

Harvard Forest Schoolyard LTER



Data I Workshop
Harvard Forest
14 Nov 2013

Emery R. Boose

Photos contributed by program staff & teachers

Data I Workshop

Introduction to data management
How to use the online system



Data Management Goals

Make data available to other scientists and the public
Preserve data for use by future generations



Harvard Forest Archives

This agreement was prepared by Otto Louis Richardson, Esq. (Attorney) of Boston, to determine unmistakably the exact direction of the south boundary, measured as the rail fence which originally determined the boundary, had almost disappeared in decay. - Mr. Lucien P. Cutler, Townsman, returned to sign the agreement.

The undersigned, agree that the boundary lines as shown on a plan entitled "G. F. Schwarz Tract" surveyed by R. M. Marble and L. T. Tynan, 1913*, to be recorded herewith, are and heretofore have been the true and correct bounds between the lands owned by each of us. The compass courses and distances of the lines dividing our lands are shown on said plan against our names, and bound corners and drill holes lying in said courses are shown on said plan in red ink.

Signed and sealed this _____ day of _____ 1913.

G. Frederick Schwarz
 U. P.
 C. B. C.

Witnessed by
 Lucien P. Cutler
 U. P.
 C. B. C.

COMMONWEALTH OF MASSACHUSETTS

ss. _____ 1913. Then personally appeared the above-named Lucien P. Cutler and Charles B. Cutler and acknowledged the foregoing instrument to be their free act and deed, before me, -

Justice of the Peace.

COMMONWEALTH OF MASSACHUSETTS

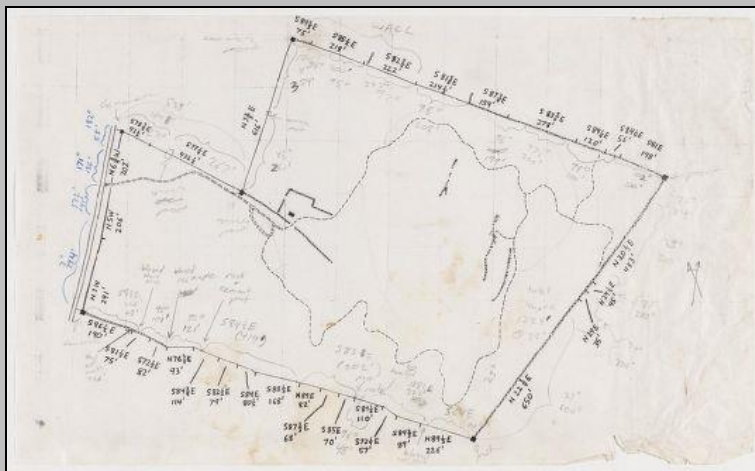
ss. _____ 1913. Then personally appeared the above-named G. Frederick Schwarz and acknowledged the foregoing instrument to be his free act and deed, before me, -

Justice of the Peace.

HARVARD FOREST RECORDS

PROPERTY OF Schwarz Lot YEAR OF 1930-31

DATE	LOCATION	KIND OF TREATMENT	AREA	WORKMEN AND TIME OF EACH	TRUCK LOADS	SUPERVISOR	TIME	TRANS.	LABOR	TRAILS	SUPPLY	TRAILS	COSTS	REMARKS
1926		Boundary	CA 4	LR 4	20	10	10							CA 14.25
1926		"	8	8	60	10	8							LF 3.00
1925		Clearings	7	19	40	60	10	7						LF 4.50
1918		Typing	6	6			10	6						LF 4.50
1919		Mapping	4	4										
1922		Planting	3	3			3		10					CA 13.75
1921			4	5			10	4						MS 5.25
1910		Clearings												LF 16.50
4/14		Typing	7	7	7	7	10							CA 8.60
4/14		"	7	7	7	4	10							MS 17.60
4/16		"	3	3	3	3	10							MS 6.35
4/17		Mapping	2	2										
4/22-24		Office work	6	6										
			25	22	7									
5/21		Clearings	2	2	2		10							
5/26		"	6 1/2	6 1/2			10							
5/27		"	2	2	2		10							
5/27		Office work	1	1										
			1/2	1/2	84									



Diary of Work
 on
 Schwarz Tract

20 June 61
 Started work for the summer by locating, marking, and brushing out the boundary extending north & west from the corner stone located a short distance down the road from the cabin. Also, the section of the North boundary which did not follow a stone wall, was located, marked and brushed out.

The days crew consisted of Jack Coney, Ed _____, Bill Page, Alex Haggard, and myself, Paul Johnson.

21 June 61
 With regular crew of three men, Page, Knapp, and myself.

Phenology of Woody Species



Harvard Forest Data Archive HF003

DATE	TREEID	FOPEN	FPAST	LCOLOR	LFALL	CIRCUIT	COMMENTS
2006-09-01	AMSP-01	NA	NA	12	2	1	
2006-09-01	FRAM-01	NA	NA	3	0	2	
2006-09-01	PRSE-01	NA	NA	5	2	3	
2006-09-01	ACRU-01	NA	NA	0	0	4	
2006-09-01	AMSP-02	NA	NA	0	0	5	
2006-09-01	ACSA-01	NA	NA	0	0	6	
2006-09-01	BELE-01	NA	NA	0	0	7	

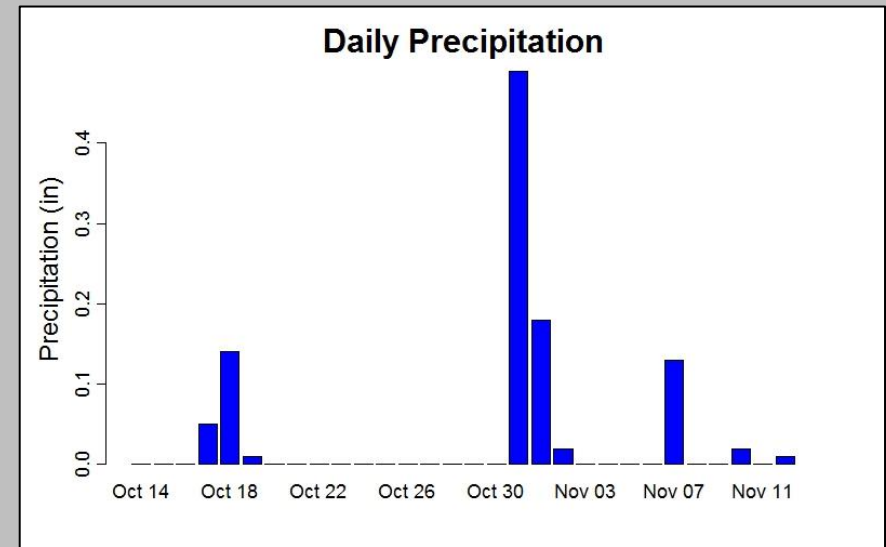
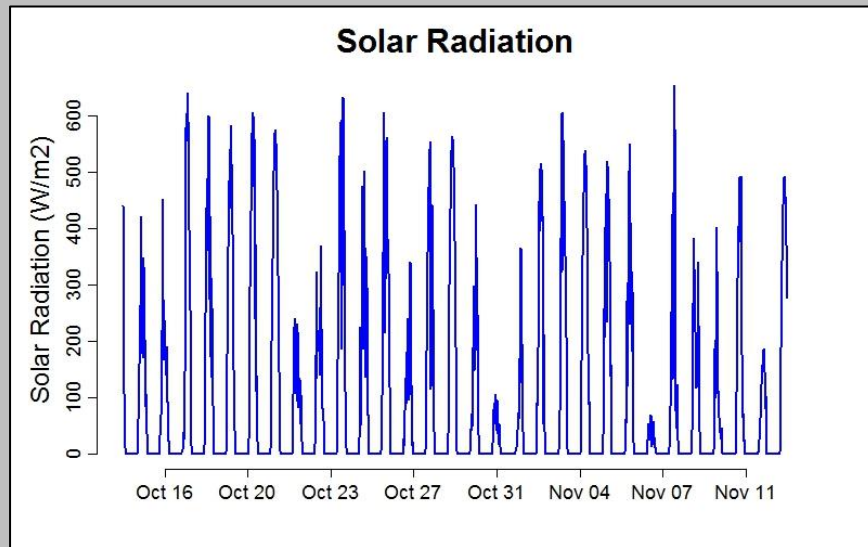
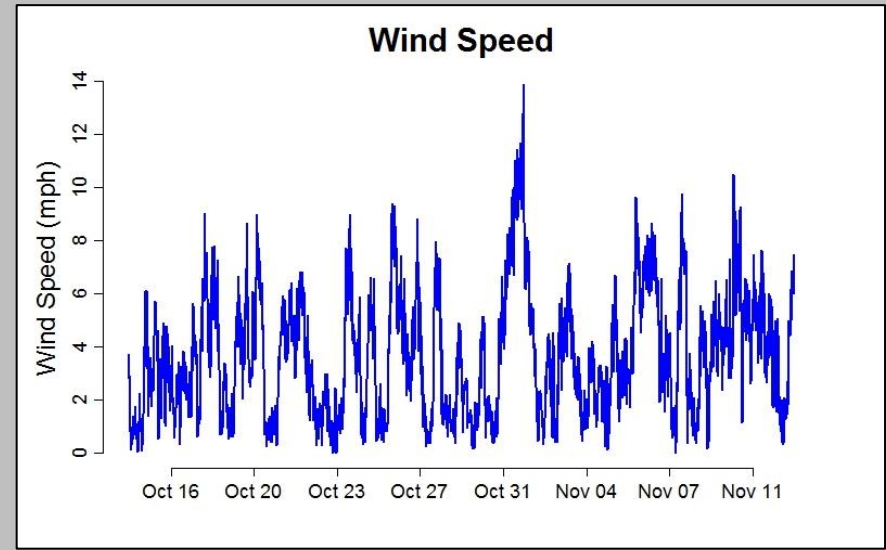
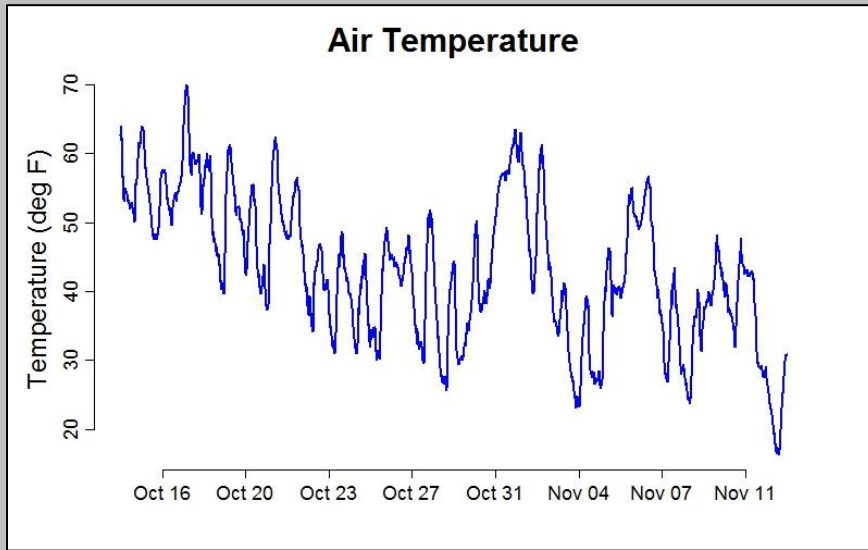
Fisher Meteorological Station



Harvard Forest Data Archive HF001

```
DateTime, Jul, AirT, Rh, DewP, Prec, SlrR, ParR, NetR, Bar, Wspd, Wres, Wdir, Wdev, Gspd, S10T
, , (C), (%), (C), (mm), (W/m2), (umol/sm2), (W/m2), (mb), (m/s), (m/s), (deg), (deg), (m/s), (C)
2005-01-01T00:15, 1, 5.1, 84, 2.5, 0.0, 0, 0, -58, 1017, 2.6, 2.4, 205, 26, 7.2, 0.7
2005-01-01T00:30, 1, 5.0, 84, 2.5, 0.0, 0, 0, -59, 1017, 2.3, 2.1, 213, 25, 5.9, 0.7
2005-01-01T00:45, 1, 4.9, 85, 2.6, 0.0, 0, 0, -59, 1017, 2.1, 1.8, 217, 27, 5.8, 0.7
2005-01-01T01:00, 1, 4.7, 86, 2.6, 0.0, 0, 0, -58, 1017, 1.8, 1.6, 226, 26, 5.1, 0.7
2005-01-01T01:15, 1, 4.5, 87, 2.6, 0.0, 0, 0, -58, 1017, 1.4, 1.2, 224, 29, 4.6, 0.7
2005-01-01T01:30, 1, 4.6, 87, 2.7, 0.0, 0, 0, -58, 1017, 1.6, 1.4, 214, 30, 4.4, 0.7
2005-01-01T01:45, 1, 4.6, 87, 2.7, 0.0, 0, 0, -57, 1017, 1.5, 1.3, 214, 30, 5.0, 0.7
2005-01-01T02:00, 1, 4.7, 88, 2.8, 0.0, 0, 0, -57, 1017, 1.5, 1.4, 213, 27, 4.2, 0.7
2005-01-01T02:15, 1, 4.6, 88, 2.8, 0.0, 0, 0, -59, 1017, 1.6, 1.4, 217, 27, 4.2, 0.7
```


Real Time Data Graphs



Metadata

Metadata provide the information needed to locate, access, and correctly interpret a dataset



source: The New Yorker

Data & Metadata

METADATA

DateTime = Date and time at end of sampling period (YYYY-MM-DDThh:mm)

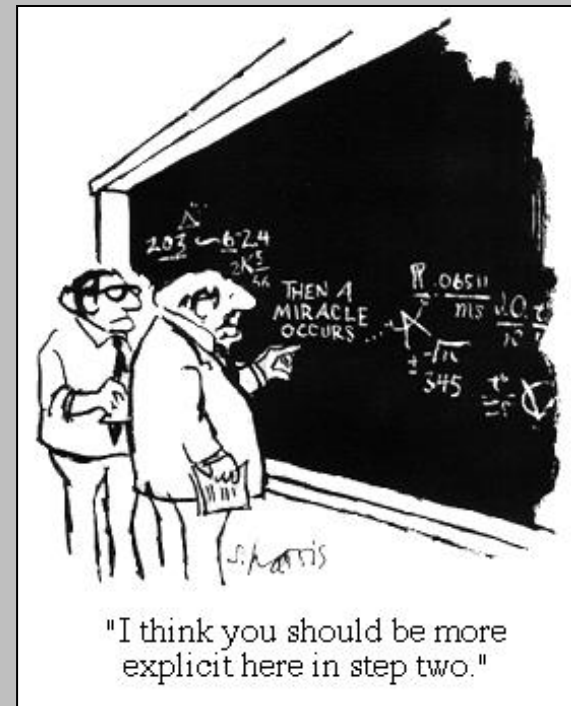
Jul = Julian day (DDD)

AirT = Air temperature. Average of 1-second measurements. (celsius)

Rh = Relative humidity. Average of 1-second measurements. (percent)

DewP = Dew point. Average of 1-second values calculated from air temperature and relative humidity. (celsius)

Prec = Precipitation. Includes water equivalent of snow. Total value for 15-minute period. Measured in increments of 0.01 inch. (millimeter)



source: The New Yorker

DATA

DateTime	Jul	AirT	Rh	DewP	Prec
2005-01-01T00:15	1	5.1	84	2.5	0.0
2005-01-01T00:30	1	5.0	84	2.5	0.0
2005-01-01T00:45	1	4.9	85	2.6	0.0
2005-01-01T01:00	1	4.7	86	2.6	0.0

Schoolyard LTER Database

id	school_code	teacher_lastname	date	tree_id	species_code	leaves_total
1	AHE	Rosenthal	2010-09-14	1	SH	18
2	AHE	Rosenthal	2010-09-14	2	SA	12
3	AHE	Rosenthal	2010-09-14	3	RM	12
4	AHE	Rosenthal	2010-09-14	4	BC	12
5	AHE	Rosenthal	2010-09-14	5	GB	12
6	AHE	Rosenthal	2010-09-14	6	WB	18
7	AHE	Rosenthal	2010-09-14	7	WO	12
8	AHE	Rosenthal	2010-09-14	8	RO	12
9	AHE	Rosenthal	2010-09-14	9	BB	12
10	AHE	Rosenthal	2010-09-14	10	SA	18
11	AHE	Rosenthal	2010-09-14	11	WB	12
12	AHE	Rosenthal	2010-09-14	12	RM	12
13	AHE	Rosenthal	2010-09-21	1	SH	18
14	AHE	Rosenthal	2010-09-21	2	SA	12
15	AHE	Rosenthal	2010-09-21	3	RM	12
16	AHE	Rosenthal	2010-09-21	4	BC	12
17	AHE	Rosenthal	2010-09-21	5	GB	12
18	AHE	Rosenthal	2010-09-21	6	WB	18
19	AHE	Rosenthal	2010-09-21	7	WO	12
20	AHE	Rosenthal	2010-09-21	8	RO	12
21	AHE	Rosenthal	2010-09-21	9	BB	12
22	AHE	Rosenthal	2010-09-21	10	SA	18
23	AHE	Rosenthal	2010-09-21	11	WB	12
24	AHE	Rosenthal	2010-09-21	12	RM	12
25	AHE	Rosenthal	2010-09-29	1	SH	18
26	AHE	Rosenthal	2010-09-29	2	SA	12
27	AHE	Rosenthal	2010-09-29	3	RM	12
28	AHE	Rosenthal	2010-09-29	4	BC	12
29	AHE	Rosenthal	2010-09-29	5	GB	12
30	AHE	Rosenthal	2010-09-29	6	WB	18
31	AHE	Rosenthal	2010-09-29	7	WO	12
32	AHE	Rosenthal	2010-09-29	8	RO	12
33	AHE	Rosenthal	2010-09-29	9	BB	12
34	AHE	Rosenthal	2010-09-29	10	SA	18
35	AHE	Rosenthal	2010-09-29	11	WB	12
36	AHE	Rosenthal	2010-09-29	12	RM	12
37	AHE	Rosenthal	2010-10-05	1	SH	18

Programs



Data (PHP)

Graphs (R)

Harvard Forest > Schoolyard LTER Website

Schoolyard LTER Database

Welcome to the Harvard Forest Schoolyard LTER Database. This page provides access to the database data and to view current lists of schools, teachers, and trees. You can also submit new data. HF Schoolyard Staff can review current data.

- Instructions
- Download Data
- Graph Data
- Schools
- Teachers
- Tree Species
- Submit Data
- Review Data
- Find Duplicates

Back End

Database on HF Server
(MySQL)

Front End

Web page in your browser
(Firefox, etc)

Missing Values



source: sendaiben.org

PROBLEM

- No universal standard for representing missing values
- Different software packages handle missing values differently
- Never use zero. Zero could be a measured value (0 degrees) or a code (0 = dead)

SCHOOLYARD DATABASE

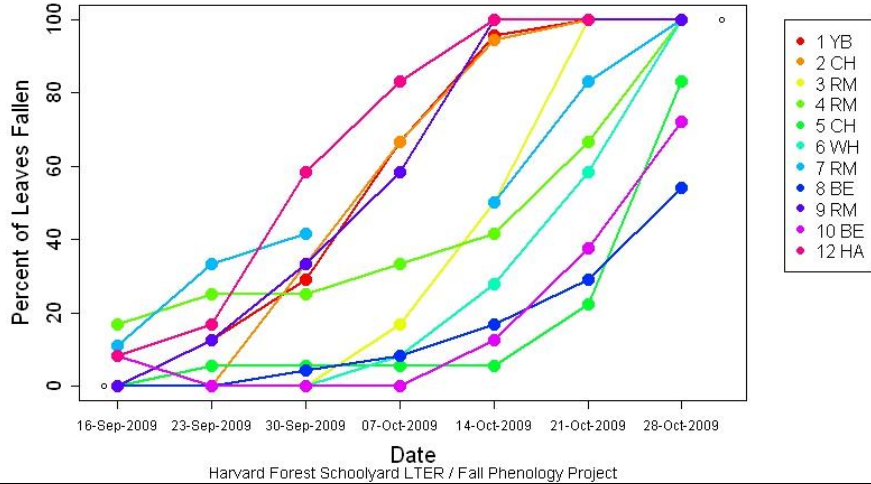
- When entering data, leave text box empty or select “Missing Data” from pull-down list
- Missing value code in MySQL database = NULL
- Missing value code when downloading data = NA

OTHER SOFTWARE

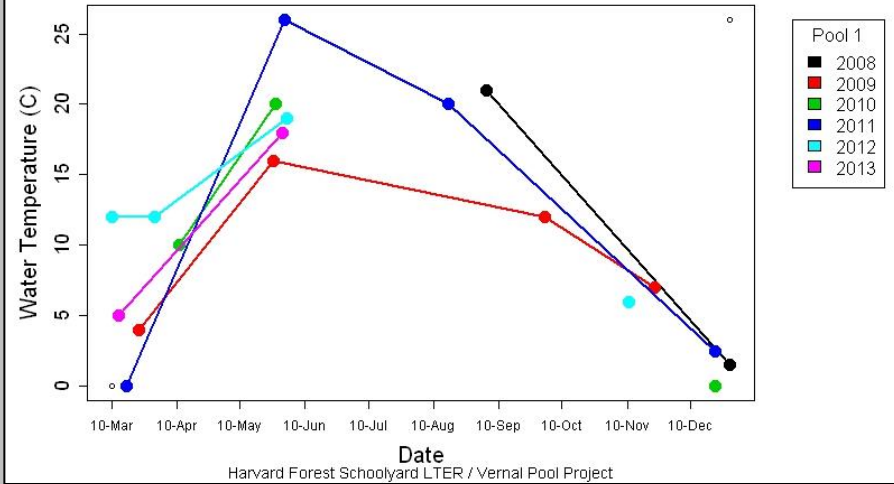
- Missing value code in R = NA
- Missing value code in Excel = #N/A

Schoolyard LTER Database

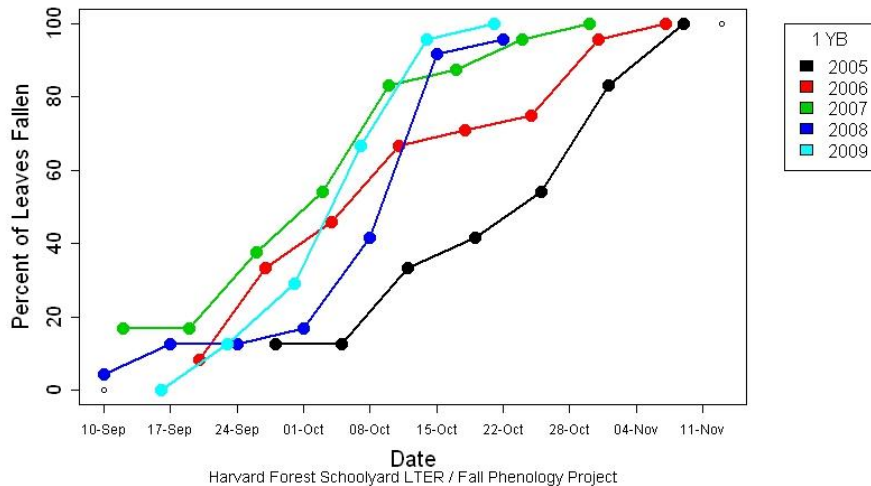
Athol-Royalston Middle School



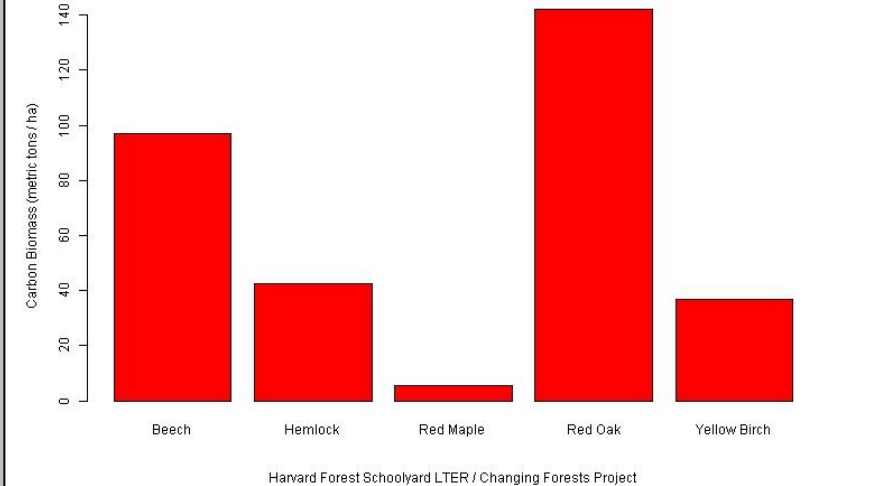
Drumlin Farm Mass. Audubon



Athol-Royalston Middle School



Gardner High School Plot 1 Survey 1 (2013)



Looking at Data Workshop

9 Jan 2014

