Characterization of Spring and Surface Water Conductance: Whychus Creek from Pole Creek Ditch to the Camp Polk Meadow Riparian Area May 2006.

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Background

⇒Site of Current Restoration Site
⇒Includes Whychus Creek and several ponds, springs and riparian area
⇒Riparian Area is of critical concern because of:
- Human Habitat
- Wildlife
  - -Important Ungulate Habitat and Steelhead / Salmon Spawning
- Biodiversity

⇒Canal issues upstream of Whychus Creek
- Fractured basalt and glacier outwash plains make up geomorphology
- Several canals have been built in this landscape
  - Pole Creek Ditch, Sokol Ditch, Cloverdale Ditch, Squaw Creek Irrigation Canal
- Leakage from canals into groundwater is of concern across most of Central Oregon and piping proposals continue to pop up.
  - Main concern is that level of groundwater in Camp Polk possibly from mixing of canal water.
  - If leaked canal water does have influence would piping degrade riparian habitat?

Specific Conductance

Is the measure of dissolved ions in an aqueous solution. Imagine stirring sugar in the glass of water, that is effect the of dissolved ions. Specific conductance is a measurement of conductance at a specific temperature, which is proportional to conductance.

Measurement of dissolved ions is measured in µS/cm (1/1,0000,000 microsiemen / cm). The s standard for the Cascades in Central Oregon is 140 µS/cm according to DEQ

Methods

Specific Conductance Samples.
- YSI 30 Conductance Meter

9 Site Locations
- -Spring influence in meadow and main stem of Whychus Creek.

GIS Data
- Each site marked with portable GPS in coordinates according to NAD 83.

Discussion

The main study was around whether or not leaking canal water was making it into Whychus Creek thru groundwater discharge influence. Specific conductance measurements were used because dissolved ions have higher influence in groundwater where evaporation does not occur as much as surface water features. According to my hypothesis, groundwater would be highest in specific conductance above surface water and canal water in the same system.

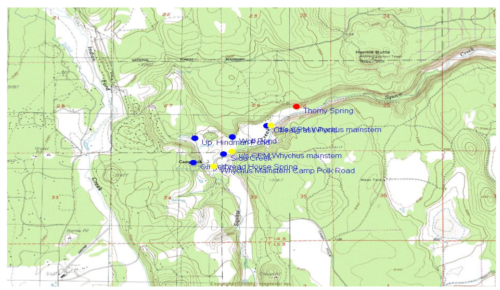
Canal water has been significantly lower than the surface water in the characterization. If canal water had higher specific conductance than groundwater or spring water discharge, then we might be able to assume that canal water might have an influence in groundwater quantities and piping programs may have taken valuable water away from riparian areas in the Camp Polk Meadow.

Unfortunately, the study showed that canal water in Pole Creek Ditch was significantly lower in Conductance and not higher. This could be that water in these canals is actually taking water from ground water supplies. This could be verified with at least two seasons of characterization in as many sites as possible throughout the meadow and the Whychus Basin.

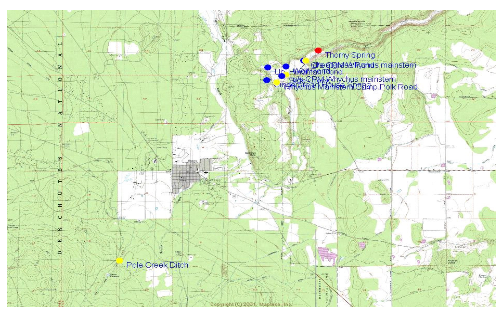
In the future, we must continue to gain insight into how groundwater is working in subterranean areas. According to *Environment*, groundwater is the least understood pool of water on our planet. With this study there are many other variables to take into consideration. Different geologic materials in sections of the Basin might be able to have influence on conductance readings. Irrigation water in ditches may skew data from a seasonal influence and not year round. Also, according to the state water resources department, Indian Ford Creek, to the Northwest, may also have significant influence into the groundwater discharge occurring in the Camp Polk Meadow and Whychus Creek.

Results : Specific Conductance — Temperature — Location

Name	Location	Specific Conductance	Temperature	Time	Date
Pole Creek Ditch	44.27280 N 121.5623 W	29.0 µS/cm	@ 6.5° C	19:13	05/26/06
Gingerbread House Springs	44.32111 N 121.5206 W	140.1 µS/cm	@ 9.3° C	15:30	05/26/06
Whychus Main stem Camp Polk Road	44.32001 N 121.5190 W	43.8 µS/cm	@ 8.7° C	14:50	05/26/06
Hindman Springs Over Flow	44.3225 N 121.5191 W	202.2 µS/cm	@ 12.0° C	14:05	5/26/06
Side Creek	44.31997 N 121.5124 W	157.5 µS/cm	@ 10.5° C	13: 39	5/30/06
u/s CPM Whychus Main stem	44.31997 N 121.5154 W	46.75 µS/cm	@ 9.1° C	13:42	05/30/06
Wolf Pond	44.32781 N 121.5115 W	152.6 µS/cm 212 µS/cm	@ 14.8° C @ 14.2° C	17:09 19:40	05/13/06 05/26/06
Cheatgrass Pond	44.32463 N 121.5047 W	267.2 µS/cm 307.5 µS/cm	@ 18.2° C @ 16° C	15:57 20:00	05/13/06 05/26/06
Thorn Spring	44.32781 N 121.5004 W	92 µS/cm 71.2 µS/cm	@ 10.7° C @ 10.1° C	16:37 19:35	05/13/06 05/26/06



Henkle Butte, OR 7.5 Topographic Quadrangle



Sisters, OR 7.5 Topographic Quadrangle


Upper Pond / Hindman Spring


Pole Creek Ditch

Above Sisters, Oregon


GingerBread House Spring

U/s Camp Polk Meadow


Side Creek

Hindman Spring g/w discharge Whychus Creek


Whychus Creek @ Camp Polk Meadow

d/s confluence w/ Side Creek


Camp Polk Meadow


Thorn Spring

D/s Camp Polk Meadow


Hindman Spring Outflow

Tools of the Trade:
Ysi 30 Meter, Portable GPS, Rite-In in the Rain Field book