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# Homework 6 - Brainstorming Term Project

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## 1. Who is involved in your study? (list all group members)

The people involved in the study are: Curtis Crandall, Hayden Lewis, and Alex Edwards.

## 2. In a general sense, what is the topic you plan to study?

The topic that we are planning to study is the mass balance flow through the Boise Basin. There is data collected from Curtis regarding the water input and outputs within the Basin. This data is raw, so there will need to be some sort of data reduced to create presentable information. The hope is to use equations to create graphs and give us a better understanding to the mass balance effect that occurs within the Boise area.

## 3. Identify any key references or articles you will need to read in order to complete your study?

References will include information provided from Curtis, and possibly from instructors within the hydrology department. Another reference would be mathworks.com to look up any code necessary to create various graphs. There are numerous articles that we can read as well in order to gain insight to the process necessary to create understandable graphs. Some articles include: <https://www.idwr.idaho.gov/WaterInformation/projects/tvhp-revised/> <http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=32186.wba> <http://www.idahowaterengineering.com/wp-content/uploads/2009/09/D.-Tuthill->

[Presentation-to-IWRB-Ground-Water-Recharge-Legislation-January-24-2014.pdf](http://water.usgs.gov/nrp/proj.bib/Publications/2011/mcmahon_plummer_et_al_2011.pdf) [http://water.usgs.gov/nrp/proj.bib/Publications/2011/mcmahon\\_plummer\\_et\\_al\\_2011.pdf](http://water.usgs.gov/nrp/proj.bib/Publications/2011/mcmahon_plummer_et_al_2011.pdf) <http://info.ngwa.org/gwol/pdf/040678079.pdf> <http://ces.iisc.ernet.in/energy/water/proceed/section7/paper5/section7paper5.html>  
[https://www.idwr.idaho.gov/waterboard/WaterPlanning/CAMP/TV\\_CAMP/PDF/2010/05-20-10\\_TV-AquiferSys\\_WaterBdgt.pdf](https://www.idwr.idaho.gov/waterboard/WaterPlanning/CAMP/TV_CAMP/PDF/2010/05-20-10_TV-AquiferSys_WaterBdgt.pdf)

#### **4. What type of data will you be modeling or analyzing? (e.g. time series, spatial maps)**

For this project we will need to use modeling and a time series to create hydrographs within certain time periods. The data will be stream flow rates collected at certain stations within. There will be observational and modeled data from different data sets including Daymet, PRISM, NASA/EOS, NTSG, Bureau of Rec., USGS... There will also be a geodatabase that has spatial maps of different water balance variables (SWE, discharge, reservoir levels, precip, temp, ET,...).

#### **5. What are the inputs and outputs of your code?**

Inputs would include stream flow data, rate of discharge, soil characteristics. Also dates and times in which collection occurs. Outputs would be information such as hydrographs, recharge values, season variability.

#### **6. How will you know if your code is correct? (e.g. can you compare with existing results?)**

There is data available both online and through the library that we can compare our data to. There are also several papers that have been written by scholars in the field and even at Boise State that we can check resources with. There are also ways to calculate results in a spreadsheet setting.

#### **7. What type of logic will your code use? (e.g. for loops, if,else statements, etc.)**

We will be using large amounts of for-loops and functions to crunch large data sets. We may use if-else statements to exclude data that doesn't fit within a certain range of the experiment -- outliers. We also may use catch statements to find or remove errors in the data-set, as NaN's or errors may be prevalent.

#### **8. How will you present the inputs and outputs? (e.g. 2D plots, histograms, etc.)**

We will present our data in the form of box-whisker plots to show deviation and mean values as recharge may vary seasonally. We will use histograms to show variations in recharge through time, we may even have a red line that denotes the RMSE (root mean squared error) of the data. The red line ultimately will help determine the wellness of fit. There will also be multiple graphs, some in the form of hydrographs, to represent some of the data we have collected. A model representation of area evolution for different water variables may also be useful.

## **9. What is the significance of the output data? (e.g. how can it be analyzed or used)**

The significance of the output data is information that would be available to the general public regarding data for hydrogeologic problems within the Boise Basin area. It can also give information about climate and the ecology of the area. Water management is an important issue in the area and the more data/interpretation/visualization available, more more informed decisions can be made concerning wildlife/ecosystem management, as well as urbanization and construction.

## **10. Are there any parts to your project that you currently do not know how to accomplish or implement? Which parts will you need help from me, if any?**

Most of the conceptual questions are easily answered from knowledge from previous classes. At the moment, there is not any questions that we have, but it is likely that inquiries regarding computing in MATLAB will occur once the project gets fully started. I think the biggest hurdles will be getting the data to come together in the most coherent way possible. I don't want a bunch of different data that doesn't compliment each other. But formulating the project and presentation in a way that developes the local watershed mass balance may prove to be the most useful representation.

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