Web Access to Long-term Research Hydrology Data

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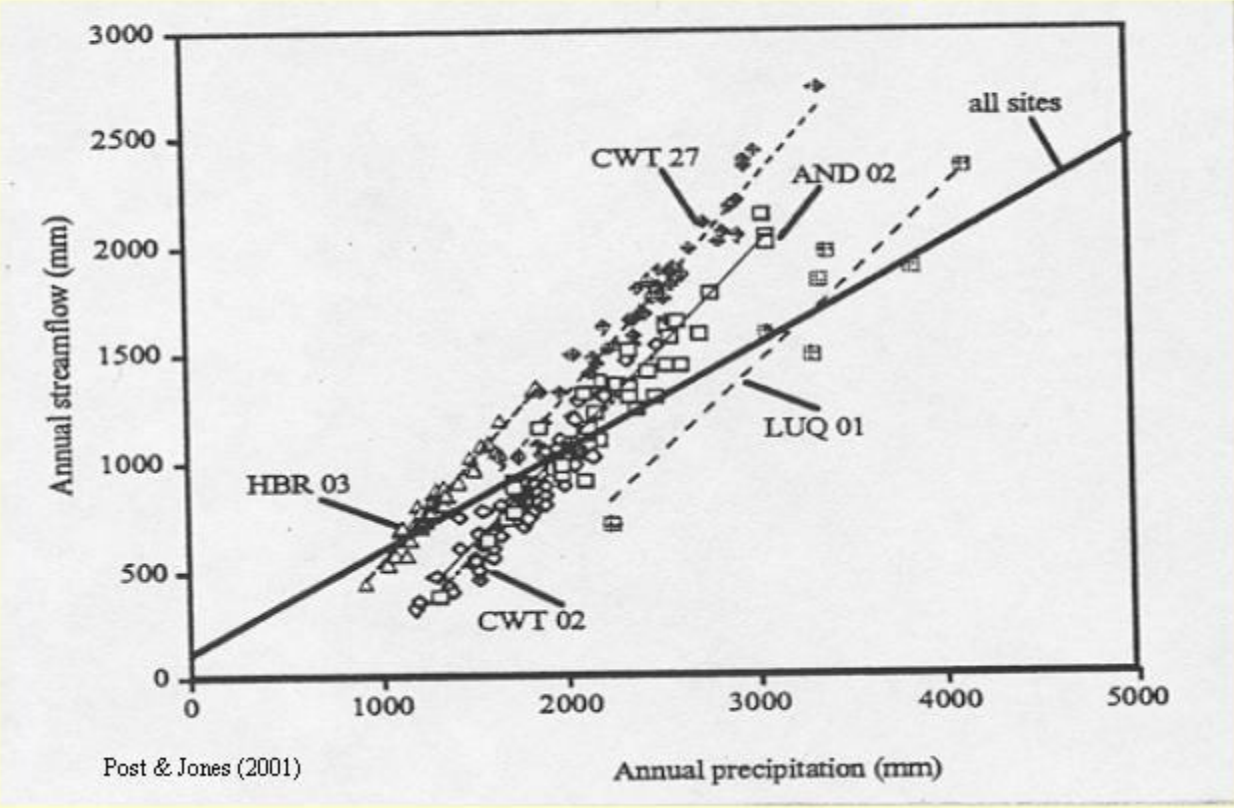
The Needs

- Watershed scale information
- Needed to address many issues
- A few examples:
- Post-fire risks
- Watershed restoration/rehab
- Fish passage

Advantages of Research Data

- Precisely measured
- Quality controlled
- Small watersheds
- Supporting data available (metadata)
- Land use known and/or controlled
- Many other aspects studied

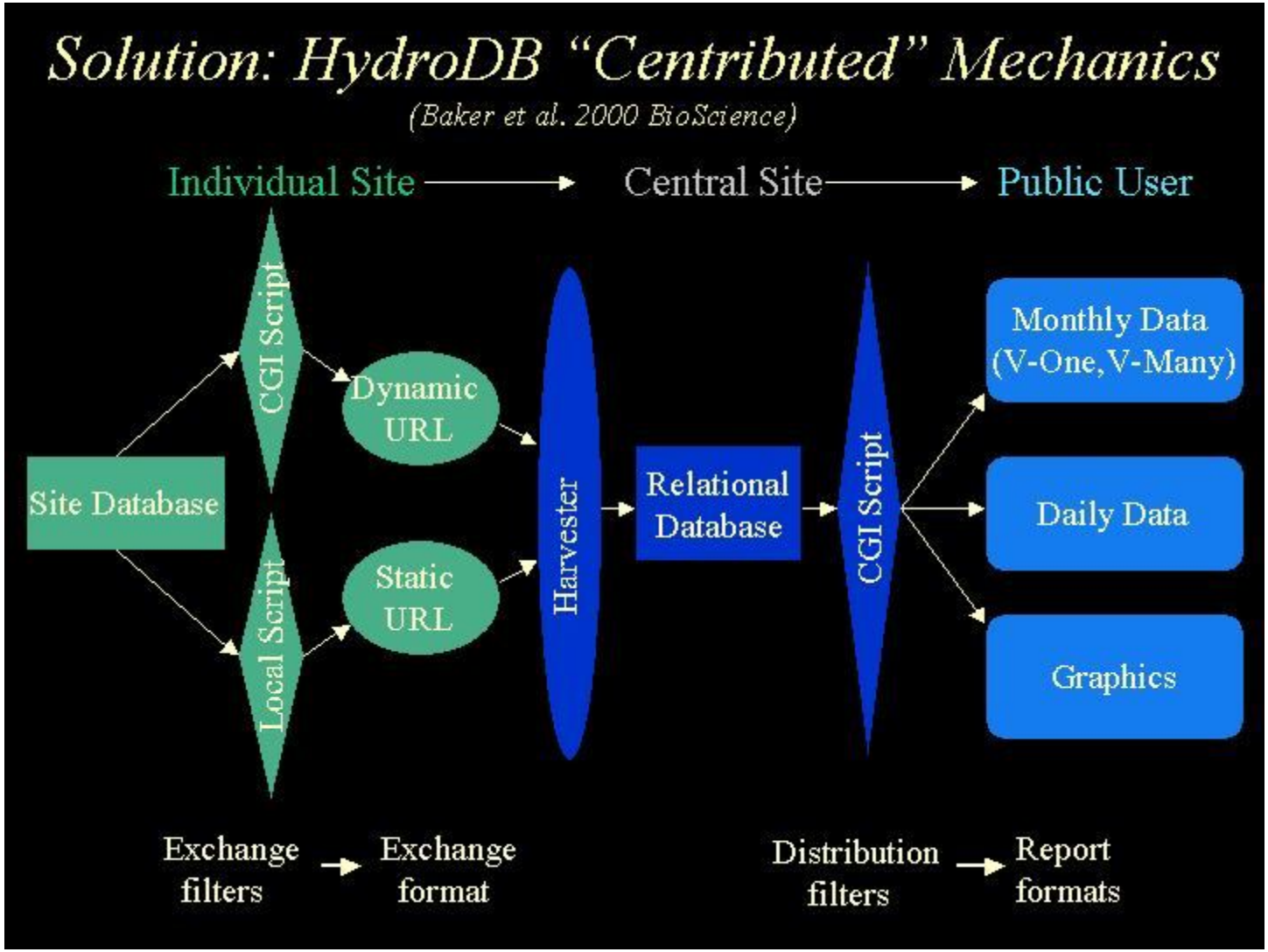
Watershed Cross-Comparison



Post & Jones (2001)

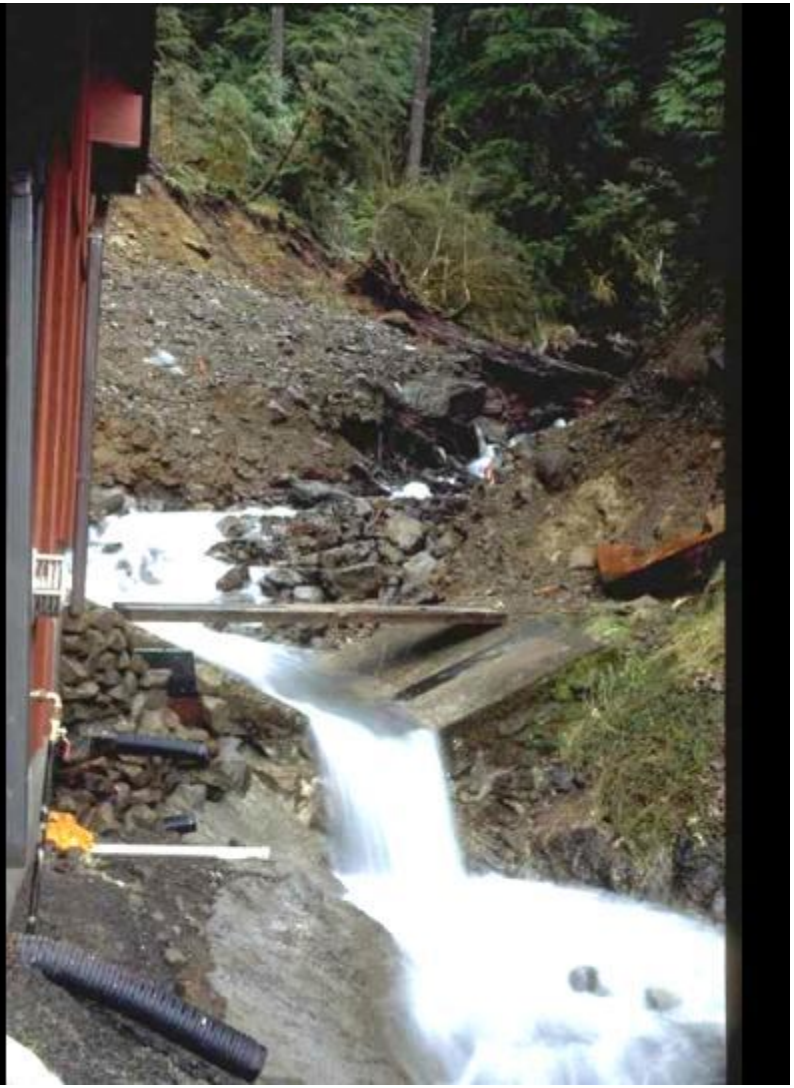
Long-term Data Exist

- Experimental watershed studies
- In many parts of country
- High quality data
- Many variables measured/controlled
- But access has been difficult
- Needed: One-stop, easy access


Solution: HydroDB "Centributed" Mechanics
(Baker et al. 2000 BioScience)
Individual Site
Central Site
Public User
CGI Script
Dynamic URL
Site Database
Local Script
Static URL
Harvester
Relational Database
CGI Script
Monthly Data (V-One, V-Many)
Daily Data
Graphics
Exchange filters
Exchange format
Distribution filters
Report formats

HydroDB: Long-term Research Hydrologic Data Accessible on the Web

HJ Andrews
Experimental Forest
V-notch weir



Beta version of web harvester

- http://www.fsl.orst.edu/hydrodb/index.htm
- Primarily developed for data input
- Next phase will improve public access

Hydrological Data Project (HYDRODB)

Hydrological Data Access

Please note that these pages may work better using Internet Explorer

Welcome to HYDRODB, a centralized server to provide open access to long-term streamflow and accompanying meteorological records from a collection of research watersheds.

- Description
  - User Guide
  - Metadata Draft Document
  - Map of Participating Sites
  - Participating Sites
  - Hydro/Climate Variable Date Ranges
- Data Queries
  - Daily Hydrology Data
  - Monthly Data
    - One variable by month format
    - Multiple variables format
- Graphing
  - Daily data
  - Daily data vs monthly and all-years

For information on becoming a participating site, contact the HYDRODB Data Manager.

LTER HydroDB Data

NB: If there seems to be no output after submitting your query, please check any other browser windows that are open.

Site__ Station _____ Date Range

AND	CS2MET	10/01/1957 - 12/31/2000
AND	GSWS01	10/01/1952 - 09/30/2001
AND	GSWS02	10/01/1952 - 09/30/2001
AND	GSWS03	10/01/1952 - 09/30/2001
AND	GSWS06	10/01/1963 - 09/30/2001
AND	GSWS07	10/01/1963 - 09/30/2001
AND	GSWS08	10/01/1963 - 09/30/2001
AND	PRIMET	06/01/1972 - 11/10/1998
BNZ	LTER1	01/01/1990 - 12/31/1995
CAS	ARF	08/01/1995 - 07/31/2000

Climate variables

DAILY_AIRTEMP_ABSMAX_C
DAILY_AIRTEMP_ABSMIN_C
DAILY_AIRTEMP_MEAN_C
DAILY_ATMPRESSURE_MEAN_KPA
DAILY_DEWPOINT_MEAN_C
DAILY_DISCHARGE_MEAN_LPS
DAILY_GLOBALRAD_TOTAL_JCM2
DAILY_PRECIP_TOTAL_MM
DAILY_RESWINDDIR_MEAN_DEG
DAILY_RESWINDSP_MEAN_MSEC
DAILY_RH_MEAN_PCT
DAILY_SOILTEMP_ABSMAX_C
DAILY_SOILTEMP_ABSMIN_C
DAILY_SOILTEMP_MEAN_C
DAILY_WATERTEMP_ABSMAX_C
DAILY_WATERTEMP_ABSMIN_C
DAILY_WATERTEMP_MEAN_C
DAILY_WINDSP_MEAN_MSEC

Check all years desired

☐ 1931 ☐ 1932 ☐ 1933 ☐ 1934 ☐ 1935 ☐ 1936 ☐ 1937 ☐ 1938 ☐ 1939 ☐ 1940 ☐ 1941 ☐ 1942 ☐ 1943 ☐ 1944 ☐ 1945 ☐ 1946 ☐ 1947 ☐ 1948
☐ 1949 ☐ 1950 ☐ 1951 ☐ 1952 ☐ 1953 ☐ 1954 ☐ 1955 ☐ 1956 ☐ 1957 ☐ 1958 ☐ 1959 ☐ 1960 ☐ 1961 ☐ 1962 ☐ 1963 ☐ 1964 ☐ 1965 ☐ 1966
☐ 1967 ☐ 1968 ☐ 1969 ☐ 1970 ☐ 1971 ☐ 1972 ☐ 1973 ☐ 1974 ☐ 1975 ☐ 1976 ☐ 1977 ☐ 1978 ☐ 1979 ☐ 1980 ☐ 1981 ☐ 1982 ☐ 1983 ☐ 1984
☐ 1985 ☐ 1986 ☐ 1987 ☐ 1988 ☐ 1989 ☐ 1990 ☐ 1991 ☐ 1992 ☐ 1993 ☐ 1994 ☐ 1995 ☐ 1996 ☐ 1997 ☐ 1998 ☑ 1999 ☐ 2000 ☐ 2001

Check all months desired

☑ Jan ☑ Feb ☑ Mar ☑ Apr ☑ May ☑ Jun ☑ Jul ☑ Aug ☑ Sep ☑ Oct ☑ Nov ☑ Dec

Date Format YYYYMMDD

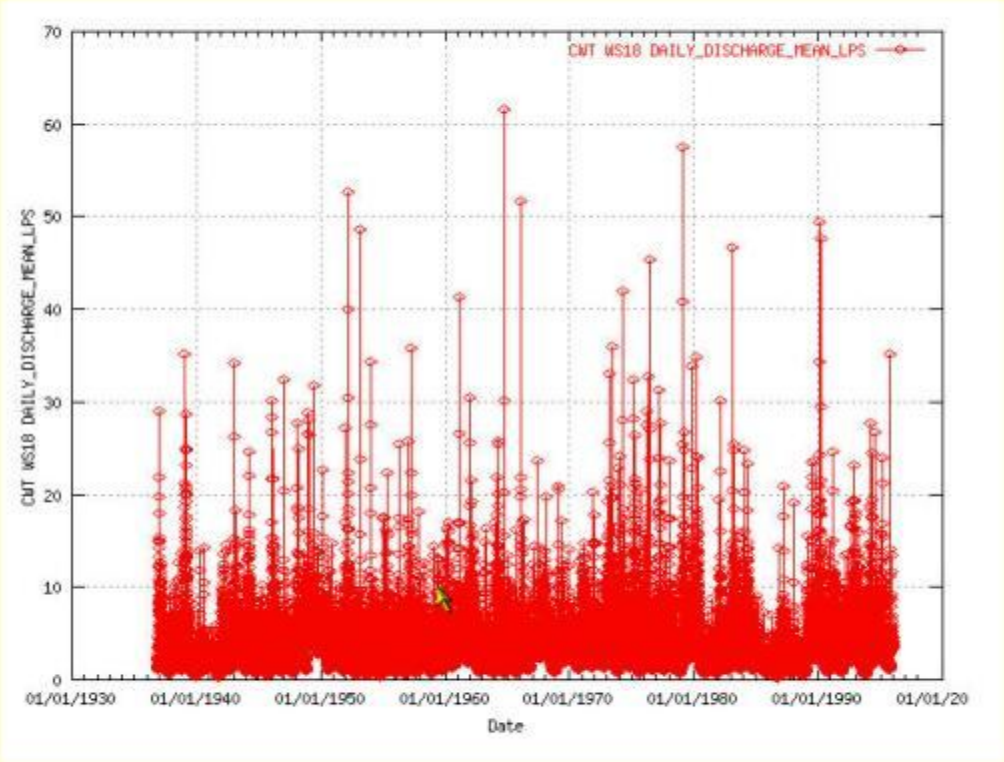
◉ screen (max 500 days) ○ comma delimited download ○ tab delimited download

Reset | Submit

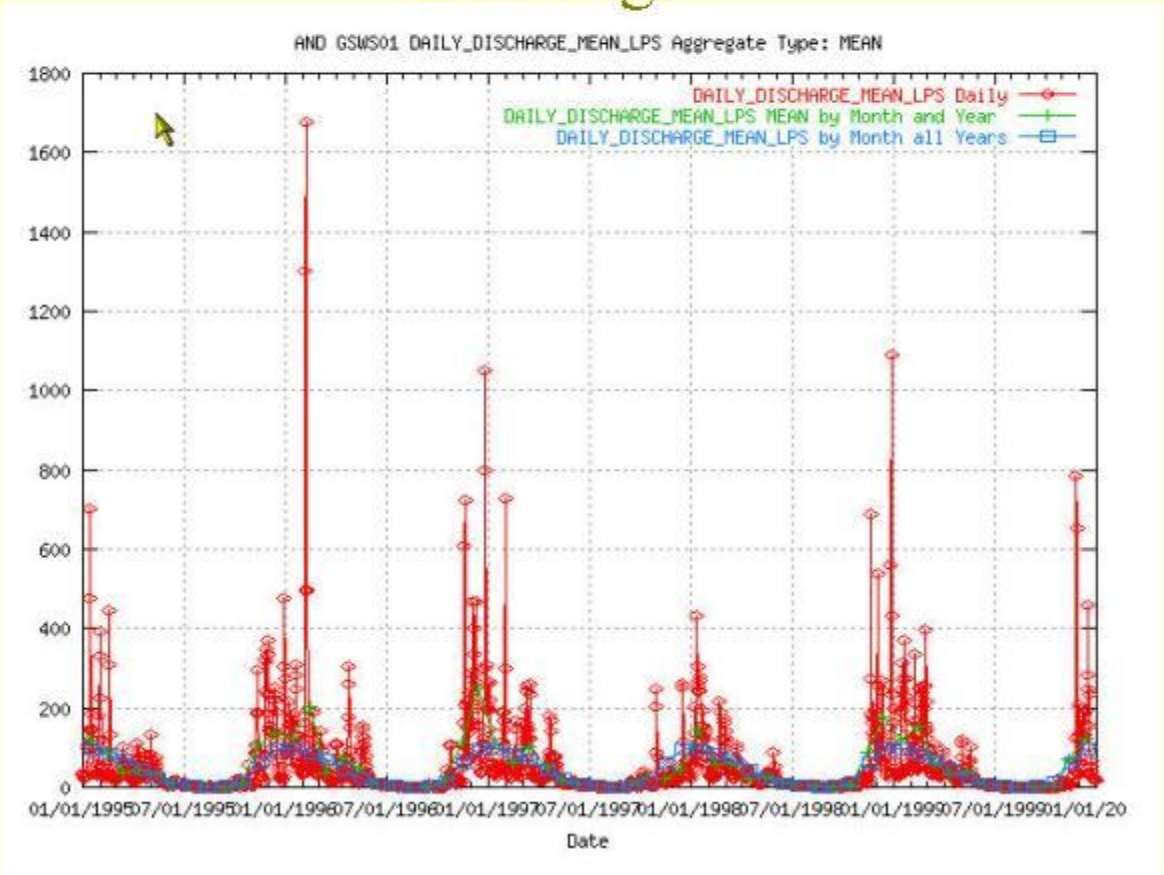
LTER Climate Data

Site	Station	Date	DAILY_DISCHARGE_MEAN_LPS	Flag
AND	GSWS03	19991001	1.982	
AND	GSWS03	19991002	1.954	
AND	GSWS03	19991003	1.926	
AND	GSWS03	19991004	1.897	
AND	GSWS03	19991005	1.897	
AND	GSWS03	19991006	3.285	
AND	GSWS03	19991007	2.237	
AND	GSWS03	19991008	2.520	
AND	GSWS03	19991009	2.379	
AND	GSWS03	19991010	2.180	
AND	GSWS03	19991011	2.124	
AND	GSWS03	19991012	2.010	
AND	GSWS03	19991013	1.897	
AND	GSWS03	19991014	1.897	
AND	GSWS03	19991015	1.869	
AND	GSWS03	19991016	1.869	
AND	GSWS03	19991017	1.841	
AND	GSWS03	19991018	1.812	
AND	GSWS03	19991019	1.812	
AND	GSWS03	19991020	1.869	

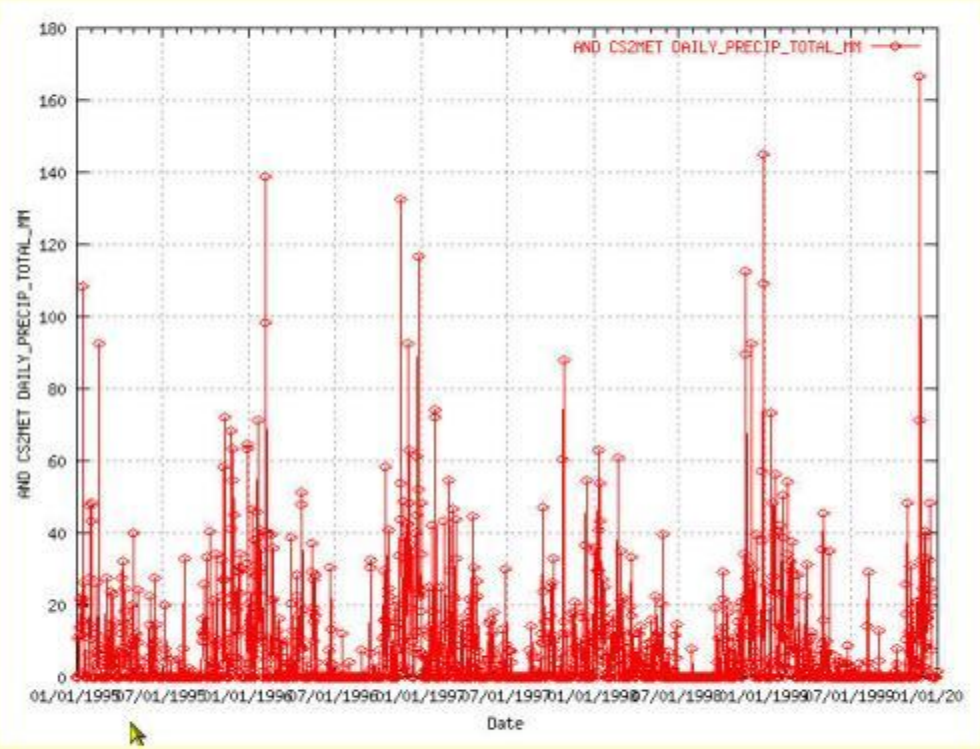
Coweeta (NC) daily stream discharge



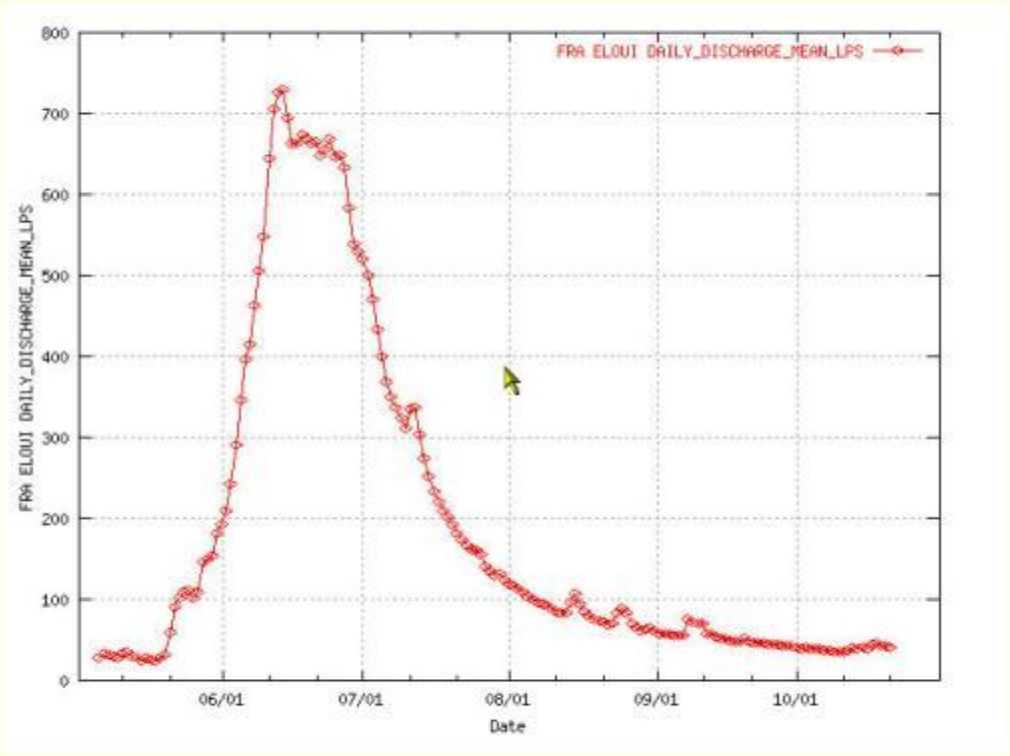
H. J. Andrews (OR) daily Stream discharge



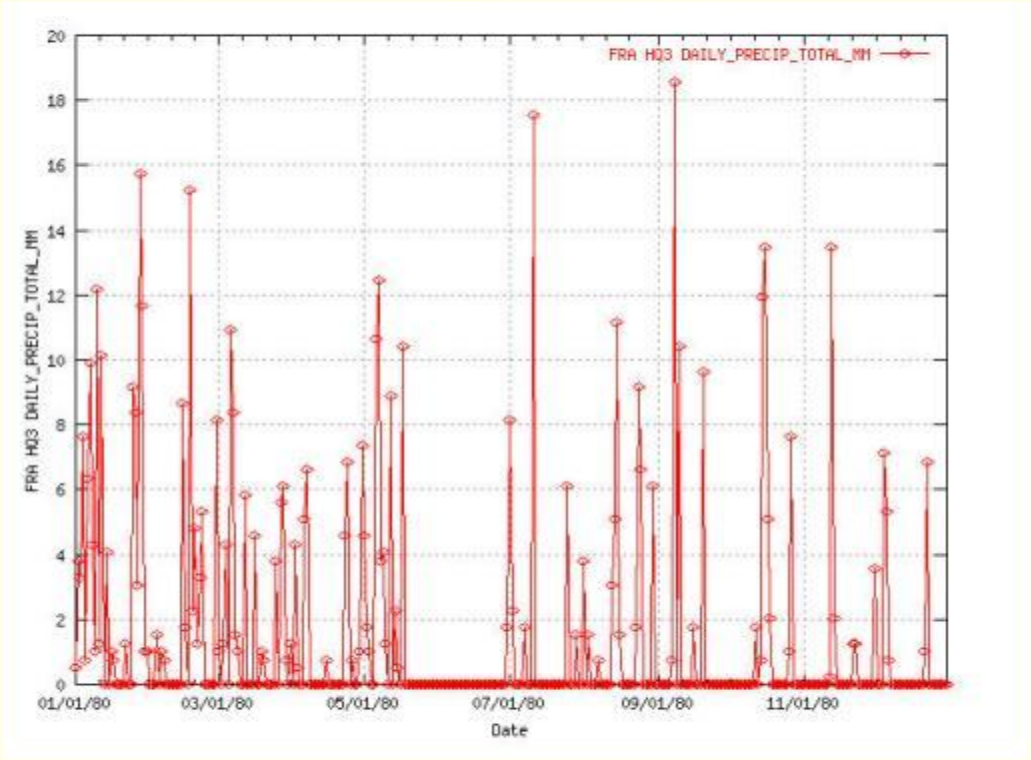
H. J. Andrews (OR) total daily precipitation



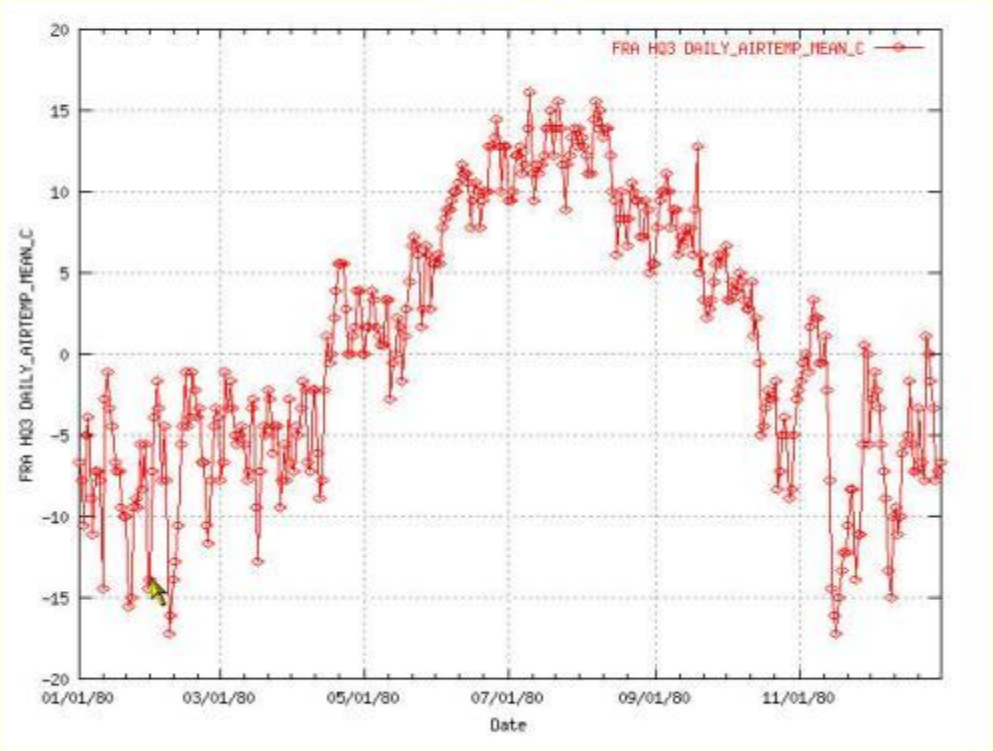
Fraser (CO) daily stream discharge 1991



Fraser (CO) daily precipitation 1991



Fraser (CO) mean daily air temperature 1991



4.2. Hydrologic Metadata Variable Names and Descriptions (HydroDB)

(see http://www.fsl.orst.edu/hydrodb/harvest/hydrodb_descriptors.htm)

1) Research Area Information - Watershed Studies
2) Watershed Spatial Characteristics
3) Watershed Ecological Characteristics
4) Watershed Descriptions
5) Gauging Station
6) Meteorological Station
7) Climatic Measurement Parameters
   a) Air Temperature
   b) Precipitation
   c) Snow Depth

Update of Research Area Information - Watershed Studies variables; Page 3

Please insert the values:
Hydrologic Regime (e.g., perennial/ephemeral, rain/rain-on-snow/snowmelt)

rain

Publications or References or URL if list is online
(Please limit your entry to 4,000 characters)

http://www.rsl.psw.fs.fed.us/projects/water/caspubs.html

URL for the research site's webpage location covering relevant watershed studies

http://www.rsl.psw.fs.fed.us/projects/water/casper.html

Experimental Design
(Please limit your entry to 4,000 characters)

http://www.psw.fs.fed.us/Tech_Pub/Documents/gtr-160/01henry.pdf

URL of the research site's webpage location showing a topographic map of the research site and the associated gauged watersheds

http://www.rsl.psw.fs.fed.us/projects/water/all_casper_topo.jpg

URL of the research site's webpage location covering relevant climate research

http://www.rsl.psw.fs.fed.us/projects/water/CasperGagedWtshds.pdf

Site north bounding coordinate (in decimal degrees - 5 decimal places)

39.37936

Site west bounding coordinate (in decimal degrees - 5 decimal places)

-123.75925

Site south bounding coordinate (in decimal degrees - 5 decimal places)

39.32693

Site east bounding coordinate (in decimal degrees - 5 decimal places)

-123.70192

submit

5 minute

Summary interval of finest time step output for streamflow data (i.e., 15 minute, hourly, daily)

daily

Data accuracy (e.g., +/-0.1 degrees C or +/-10 mm, specify units)

+- 0.003 feet

Instrumentation description (type and brand)

(Please limit your entry to 4,000 characters)

Discharge for WS18 is measured with a 120 degree sharp crested weir. The weir blade is installed in a concrete wall that serves as a broad-crested weir for flows over 3 feet. A Stevens L-Type chart recorder was first used to record flow in 1936. The recorder was changed to an FW-1 on January 6, 1955, upgraded to Fisher-Porter analog to Digital punched tape recorder on September 3, 1964, and to the current Stevens Type A/F Logger, Model 8901 on November 9, 1994.

Calibration and modification history (dates of major modifications or recalibrations; if documented in site records, give directions to that information)

(Please limit your entry to 4,000 characters)

07/03/1936-01/06/1955 Stevens L-Type chart recorder
01/06/1955-09/03/1964 FW-1 chart recorder
09/03/1964-09/09/1994 Fisher-Porter analog to digital punched tape recorder
09/09/1994-present Stevens Type A/F Logger,

Methods description; field collection, data aggregation, and quality assurance methods

(Please limit your entry to 4,000 characters)

A/F Logger cards are collected monthly from the field then downloaded. These data are checked for missing values, or false storms. The edited data is processed by a flow computation, integration, and frequency program. Every year each weir is inspected and surveyed. A level is used to verify that the relative elevations of both ends of the weir blade and hook-gage bracket have not changed.The head or water depth is verified each week by a hook-gage

Identify precipitation gauging and ambient air temperature measurement location/name that best represents conditions in the watershed monitored by this gauging station

CS01

Harvest summary for Hubbard Brook

From http://64.77.52.111/research/hydrodb/hbr_hydro.txt

Harvest initiated on Tue, 29 Jan 2002 18:30:32 GMT
The data file was last modified on : Tue, 29 Jan 2002 18:29:24 GMT

Started with HBR,WEASTA_14,19650101

WARNING(106): Failed (min < mean < max) relationship at:
HBR,WEASTA_14,19661011 input file (HBR.dat) line 650

WARNING(106): Failed (min < mean < max) relationship at:
HBR,WEASTA_14,19710422 input file (HBR.dat) line 2304

WARNING(106): Failed (min < mean < max) relationship at:
HBR,WEASTA_14,19790220 input file (HBR.dat) line 5165

Finished with HBR,WEASTA_14,20001231

Summary of HBR.dat follows:

ON INPUT:

13149 lines read.
0 blank lines.
1 header lines.

DURING PROCESS:

0 errors raised. (first 10 listed above)
0 data points dropped because of duplication of records.
3 warnings raised.

ON OUTPUT:

39444 data points ingested.

Would you like to see the harvested data from Hubbard Brook?
Would you like to see the ingested data from Hubbard Brook?
Would you like to return to the HydroDB participant web page?

HJ Andrews Experimental Forest V-notch weir

Next Goals

- Improve user-friendliness
- Add tools to use long-term data:
- Fish passage
- Post fire risk
- Roads/culvert design
- Add other kinds of observations
- Suggestions?

Conclusions

- Long-term hydrology important
- Web-access now possible
- More development needed:
- Add more types of observations
- Add tools to use this gold mine