

Use Rapache: It Works!

Jeffrey Horner

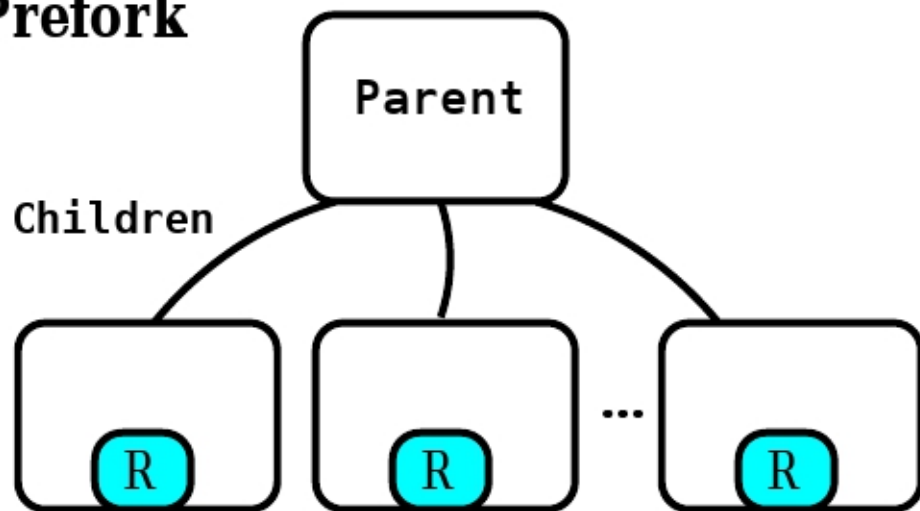
<http://rapache.net>

Bay Area User R Users Group
January 12, 2010

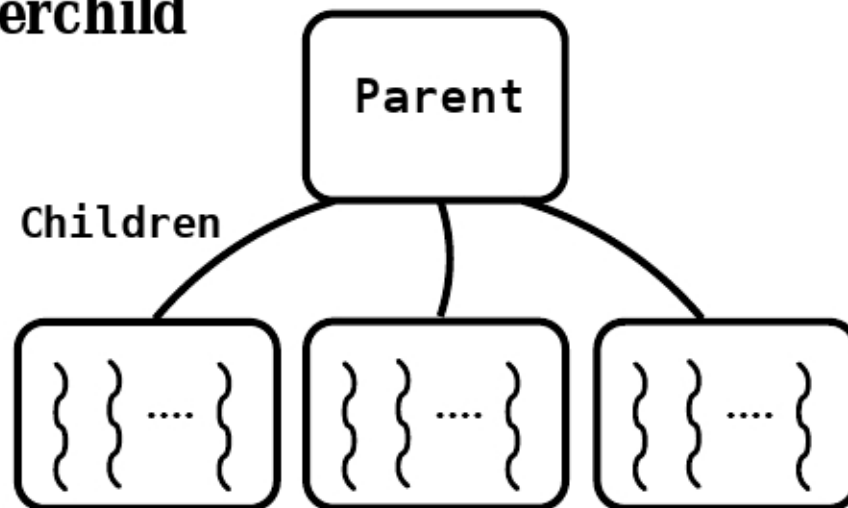
<http://www.meetup.com/R-users>

Basic Rapache Architecture

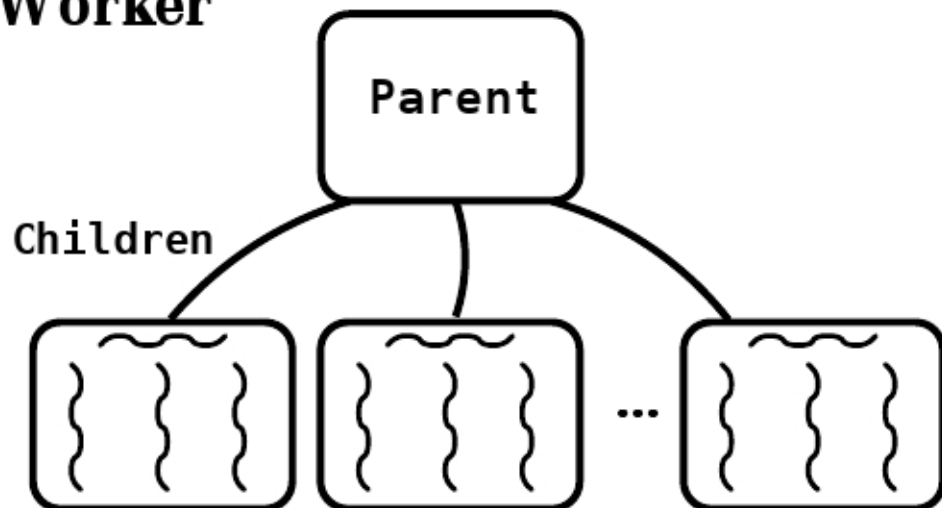
Prefork



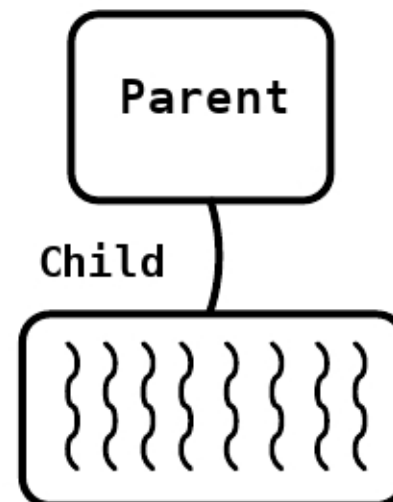
Perchild



Worker



WinNT



Configuring Apache for Rapache

Edit http.conf or similar

```
Location R_module /usr/lib/apache2/modules/mod_R.so
```

```
<Location /R/hello>
```

```
    SetHandler r-handler
```

```
    RfileHandler /var/www/test.R::hello
```

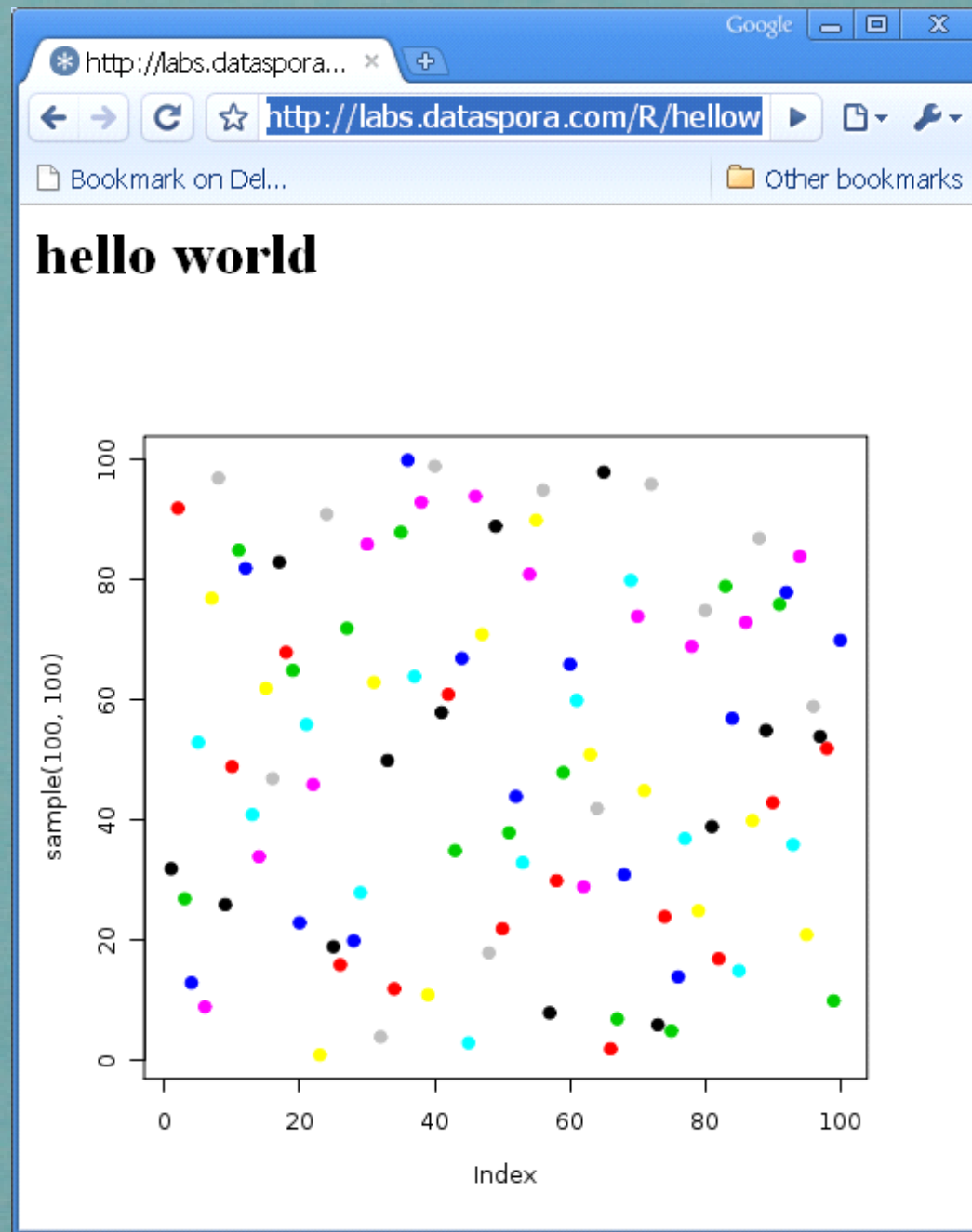
```
</Location>
```

Writing Hello World!

Edit test.R

```
hello <- function(){  
  setContentType("text/html")  
  png("/var/www/hello.png")  
  plot(sample(100,100),col=1:8,pch=19)  
  dev.off()  
  cat("<html>")  
  cat("<body>")  
  cat("<h1>hello world</h1>")  
  cat('")  
  cat("</html>")  
  OK  
}
```

Writing Hello World!



Rails - AJAX - MySQL - OH MY!

Google

Art created through the pr... x

← → ↻ ⌂ ☆ http://polyart.rapache.net/ ▶ ⌵ ⚙

Art created through the process of finding roots of functions



Details

[Start Making Art!](#)

[Intro](#)

[Writing Functions](#)

[Defining Colors](#)

Gallery



Links

Download the code

Intro

This web application demonstrates the use of [RApache](#) as a web service to explore images created through the process of finding roots of functions. It was inspired by and makes heavy use of Francois Pinard's [NRart](#) software, an [R](#) package which creates images and movies with the Newton-Raphson method.

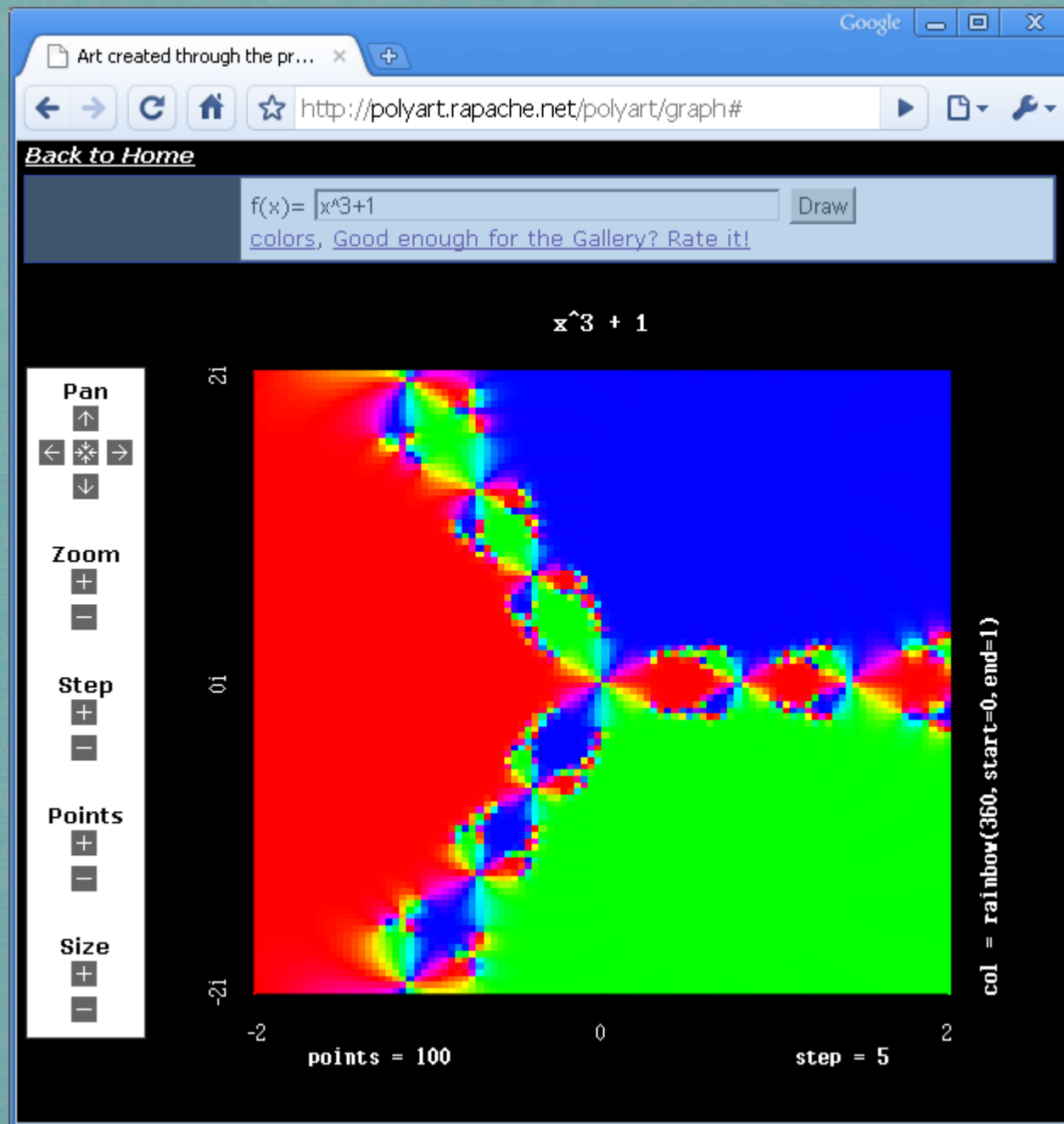
[Start Making Art!](#)

How To

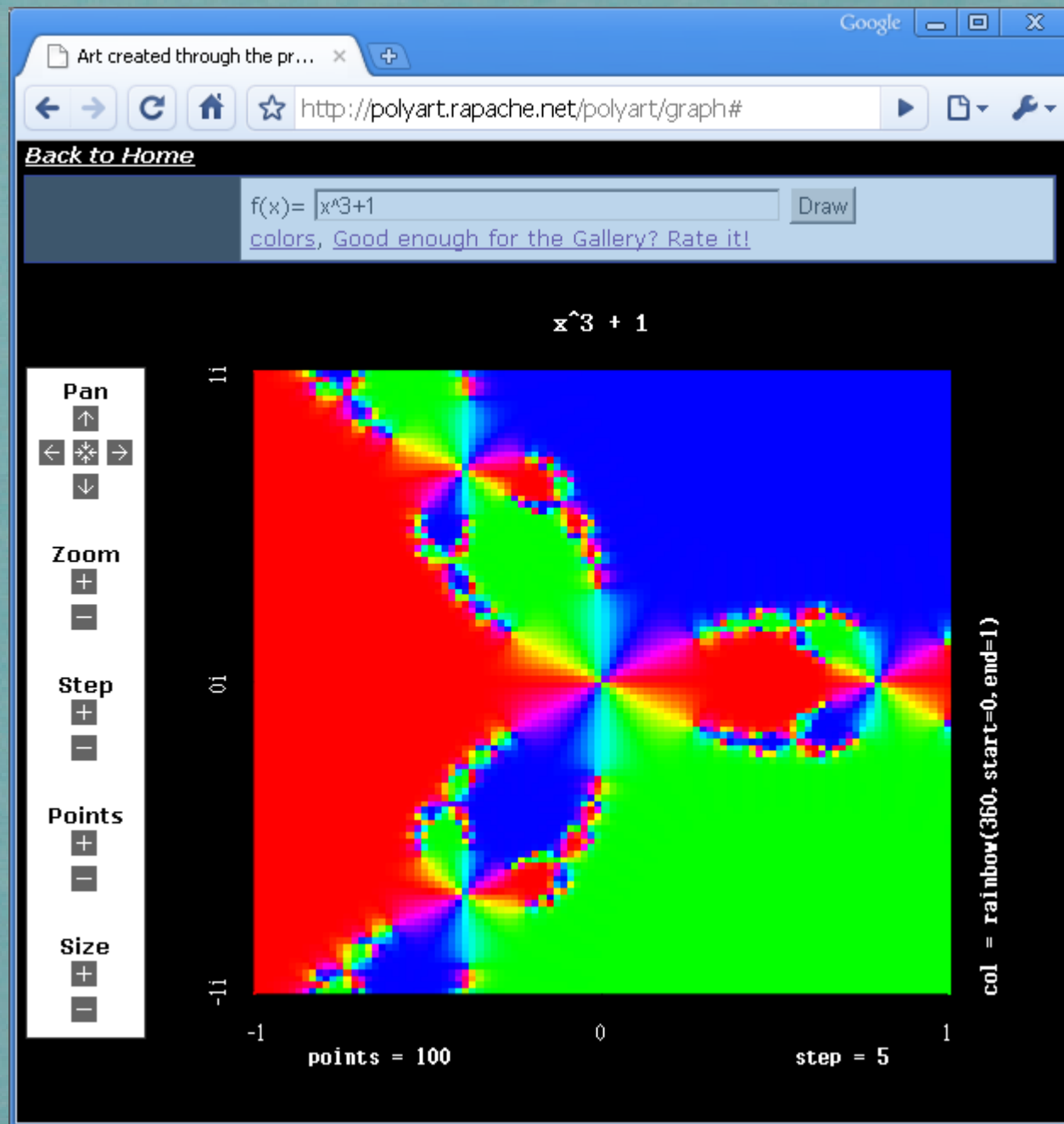
Users start off by typing in a [function](#) (usually a polynomial but it can also include logarithmic and trigonometric functions) in terms of the variable **x** and then clicking the **Draw** button. A nicely colored graph will appear in the main portion of the window. Next, the user can explore the image by clicking on the buttons from the left panel. **Pan** buttons allow one to move left, right, up, down, or center the complex plane. **Zoom** buttons allow one to zoom in or out. **Step** buttons control the number of Newton-Raphson iterations performed. **Points** increase or decrease the plane by a factor of 100 in both the x and y direction. **Size** increases or decreases the size of the image.

More advanced R users can click on the **color** link to type in a [color expression](#), which must return a vector of R colors. The default is [rainbow\(256 start=0 end=1\)](#). Another interesting example is

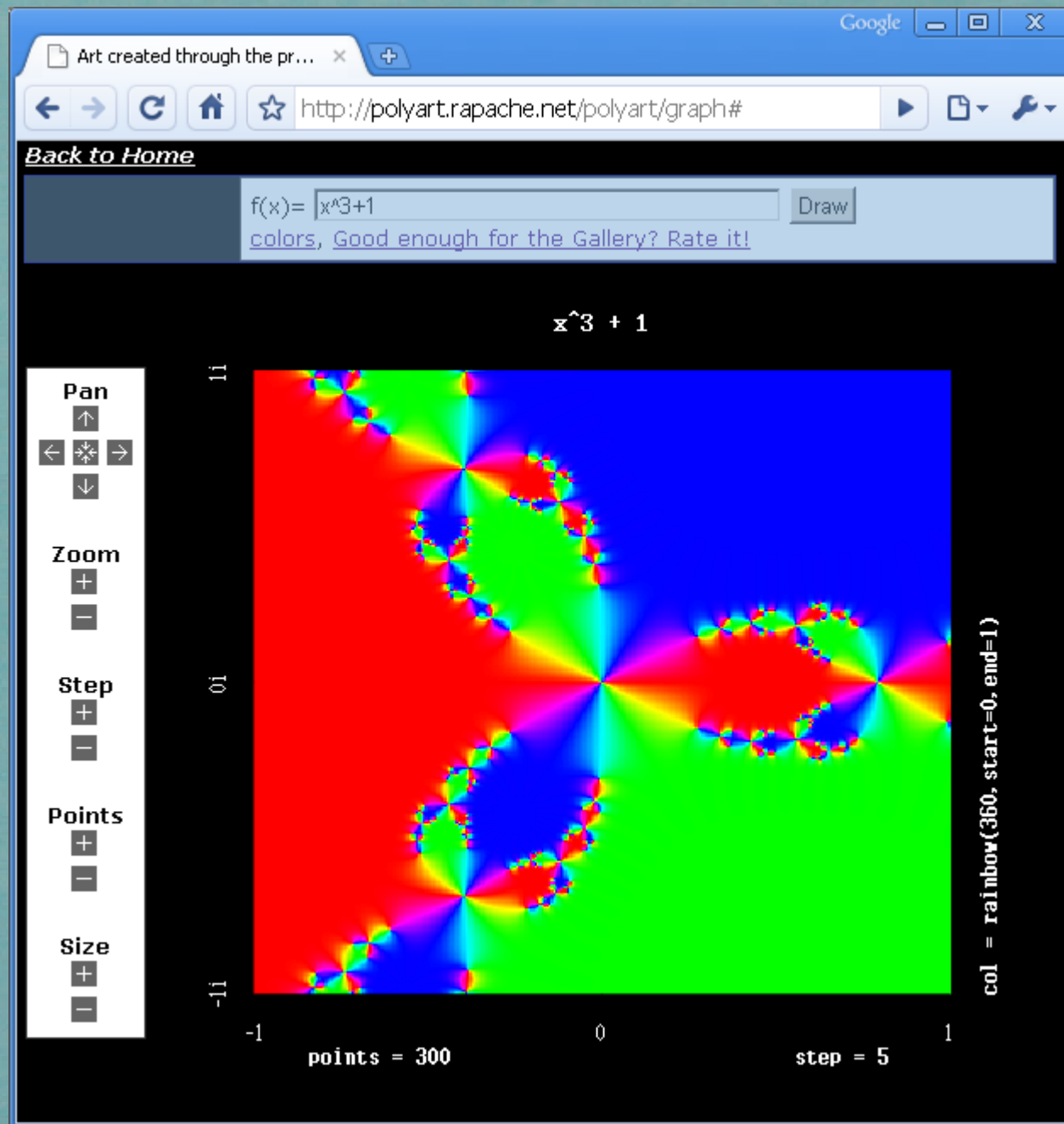
Rails - AJAX - MySQL - OH MY!



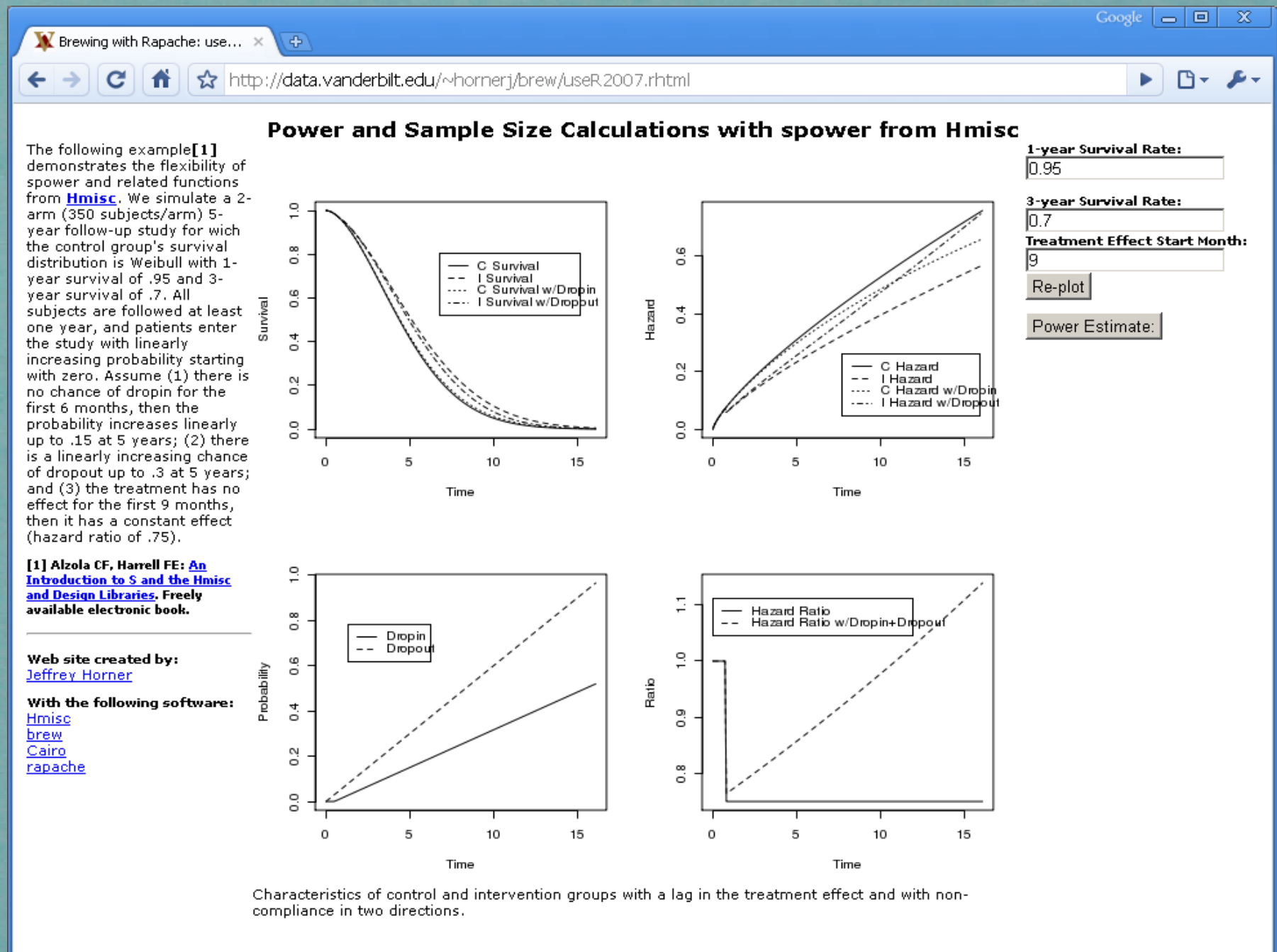
Rails - AJAX - MySQL - OH MY!



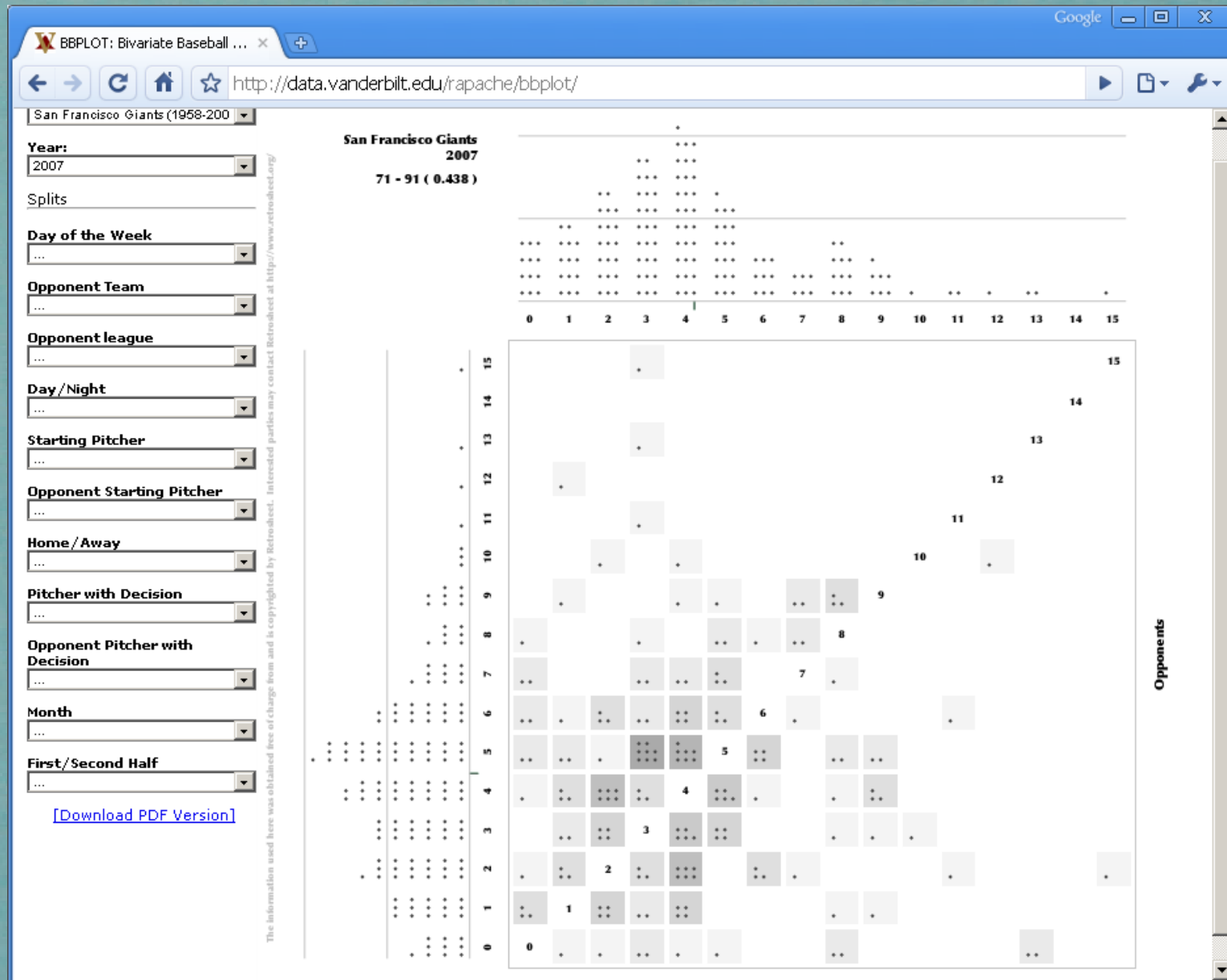
Rails - AJAX - MySQL - OH MY!



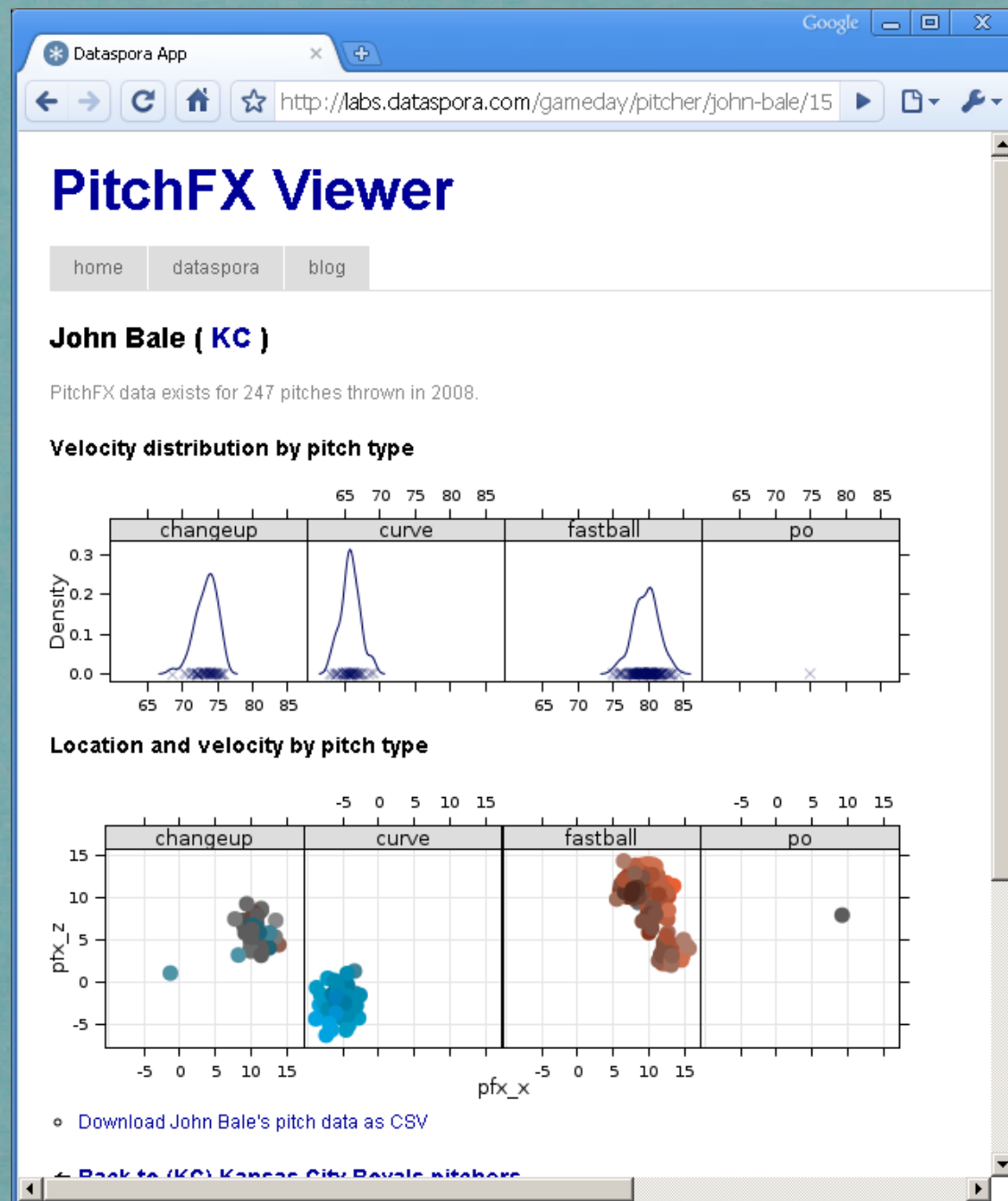
Hmisc - Power and Sample Size



Baseball Plots



Baseball Plots: Reloaded!



Go Fish! or Swim!

Revolutions: April 5, 2009 - ... x

http://blog.revolution-computing.com/2009/week15/

Find yourself a safer place to swim or fish in the Bay Area

Another example of a [web dashboard](#) built using [R](#) comes from John Oram, a scientist at the [San Francisco Estuary Institute](#). SFEI collects and monitors environmental data from the waters and wetlands of the Bay Area. By sampling the waters, sediments and fish of the San Francisco Bay and testing for toxins, pollutants and other hazards, they monitor the health of the environment for Bay Area residents.

Making sense of such data could be a challenge: how do you translate random point-samples of pollutants taken over a long period of time into an overall picture of the environmental impact? John Oram has met this challenge in two ways: by linking the point data to a Google map of the region, where you can see the individual measurements in context; and by using [kriging](#) analysis and contour charts from [R](#) to extrapolate those samples to the entire Bay. Using his [Web Query Tool](#) you can select whether to review sediment, water, or fish data, choose the period over which the samples were collected to view, and select a specific toxin or pollutant to analyze. Here's a screenshot (click to enlarge) showing the distribution of all [PCBs](#) in the sediments of the bay based on samples from 2002-2007, but you can try it yourself and produce maps for other pollutants.

Map Legend

Sum of PCBs (SFEI) in Sediment (ug/Kg) 2002 to 2007

- Not Reported
- 0.00 - 4.44
- 4.44 - 8.89
- 8.89 - 13.33
- 13.33 - 17.77
- 17.77 - 22.21
- 22.21 - 26.66

Map Generated: 3/10/2009
© SFEI www.sfei.org

Map Controls

Map Layers

POWERED BY Google

Map data ©2009 Tele Atlas, NEXRAD, Mapbox, Mapbox Environmental Mesoscale

Amazingly, John created this application on basically zero budget; it uses all free tools

Thanks!

Need Help!

- Debian/Ubuntu/Redhat package
- Amazon EC2 image
- C programmers for new features

Future Stuff

- Session timeout for long running scripts
- tryCatch() for better error messaging
- Rails/Django like MVC package