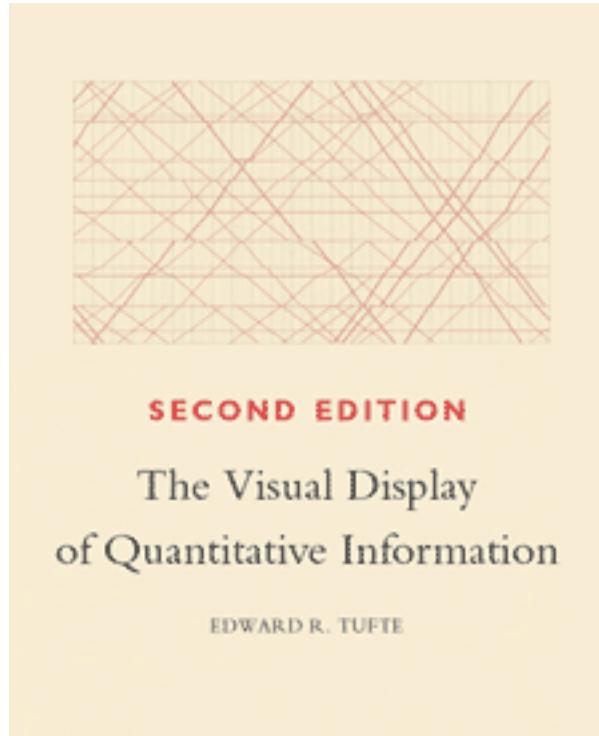


Visualizing metagenomics EDAMAME 2014

Why work to visualize metagenomic data?

You just showed us all these great statistics. Isn't that enough?

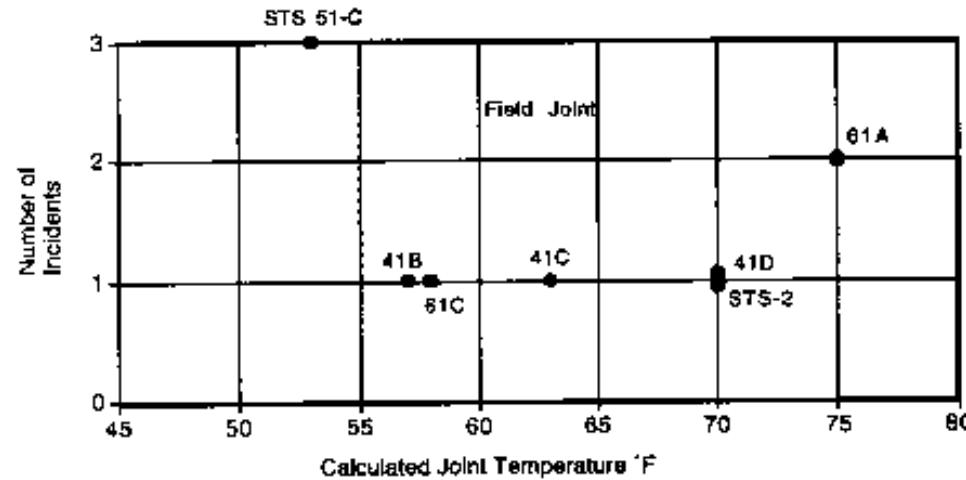
Edward Tufte says "no".



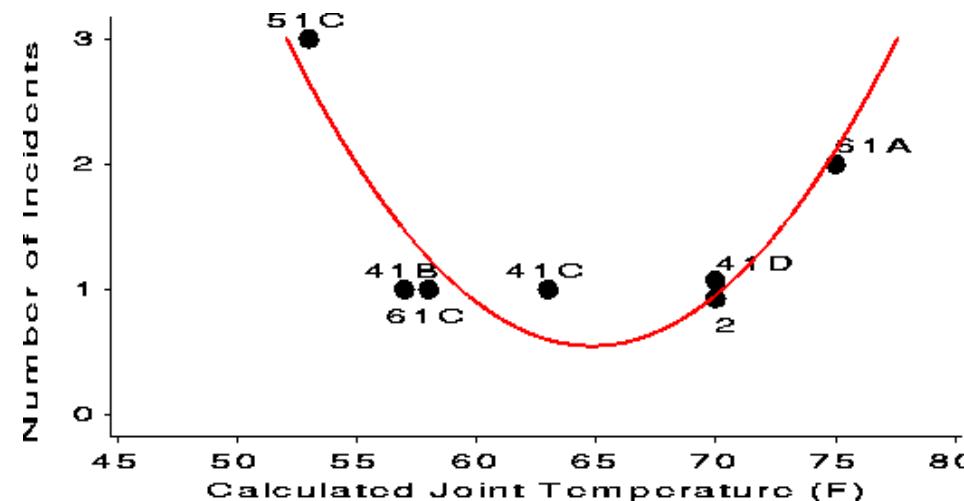
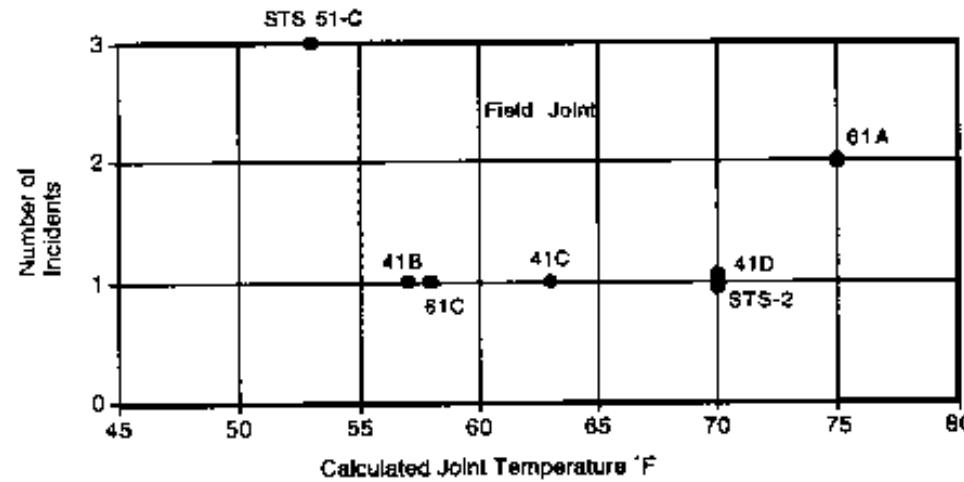
The "main goal of data visualization is to communicate information clearly and effectively through graphical means."

- Vitaly Freidman (2008)

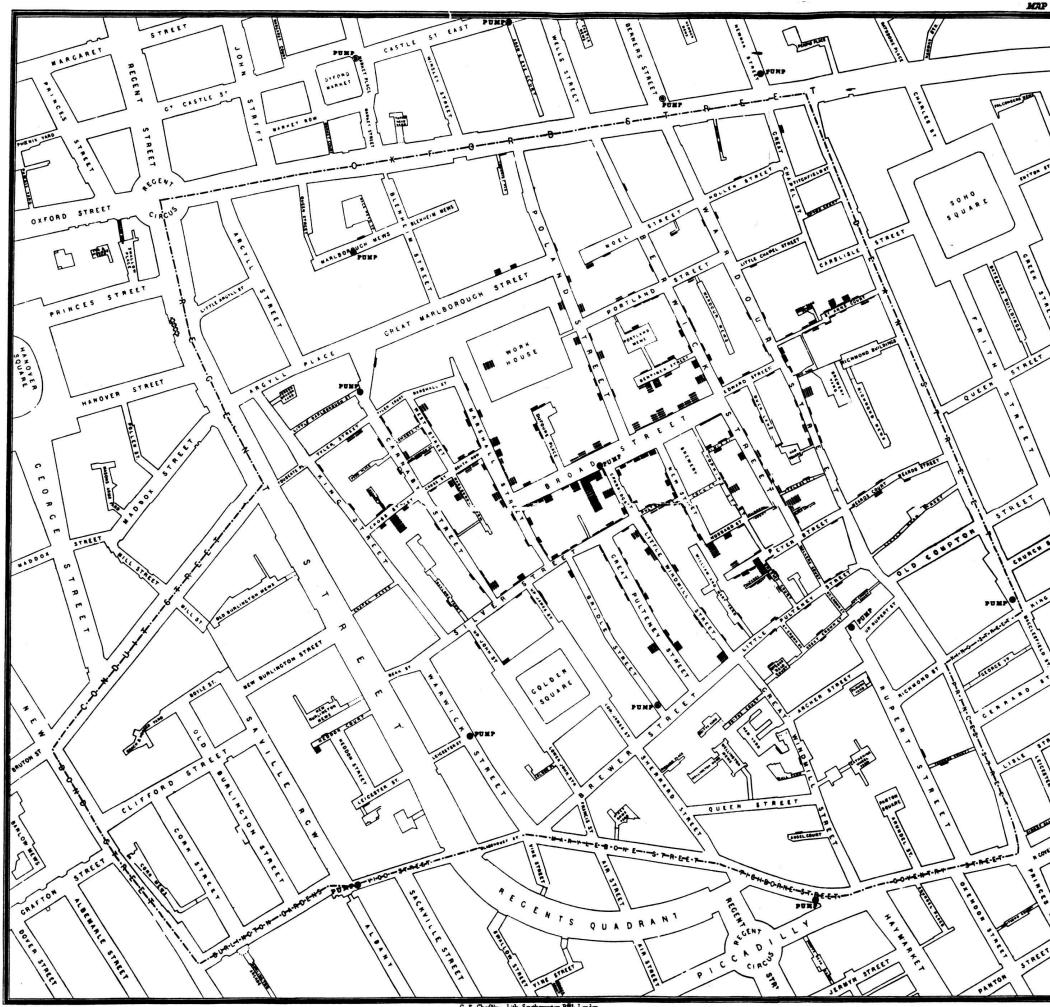
Challenger disaster



Challenger disaster

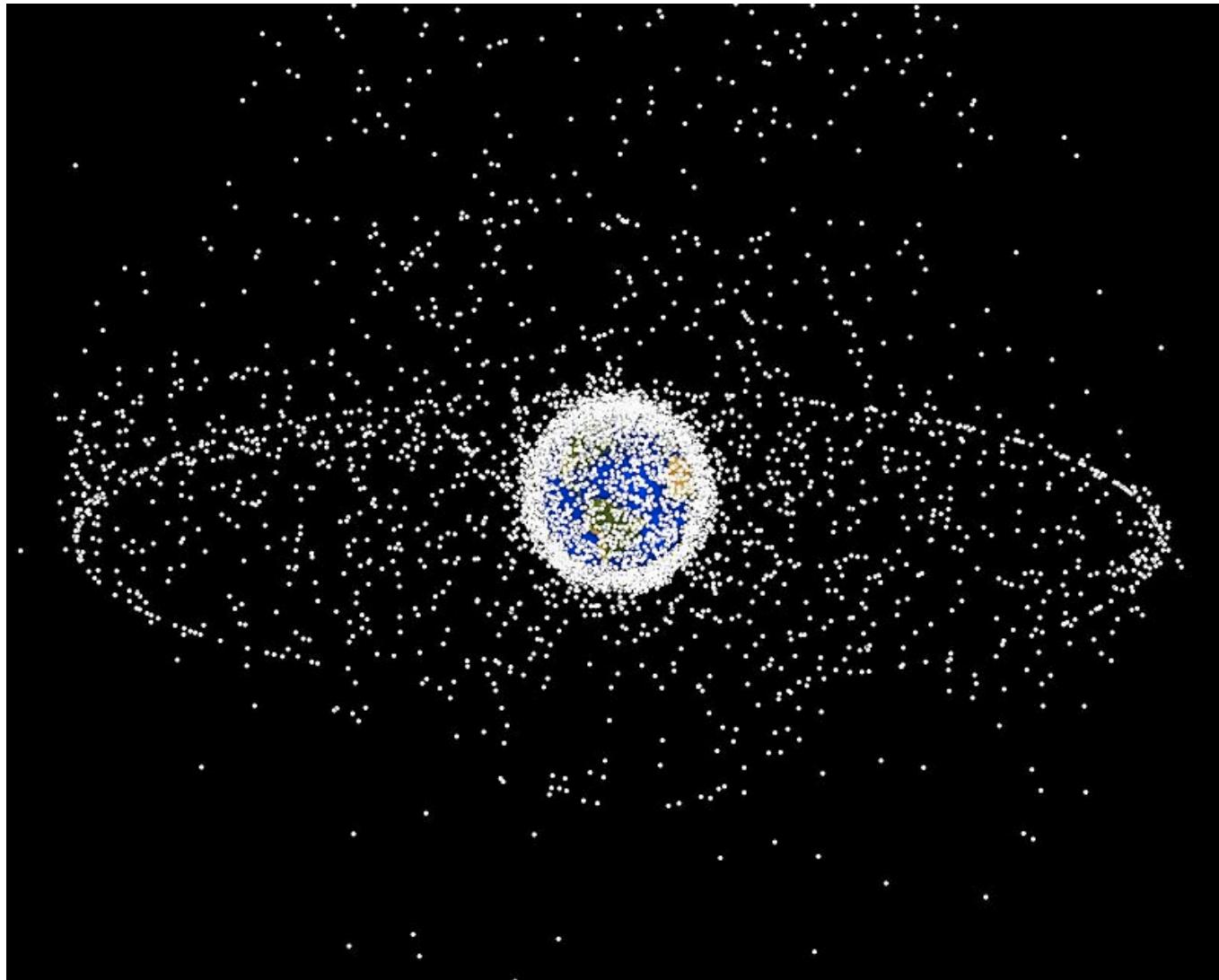


John Snow 1854 cholera map



Cholera cases highlighted in black. Founding of epidemiology.

Space debris



Graphical summary of patient information

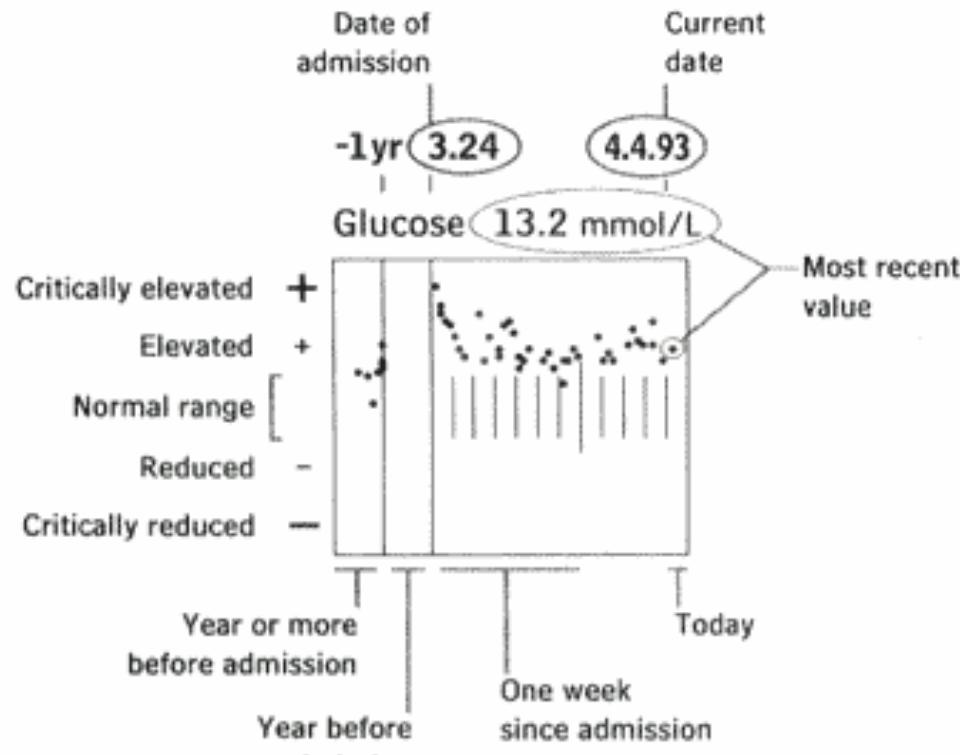


Figure 1: The basic graph

American date-format used.

Example: data reporting

- <http://fivethirtyeight.com/>

What does that mean for us?

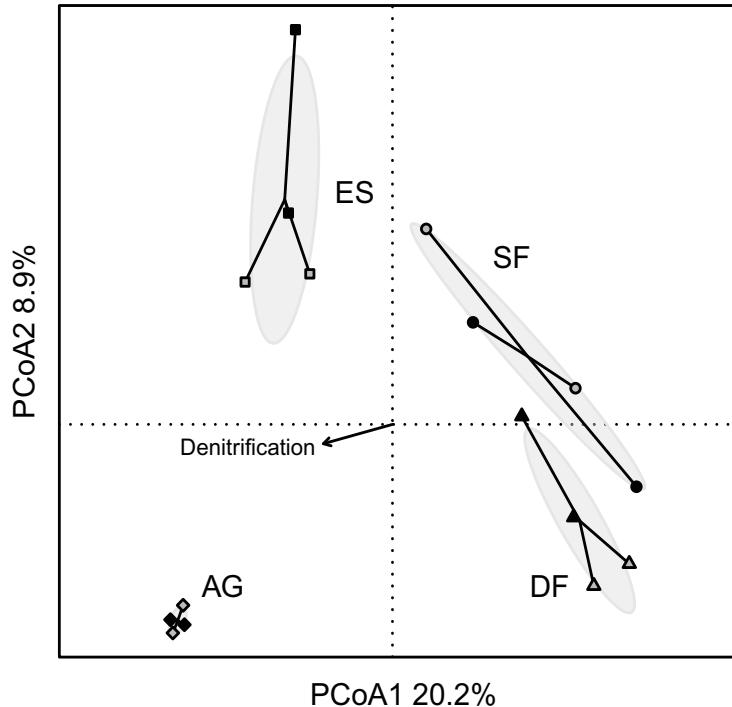
A	B	C	D	E	F	G
label	Group	numOtus	Otu0001	Otu0002	Otu0003	Otu0004
0.03	F3D0	391	115	355	37	
0.03	F3D1	391	35	116	7	
0.03	F3D141	391	103	279	62	
0.03	F3D142	391	85	193	24	
0.03	F3D143	391	44	195	27	
0.03	F3D144	391	92	282	42	
0.03	F3D145	391	191	474	91	
0.03	F3D146	391	75	257	51	
0.03	F3D147	391	493	1057	385	
0.03	F3D148	391	250	725	198	
0.03	F3D149	391	166	654	163	
0.03	F3D150	391	72	277	60	
0.03	F3D2	391	151	412	33	
0.03	F3D3	391	68	213	14	
0.03	F3D5	391	67	137	14	
0.03	F3D6	391	60	357	7	

Tools for metagenomic visualization

- R
- Python
- PAST
- QIIME
- Phinch

R

```
library(ggplot2)
```



R cookbook graphs

<http://www.cookbook-r.com/Graphs/>

R galleries

<https://storify.com/tracykteal/r-galleries>

R - phyloseq

- Phyloseq (demo)

McMurdi & Holmes, Plos ONE 2013

<http://joey711.github.io/phyloseq/>

Input format can be from many sources including mothur & QIIME

Challenge is getting data in to that format

Python

Matplotlib – Gallery: <http://matplotlib.org/gallery.html>

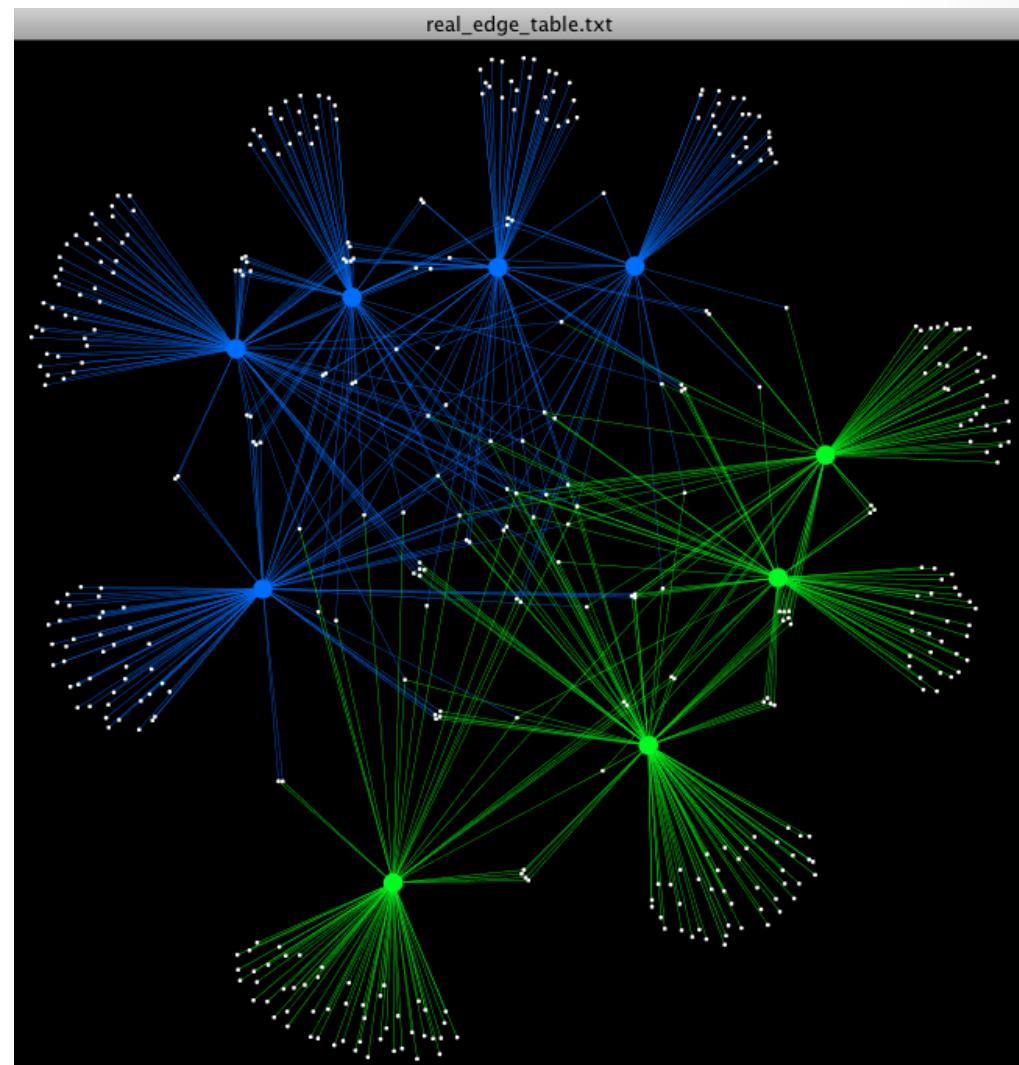
PAST

<http://folk.uio.no/ohammer/past/>

QIIME

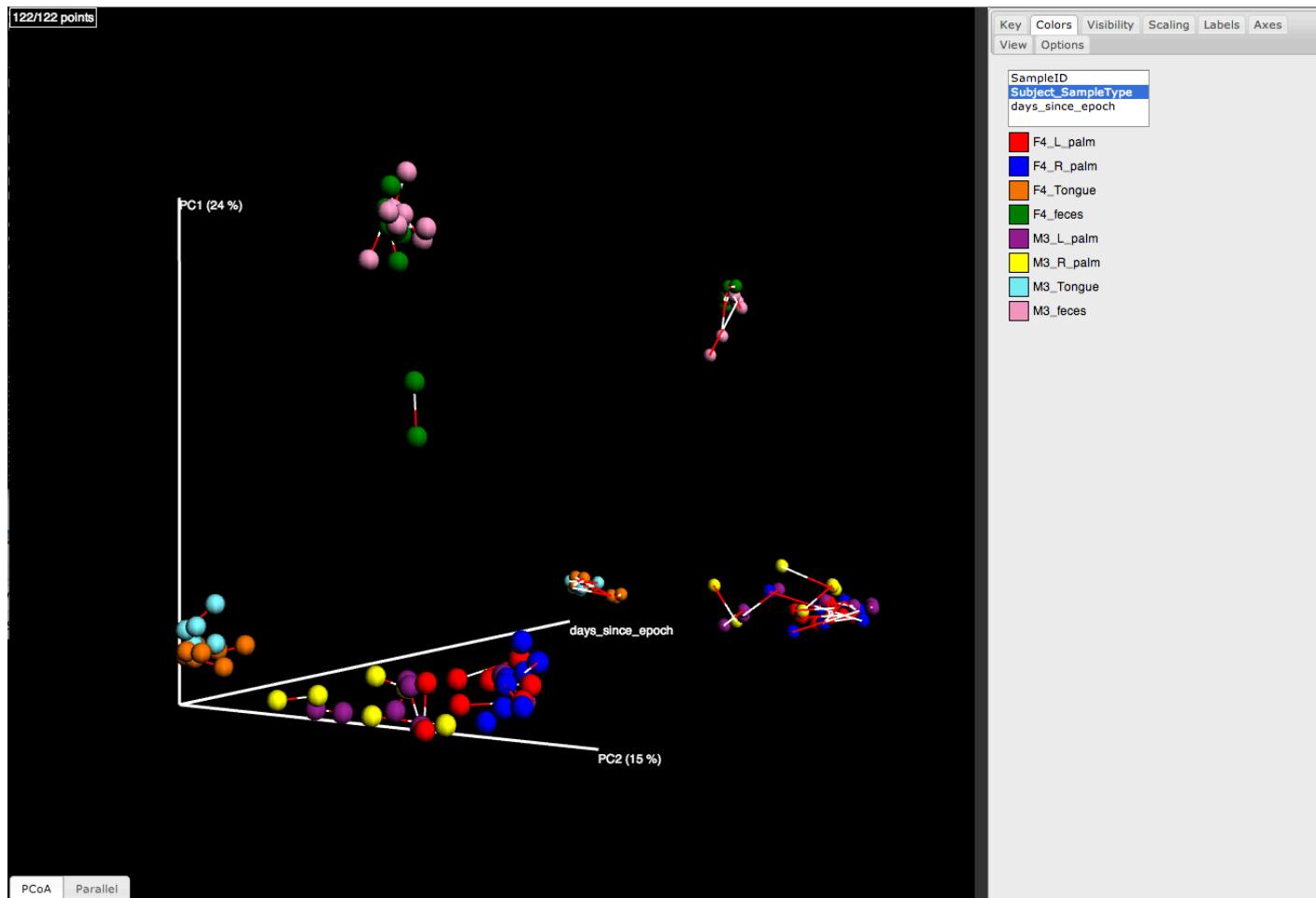
Cytoscape networks

<http://qiime.org/tutorials/index.html>



QIIME

Procrustes analysis



Taxonomy Bar Chart



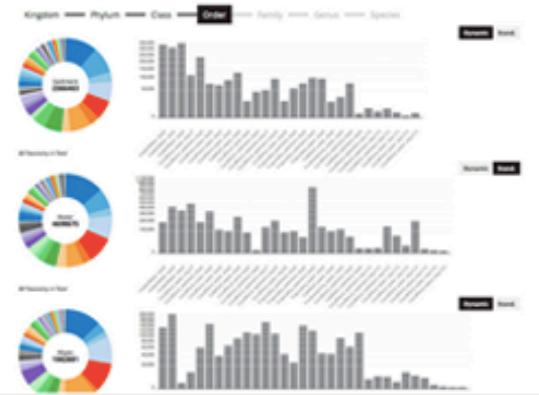
Bubble Chart



Sankey Diagram



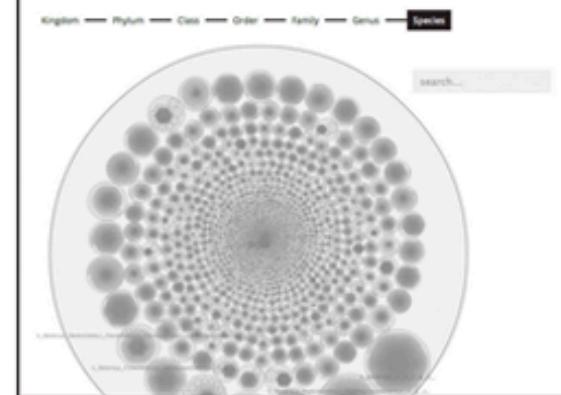
Donut Partition



Attributes Column Chart



Bubble Chart By OTU



<http://phinch.org/>

Holly Bik et al Supported by Sloan foundation

Phinch

Video: <http://phinch.org/blog/?p=215>

Visualization gallery: <https://github.com/shujianbu/Phinch/wiki/>

Input data type: QIIME BIOM format

Tufte guidelines

- Data visualization principles

<http://moz.com/blog/data-visualization-principles-lessons-from-tufte>

Visual data!
You and others can learn more
Seeing without words