Tips for Data Manipulation: Tutorial

Information to get started:

- The lesson below contains step-by-step instructions and "snapshots" of what each step looks like when carried out in a Microsoft Excel workbook. Blue shading of information in the Excel illustrations denotes changes made from the previous step. Dots placed in three consecutive rows indicate that a portion of data is hidden from sight.
- You can download an Excel workbook containing the complete data set by clicking on the "Download Data" link below. It contains each calculation step on a separate worksheet. To move between steps, click on the tabs at the bottom of the excel window.
- When you download the file, it may open in your browser window. You may wish to use the "save as" function to save the file to a local drive and then reopen it in Excel. This will make it easier to flip between the online lesson and the example workbook.
- Finally, we want to remind you that the techniques explained on this site are statistically based; therefore results must be viewed as predictions and not as facts. Please use the techniques and the information obtained from them responsibly!

Download Data

Step 1: Copy Daily Streamflow Data from USGS web site into Excel Spreadsheet

- Go to http://oregon.usgs.gov
- Select Historical Water Data
- Select Surface Water
- Select Streamflow
- Check box under Site Identifier for Site Name and Submit
- Type in Alsea under Site Name and select match any part and Submit
- Select gage near TIDEWATER (14306500)
- In the Retrieve data from boxes enter the date range of "1990-10-01" to "2000-10-01"
- Select Tab-separated data and Display in browser and Submit
- Select the entire data set to copy
- Paste Special as text (this will separate the data into columns)

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Step 2: Organize spreadsheet with data

- Eliminate extraneous data (i.e., column E)
- Add titles to remaining Four columns

NOTE: Data are listed in water years, hence 10/1/1990- 9/30/1990 is Water Year 1990.

• Label Sheet

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Step 3: Obtain Monthly Averages

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• In fifth column, use the average function in Excel to obtain the average for each month for the first four years.

Copy the Monthly Average Column for the first four years and paste to rest of data set. This will compute the monthly averages for the remaining years.

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Organize Monthly Data by Year

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YEAR	MONTH	STREAMFLOW (CFS)									STREAMFI	LOW (CFS)	í
1990	10	256			WATER YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	1
1990	11	1663			1991	255	1553	1554	1905	1968	2467	1889	1
1990	12	1554			1992	92.4	721	1464	1760	2526	774	1303	1
1991	- 1	1905			1993	124	878	2478	2371	921	2456	2858	1
1991	2	1968			1994	100	108	1389	1533	1969	1486	1208	-
1991	3	2467			1995	314	2254	3925	4823	3646	3029	1784	
1991	4	1889			1996	327	2412	5250	4745	6909	1386	2012	
1991	6	889			1997	323	2307	6977	4115	2127	3035	1314	
1991	6	413			1998	1291	2039	2085	4233	3675	2533	1055	
1991	7	200			1999	170	2782	5507	4848	6750	2854	1441	
1991	8	119			2000	133	2189	3879	3535	2903	1620	650	
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 Tips for Data Manipulation: Tutorial from Streamflow Evaluations for Watershed Restoration Planning and Design, http://water.oregonstate.edu/streamflow/, Oregon State University, 2002-2005.

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	WATER YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AllG	SEPT	
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	1992	92.4	721	1464	1760	2526	774	1303	503	209	116	71.8	82.6	
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	1996	327	2412	5250	4745	6909	1386	2012	1262	493	224	120	122	_
	1997	323	2307	6977	4115	2127	3035	1314	746	443	203	128	262	
	1998	1291	2039	2085	4233	3675	2533	1055	738	446	211	118	102	_
	1999	170	2782	5507	4848	6750	2854	1441	962	383	191	128	80.5	-
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IF USING A USGS GAGE, MONTHLY STATISTICS ARE ALREADY CALCULATED

- Go to http://oregon.usgs.gov
- Select Historical Water Data
- Select Surface Water
- Select Statistics (Monthly)
- Check box under Site Identifier for Site Name and Submit
- Type in Alsea under Site Name and select match any part and Submit
- In the Retrieve data from boxes enter the date range of "1990-10-01" to "2000-10-01"
- Select Tab-separated data and Display in browser and Submit
- Select gage at TIDEWATER (14306500)

** Data included in this table are for all of the Alsea gages, be absolutely certain that you are using the data for your desired gage (in this case 14306500)

- Select Data Set for desired gage to copy
- Paste Special as text (this will separate the data into columns)

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YEAR	MONTH	STREAMFLOW (CFS)				-					STREAME	LOW (CFS	1
1990	10	256			WATER YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MA
1990	11	1663			1991	256	1553	1554	1905	1968	2467	1889	885
1990	12	1654			1992	92.4	721	1464	1780	2526	774	1303	50
1991	1	1905			1993	124	878	2478	2371	921	2456	2858	134
1991	2	1968			1994	100	108	1389	1533	1969	1486	1208	41
1991	3	2467			1995	314	2254	3925	4823	3646	3029	1784	68
1991	4	1889			1996	327	2412	5250	4745	6909	1386	2012	126
1991	- 5	889			1997	323	2307	6977	4115	2127	3035	1314	74
1991	6	413			1998	1291	2039	2095	4233	3675	2533	1055	73
1991	7	200			1999	170	2782	5507	4848	6750	2854	1441	96
1991	8	119			2000	133	2189	3879	3535	2903	1620	650	96
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1992	5	503											
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WATER YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
1991	256	1553	1554	1905	1968	2467	1889	889	413	200	119	83
1992	92.4	721	1464	1760	2526	774	1303	503	209	116	71.8	82.6
1993	124	878	2478	2371	921	2456	2958	1341	1053	346	173	105
1994	100	108	1389	1533	1969	1495	1208	410	332	151	89.1	80.8
1995	314	2254	3925	4823	3646	3029	1784	880	402	166	109	123
1996	327	2412	5250	4745	6909	1386	2012	1262	493	224	120	122
1997	323	2307	6977	4115	2127	3035	1314	746	443	203	128	262
1998	1291	2039	2085	4233	3675	2533	1055	738	446	211	118	102
1999	170	2782	5507	4848	6750	2854	1441	962	383	191	128	80.5
2000	133	2189	3879	3535	2903	1620	650	961	602	229	125	113
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Step 4: Obtain Annual Averages

• In Fifth Column, use the average function in Excel to obtain the average for each water year for the first four water years in the period of record.

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	B	C	D	E	F	G	H	1	
AGENCY	STATION	DATE (Month, Day, Year)	STREAMFLOW (CFS)	ANNUAL AVERAGES (CFS)			-		
USGS	14306500	10/1/90	83						-
USGS	14306500	10/2/90	86				_		-
USGS	14306500	10/3/90	93						
USGS	14306500	10/4/90	96				-		-
USGS	14306500	10/5/90	101						
USGS	14306500	10/6/90	106						
USGS	14306500	10/7/90	94						-
USGS	14306500	10/8/90	87						
USGS	14306500	10/9/90	84						
USGS	14306500	10/10/90	82						
USGS	14306500	10/11/90	83						
USGS	14306500	10/12/90	94						
USGS	14306500	10/13/90	99						
USGS	14306500	10/14/90	97						
USGS	14306500	10/15/90	130						
USGS	14306500	10/16/90	177				-		
USGS	14306500	10/17/90	152						
USGS	14306500	10/16/90	241						-
USGS	14306500	10/19/90	340						
USGS	14306500	10/20/90	209						-
USGS	14306500	10/21/90	272						
USGS	14306500	10/22/90	575						-
USGS	14306500	10/23/90	315					-	-
USGS	14306500	10/24/90	220						-
USGS	14306500	10/25/90	195						-
USGS	14306500	10/26/90	352						-
USGS	14306500	10/27/90	315					1	1
USGS	14306500	10/26/90	323					1	+
USGS	14306500	9/26/94	62						-
LISSS	14306500	9/27/94	62					-	-
LISGS	14306500	9/26/94	61						-
LISGS	14306600	9/29/94	65						1
LISGS	14306500	0/30/04	75	731				-	-
LISOS	1/306500	10/1/94	78	(3)					-
110000	14306500	10/0/04	70						
Alsea Da	ta / Sheet? / Sheet)	1		10			1000	100	100 State

• Copy the Annual Average Column for the first four years and paste to rest of Data Set. This will compute the annual averages for the remaining years.

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AGENCY	STATION	DATE (Month, Day, Year)	STREAMFLOW (CFS)	ANNUAL AVERAGES (CFS)				_	
USGS	14306500	10/1/90	83	Contraction of the second second second			-		-
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USGS	14306500	10/3/90	90						
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USGS	14306500	9729794	65						
USGS	14306500	9/30/94	75	731			-		-
USGS	14306500	10/1/94	78						
USGS	14306500	10/2/94	73						-
USGS	14306500	10/3/94	69						_
USGS	14306500	10/4/94	63			_			
USGS	14306500	10/5/94	60				-		-
USGS	14306500	10/6/94	60			_		_	
USGS	14306500	10/7/94	59						-
USGS	14306500	10/6/94	58				-	1	
USGS	14306500	10/9/94	58			_			-
USGS	14306500	10/10/94	58						-
USGS	14306500	10/11/94	58					_	
USGS	14306500	10/12/94	58						-
USGS	14306500	10/13/94	59				-		
USGS	14306500	10/14/94	74			_		_	
USGS	14306500	10/15/94	93					-	
USGS	14306500	10/16/94	87				-		
USGS	14306500	10/17/94	11			_			
USGS	14306500	10/18/94	72						-
USGS	14306500	10/19/94	71				-		
USGS	14306500	10/20/94	70						
USGS	14306500	10/21/94	82	80 I S			-		
USGS	14306500	10/22/94	96			_		_	
USGS	14306500	10/23/94	87	1 V/2					
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• Organize Annual Data by Year for Period of Record

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WATER YEAR	STREAMFLOW (CFS)	STREAMFLOW (CFS)								10-1-1
	WATER YEAR	USGS - CALENDAR YEAR								
1991	1102	1012				_		-		
1992	795	896								
1993	1262	1104						-		
1994	731	1141								
1995	1782	1908								
1996	2088	2226								
1997	1837	1482								
1996	1533	1790								
1999	2148	1958								
2000	1409									
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 Tips for Data Manipulation: Tutorial from Streamflow Evaluations for Watershed Restoration Planning and Design, http://water.oregonstate.edu/streamflow/, Oregon State University, 2002-2005.

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IF USING A USGS GAGE, ANNUAL STATISTICS ARE ALREADY CALCULATED

(Annual averages are based on calendar year 1/1/XX – 12/31/XX)

The monthly values can be used to generate mean annual flows by water year.

- Go to http://oregon.usgs.gov
- Select Historical Water Data
- Select Surface Water
- Select Statistics (Annual)
- Check box under Site Identifier for Site Name and Submit
- Type in Alsea under Site Name and select match any part and Submit
- In the Retrieve data from boxes enter the date range of "1990-10-01" to "2000-10-01"
- Select Tab-separated data and Display in browser and Submit
- Select gage at TIDEWATER (14306500)

** Data included in this table are for all of the Alsea gages, be absolutely certain that you are using the data for your desired gage (in this case 14306500)

• Select data set for desired gage to copy

Paste Special as text (this will separate the data into columns)

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A	8	<u>C</u>	D	E	F.	G	H	1		ĸ	L
VATER YEAR	STREAMFLOW (CFS)	STREAMFLOW (CFS)							1		
	WATER YEAR	USGS - CALENDAR YEAR									_
1991	1102	1012		-							
1992	795	896									
1993	1262	1104									
1994	731	1141			-		_				_
1996	1782	1908					_		_		
1996	2088	2226		-	-	-			-		
1967	1637	1482					-		-		
1996	1533	1790			-				-		
1999	2148	1958		-						-	
2000	1409										
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