Use Case Name	Obtain Streamflow for an Area of Interest to Calculate Water Balance		
Use Case Number	1		
Created By	Tim Whiteaker		
Date	2010-01-25	Modified By	

Revision History

Name	Date	Reason for change	version

Description/Goal

Discover, download, and export streamflow values in an area of interest, in support of computing a water balance.

Resources or actors:

Primary Actors: People who are concerned with conducting a water balance.

- Government staff overseeing water issues in a given municipality, county, state, or region.
- Consultants hired by governing agencies to find solutions to water issues.
- Academics doing research in water issues.

Secondary Actors: One from which the system needs assistance

- The Internet (implies functioning and accessible websites or services)

Assumptions:

- The region for which a water balance is to be computed is of a size such that a time interval of 15 minutes to 1 day between flow values is desired.

Workflow/Steps:

1. The user identifies an area of interest in which to search for streamflow values.
2. The user specifies a time period for which values are desired.
3. The software shows the user locations of sites in the area of interest which have streamflow whose period of record overlaps the desired time period.
4. The user browses properties of the time series for the sites, and selects time series for download. These properties include:
    a. Period of record
    b. Temporal spacing between streamflow values

    c. Units of measure (to make sure recognizable units are present)
    d. Data source
    e. Data type (e.g., average vs. maximum vs. minimum vs. real-time)
5. The user browses the resulting time series values in tabular or graphical form to verify suitability for use in a water balance calculation.
6. The user exports selected time series to a text file so that the data can be imported into other software for computing the water balance.

Variations (optional):

- The user specifies a data source(s) of interest from which to retrieve the data.
- The software contains functionality to perform water balance calculations, so that the user uses the software for that purpose instead of exporting the data to a text file for use in a different program.
- The software contains additional utilities so support water balance calculations such as time aggregation of data, gap filling, watershed delineation, etc. These utilities are used to prepare the data before export to text file.

Non-Functional Requirements

Performance : Lags in discovery of site locations and perusal of time series properties should be on the order of seconds or faster, and the discovery process will likely involve lots of user interaction with the software. The actual retrieval of time series values can take on the order of minutes, as this step does not require any interaction. Browsing the downloaded data should have lags less than 2 seconds. The user may need to browse a lot of data to insure its suitability for use in a water balance calculation. Data export should require less time than the retrieval of the data from the Internet.

Reliability : System should have outages of no more than 48 consecutive hours, and be online at least 90% of the time.

Fault Tolerance : The system cannot handle faults in data acquisition. Without the data, a water balance cannot be calculated. If data are faulty or incorrect, the system may still perform a water balance, and it's up to the user to recognize that water balance looks incorrect.

Frequency : With good discover mechanisms, the user would only need to make one search request and one retrieval request for streamflow data to support a water balance calculation.

Application Environment : The system should operate on a computer that the primary actors are likely to have access to.

Data Quality : The system should access data from trustworthy sources.

Possible implementation strategy (in HydroDesktop)

- Data discovery and retrieval through the Search plugin of HydroDesktop (augmented by the Metadata Fetcher plugin if search on HIS Central is not desired), followed by:
    - Export to CSV for use in external model, or
    - "Water Balance" plugin in HydroDesktop, or

- HydroModeler plugin in HydroDesktop