



# Presenting Data Effectively

Based on Materials by Geoff Dates  
River Network

Elizabeth Herron  
Volunteer Water Quality Monitoring  
National Facilitation Project

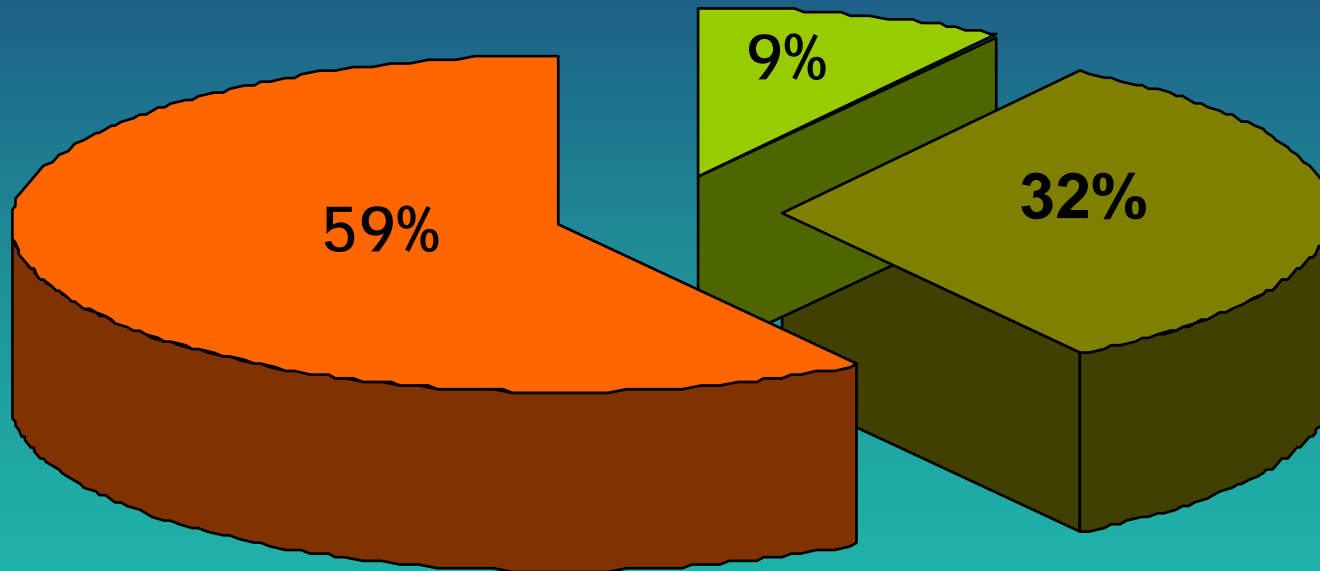
USDA-CSREES National Water Conference, Sparks NV  
February 6, 2008



# Turning Data Into Information

- 1) Program and Study Design
- 2) Monitoring and Recording
- 3) Data Entry and Validation
- 4) Data Summary
- 5) Data Interpretation
- 6) Data Presentation
- 7) Action and/or Further Monitoring

# *What People Remember*



■ Oral ■ Visual Alone ■ Visual & Oral

# Design Basics



- 💧 Slide Layout
- 💧 Type Size and Style
- 💧 Color
- 💧 Images

# Slide Layout Avoid Clutter

The "Tree" starts  
to look like this:

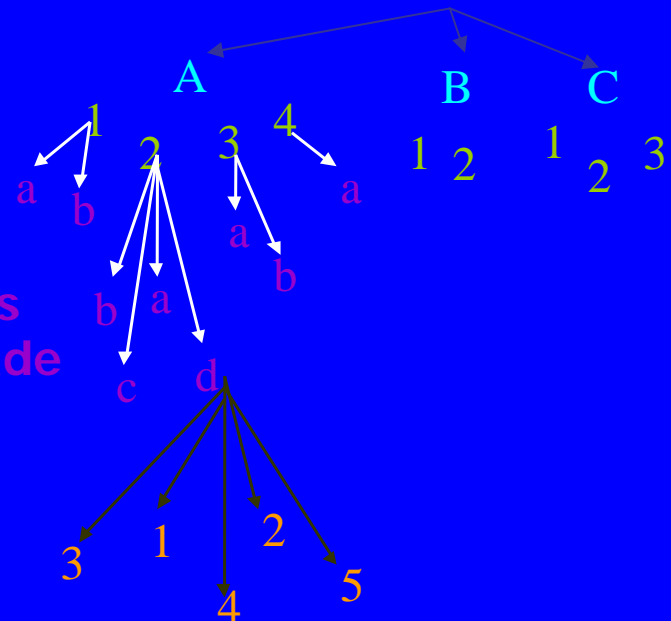
Watershed vision

- Management goal 1 of N
- Monitoring objective

List of  
decision  
makers

Decisions  
to be made

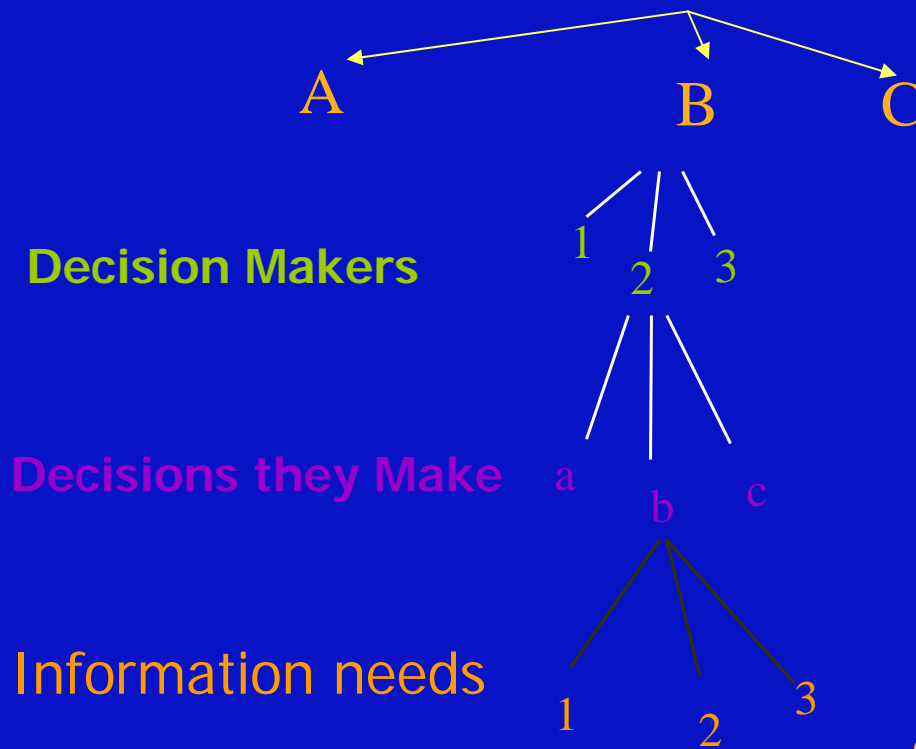
Information needs



# Information Needs Decision Tree

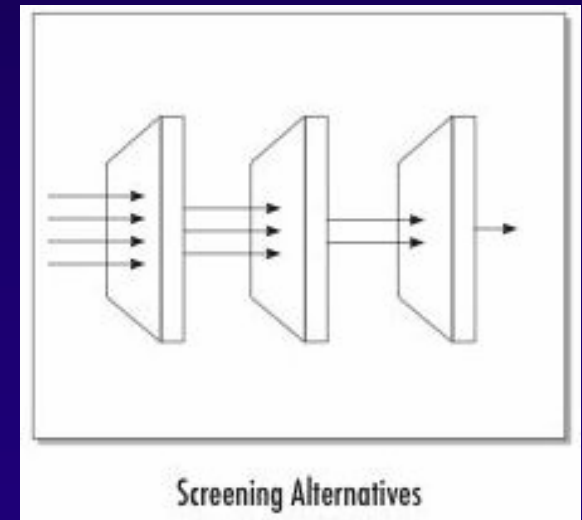
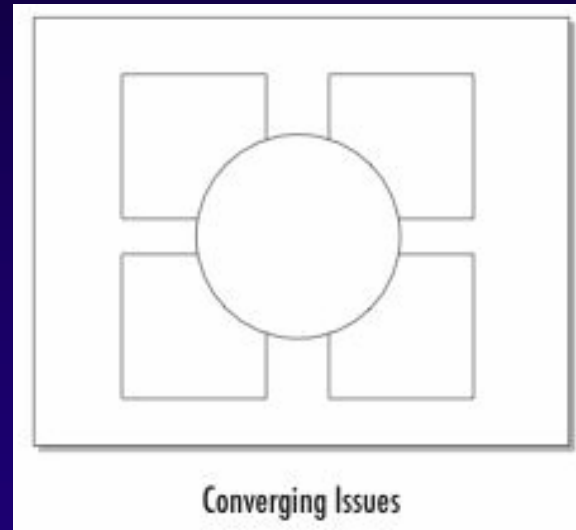
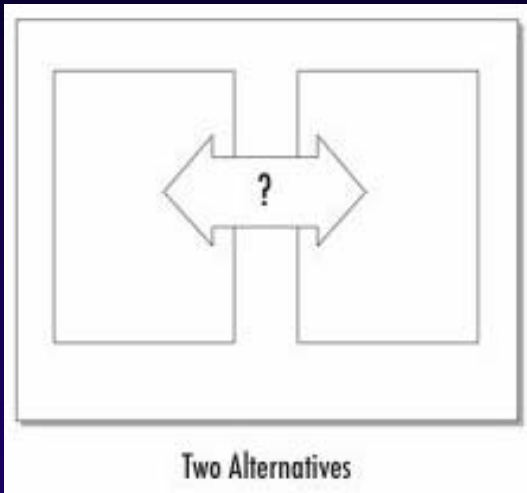
Management goal 1 of N

Monitoring objectives




Slide Layout  
Avoid Clutter

# Layout Supports Your Point



# Design Basics

## Type




**Typeface:** a collection of characters, letters and symbols that have a unique design: e.g. Arial.

**Font:** a specific typeface in a specific point size and style. e.g. Arial 24 pt.

*Used interchangeably*



# Size Matters



Raise your hand if you can read this. (8 pt)

Raise your hand if you can read this. (10 pt)

Raise your hand if you can read this. (12 pt)

Raise your hand if you can read this. (16 pt)

Raise your hand if you can read this. (20 pt)

Raise your hand if you can read this. (24 pt)

Raise your hand if you can read this. (28 pt)

# Fonts Matter



Which is easiest to read?

## Sans Serif

Arial  
Comic Sans  
Helvetica  
Trebuchet  
Verdana

## Serif

Courier  
Garamond  
Times New Roman

## “Other”

Curly MT  
*Edwardian Script*  
*Lucida Handwriting*  
Olive Oil  
**STENCIL**

Book Antigua  
Goudy



# Design Basics

## Color

Contrast and Readability

Which Is Most Readable?

Which Is Most Readable?

Which Is Most Readable?

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# Design Basics

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## Color



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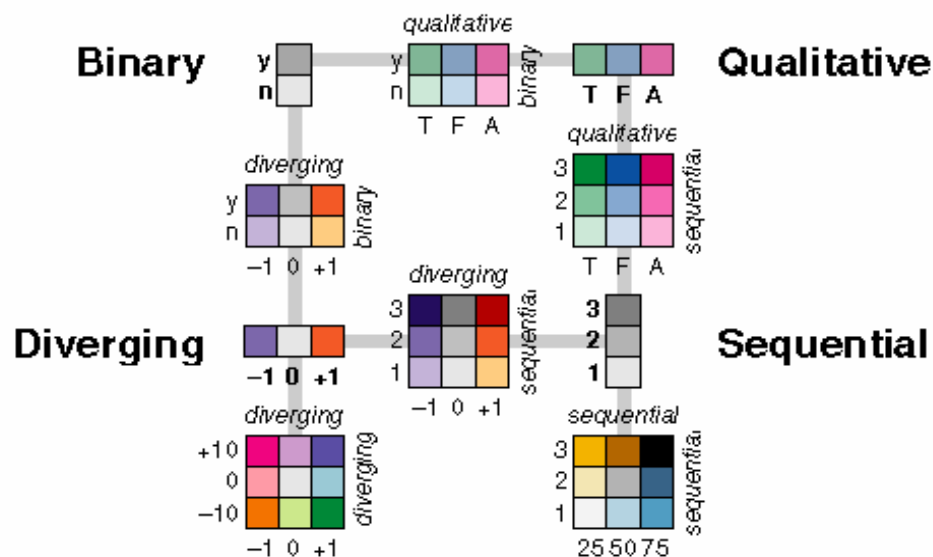
## Color Use Guidelines for Mapping and Visualization

Cynthia Brewer

<http://www.personal.psu.edu/cab38/ColorSch/Schemes.html>

### Color Scheme Types and Combinations: Overview

Select the color scheme of interest below to see examples of it in use.



Go back to [Cindy's page](#) or [PSU Geography](#) or [GeoVISTA](#)

Dr. Cynthia Brewer (Department of Geography) / The Pennsylvania State University

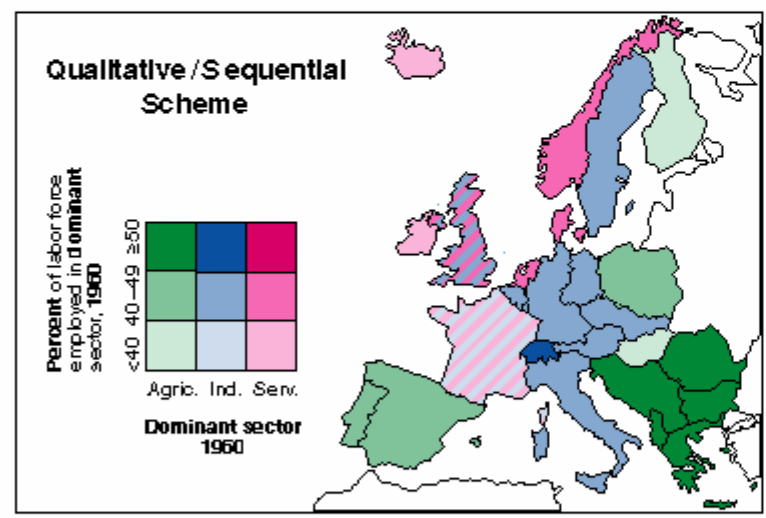
Done

Stop loading this page

## Qualitative Sequential Color Schemes

In qualitative/sequential schemes, the qualitative variable is represented with hues and the quantitative variable is represented with sequences of lightness steps within each hue. Binary/sequential schemes are a subset of qualitative/binary schemes with the binary variable represented by a hue difference and lightness difference reserved for the sequential variable. Population percentages (sequential) of varied dominant ethnic groups or religions (qualitative), for example, are well represented by a qualitative/sequential color scheme.

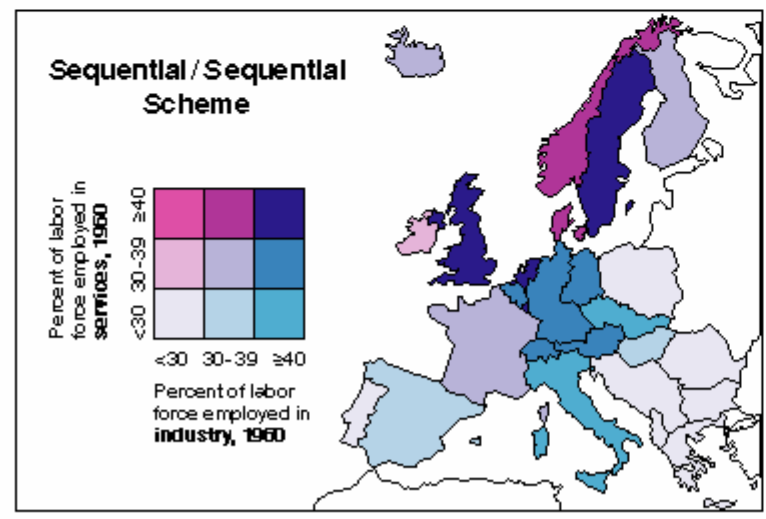
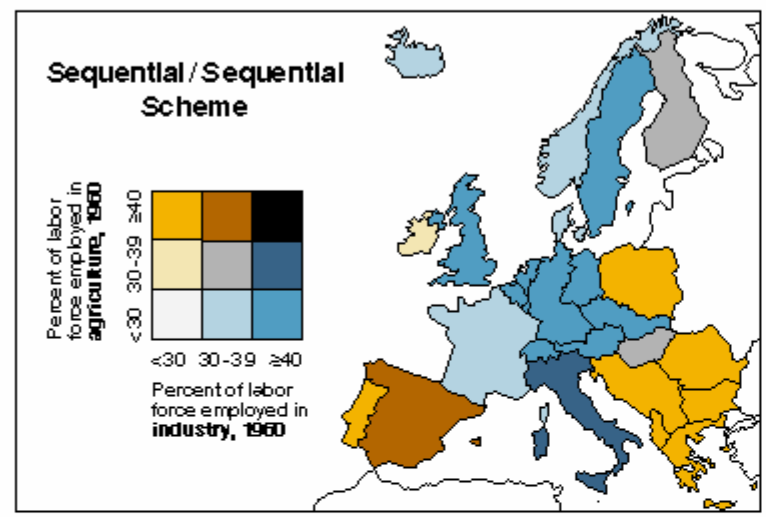
### Qualitative Sequential Color Example



[...back to Color Scheme Types and Combinations: Overview](#)

Go back to [Cindy's page](#) or [PSU Geography](#) or [GeoVISTA](#)  
 Dr. Cynthia Brewer / Department of Geography / The Pennsylvania State University

## Sequential Sequential Color Examples



# Data Presentation



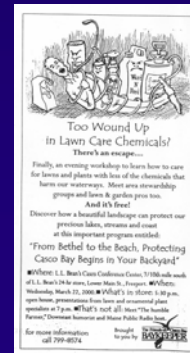
Summarize your data to tell your story

- 💧 Tailor to your audience
- 💧 Tailor to your audience
- 💧 Time
- 💧 Level of detail
- 💧 Visuals
- 💧 "Sound bites"

# Data Presentation

## Present your story

- 💧 Reports
- 💧 Posters
- 💧 Slide Presentations
- 💧 Video
- 💧 Web Site





# Data Presentation

## What Makes A Good Table?

- 💧 Readable, logical data placement
- 💧 Clear column and row headings
- 💧 A title at the top
- 💧 Reporting units

E. Coli Bacteria (colonies per 100 ml)								
1992	27-May	16-Jun	3-Aug	20-Aug	23-Sep	7-Oct	21-Oct	Geomean
MoB017	-	-	-	-	500	324	300	365
MoB016	200	24000	10000	2500	700	200	500	1355
MoB015	7	430	10000	6200	1200	600	1400	788
MoB014	200	7500	-	13800	10000	2900	700	2737
MoB013	200	2400	-	12200	10000	1800	1300	2271
MoB001	200	90	770	310	7100	248	8	250

# Data Presentation

## What's Wrong with This Table?

Table 7. Water chemistry data collected at Maryland Biological Stream Survey sites in Allegany County, 1994-1997.

Site	pH	Conductivity ( $\mu\text{S}/\text{cm}$ )	Acid Neutralizing Capacity ( $\mu\text{eq}/\text{L}$ )	Nitrate ( $\text{mg}/\text{L}$ )	Sulfate ( $\text{mg}/\text{L}$ )	Dissolved Oxygen ( $\text{mg}/\text{L}$ )	Dissolved Organic Carbon ( $\text{mg}/\text{L}$ )
AL-A-007-304-96	7.46	0.246	515.90	1.177	73.513	7.70	1.20
AL-A-020-228-95	6.33	0.043	93.73	0.143	10.597	1.70	2.00
AL-A-027-205-95	6.94	0.115	183.60	0.171	14.624	8.20	2.00
AL-A-027-209-95	6.98	0.113	175.46	0.185	14.875	7.60	3.00
AL-A-033-314-95	7.07	0.047	182.15	0.323	10.027	8.20	2.00
AL-A-054-320-96	7.21	0.632	654.80	0.859	235.872	8.10	1.10
AL-A-061-125-95	6.12	0.048	33.65	0.200	17.200		2.00
AL-A-069-102-95	5.94	0.032	73.24		8.779		1.00
AL-A-143-226-95	6.84	0.066	138.19	0.577	15.442	9.20	2.00
AL-A-146-301-95	6.89	0.048	177.81	0.293	10.269	9.30	2.00
AL-A-148-201-96	7.85	0.202	1163.00	0.183	36.002		2.70
AL-A-167-230-95	6.91	0.047	131.04	0.159	11.097	5.70	1.00
AL-A-171-206-95	6.49	0.042	92.90	0.115	11.021	6.40	2.00
AL-A-177-232-95	6.70	0.051	94.23	0.160	14.913	3.40	2.00
AL-A-187-218-96	7.33	0.102	391.60	0.789	22.004	7.50	2.00
AL-A-199-122-95	6.60	0.106	74.56	0.354	11.412	8.40	2.00
AL-A-202-121-96	7.28	0.160	343.10	1.113	44.963	8.20	1.10
AL-A-207-307-95	6.91	0.055	172.95	0.256	10.337	7.40	2.00
AL-A-215-112-95	6.99	0.053	231.11	0.144	11.985	6.80	2.00
AL-A-221-107-96	4.98	0.981	-3.40	1.211	520.266	9.30	1.00
AL-A-232-313-96	7.01	0.345	175.70	0.795	22.083	7.40	2.40
AL-A-233-601-96	8.23	0.692	3364.50	1.585	71.875	8.60	1.20
AL-A-244-227-95	6.77	0.054	144.01	0.120	14.358	3.80	2.00
AL-A-248-213-95	6.69	0.084	291.05	0.135	21.552	7.90	2.00
AL-A-248-234-95	7.30	0.114	400.21		35.383	8.40	5.00
AL-A-254-326-96	7.97	0.861	308.70	0.594	346.426	10.10	0.80
AL-A-255-108-95	7.14	0.073	255.68	0.507	17.050	6.50	2.00
AL-A-268-221-96	7.24	0.130	475.20	0.303	28.983	6.00	3.30

# Data Presentation

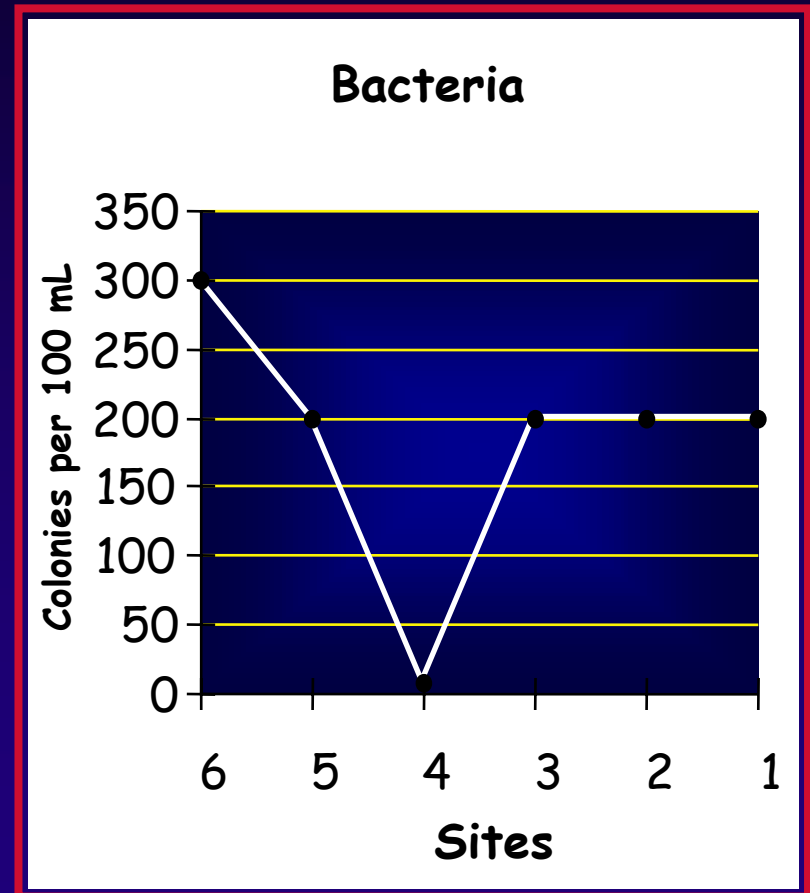
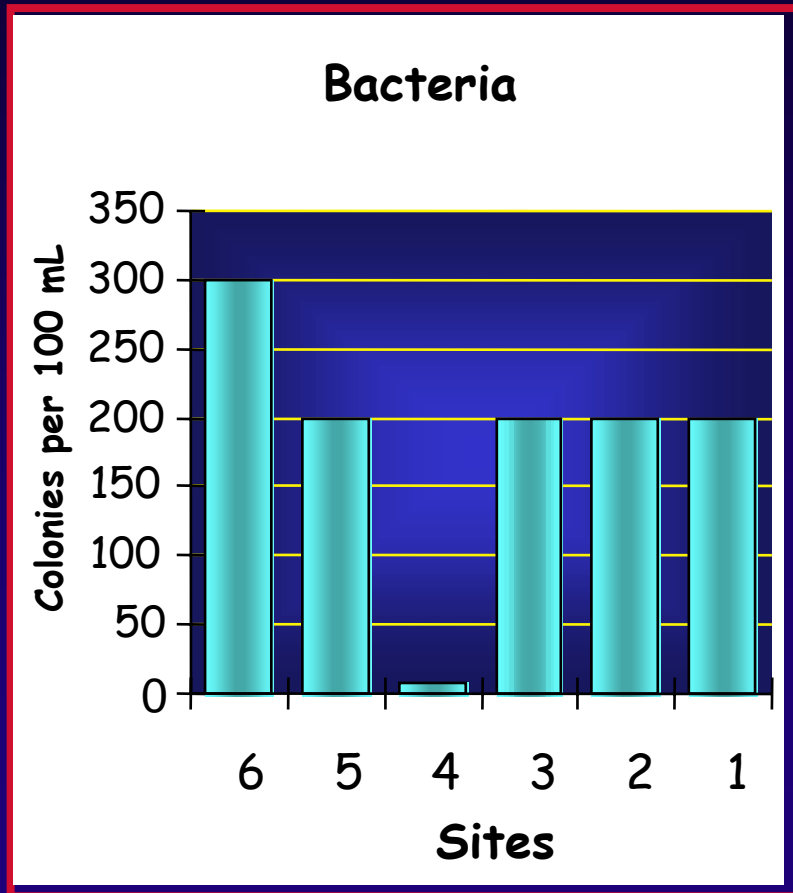
## What Makes A Good Graph?



- 💧 Clear title
- 💧 Simple clear axis labels
- 💧 Elements that allow the reader to get the point
- 💧 A legend explaining graph elements
- 💧 A scale appropriate to the data
- 💧 Clear reporting units
- 💧 Reveals a story
- 💧 Minimum of clutter

# Data Presentation

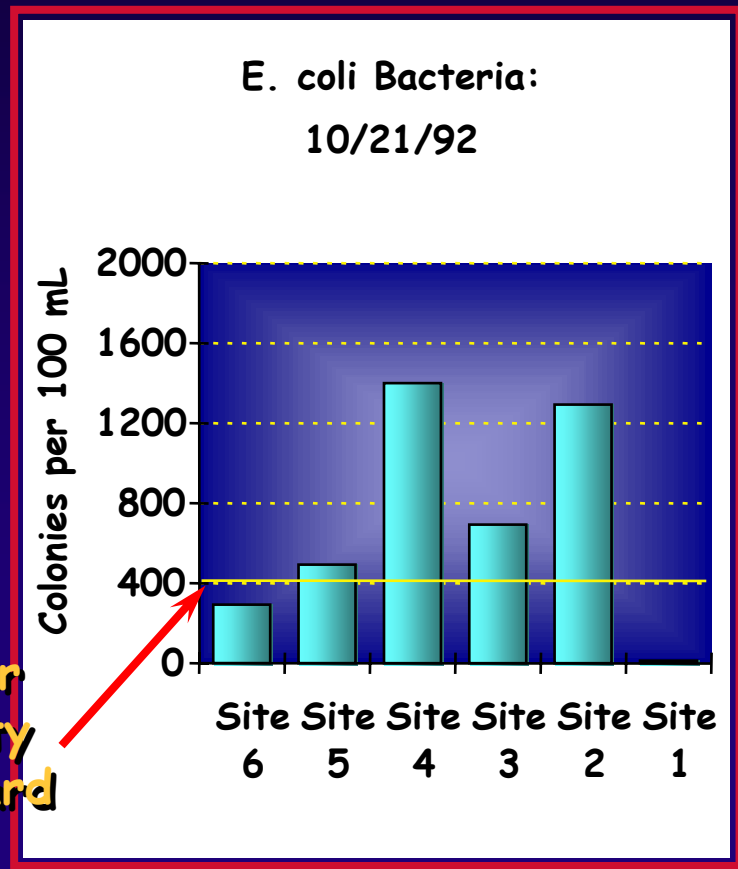
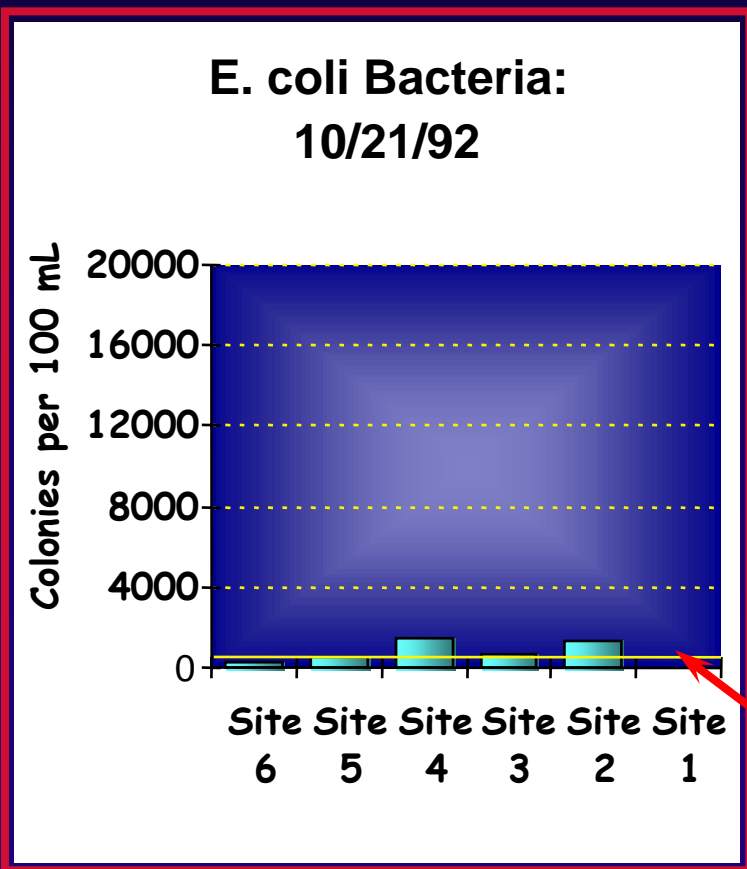
## What Makes A Good Graph?



# Data Presentation

## What Makes A Good Graph?

### The Importance of Scale

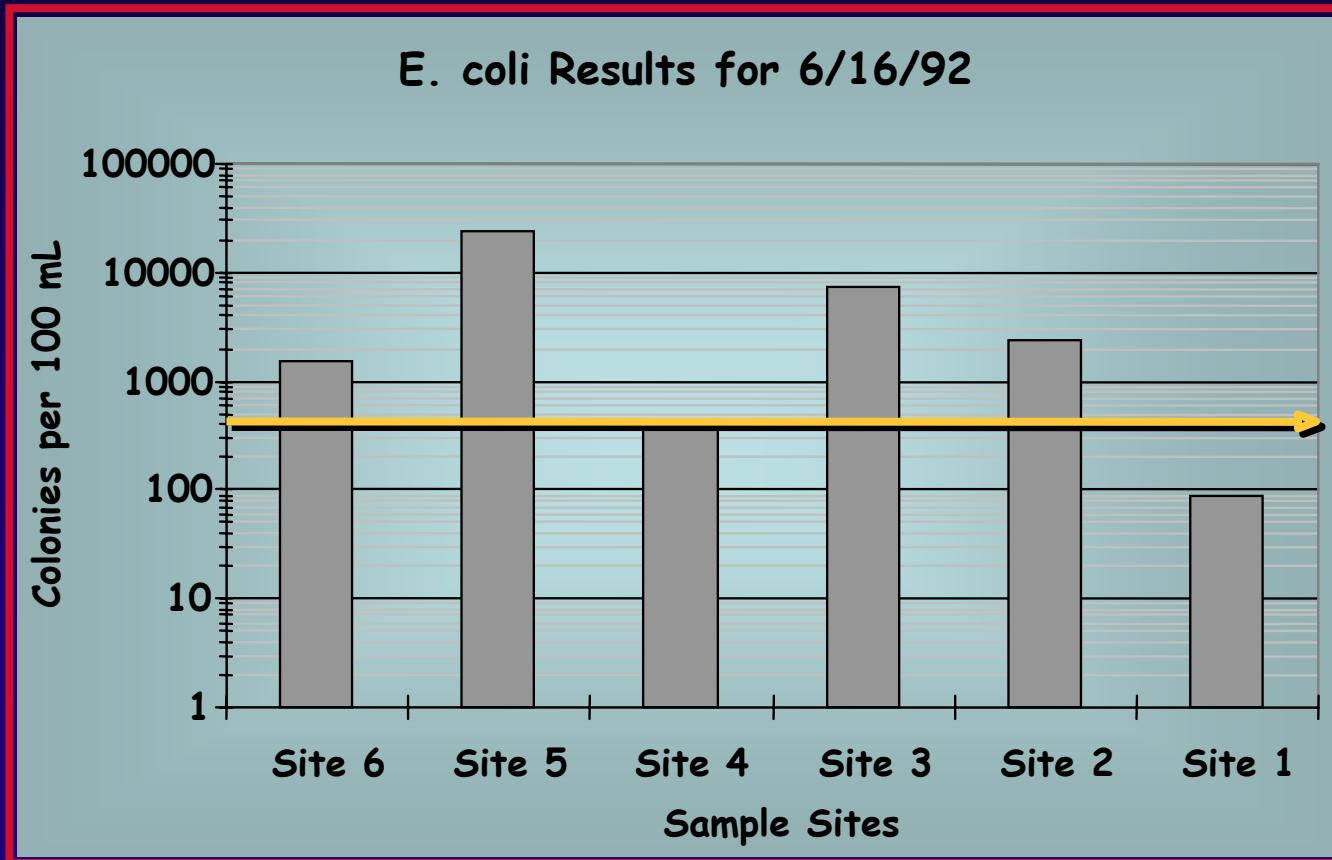


Water Quality Standard

# Data Presentation

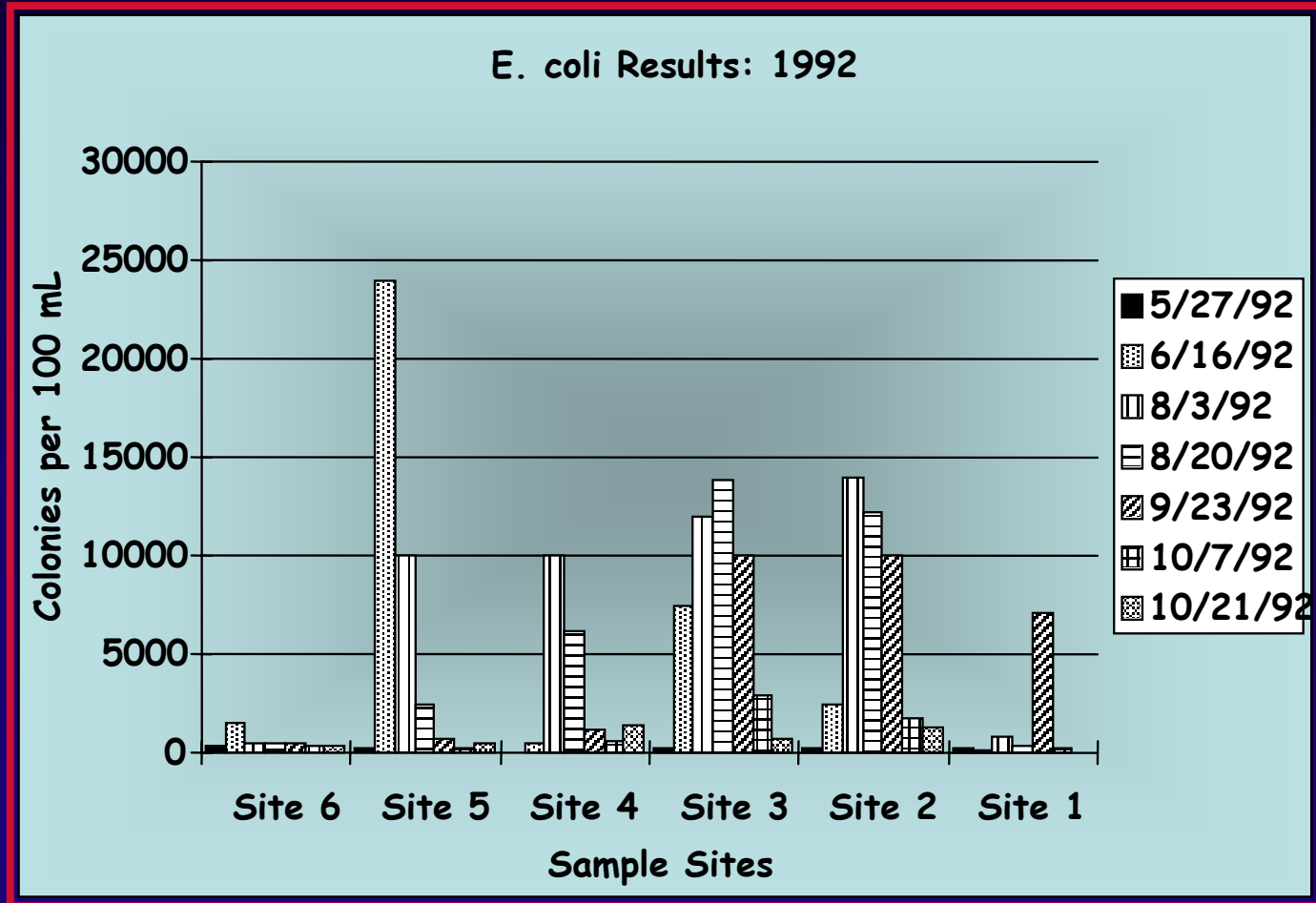
## What Makes A Good Graph?

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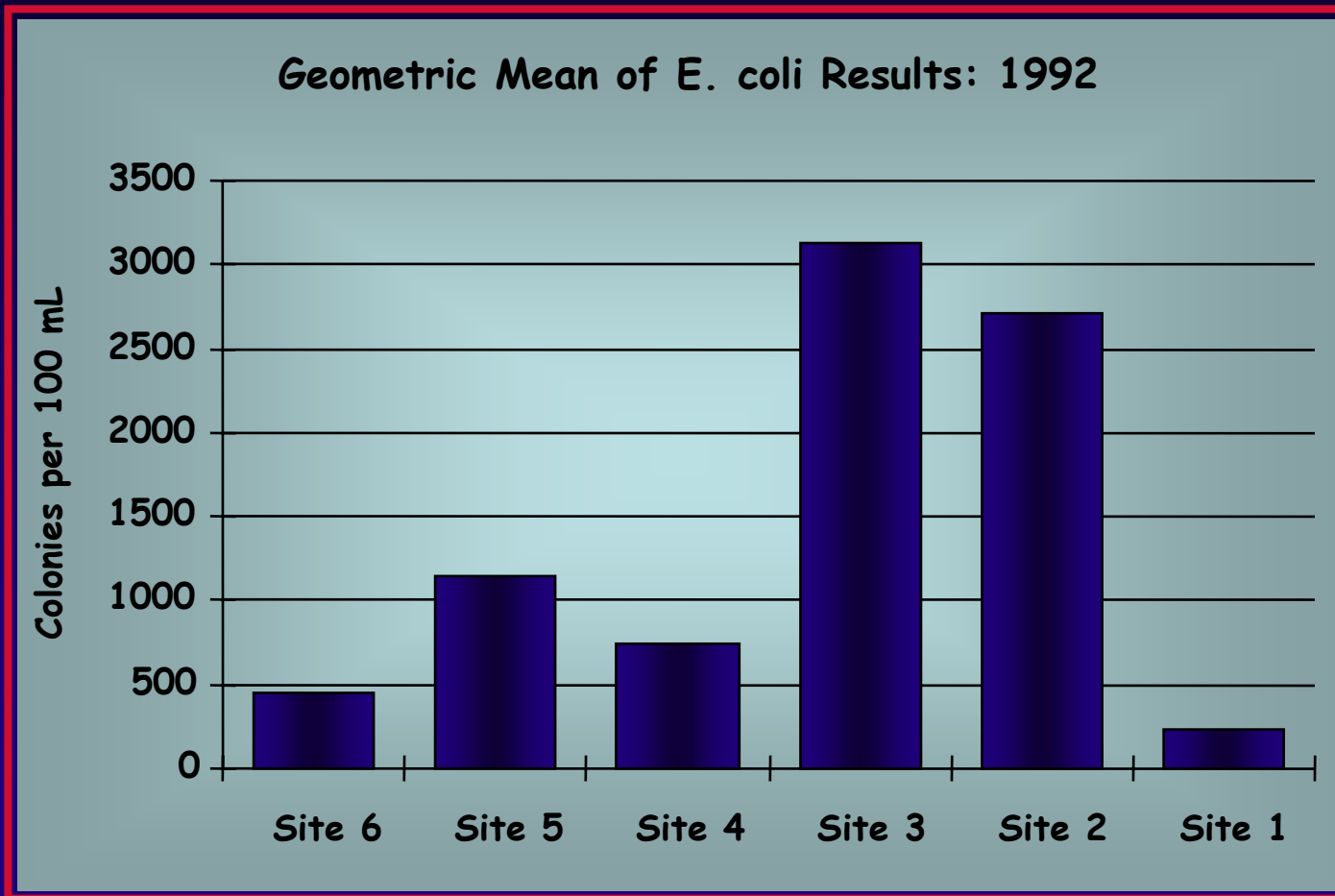
# Data Presentation

## What Makes A Good Graph?



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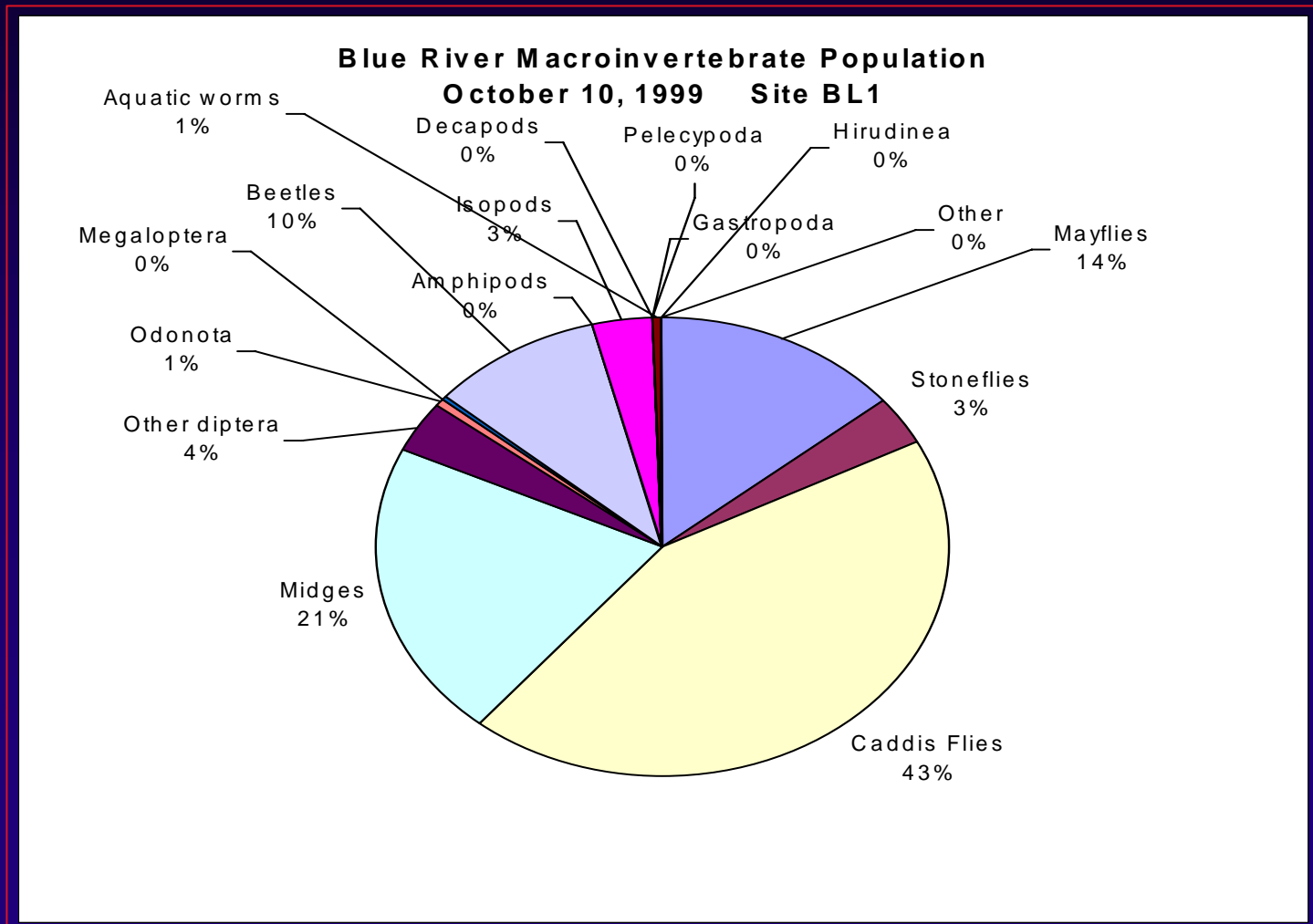
## What Makes A Good Graph?





# Data Presentation

## What's Wrong With This?







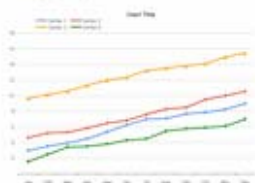
## Welcome to the Chart Chooser

Use the filters to find the right chart type for your needs. Then download as Excel or PowerPoint templates and insert your data.

- Comparison
- Distribution
- Composition
- Trend
- Relationship
- Table

**2 charts selected**

### Line chart



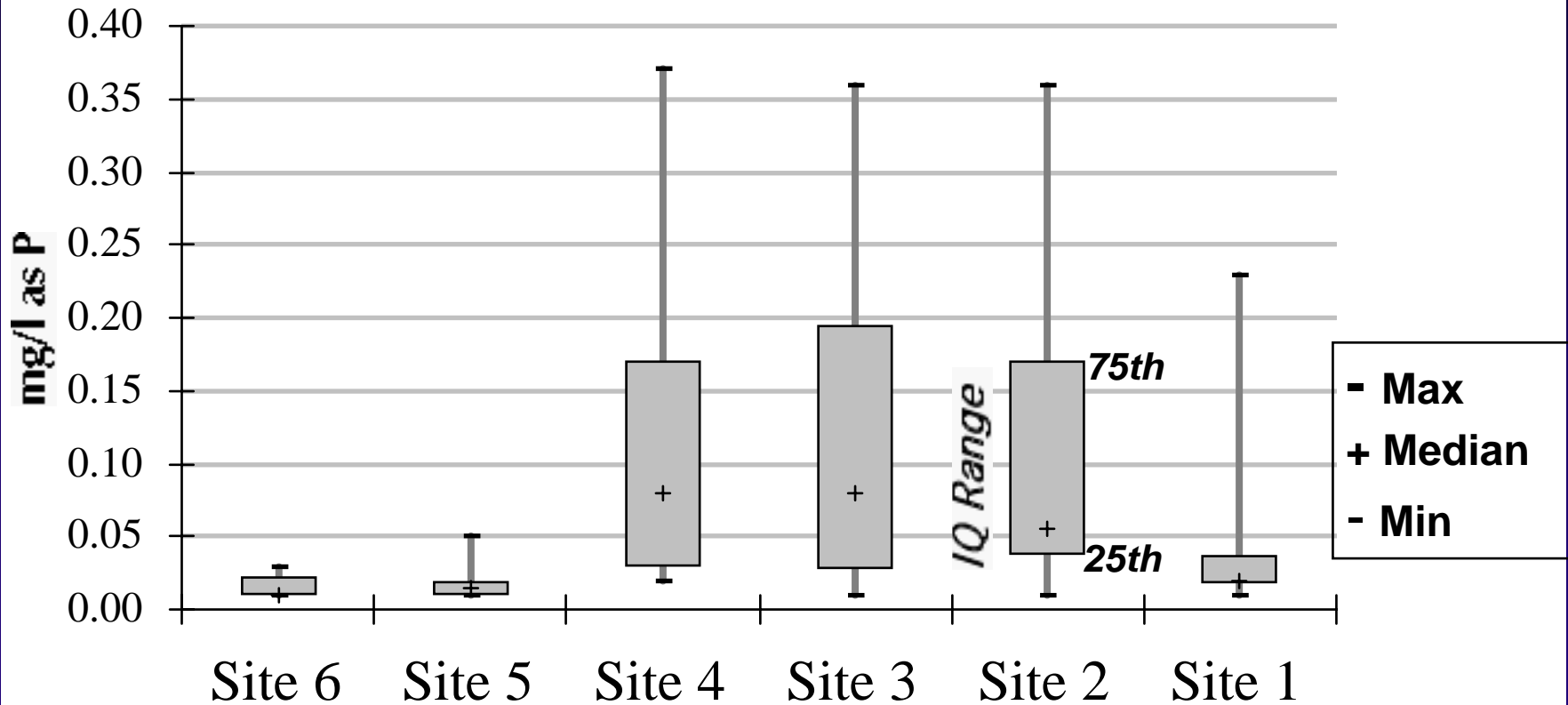
### Column chart



[www.chartchooser.com](http://www.chartchooser.com)

# Data Presentation

## Total Orthophosphate 1992-1994 Quartiles



# The Power of Images

## Watershed Management Goals

"75% reduction in TSS"



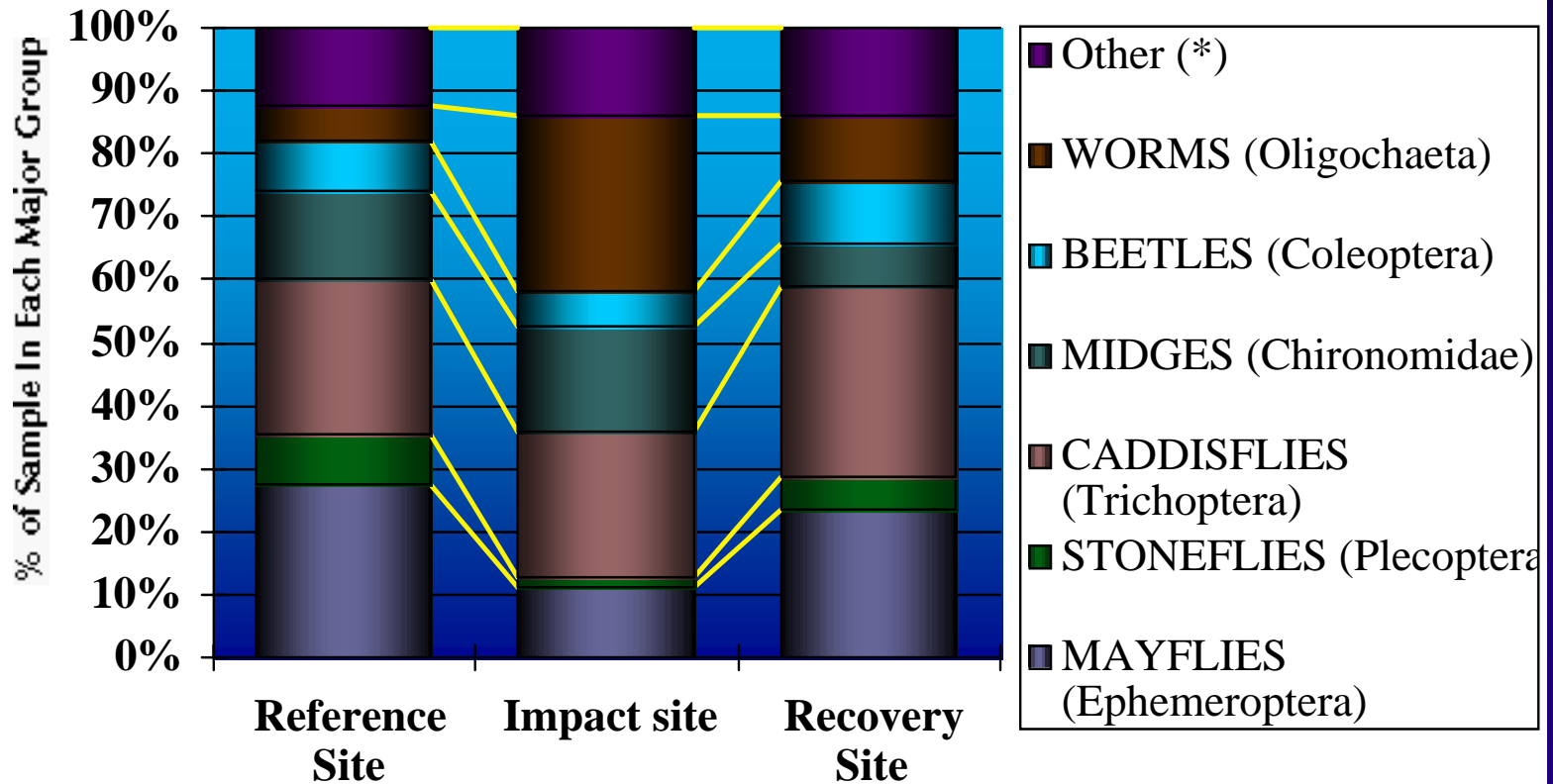
# The Power of Images



And humor...

# Data Presentation

**% Composition of Selected Major Group  
1992**



# A Tier 1 Community



Stoneflies

Dragonflies,  
Damselflies

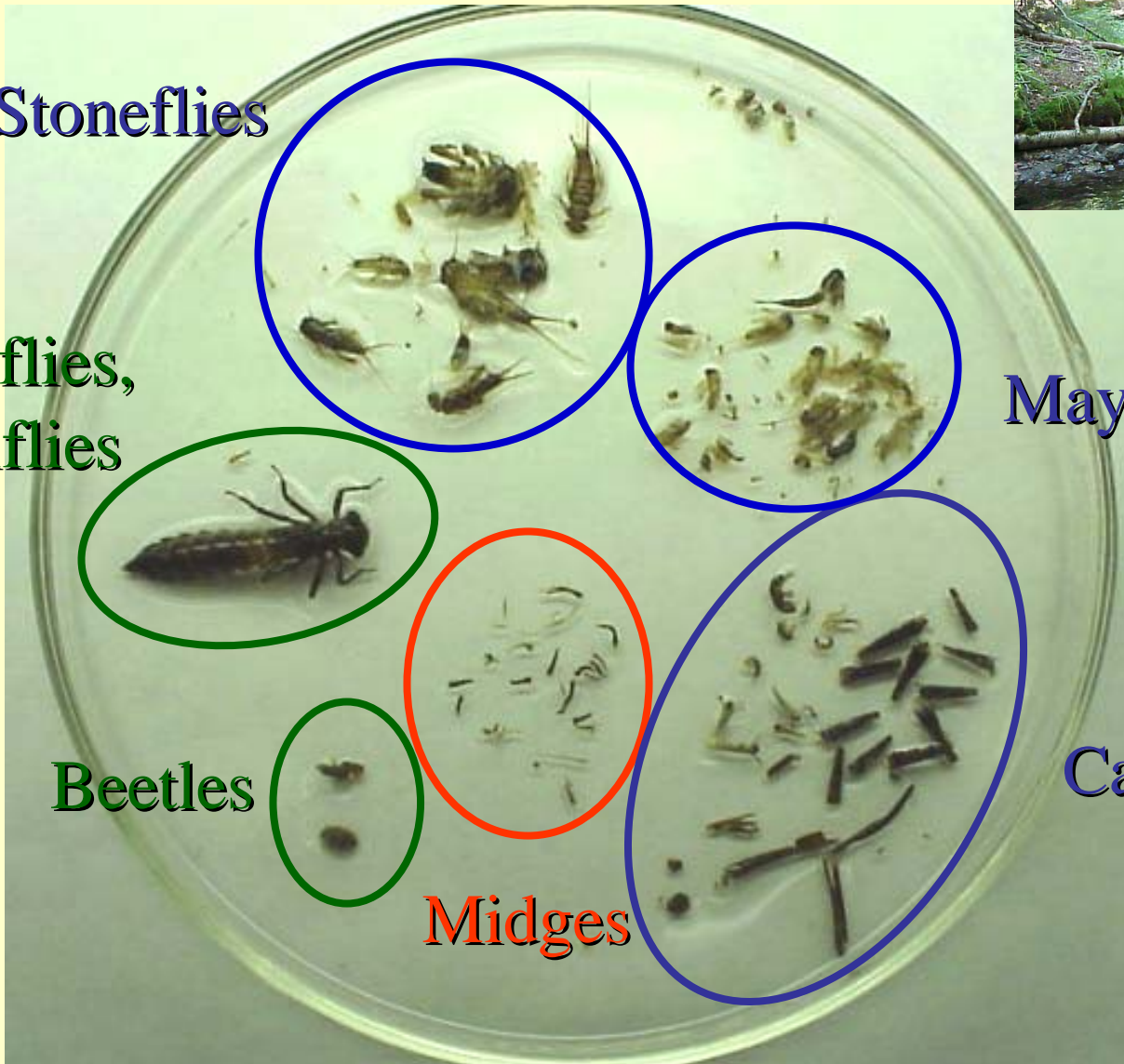
Mayflies

Beetles

Midges

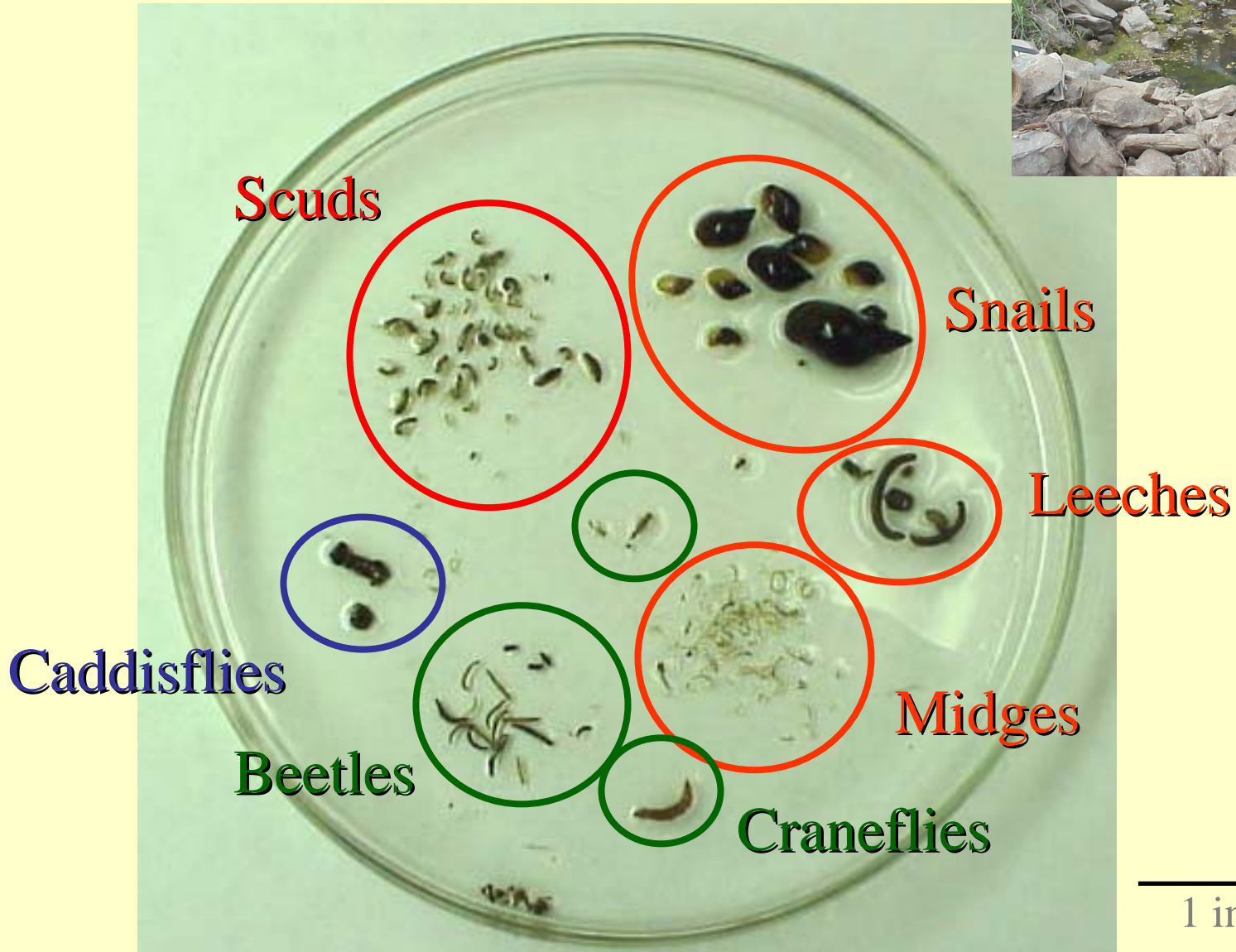
Caddisflies

1 inch

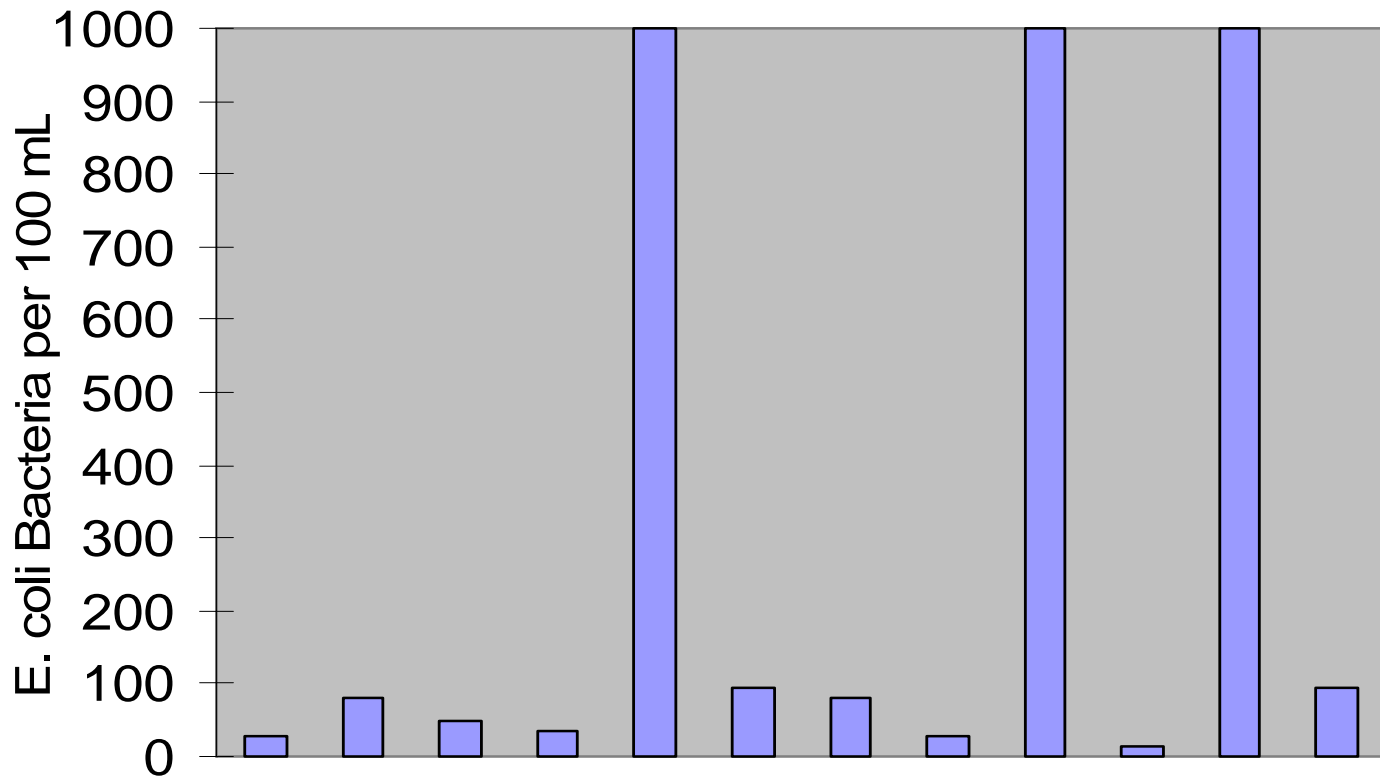




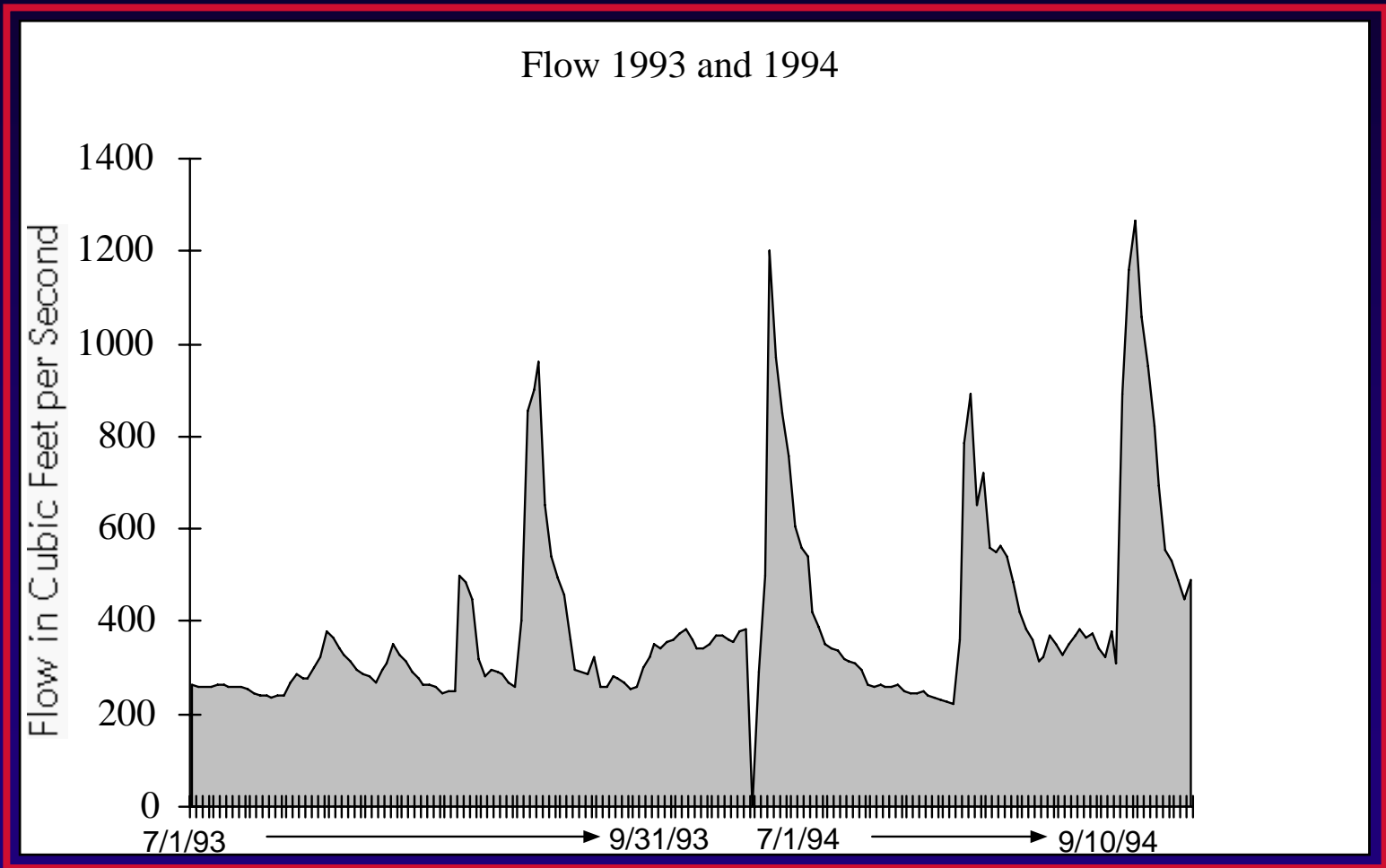
# A Tier 5-6 Community



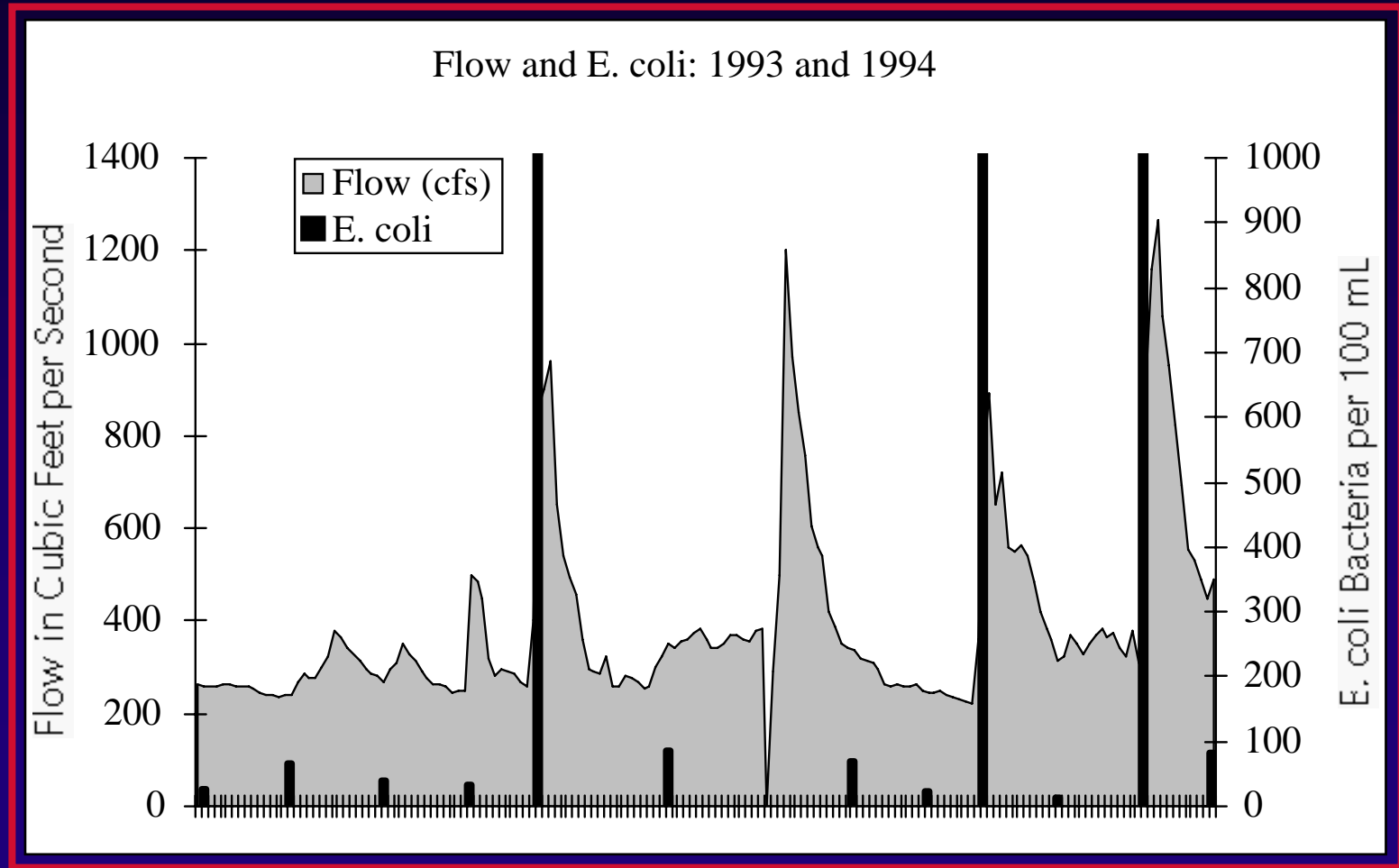
# Data Summary



# Data Summary



# Data Summary



# Summary

- Data should tell a story
- Tailor your presentation to your audience(s)
- Use multiple formats to help get your message to all types of learners
- Use images to help explain complex information
- See [usawaterquality.org/volunteers](http://usawaterquality.org/volunteers) and [http://www.usawaterquality.org/NewEngland/Focus\\_Areas/volunteer/default.html](http://www.usawaterquality.org/NewEngland/Focus_Areas/volunteer/default.html)