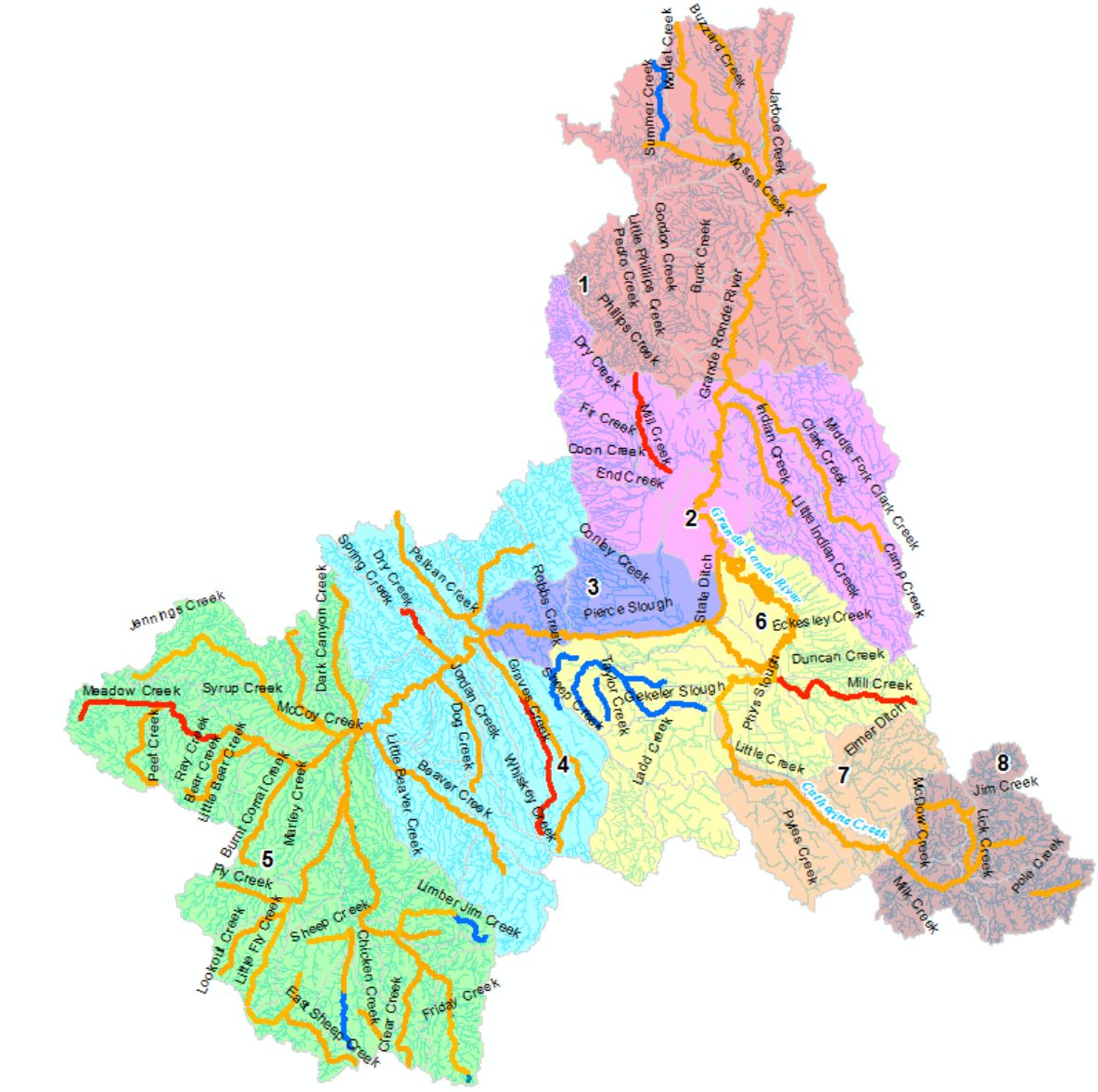
Comments from 4/12 - Draft Responses

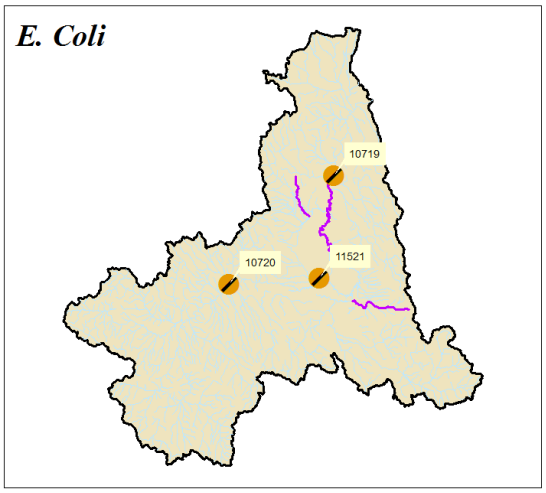
Water Quality Comments

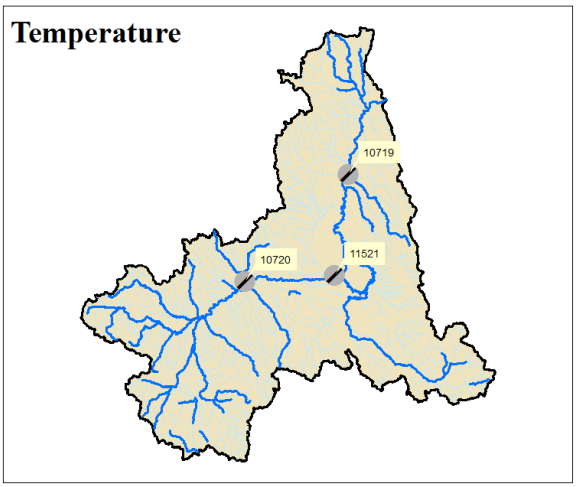
- ***Comment: Provide 303(d) water quality information on a map***
  Response: The following information is currently included in the report (could make multiple figures showing each different parameter, like the figure from DEQ report below)

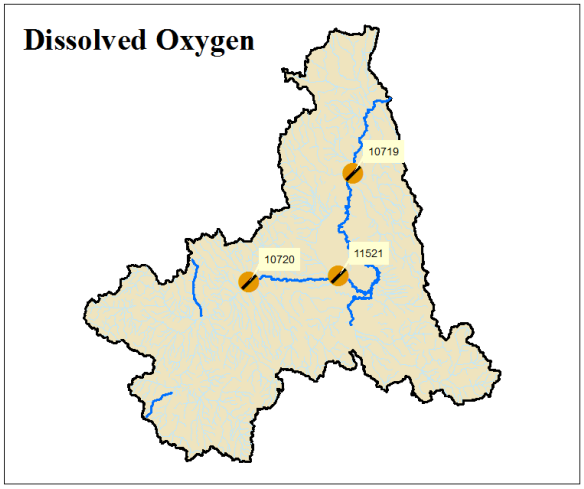


Upper Grande Ronde Ag WQ Management Area

Water Quality Status and Trend
Temperature, E. Coli, pH, and Dissolved Oxygen







Stations

Water Quality Status

- Meeting
- Not meeting
- Insufficient Data

Trend

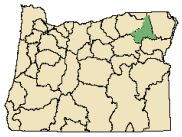
- Improving
- Degrading
- Steady
- No Trend

ODA_AgWQMA

Streams

Listing Status

- Cat 5: Water quality limited, 303(d) list, TMDL needed
- Cat 4A: Water quality limited, TMDL approved



0 5 10 20 30 40 Miles

Date: 1/23/2017

Oregon Department of Environmental Quality/Water Quality Division

- ***Comment: Beneficial use is demand – move demand to step 3***
  Response: Beneficial use is specifically listed in step 2 report requirements by OWRD**.** We plan to include it, but will try to use it only in terms of describing the quality of water – and as described below, can consider not showing some of the uses without criteria.

Step 2: Characterize Water Resources, Water Quality, & Ecological Issues

Describe the Place

• Economic, social, cultural characteristics
• Unique features or attributes
• Physical and landscape characteristics:
  ○ Major rivers & tributaries
  ○ Aquifer systems and springs
  ○ Estuaries and bays
  ○ Reservoirs and lakes
  ○ Conveyance systems
  ○ Hydrology (rain, snow or spring fed systems),

etc.

Surface & Groundwater Quality/Quantity

• Availability
• Existing protections
• OWRD basin programs
• Beneficial uses (water quality)
• Impaired water bodies
• Groundwater management areas (water quality)
• Total maximum daily loads
• Permitted discharges

Ecological Health of the Watershed

• Key species & habitats
• Historical and current fish species
• ESA STE species; ODFW sensitive species
• Limiting factors

- ***Comment: What causes sediment impairment – sources of data need to be labeled***
  Response: Description in report, from DEQ. Data sources are labeled in report. "Sedimentation While sediment is an essential part of healthy functioning stream systems, excessive sediment loads can have severe negative impacts on a stream ecosystem. Many fish species are adapted to high suspended sediment levels that occur for short periods of time, but longer exposure to high levels of suspended sediment can interfere with feeding behavior, damage gills, reduce available food, and reduce growth rates. Deposition and sedimentation (when sediment falls out of the water column and deposits on the streambed) can smother eggs and fry in the substrate and fill in pools within the stream channel (reducing or eliminating cold water refugia important to cold water aquatic life during periods of high water temperature). Because bacteria, nutrients and other chemical substances are often attached to sediment particles, excessive sediment loading can also increase nutrient and toxics concentrations and contribute to decreased dissolved oxygen in both the water column and the spawning gravels. A reduction in streamflow will lead to locally increased deposition and sedimentation. It will also result in an increased rate of evaporation in warm weather, which in turn can increase nutrient and toxic

concentrations in the stream. This would result in the diminution of water quality for the habitat of sensitive, threatened, or endangered fish species."

- ***Comment: Why are there flow concerns (water quality) listed in basin 7 (and others) during spring time?***
  Response: flow concerns for DEQ are blocked areas/areas with fish passage barriers/restricted channels, this occurs year round, so there is no differentiation between when there is more water in the stream, because the physical features of that basin are always restricted.

  For our report - this will be moved to the physical characteristics section of the report – and not shown in Water Quality Tables.

- ***Comment: What will water quality data be used for?***
  Response: answered in report – will be used to characterize watershed, and understand if issues should be addressed in step 4.

- ***Comment: There is no data saying when we are unable to use water for irrigation***
  Response: Correct, DEQ does not have information on this in terms of quality. This water would always be able to be used for irrigation in terms of water quality. We have not received any information that shows the water quality is limited for irrigation. Do we need to research this further?

- ***Comment: Most of the beneficial use data criteria seems focused on fish (what are standards for other listed uses such as boating?) Maybe only include the uses for which there are criteria. Flow should potentially be removed from the chart. Chart seems limited.***
  Response: See revised charts, example below. The charts focus on the most restrictive criteria for beneficial use, which is aquatic life use. The charts show other uses when the information is available. Agree?

Limits to Beneficial Use

Month	Days		Anadromous fish passage	Salmonid Fish Spawning	Salmonid Fish Rearing	Resident Fish and Aquatic Life		Aquatic Life	Human Health		Public Dom. Water Supply	Private Dom. Water Suppy		Water Contact Recreation	Industrial Water Supply	Irrigation	Livestock Watering	Wildlife and Hunting	Fishing	Boating	Aesthetic Quality	Hydropower	Commercial Nav. and Trans.
Oct	1st to 15th		Temperature, pH			Flow, Sedimentation		Ammonia, Phosphate Phosphorus, Iron, Biological criteria	Manganese, Iron					Algae, pH					Algae		Phosphorus, Algae		
	16th to 31st			Flow, Sedimentation DO	Flow, Sedimentation																		
Nov	1st to 15th																						
	16th to 30th																						
Dec	1st to 15th																						
	16th to 31st																						
Jan	1st to 15th																						
	16th to 31st																						
Feb	1st to 15th																						
	16th to 28th																						
Mar	1st to 15th																						
	16th to 31st																						
Apr	1st to 15th																						
	16th to 30th																						
May	1st to 15th																						
	16th to 31st																						
Jun	1st to 15th																						
	16th to 30th																						
Jul	1st to 15th																						
	16th to 31st																						
Aug	1st to 15th																						
	16th to 31st																						
Sep	1st to 15th																						
	16th to 30th																						

Month	Days		Anadromous fish passage	Salmonid Fish Spawning	Salmonid Fish Rearing	Resident Fish and Aquatic Life
Oct	1st to 15th					
	16th to 31st					
Nov	1st to 15th					
	16th to 30th					
Dec	1st to 15th					
	16th to 31st					
Jan	1st to 15th					
	16th to 31st					
Feb	1st to 15th					
	16th to 28th					
Mar	1st to 15th					
	16th to 31st					
Apr	1st to 15th					
	16th to 30th					
May	1st to 15th					
	16th to 31st					
Jun	1st to 15th					
	16th to 30th					
Jul	1st to 15th					
	16th to 31st					
Aug	1st to 15th					
	16th to 31st					
Sep	1st to 15th					
	16th to 30th					

Temperature, pH

Flow, Sedimentation DO

Flow, Sedimentation

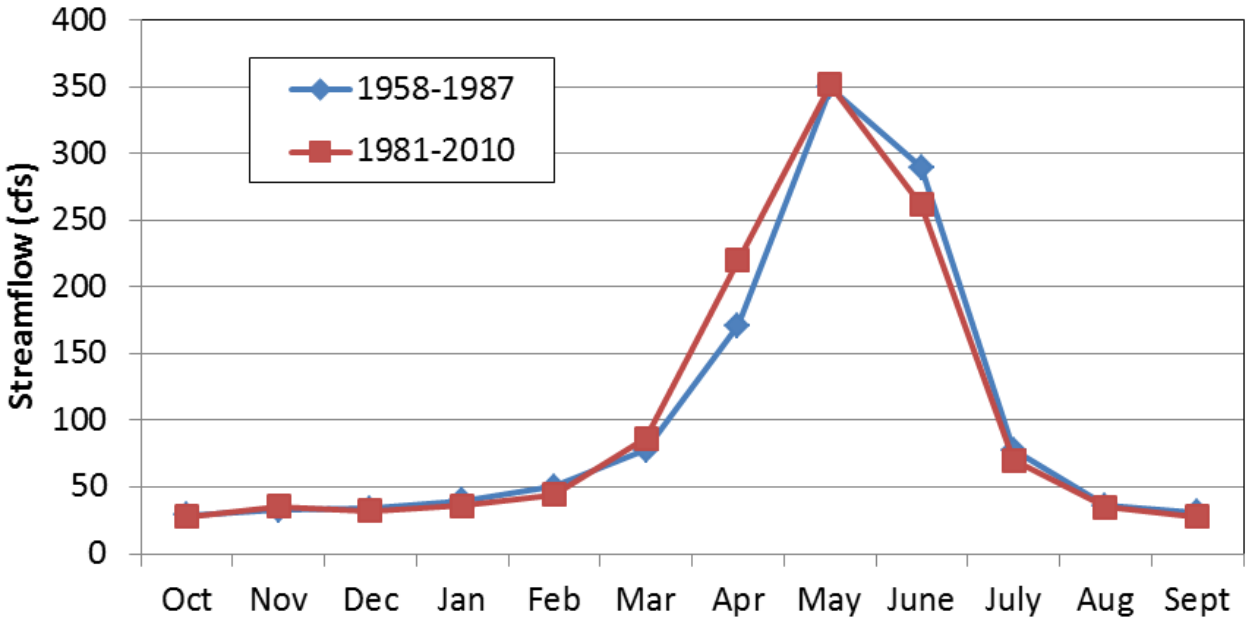
Temperature, pH

Flow, Sedimentation

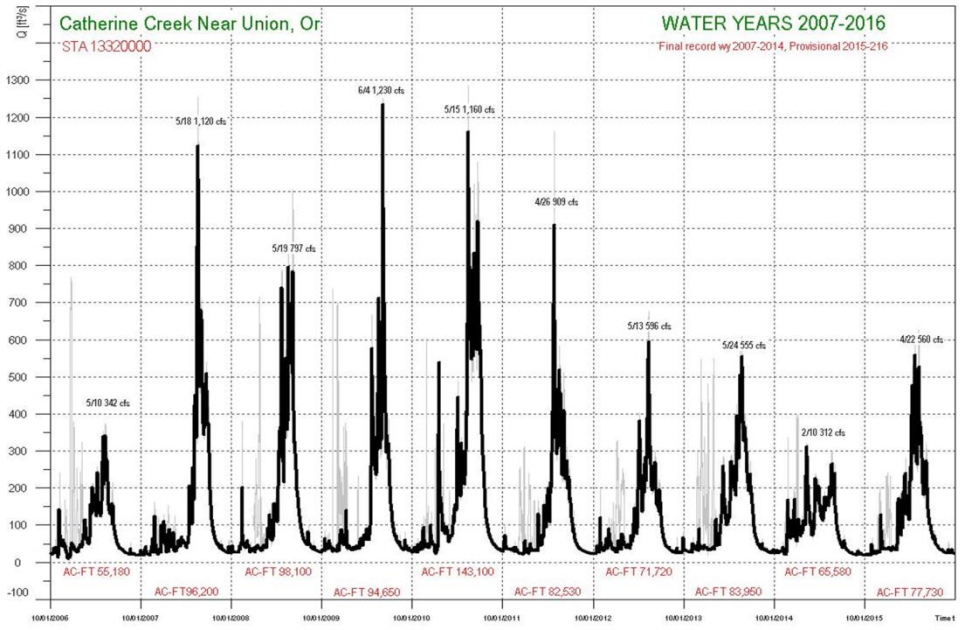
pH

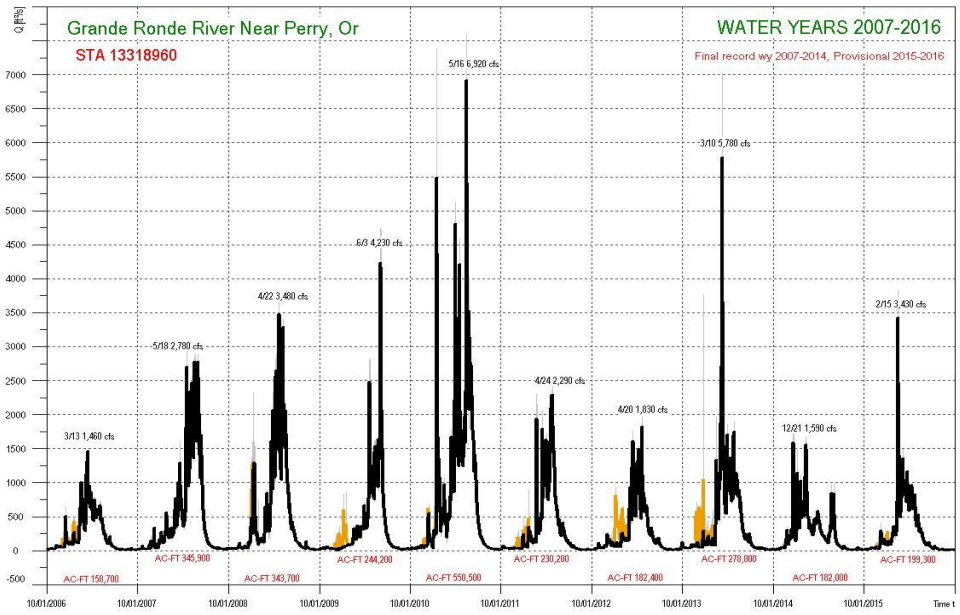
Water Quantity Comments

- ***Comment: Flow data from the 1980's coincides with the period of heaviest logging – is there a possibility that this could make the flows in our system look flashier than they really are? Consider how land use at different periods of time affects flow.***
  Response: addressed in report, temporal comparison of 2 30 years periods in Catherine Creek – no statistical difference. Will also review with non-stationarity evaluation



- ***Comment: Consider just showing gauged data (without consumptive use added in).***
  Response: These are two graphs of gauged data for Catherine Creek and UGR. We have data like this from about 3 other gauges. We can include this in the report, do we want the other ones? We have gauged data, but it does not serve our ultimate purpose to complete the water balance. Wewould recommend not showing this information, because it seems like it would add confusion to the report. Thoughts?

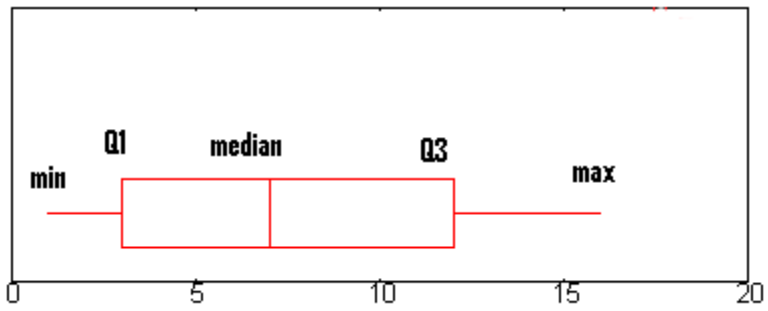




- **Comment: Why did we use medians and not means for flow? Add in average, box and whiskers plots with median and means for more information**
  Response: We used exceedances of the median. We could work with OWRD to make these box plots. We have not moved forward with this yet, we should decide as a technical committee. Request this data?

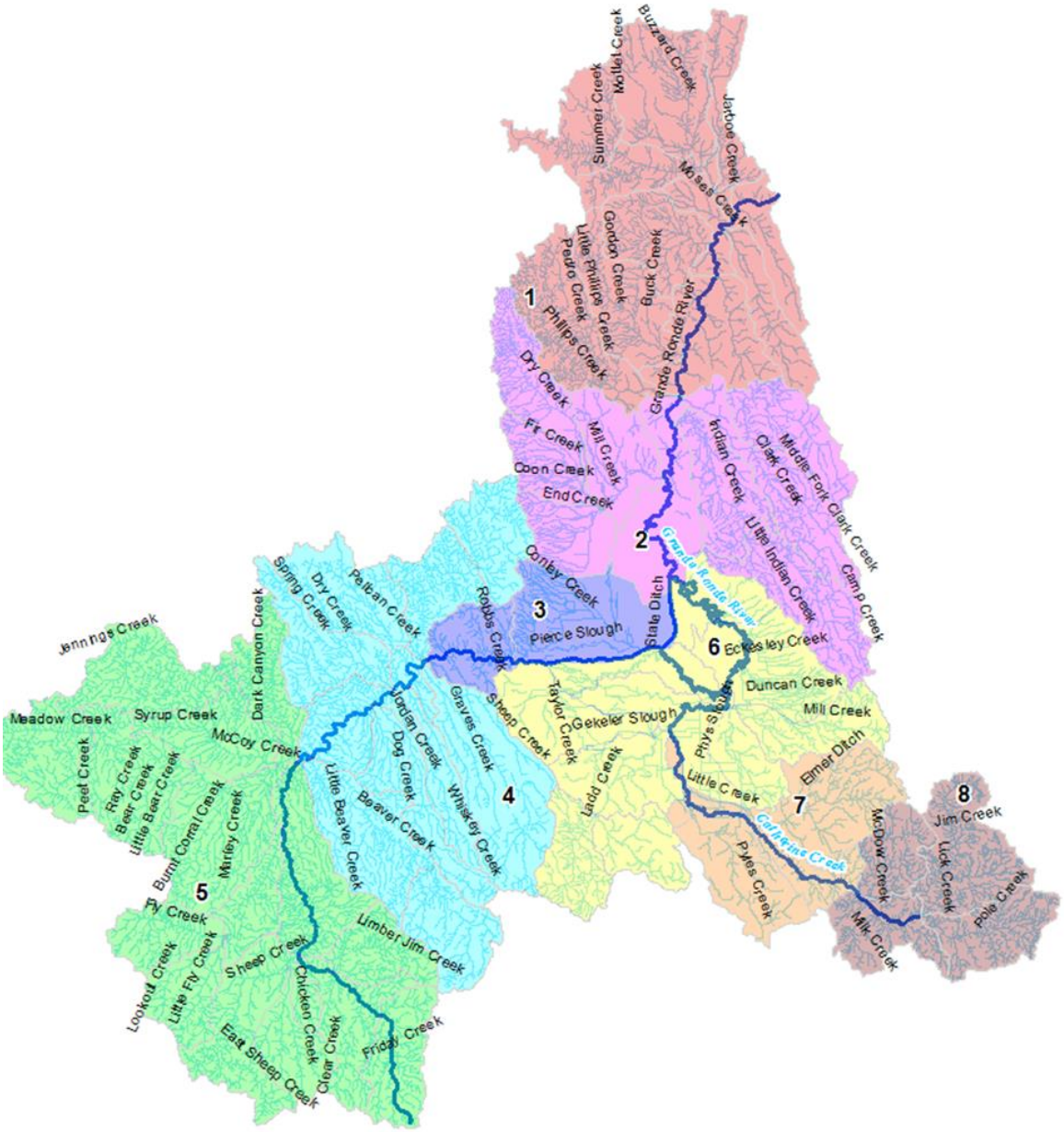
(From OWRD) *Typically the median (50% exceedance) annual volume is less than the mean annual value, in some cases 10-20% less*. Using the mean would overestimate the amount of water that would normally be available for use in any given year.

This information is generally shown in the graphs – we could discuss alternate methods for showing this data. Do we want to show flow in this type of format?



Miscellaneous Comments

- ***Comment: The old river channel is shown on the map – we need to label it as the old channel to avoid confusion Include more land marks on the large map – label tributaries***
- Response: Map is being revised. Review base map below:



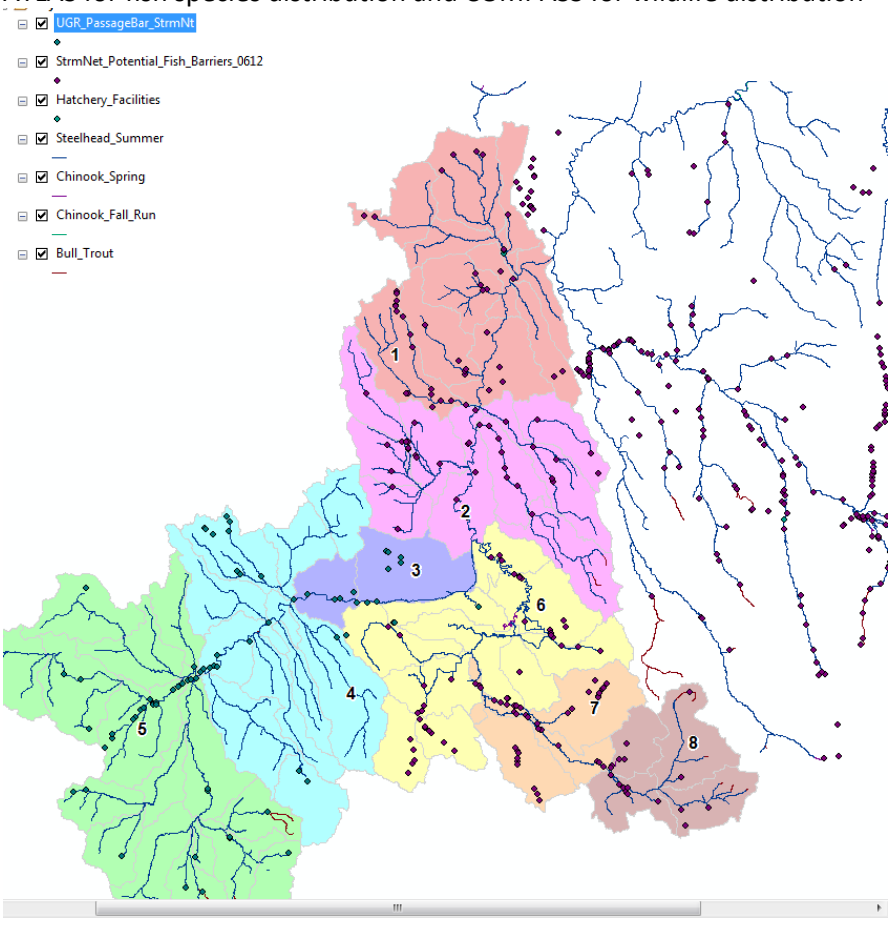
- ***Comment: Consider grouping subbasins differently (Cove, Union, La Grande together). Different groupings can answer different questions (ie: Basin 8 contains two very different areas – north fork vs south fork***
  Response: The basins were developed to provide consistency with available data while not providing too much detail that is beyond the scope of this planning effort. Different subbasin groupings may be used to answer different questions. Unless there is a concern with the surface water basins, we will leave them as is for step 2 and then can return to this question if we need to later.

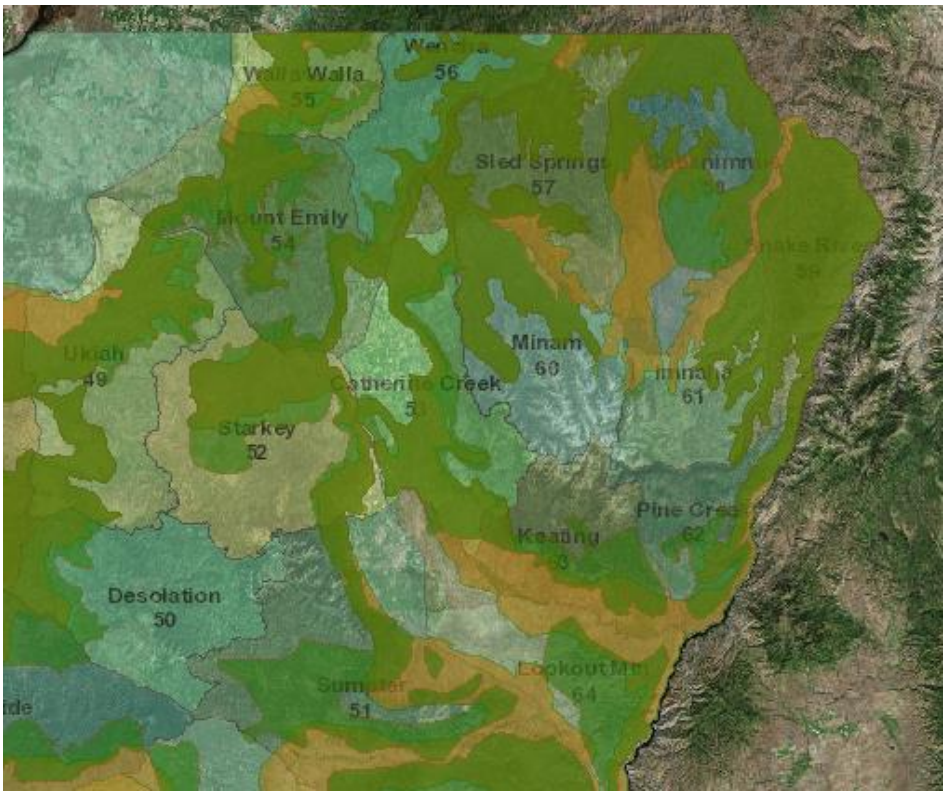
- ***Comment: Clarify how different elements were measured (flow, consumptive use, explain units)***
  Response: Unit measurements will be included in the report. Flow is listed in CFS and Acre-Feet. Flow is normalized for the expected water found in stream (not raw numbers from the gage) Consumptive use is estimated by water rights only. We will look into if we need to (if we can) modify this calculation in step 3.

- ***Comment: Basin 8 & 5 are likely affected by terrain***
  Response: This description was added to report.

- ***Comment: Basin 7 & 8 lack information***
  Response: this is a data gap, and can be listed in the report, but also may be addressed below.

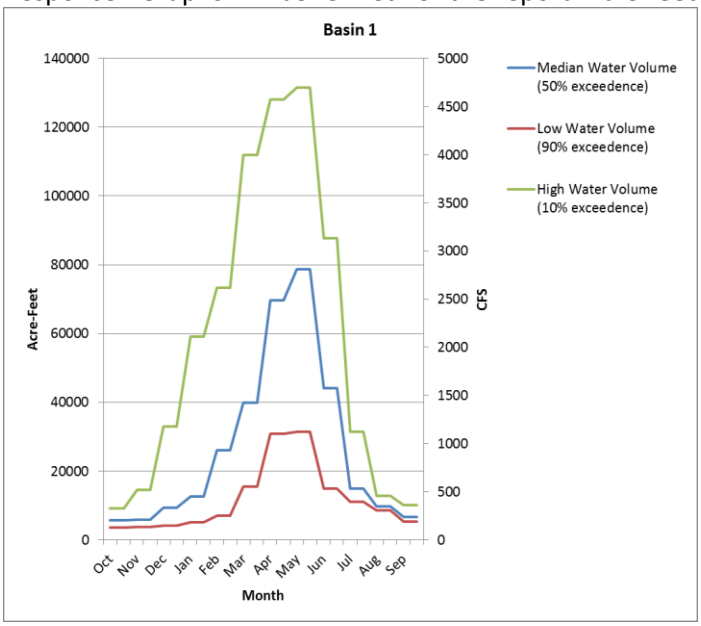
- ***Comment: Use Atlas for biological characteristics***
  Response: ATLAS and COMPASS will be used, some graphics are included, specific feedback is needed on which datasets would be helpful for this planning effort. So far – planning to use ATLAS for fish species distribution and COMPASS for wildlife distribution





The UGR includes both winter deer (yellow) and elk (green) habitat

- ***Comment: Acre-feet vs CFS need to explain how that information is shown on the chart***
  Response: Graphs will be refined for the report. Acre-feet is per 2 weeks on this graph



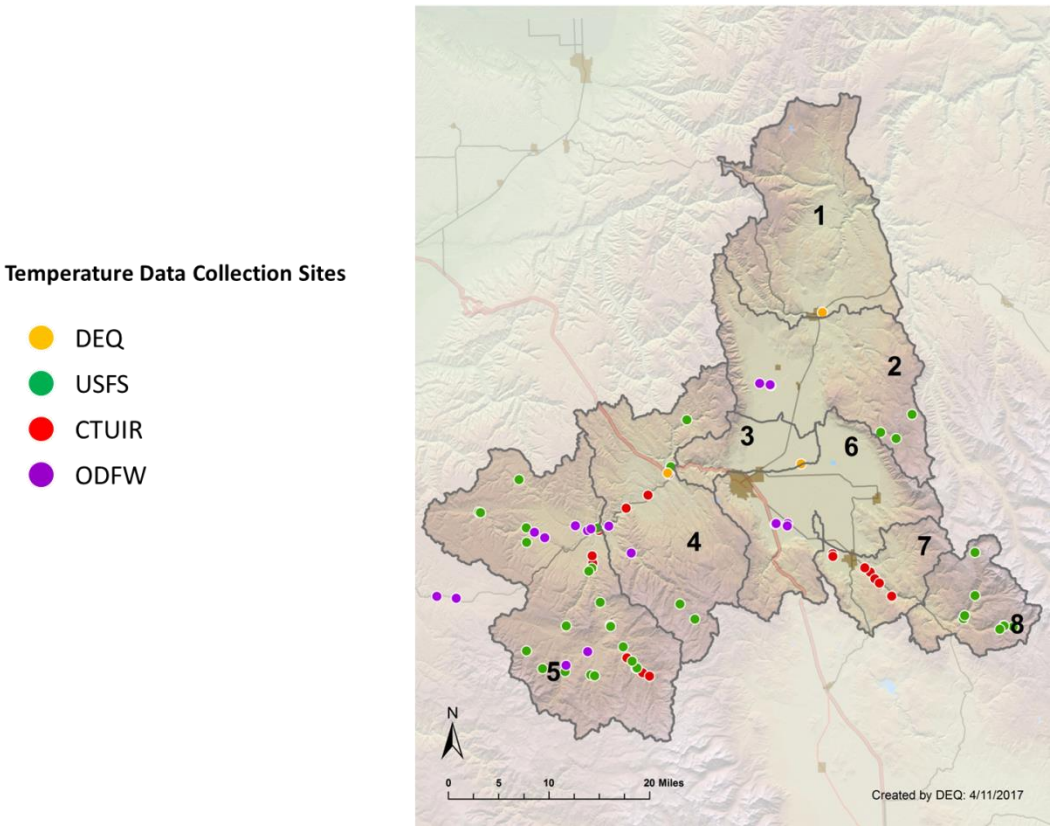
- **Comment: How does volume vary with precipitation? What volume of water enters and exists the watershed?**

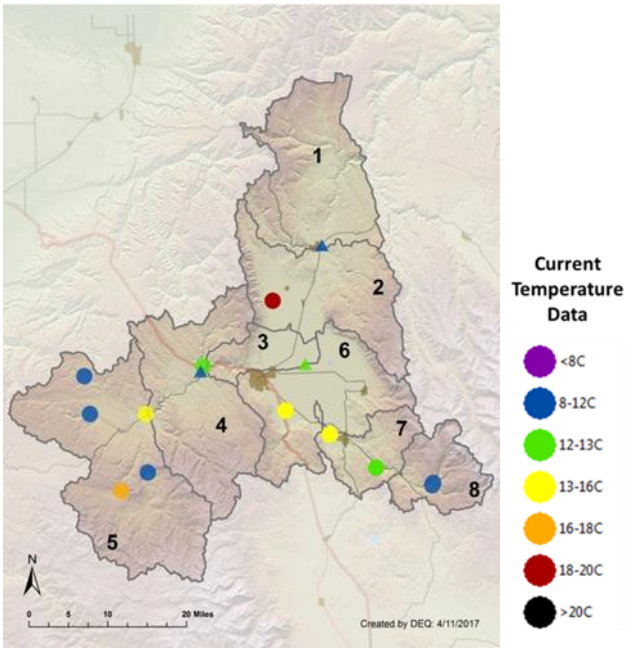
Response from Jordan: With regards to your idea about comparing basin precipitation with streamflow, that would give you guys a pretty good idea of the watershed's annual precipitation input and the streamflow out of the watershed. Obviously there other major terms of the hydrologic budget (ex. groundwater inflow, outflow and storage changes, evapotranspiration, etc.) that are not being estimated. Also, the precipitation maps contain some amount of uncertainty (compared with gage streamflows), especially in the higher mountainous regions that do not have direct precipitation measurements. Understanding this is critical when using this dataset.

I'd caution against comparing the scaled 50% exceedance annual runoff volumes (58-87) with the PRISM (61-90) mean annual precipitation volumes at your 8 basins. Typically the median (50% exceedance) annual volume is less than the mean annual value, in some cases 10-20% less. In order to more accurately account for the annual hydrologic budget components, a better comparison would be to compute the mean annual streamflow volume at the gages and see how that compares with gaged watershed precipitation input. In process with OWRD.

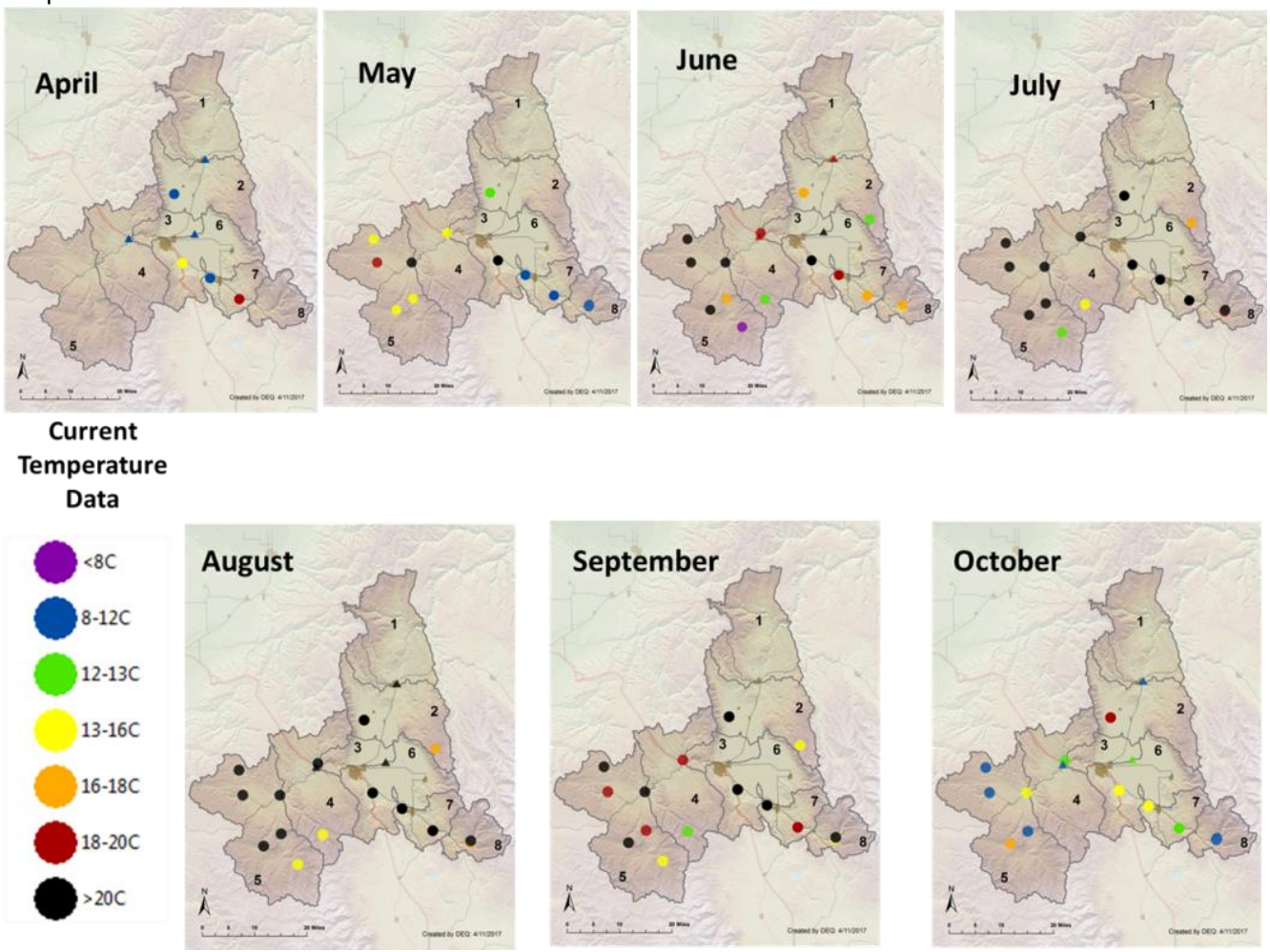
Temperature Comments

- ***Comment: USFS has much more temperature data - use this to address data gaps***
  Response: Data was used from the following areas and simplified the map by using a single dot to represent multiple sources. I think that we just didn't explain this clearly at the meeting and can work to clarify at the next stakeholder meeting. No additional work recommended here.





- ***Comment: Temperature trends in bottom chart need to be explained***
  Response: Unit measurements will be included in the report. Trends are that June-September most locations are temperature limited. October through May most locations are not temperature limited.



- **Comment: Limit Step 2 to hydrology, vegetation, geology, precipitation trends "what fills the water bucket?" inputs to the water system**
  Response: We agree that some of the information provided is too detailed and may not completely apply, so we will try to limit step 2, we will work to focus the report more on those characteristics. OWRD guidance document includes water quantity and quality so we will still need to include the other information (quality and quantity).

- **Comment: Step 2 - review average temperature in the river, exclude uses, just show temperature etc with graph, make step 2 a pure hydrology exercise**
  Response: temperature work is a large part of step 2, but as defined in OWRD requirements, it cannot just be a pure hydrology exercise. See below:

Step 2:
Characterize Water Resources, Water Quality, & Ecological Issues

Describe the Place

• Economic, social, cultural characteristics
• Unique features or attributes
• Physical and landscape characteristics:
  ○ Major rivers & tributaries
  ○ Aquifer systems and springs
  ○ Estuaries and bays
  ○ Reservoirs and lakes
  ○ Conveyance systems
  ○ Hydrology (rain, snow or spring fed systems),

etc.

Surface & Groundwater Quality/Quantity

• Availability
• Existing protections
• OWRD basin programs
• Beneficial uses (water quality)
• Impaired water bodies
• Groundwater management areas (water quality)
• Total maximum daily loads
• Permitted discharges

Ecological Health of the Watershed

• Key species & habitats
• Historical and current fish species
• ESA STE species; ODFW sensitive species
• Limiting factors

Comments to be addressed in Step 3 - Demand

- ***Comment: To determine how accurate consumptive use estimates are - compare the gauge at the top of the watershed and bottom of the watershed to see how that matches up to the flow estimates provided on the posters.***
  Response: For step 2 we are planning to use water data available from OWRD. This includes the consumptive use information, which we realize might need improvement. We will look into this in step 3, and come back and modify step 2 report/analysis if we find changes.

- ***Comment: Natural flow chart (show summary of demands that way we can see when each are met). Could show summary of demands for industrial, agricultural, municipal, ecological.***
  Response: This is something that could be produced during step 3. Will save this comment for that step.

Comments Received after the meeting

A suggestion for the way forward.

The message I heard last night is that most members need to know baseline information about the amount and timing of water generated in the planning area. The information at that level will be

coarse and is not suitable for project planning. Project planning and regulatory constraints come later.

The current assignment should be confined to the physical characteristics that describe water yield from each basin.

The information should be described as an approximation so that you acknowledge the inequality of data accuracy that is being used at this scale.

I would suggest that the technical group do a small pilot project for one of the basins and see if the following approach doesn't get you closer to the larger goal. If so then do the whole planning area.

What is the larger goal that Larry is describing? Is there confusion with stakeholders on what we are trying to accomplish and the level of detail.

Baseline information objectives:

> ***We need to know the size of the drainage area creating the flow (acres) and elevation range***
>
> ***We need to know precipitation inputs to the drainage.***
>
> ***We need to know some basic parameters of the thermal environment.***
>
> ***We need to know the kind of flow (pattern and amount) that is basin generated.***

The pilot project poster would contain:

Basin acreage and the maximum, mid-range and minimal elevation of the basin.

The study area includes the Grande Ronde River and tributaries above the confluence with Wallowa River. The valley floor is generally about 2,700 feet elevation with some mountain areas over 6,000 feet.

Over half of the watershed lies above 4000 feet. The study area is approximately 1640 square miles, with a mean elevation of 4,170 feet above sea level (asl), a maximum elevation of 6350 feet asl, and a mean slope of 10.5 degrees (OWRD, 2017).

*Obtain maximum, mid-range and minimal elevation of the basin?

We have acreage for each subbasin:

Basin number	**Drainage area (acres)**
1	1047040
2	878080
3	468480

4	427520
5	259840
6	117120
7	62080
8	249600

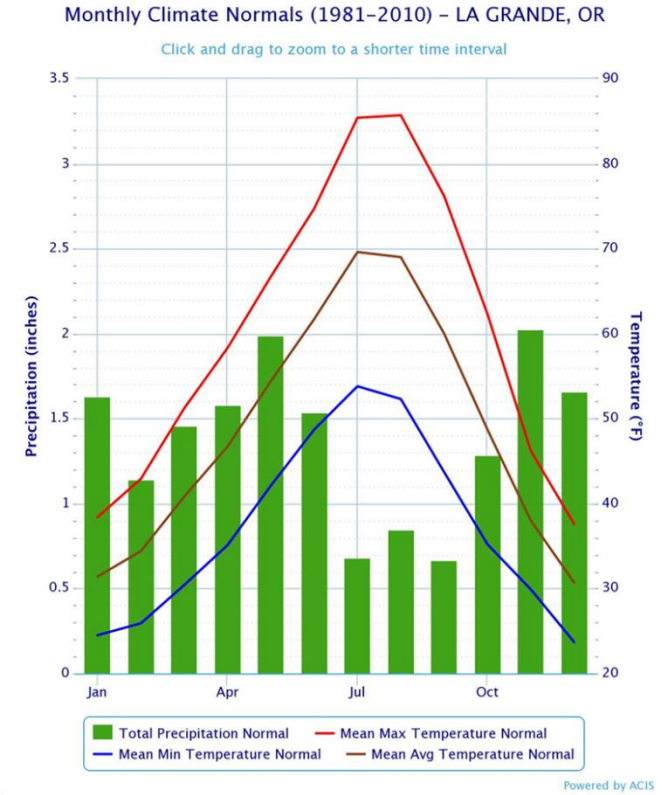
Approximate Precipitation in the form of mean monthly values and yearly total. This could be obtained from sno-tel and agrimet sites or state climate services. This is an approximation and would not need to go through a detailed analysis.

We have the mean annual precipitation for each basin:

Basin number	**Drainage area (acres)**	**Mean annual precip (feet)**
1	1047040	2.3567
2	878080	2.2817
3	468480	2.2458
4	427520	2.3108
5	259840	2.2650
6	117120	2.8433
7	62080	3.3042
8	249600	2.3458

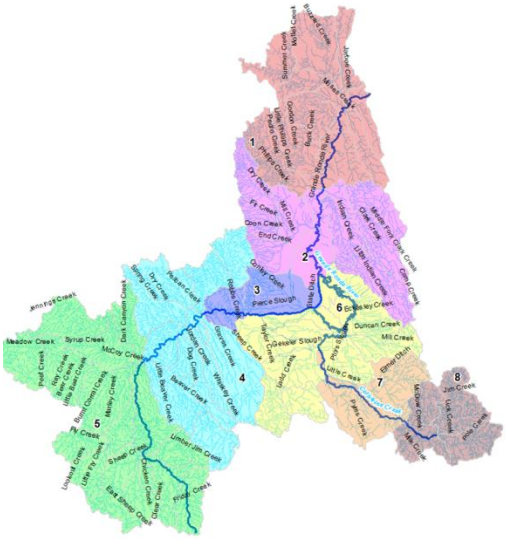
[monthly in chart below (different source)]

Approximate temperature pattern – again this is an approximation at this stage of the analysis and would contain mean monthly air temperature values.



This seems sufficient – 8 subbasin level data for air temperature is too detailed – agree?

The number of perennial streams located in the drainage and some expression of their water contribution. We have the streams (labeled map below), calculating each stream's contribution to water quantity, is beyond the level of detail we are planning to peruse for this project.



Water generation – I assume the median values presented last night are calculated for the mouth of each drainage – these are fine. I would also suggest that you take the monthly values from the 30 year data set and calculate an average monthly discharge and standard deviation.

We do not have this, should we go in this direction? Would require OWRD coordination. What does it provide us? We need to look for data that achieves our end goal, not just to have data in various forms for scrutiny.

From this information the group can make some coarse assessments about where the water is coming from and where the potential for improvements in water flow are greatest.

This appears to be a project level analysis, we will likely not get to this level of detail in our 5 step process. In this step, we are just looking at how much water there is and how it is being used.

The next step is to gather the information on water diversion by basin so that a picture can be developed on the timing and amount of demand being placed on the basin. I assume from what I heard in a previous meeting that water resources can give an approximation for both gross water rights and actual water use being diverted from each basin.

This is my suggestion. I believe it will establish objective side boards for future discussions.

Hope this helps – Larry

Data Needed (based on comments and outstanding requests)

- Direction on what portions of ATLAS and COMPASS data to include in report.

- **Comment: Why did we use medians and not means for flow? Add in average, box and whiskers plots with median and means for more information**
  Response: We used exceedances of the median. We could work with OWRD to make these box plots. We have not moved forward with this yet, we should decide as a technical committee. Request?

- ***Comment: Consider just showing gauged data (without consumptive use added in).***
  Response: These are two graphs of gauged data for Catherine Creek and UGR. We have data like this from about 3 other gauges. We can include this in the report, do we want the other ones?

- **Comment: How does volume vary with precipitation? What volume of water enters and exists the watershed?**
  Response from Jordan: With regards to your idea about comparing basin precipitation with streamflow, that would give you guys a pretty good idea of the watershed's annual precipitation input and the streamflow out of the watershed. Obviously there other major terms of the hydrologic budget (ex. groundwater inflow, outflow and storage changes, evapotranspiration, etc.) that are not being estimated. Also, the precipitation maps contain some amount of uncertainty (compared with gage streamflows), especially in the higher mountainous regions that do not have direct precipitation measurements. Understanding this is critical when using this dataset.

I'd caution against comparing the scaled 50% exceedance annual runoff volumes (58-87) with the PRISM (61-90) mean annual precipitation volumes at your 8 basins. Typically the median (50% exceedance) annual volume is less than the mean annual value, in some cases 10-20% less. In order to more accurately account for the annual hydrologic budget components, a better comparison would be to compute the mean annual streamflow volume at the gages and see how that compares with gaged watershed precipitation input. In process with OWRD.

- elevations for each basin

- ***The number of perennial streams located in the drainage and some expression of their water contribution.*** We have the streams, what is the approach to calculate each of their water contribution? In an existing data set?

- ***Water generation – I assume the median values presented last night are calculated for the mouth of each drainage – these are fine. I would also suggest that you take the monthly values from the 30 year data set and calculate an average monthly discharge and standard deviation.*** We do not have this, should we go in this direction? Would require OWRD coordination. Do not suggest doing this.