**Workshop Proposal**

**Painless Reports and Data Representation in R**

**Workshop Description**

This course will cover the basics of advanced plotting using the ggplot2 package and standardized, automated report generation using Rmarkdown. Participants will also learn how to easily handle and summarize data in R using the dplyr and tidyr packages. Each participant will leave with the knowledge and personalized set of resources to easily reproduce all analysis conducted in the workshop on their own data.

**Target Audience**

This workshop is geared towards fisheries biologists and research scientists experienced with R (comfortable importing and manipulating data) but who are interested in expanding their use and efficiency within R through data tidiness and automation. All data analysis will be conducted on existing fisheries or ecology datasets and examples can be tailored upon request.

**Learning Objectives**

At the conclusion of this workshop, participants will be able to:

1. Create a personalized RMarkdown script of ggplot2 graph templates
2. Feel comfortable constructing publication quality plots using ggplot2
3. Manipulate large datasets using tidyr
4. Summarize data using dplyr
5. Construct presentation quality reports using RMarkdown

Optional objectives:

1. Create interactive maps using Leaflet and static maps using ggmap
2. Understand the basics and value of RShiny applications and widgets
3. Create presentations using R
4. Feel comfortable with loops, functions, and conditional statements

**Workshop Topics**

*Rmarkdown*

Markdown is a language for producing slick-looking documents without having to learn all of the intracacies of a markup language (like HTML or LaTeX). Rmarkdown is an easy-to-use language geared specifically towards R. Ever try to insert an R figure into a Word document? How about a table? Imagine trying to put code into a Word doc. If you're cringing as much as I am just thinking about those tasks, then Rmarkdown is the package for you. It seamlessly integrates with R to easily produce documents that can contain complex graphics, tables, and R code examples in addition to text. Rmarkdown is perfect if you have dozens of reports to submit that all look almost identical or just a quick and elegant summary of results for a presentation or meeting. Let automation take over and do the work for you.

*ggplot2*

ggplot2 is a system for presenting potentially complex data in an eloquent manner. The graphics produced by this package are second-to-none and represent the "industry standard" for publication quality figures. If you can envision it in your mind, then ggplot2 can probably produce it.

*tidyr*

Most data is messy. The tidyr package was created with one goal in mind...to help clean up messy data. There is an entire philosophy behind tidy data, but the basics are this:  
  
-each variable is in a column  
-each observation is in a row  
-each value is in a cell  
  
tidyr helps you to repackage any dataset, no matter how messy, into one that is clean and can be easily analyzed.

*dplyr*

The dplyr package in R is a way for you to easily grapple with your data and a replacement for awkward Microsoft Excel pivot tables. It provides a consistent framework for handling data using verb-like functions that make it easy to understand what is happening. With dplyr you are able to group, arrange, change, summarize, and filter data in enough ways to cover almost all practical data handling issues. Best of all...it's lightning fast.

**Budget**

Expected workshop cost: $5330\*

* Instructor Compensation (Salary, fringe, and mileage): $3000
* CE Compensation for logistics, planning, and registration services: $1000
* Supplies: $300 (handouts, flash drives with data, etc.)
* Food: $500 (coffee and lunch both days)
* University over-head: $530

\*All expenses are based on 20 participants with the workshop being held in Stevens Point. For a group of less than 20 people subtract $37 per participant not included, i.e. for a group of 15 people subtract $185 ($37\*5) from $4450 (workshop cost at 15 people $4265).