Presentations and Graphs/Graphics

After this lecture, students should be able to:

1. Describe the elements of good presentations and graphics within presentations and papers
2. Create quality graphics and place them appropriately within presentations and papers

What are the Elements of a Good Presentation?

What are the Elements of a Good Presentation?

What are the elements of good slides and graphics within presentations and reports?

Using Text in Slides

Text slides with a lot of words are not desirable because this really detracts from the presentation, the audience will be reading the slides rather than paying attention to what you are saying, and they can become very boring after awhile. And if you are reading the text on the slides, why are you even there? Try to summarize on a bullet slide – be concise.

Using Text in Slides - Bullets

- clear, easy to read slides which can be seen from the furthest point in the room
- simple, concise, not too much information such that the audience can review the information within the time spent on the slide
- text is large enough to read even from the furthest point in the room, oh wait, did I say this already?
- you should limit the information you present in text format, are you really interested in the audience reading what is on the slides or listening to you?
- bullets should be limited, too many and the audience is going to be reading the slides and not paying attention, no more than three or four bullets per slide
- what do you think of this slide?

Using Text in Slides - Bullets

- bullets should be clear and easy to read
- limit to 5-6 bullets on a slide, max
- be concise

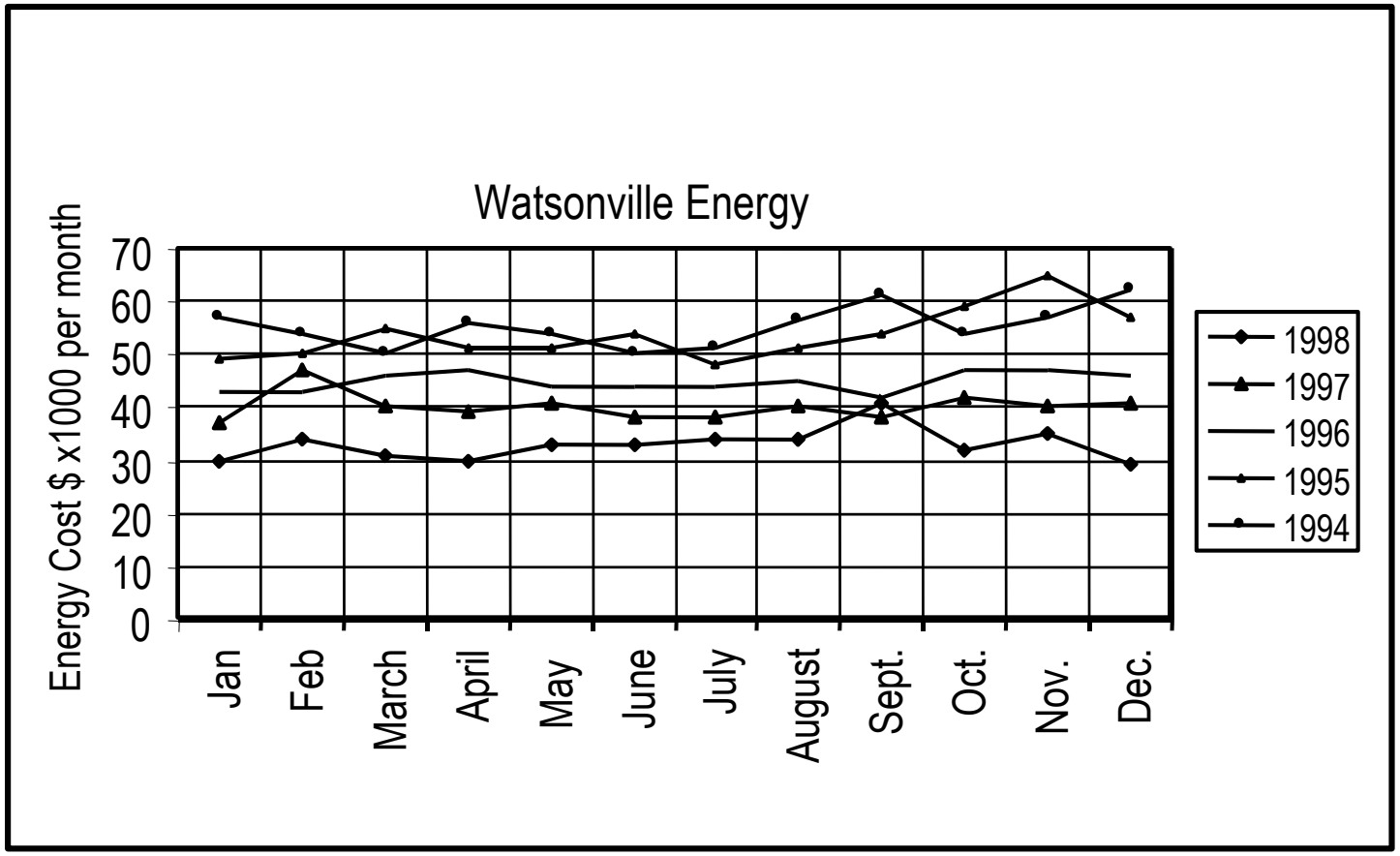
Guidelines for Presentation Graphics

- Think about what you want to convey first, then build the graph appropriately
- Many graphs have the wrong data for the intent
- Reduce the data as needed to convey appropriate message
- Keep it simple, clear, and easy to read
- Note on software:
  - Excel has gotten better, but still not a great program to create graphs.
  - Kaleidagraph is much better and producing nice graphics.

Guidelines for Presentation Graphics

- Note on software:
  - Excel has gotten better, but still not a great program to create good graphs.
  - Kaleidagraph is much better at producing nice graphics, but it is not good as a spreadsheet.

What's Wrong with this graph?

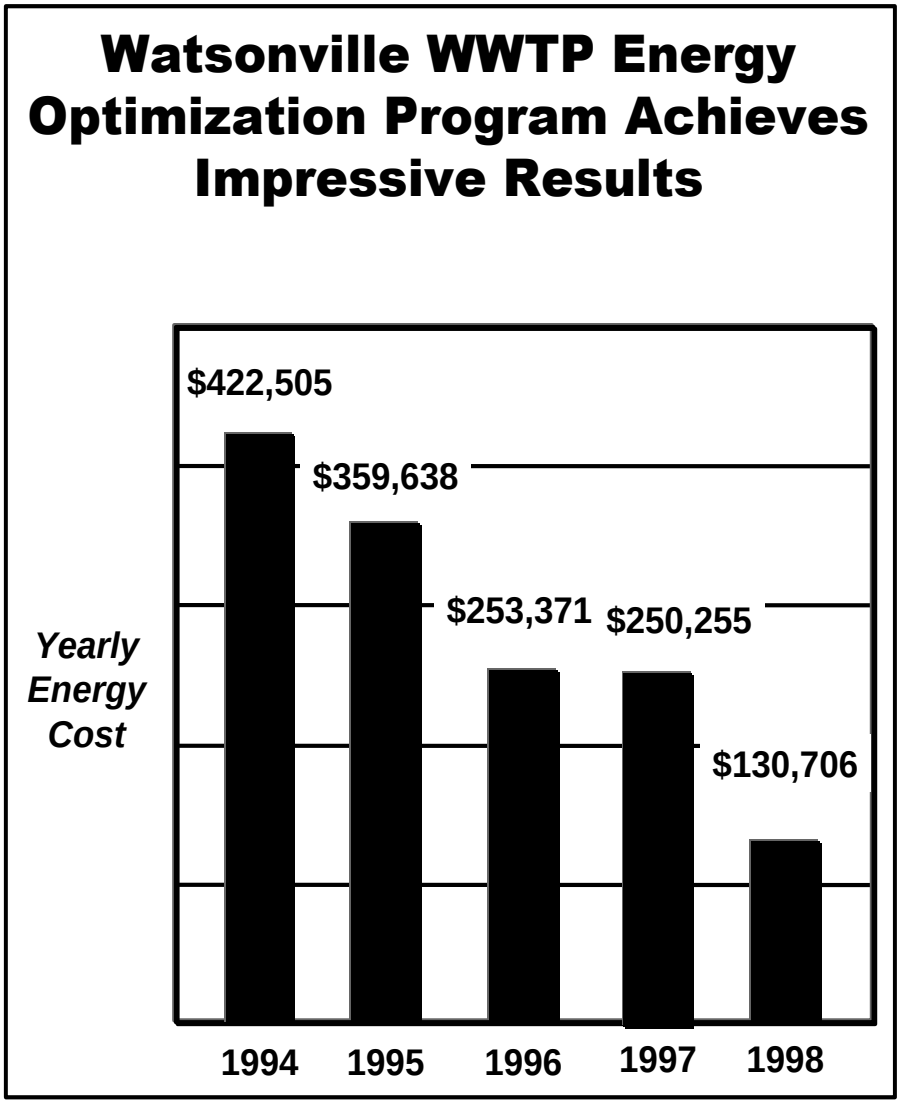


purpose of graph is to show change in energy use from one year to the next

What's Wrong with this graph?

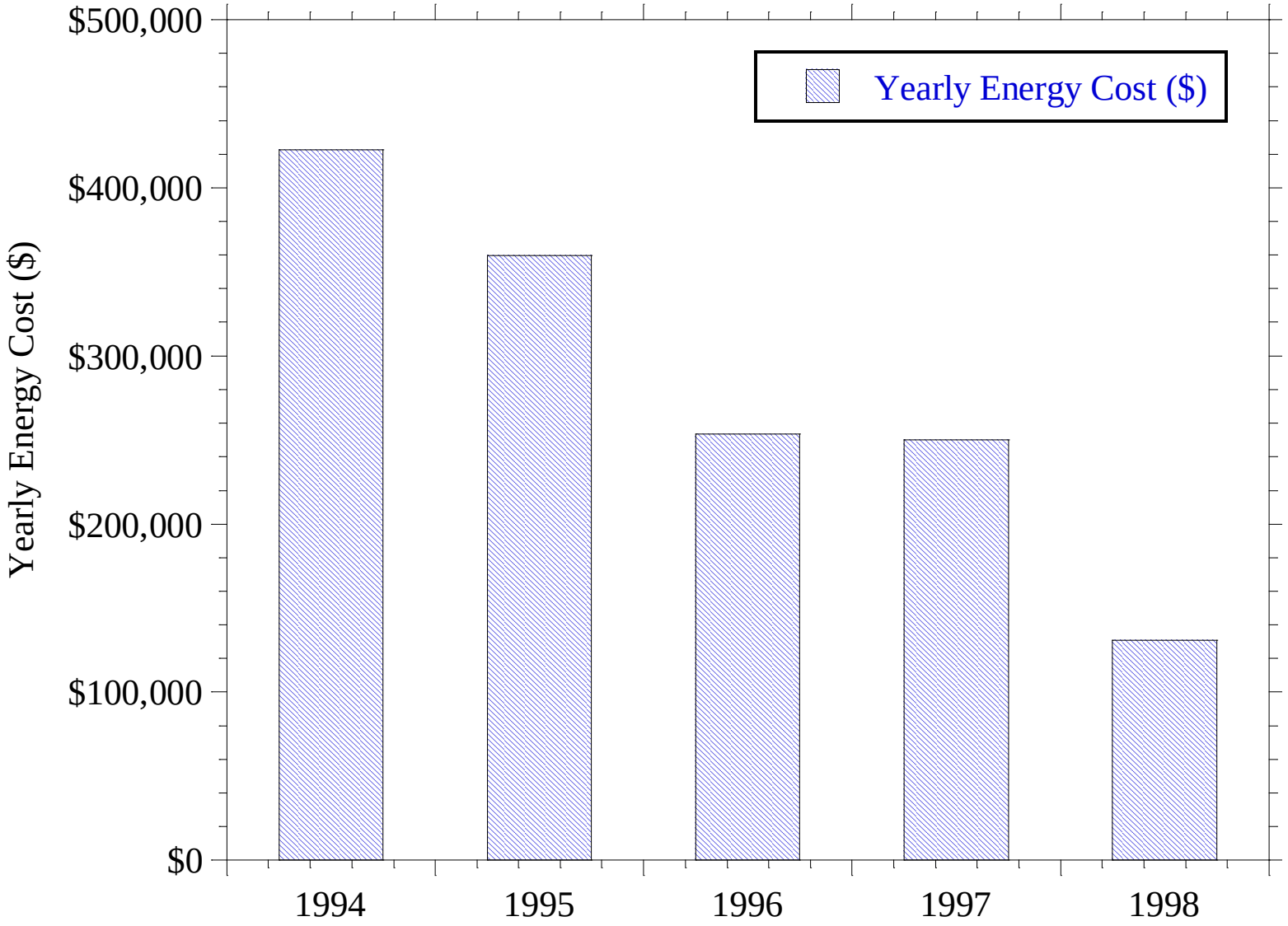
purpose of graph is to show change in energy use from one year to the next

Better, but what else is wrong?

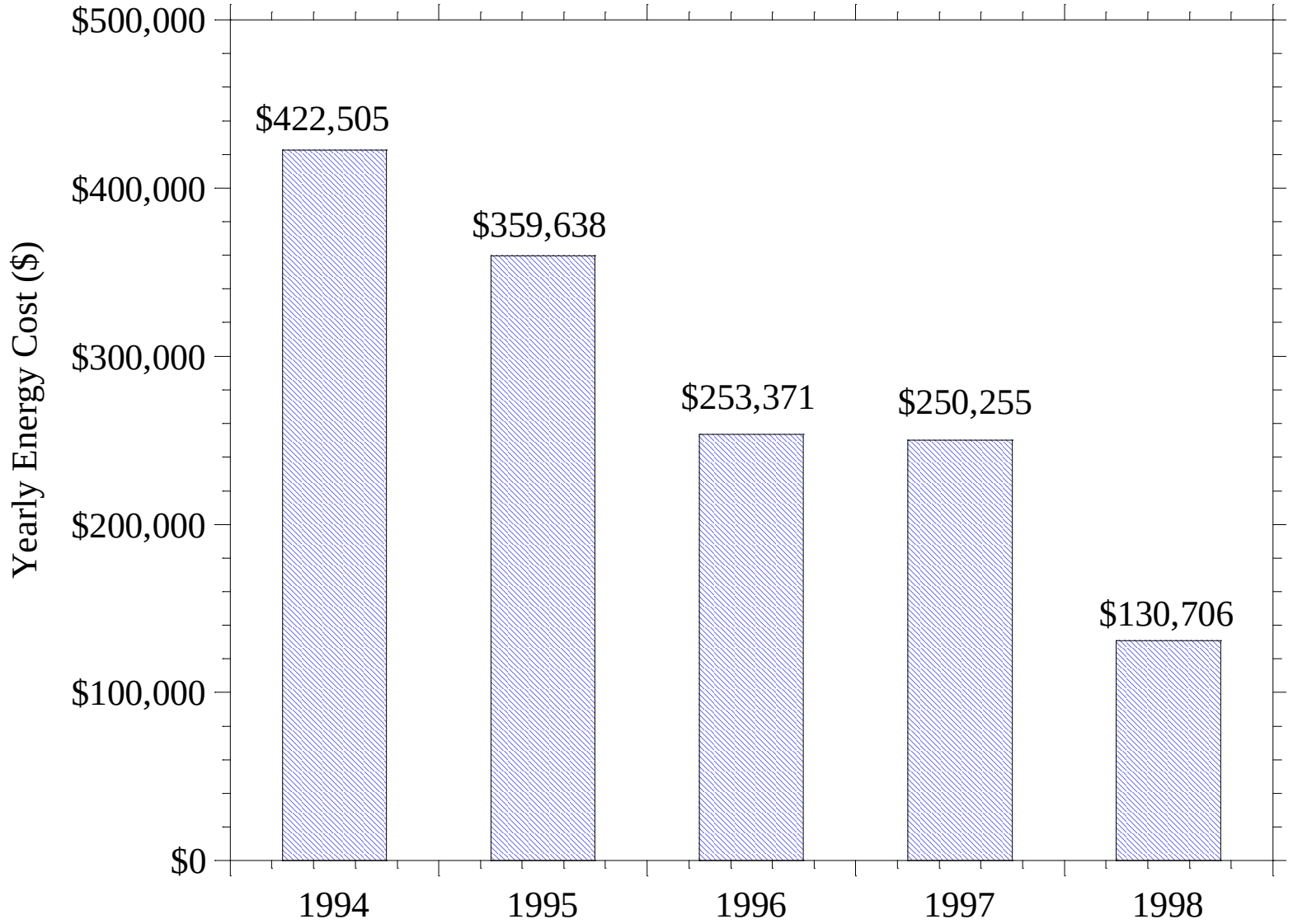


- *reduce the data to a bar graph,*
- *shows trends much more clearly*

Yearly Watsonville Energy Costs



Yearly Watsonville Energy Costs



Yearly Watsonville Energy Costs

Good or Bad Slide?

Plant No.	Digester Soluble Protein (mg/L)	Digester Soluble Protein (mg/g DS)	Digester Bound Protein (mg/g DS)	Digester NaOH Extract Protein (mg/g DS)	Cake Bound Protein (mg/g DS)	Cake NaOH Extract Protein (mg/g DS)	Cake MET Content (µg/g DS)
1	1040	51.4	18.1	156	22.6	197	0.263
2	696	34.6	21.6	133	12.5	121	0.202
2-HS	696	34.6	21.6	133	18.3	177	0.513
3	1060	47.7	22.5	291	27.9	256	0.397
4-L	609	16.7	12.9	162	19.8	230	1.128
5	629	23.7	16.4	188	17.9	206	0.413
6	523	26.4	24.4	205	21.1	180	0.170
7	1300	59.4	16.2	188	24.5	247	0.607
8-T	1770	102	45.9	183	29.9	156	0.459
9-PF	1160	50.2	24.8	218	15.8	204	0.175
10N	387	10.9	15.2	154	15.3	155	0.554
10S	285	12.9	17.5	134	17.5	134	0.418
11	403	23.0	17.8	163	24.2	143	0.437

Guidelines for Presentation Graphics

- Enclose your *plot* in a frame, but not the *figure* in a frame
- Use colors wisely
- Use sufficiently large font size for legends, labels, and symbols
- Use appropriate significant figures

adapted, in part, from Professor Mike Malusis' class handouts

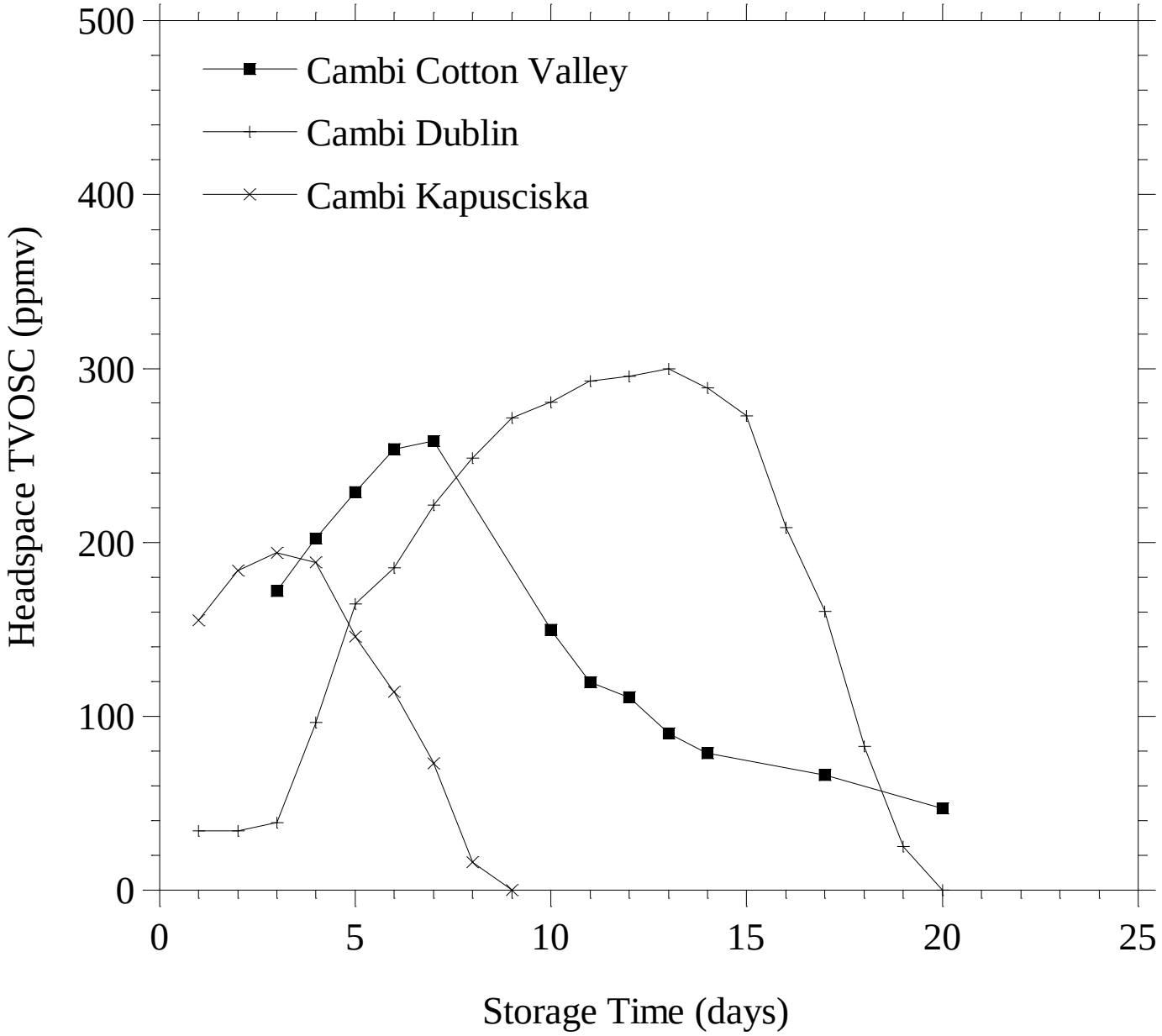
Guidelines for Presentation Graphics

- Use open or closed symbols for data points (e.g., circles, squares, triangles), avoid symbols such as crosses ("x") or plus signs ("+")

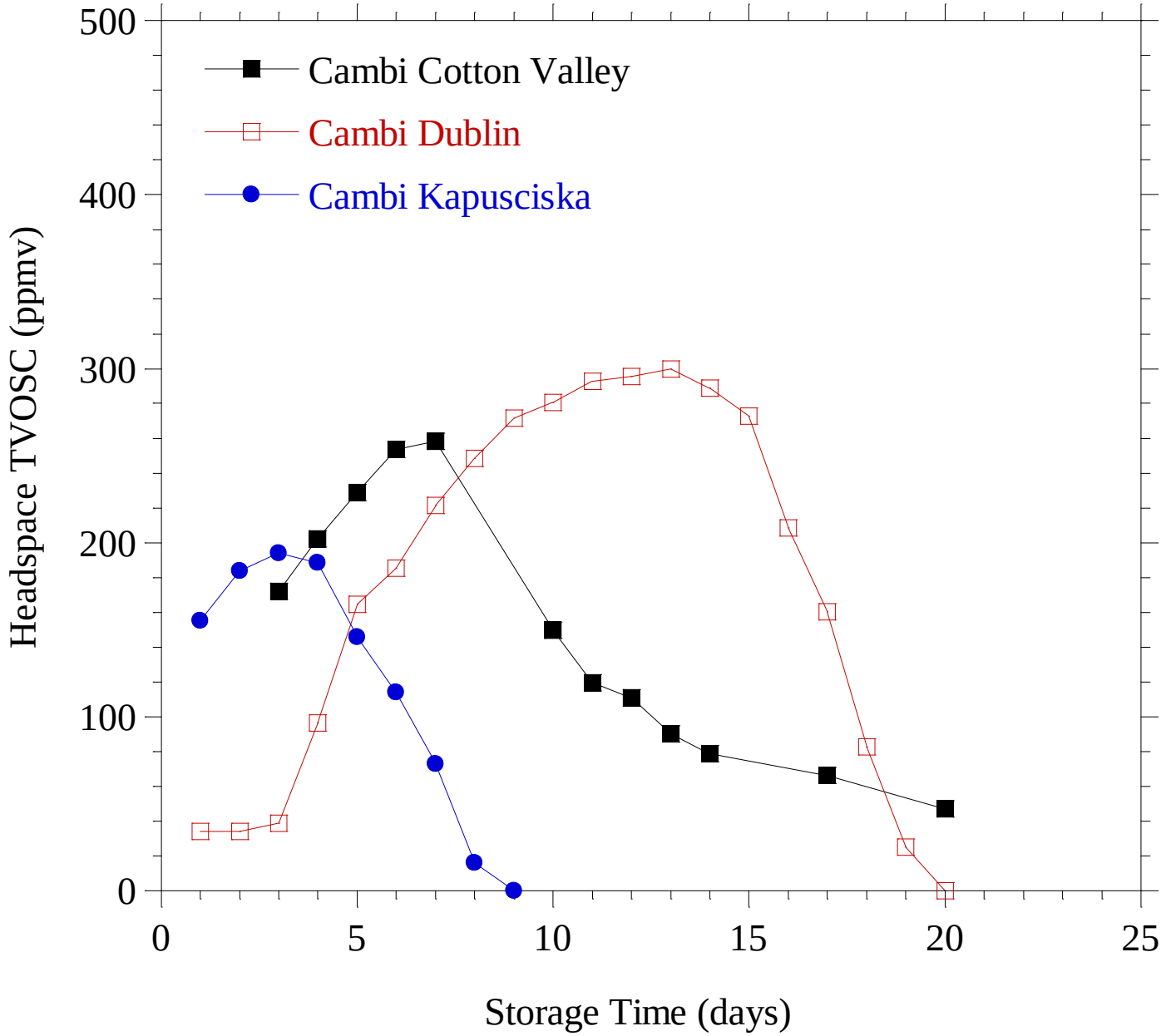
- Avoid using legends, but if you have to:
  - ✓ Place your legend *inside* the *plot frame* with a box, don't place your legend partially or fully outside the plot frame, and don't obscure data or curve fits with your legend

adapted, in part, from Professor Mike Malusis' class handouts

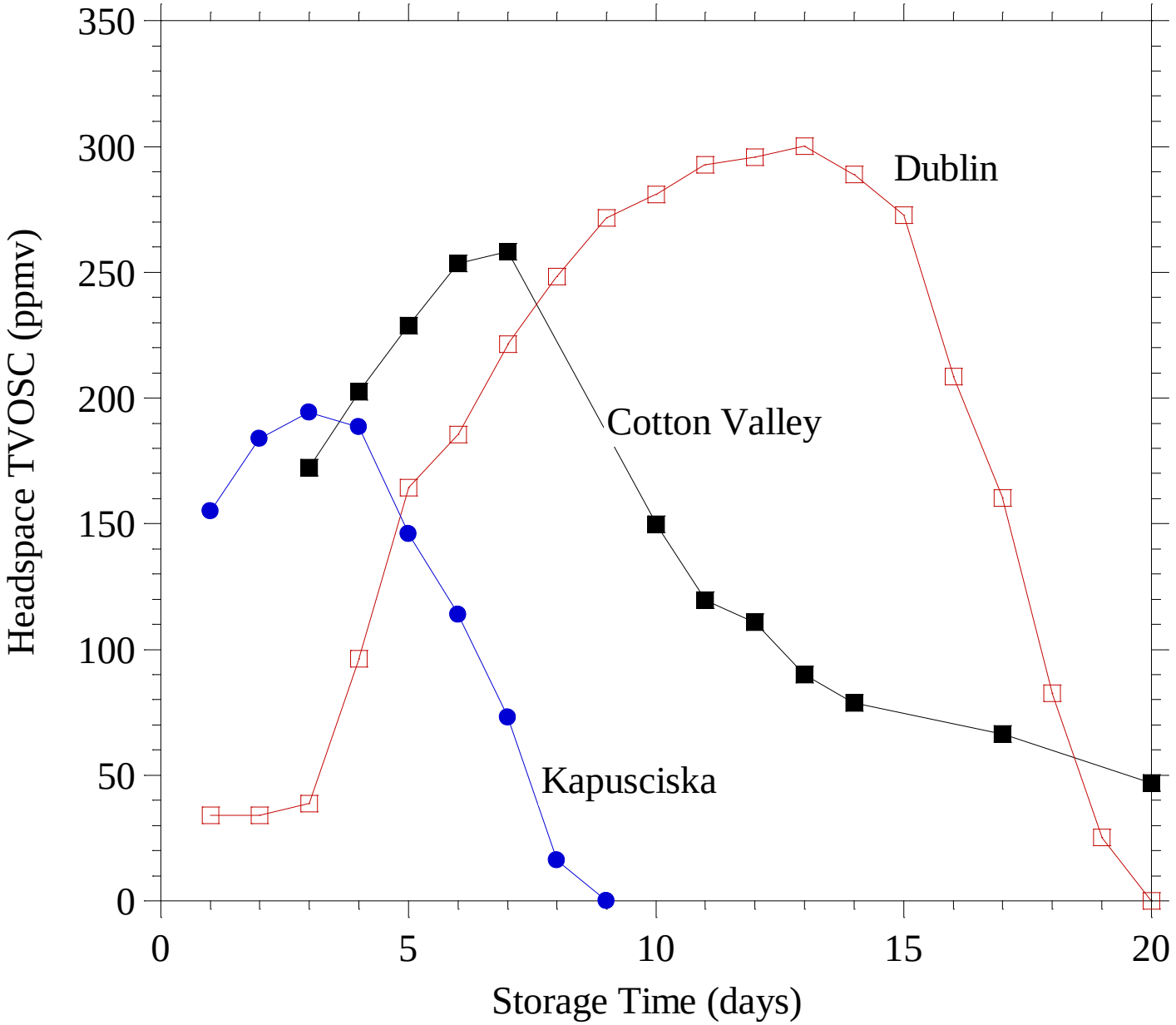
What's Wrong With This Picture?



Better…


Cambi Cotton Valley
Cambi Dublin
Cambi Kapusciska
Headspace TVOSC (ppmv)
Storage Time (days)
0
100
200
300
400
500
0
5
10
15
20
25

Even Better…


Headspace TVOSC (ppmv)
350
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250
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0
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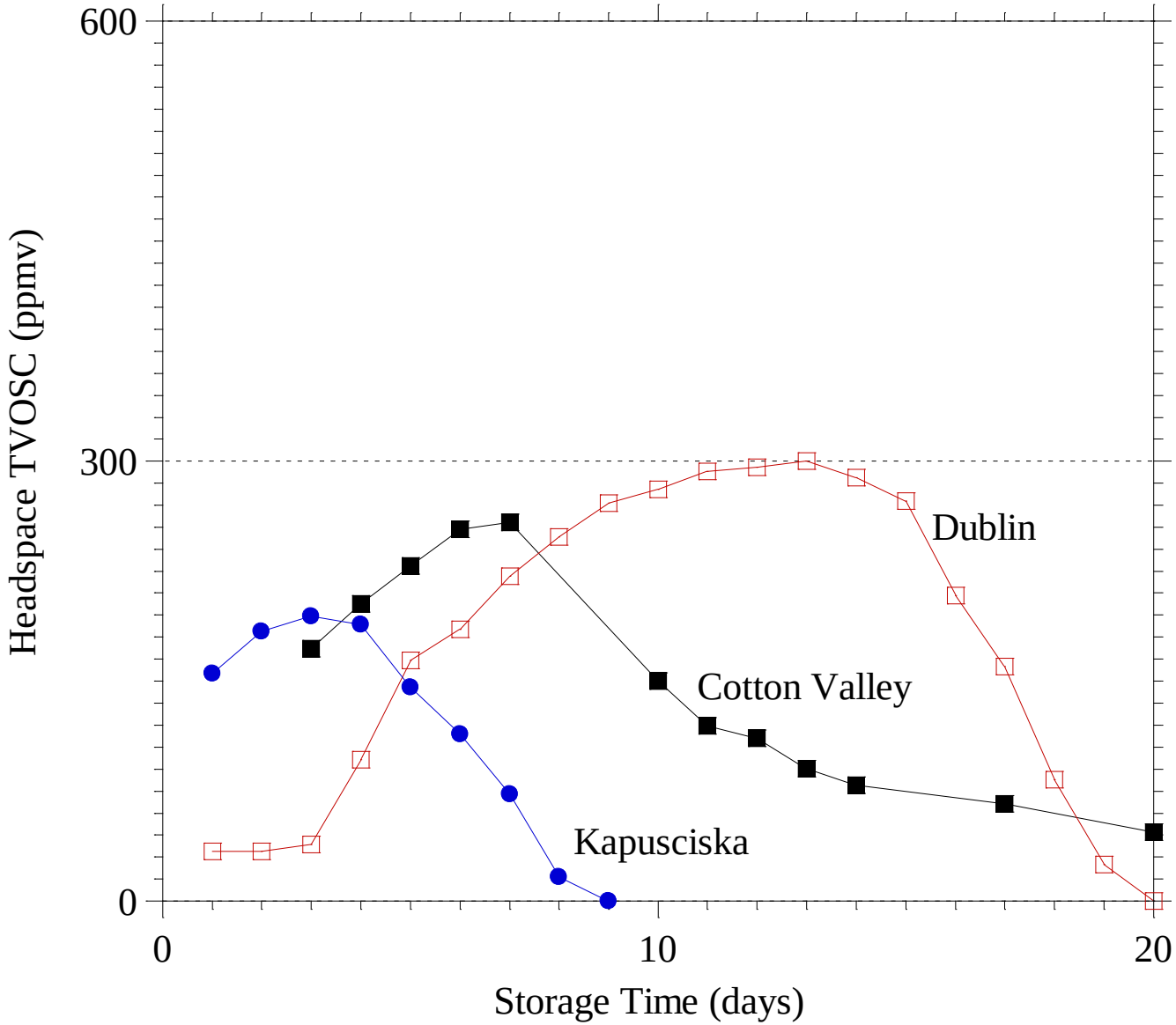
10
15
20
Storage Time (days)
Dublin
Cotton Valley
Kapusciska

Guidelines for Presentation Graphics

- Define variables in x and y axis labels including the units
- Include major and minor tick marks (preferably on all four axes) and label all major ticks
- DON'T use too many major ticks (rather, use combination of major and minor ticks)
- DON’T use gridlines unless they have a purpose
- Choose appropriate ranges and scales for x and y axes
- Show curve fits to help illustrate trends, but only when appropriate,

adapted, in part, from Professor Mike Malusis’ class handouts

What's Wrong With This Picture?



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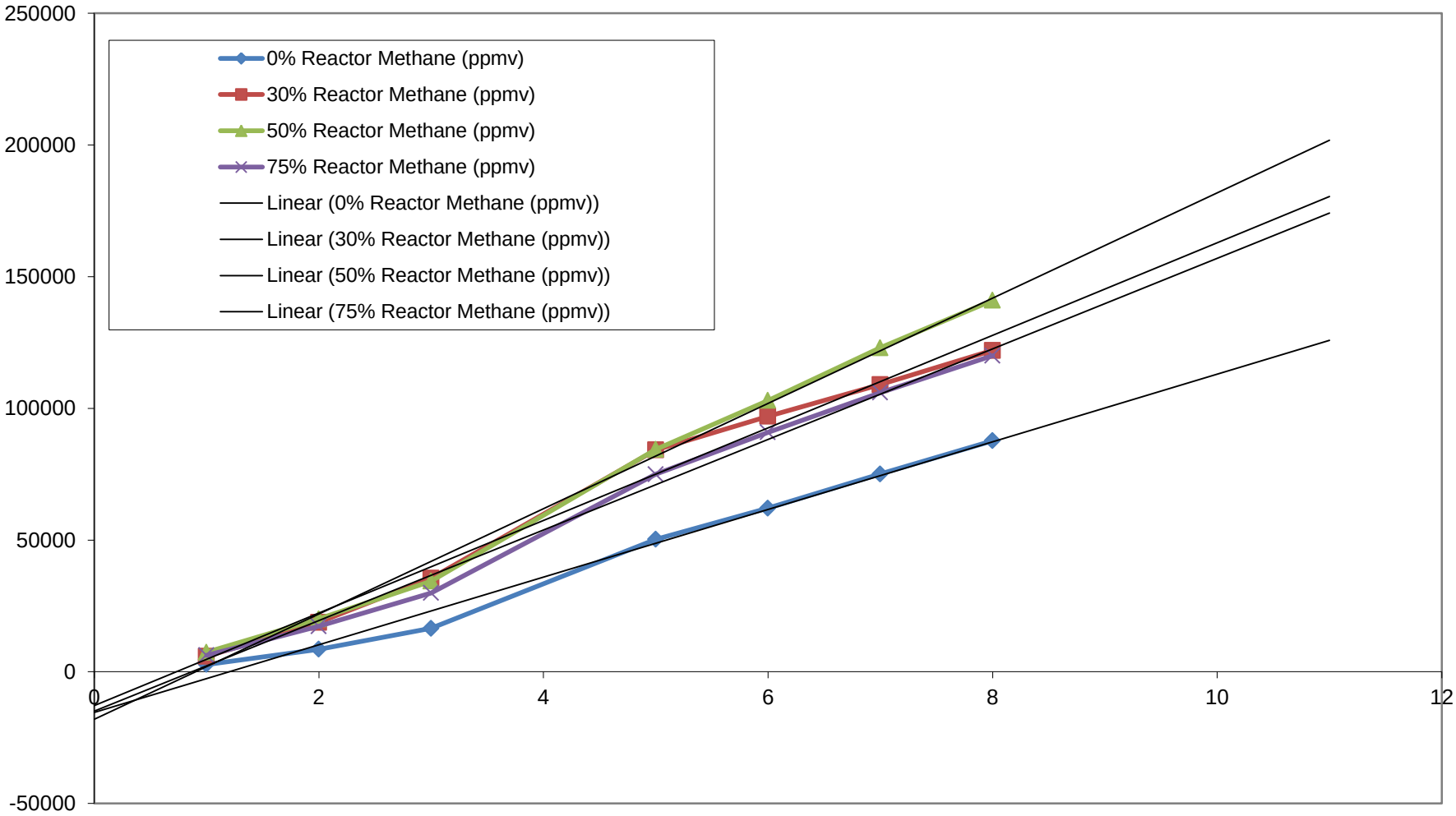


Changes in Nitrate and Sulfate Concentrations

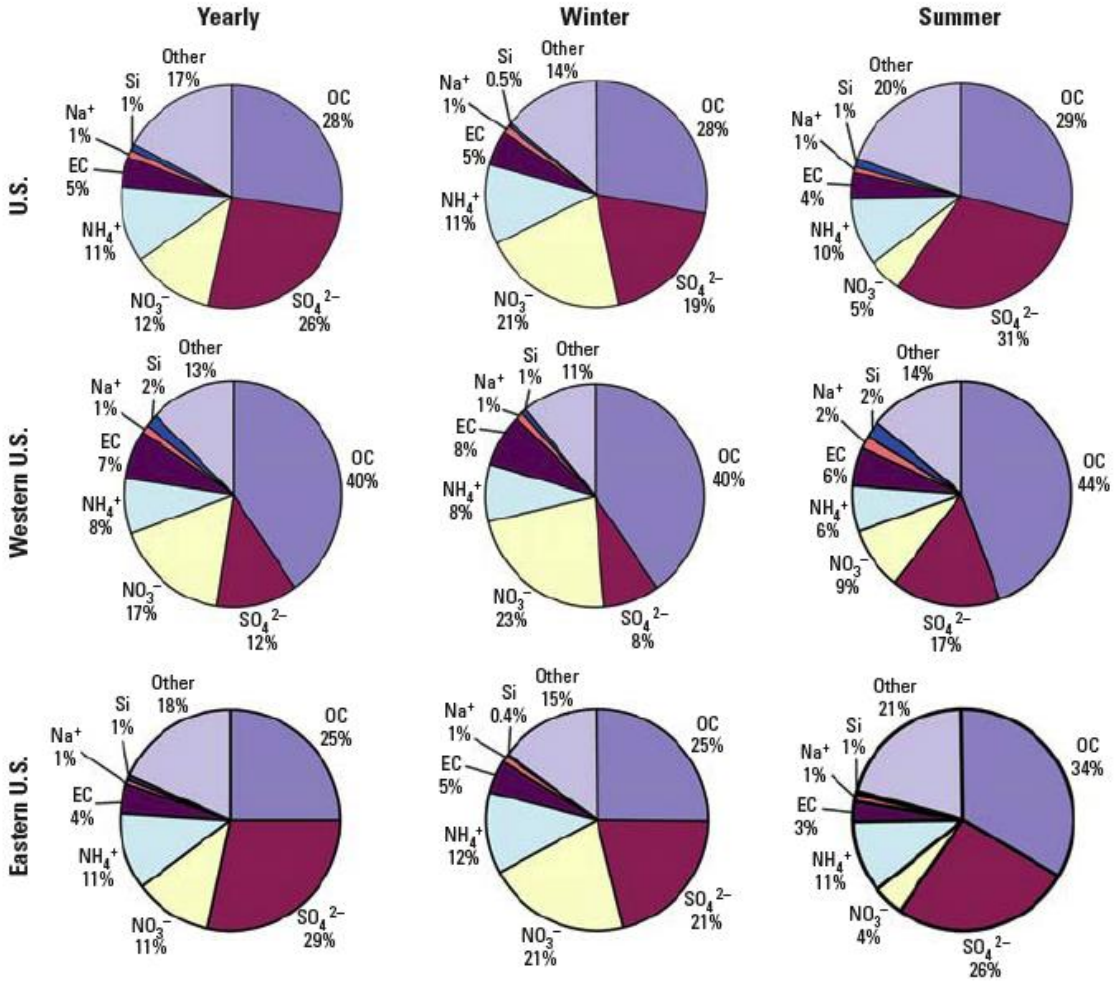
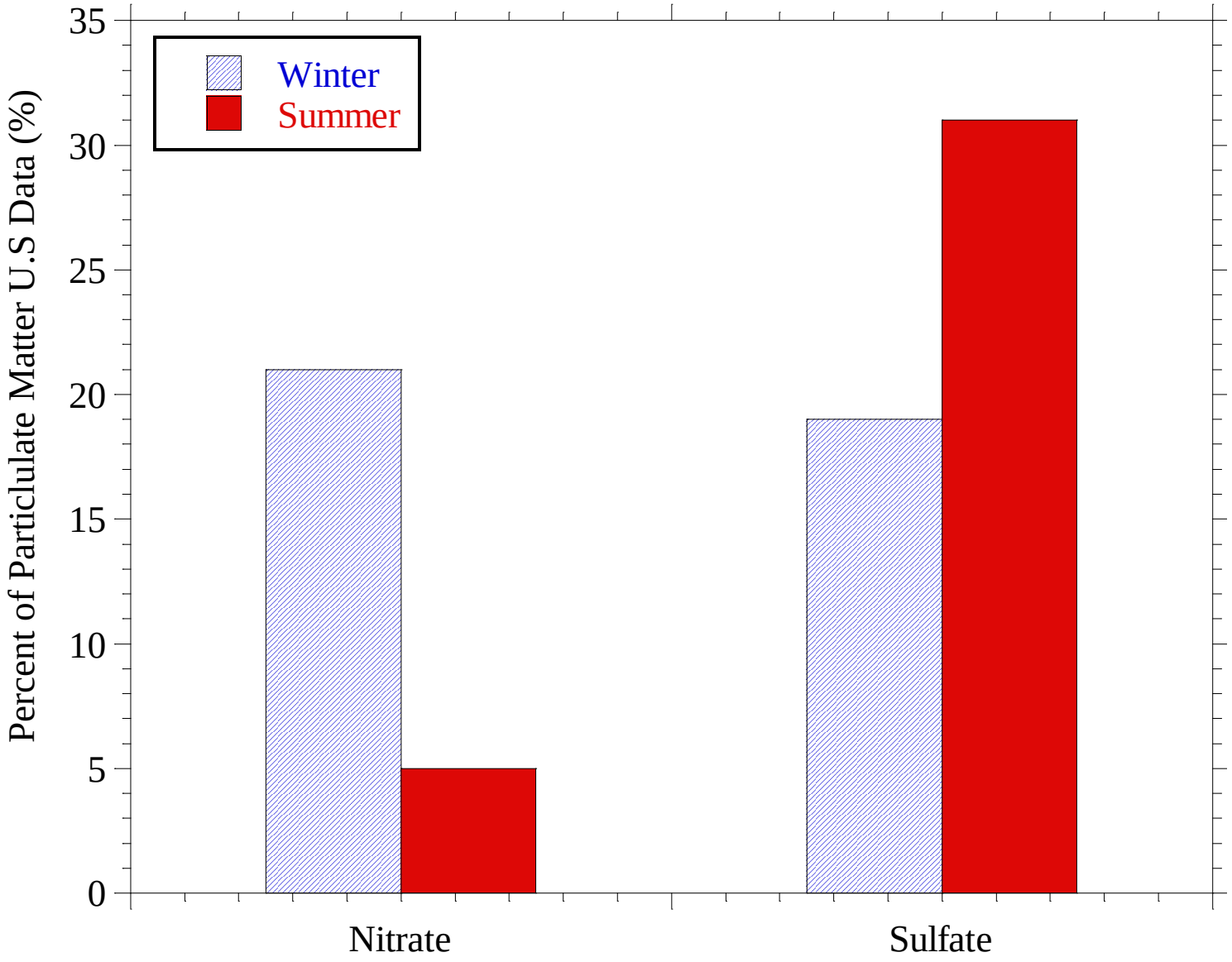


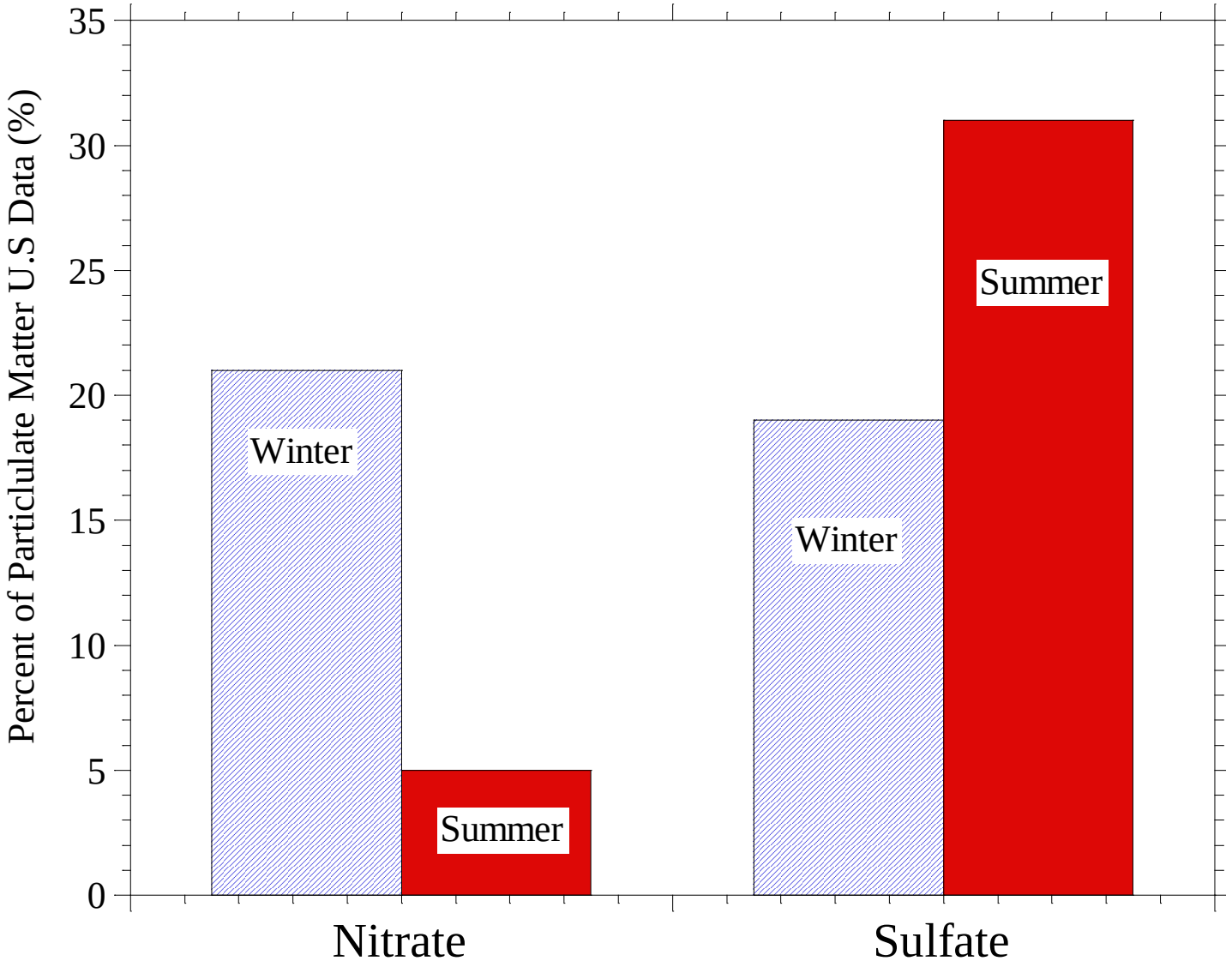
Figure 3. Percent of $PM_{2.5}$ composition by component for yearly, winter, and summer averages, by region.

purpose of graph is to show nitrate and sulfate change during the seasons and to show same results are found for different regions

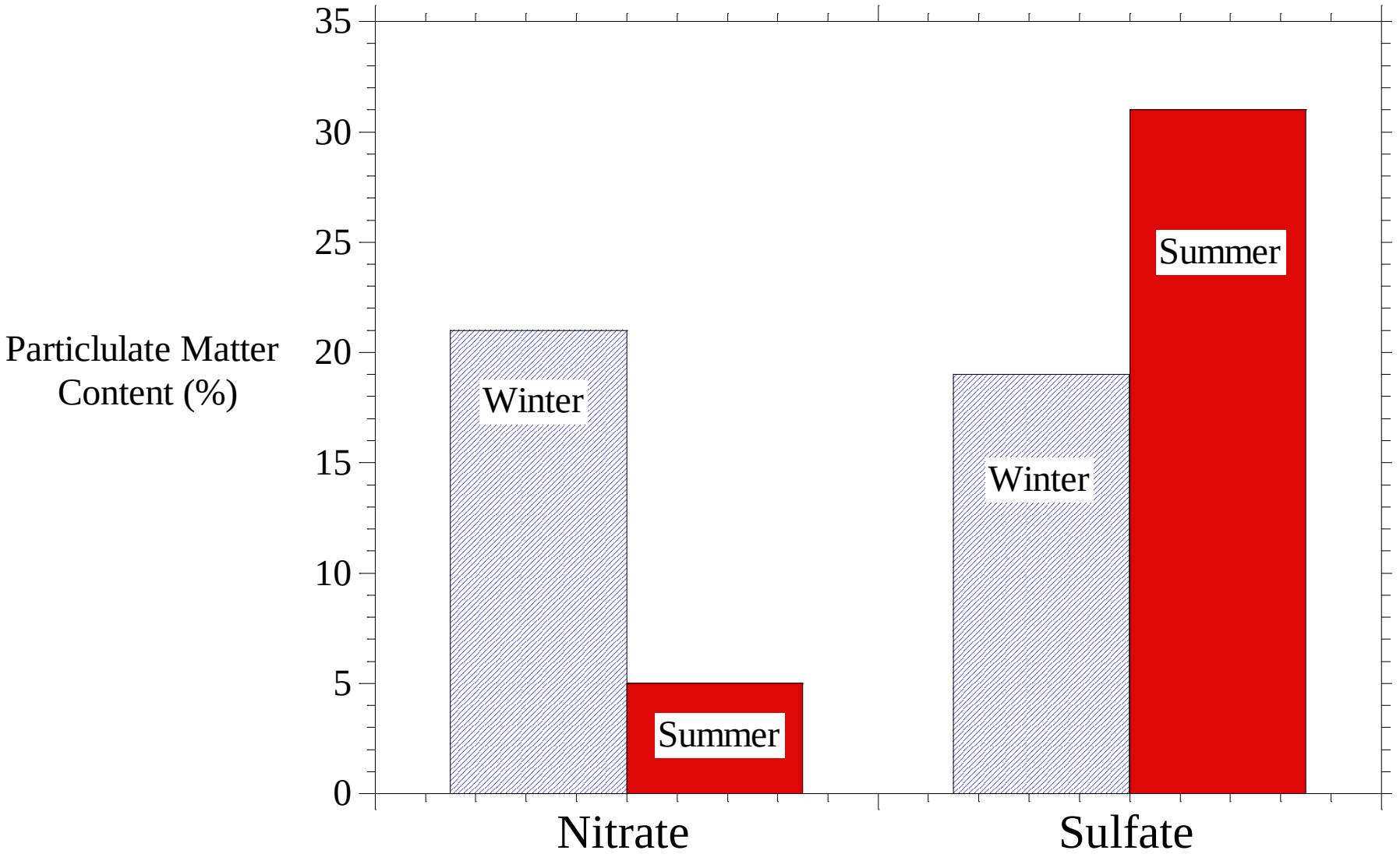
Changes in Nitrate and Sulfate Content from Winter to Summer



Changes in Nitrate and Sulfate Content from Winter to Summer



Changes in Nitrate and Sulfate Content from Winter to Summer – U.S. Averages



Additional Guidelines for Graphics in Reports

- Embed figures and tables in the body of the paper or report.
- Refer to the figures and tables by their number, such as, "…as shown in Figure 3…"
- Text describing the figure always comes before the figure.
- Make sure that an embedded figure is large enough to ensure clarity and fits within the margins
- Define acronyms (if used) in figure captions
- Place figure caption (with number and *descriptive* title) **below** figures

The average density of *E. coli* measured in each sample by the standard culturing method is shown in Figure 1. Interestingly, the density decreased by three orders of magnitude after anaerobic digestion of the sample, but increased after centrifuge dewatering. The results suggest that reactivation of *E. coli* occurred after the dewatering, resulting in the large increase in densities…

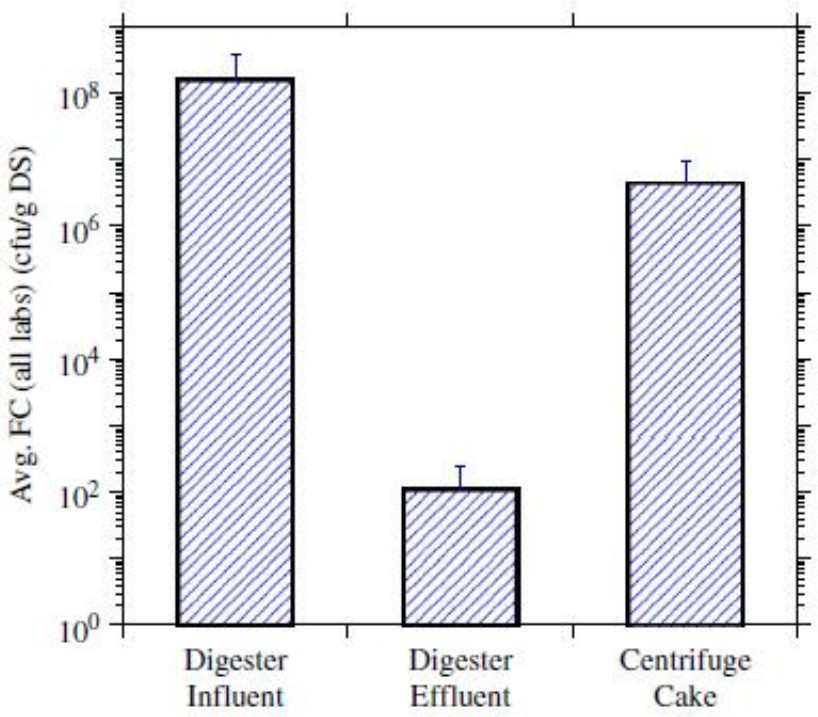


Figure 1. Average *E. coli* densities measured in samples taken from Thermophilic Plant 1. Note: error bars represent one standard deviation.

The digester parameters for each plant are summarized in Table 1. Three of the plants utilized conventional, single stage mesophilic digestion, while two utilized thermophilic digestion and one was a temperature phased anaerobic digestion (TPAD) process. The Thermo-2 process had four reactors operated in series which is typically thought to improve overall digestion, especially in terms of volatile solids reduction (VSR). This appears to be the case as the Thermo-2 process had the highest VSR of all the plants that were sampled.

Table 1. Summary of the digester operational parameters for each plant that was sampled.

Field site	Digestion type	Digestion SRT (d) and temperature	Digestion VSR (%)
TPAD-1	TPAD	15 d at 58 °C and 21 d at 37 °C	60
Thermo-1	Thermophilic—single-stage	15–20 d at 55 °C	65
Thermo-2	Thermophilic—four-stage	Total 22 d at 56 °C	60–62
Meso-1	Mesophilic—single stage	21 d at 37 °C	40–45
Meso-2	Mesophilic—single stage	30–35 d at 37 °C	50–60
Meso-3	Mesophilic—single stage	22 d at 36 °C	45–58