - Stream code
  - Index on stream code
  - Distance from stream
- **Confluence points:**
  - Stream code of stream it's on
  - Stream code of stream it's tributary to
  - Index on stream it's tributary to
  - Distance from stream it's tributary to (error check)





# It is now possible to select upstream (or downstream) POD/POAs



# Water Right Distribution Research Reporting tool

Water Right Information Query Results																																																			
<b>Contact Information</b>						<b>Documents</b> <a href="#">View all scanned documents</a>																																													
<p>▼ <b>Current contact information</b></p> <p>OWNER:            ▶ MRS ANNA FORDYCE            FORT KLAMATH, OR 97626</p>						<p>▶ <b>Application: E 3744</b></p> <p>▶ <b>Permit: E 228</b> <a href="#">document</a></p> <p>▼ <b>Certificate: 1265</b> <a href="#">document</a>, <a href="#">paper map</a></p> <p>▶ Signature: 11/2/1916</p> <p>▶ Type: Original</p> <p>▶ <a href="#">View right with Web Mapping</a></p> <p>▶ <a href="#">View Places of Use from Water Rights in the Same Area</a></p>																																													
<b>Water Right Information</b>																																																			
<p>Status: Non-Cancelled            County: Klamath            File Folder Location: Salem  <a href="#">Watermaster District: 17</a></p>																																																			
<table border="1"> <thead> <tr> <th>Program/Trait</th> <th>Document #</th> <th>Date</th> <th>Status</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>Watermaster confirmed data</td> <td></td> <td></td> <td>Approved</td> <td>IRRIGATION SEASON DEFINED BY DECREE. VC</td> </tr> </tbody> </table>						Program/Trait	Document #	Date	Status	Remarks	Watermaster confirmed data			Approved	IRRIGATION SEASON DEFINED BY DECREE. VC																																				
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<b>Point(s) of Diversion</b>																																																			
<p>▼ <b>POD 1 - ANNIE CREEK &gt; WOOD RIVER</b></p> <p>▶ Description</p> <p>▶ POD Rate</p> <p>▶ IRRIGATION (Primary)</p>																																																			
<b>Place(s) of Use</b> <a href="#">Add TRS grouping</a>																																																			
<p>▼ <b>Use - IRRIGATION (Primary) - 60.0 acres; Priority Date: 6/24/1914</b></p>																																																			
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<b>Water Right Genealogy</b>																																																			
<p>—No genealogy records available for this water right, try the family link below instead.</p>																																																			



# Water Right Regulation Research Query

[Return to WRIS Query](#)

Cert:1265 OR \*  
 MRS ANNA FORDYCE  
 FORT KLAMATH, OR 97626

POD Description  
 T-R-S-QQ: 33.00S-7.50E-5-SW NW  
 Location Description: .

**Pod Uses**

**IRRIGATION (Primary)**

Priority Date	Max Rate (cfs)	Rate (cfs)	Max Volume (af)	Volume (af)	Rate/Acre	Duty	Start Date	End Date	Remarks
6/24/1914	0.75	0.75					4/1	10/1	

**Enter Search Criteria**

Select Type of Water Right	Supplemental
Ground Water: <input type="checkbox"/> Distance from stream(ft.): <input type="text"/> Surface Water: <input type="checkbox"/> Storage: <input type="checkbox"/>	Include Supplemental <input type="checkbox"/>

Select Use Category (select [All/None](#))

Agriculture <input checked="" type="checkbox"/>	Domestic <input checked="" type="checkbox"/>	Fish <input checked="" type="checkbox"/>	Industrial <input checked="" type="checkbox"/>	Irrigation <input checked="" type="checkbox"/>	Instream <input checked="" type="checkbox"/>	Livestock <input checked="" type="checkbox"/>
Mining <input checked="" type="checkbox"/>	Miscellaneous <input checked="" type="checkbox"/>	Municipal <input checked="" type="checkbox"/>	Power <input checked="" type="checkbox"/>	Recreational <input checked="" type="checkbox"/>	Storage <input checked="" type="checkbox"/>	Wildlife <input checked="" type="checkbox"/>

Select day in year	Select Priority Date
Month: <input type="text"/> Day: <input type="text"/>	6/24/1914 ▾
Comparison Type Junior ▾	

Search



# Water Right Regulation Report

Return to - [Water Right Regulation Research Query](#)

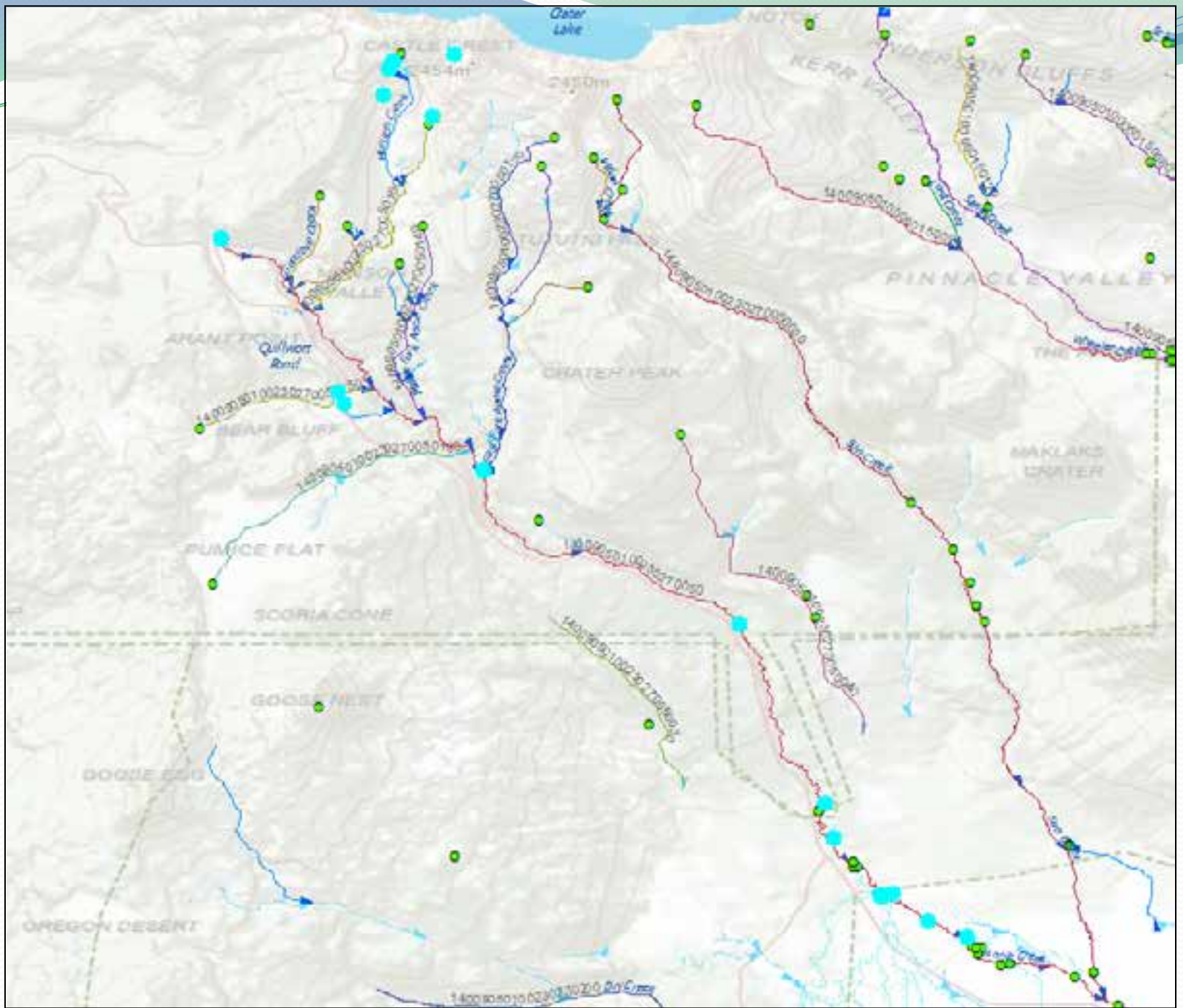
Download - [Regulation research data](#)

Records per Page:

WRName	RegulationContact	WrType	PodName	PodType	TBSQQ	PodSource	PodTributaryTo	StreamName	CountyCode	Wr
<a href="#">Cert:73392 OR *</a>		SW	SW	WM	32.00S-06.00E-04-SWNE	ANNIE/ANNA CREEK	WOOD RIVER	ANNIE CR > WOOD R	KLAM	17
<a href="#">Cert:57927 OR *</a>		SW	SW	WM	32.00S-06.00E-25-SESE	ANNIE CREEK	WOOD RIVER	ANNIE CR > WOOD R	KLAM	17
<a href="#">Cert:67090 OR *</a>		SW	SW	WM	32.00S-07.50E-31-SWNW	ANNIE CREEK	WOOD RIVER	ANNIE CR > WOOD R	KLAM	17
<a href="#">Cert:82564 OR *</a>		ST	SW	WM	32.00S-07.50E-31-NESW	ANNA CREEK	WOOD RIVER	ANNIE CR > WOOD R	KLAM	17
<a href="#">Cert:82565 OR *</a>		SW	SW	WM	32.00S-07.50E-31-NESW	ANNA CREEK	WOOD RIVER	ANNIE CR > WOOD R	KLAM	17
<a href="#">Cert:26045 OR *</a>		SW	SW	WM	32.00S-07.50E-31-NESW	ANNIE CREEK	WOOD RIVER	ANNIE CR > WOOD R	KLAM	17
<a href="#">Cert:26045 OR *</a>		SW	SW	WM	32.00S-07.50E-31-NESW	ANNIE CREEK	WOOD RIVER	ANNIE CR > WOOD R	KLAM	17
<a href="#">Cert:31065 OR *</a>		SW	SW	WM	32.00S-07.50E-31-NESW	ANNIE CREEK	WOOD RIVER	ANNIE CR > WOOD R	KLAM	17
<a href="#">Permit: S 15156 *</a>		SW	SW	WM	31.00S-06.00E-09-NENW	GARFIELD SPRING	MUNSON CREEK	MUNSON CR > ANNIE CR	KLAM	17
<a href="#">Permit: S 15156 *</a>		SW	SW	WM	31.00S-06.00E-08-SENE	RIM DIVERSION 2	MUNSON CREEK	MUNSON CR > ANNIE CR	KLAM	17











# It has already proven to be useful

- Identifying Rights above Kirk Reef on Williamson River
- Select all rights between Gaging Stations for U.S. Bureau of Reclamation (BOR) data request



# Remaining work

- Finish conflation of OWRD stream codes for state along with derivation of POD indexes (on routed stream codes)...*1-2 years*
- Obtain POD indexes on the NHD and provide to the national database (along with stream gages and dams)
- Allow location selection from web map and show results on the map.

