Note

R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
library(SolarData)
```

```
## Loading required package: ggplot2
```

```
## Loading required package: insol
```

```
lon <- c(100, -100, 0)
lat <-c(10, 0, 90)
LT <- LTF.get(lon, lat, directory = "/Volumes
LT
```

```
##     (100, 10) (-100, 0) (0, 90)
## Jan      3.50      3.55    1.90
## Feb      3.60      3.95    1.90
## Mar      4.15      4.00    1.90
## Apr      4.45      3.80    2.00
## May      4.50      3.50    2.00
## Jun      4.55      3.65    2.05
## Jul      4.60      3.35    2.10
## Aug      4.70      3.30    2.10
## Sep      4.65      3.80    2.00
## Oct      4.40      3.75    1.95
## Nov      3.95      3.60    1.90
## Dec      3.90      3.55    1.90
```

```
##################################################
##################################################
# library(SolarData)
# #California map information
# California <- maps::map('state', region = '
#               fill = TRUE, plot = FALSE)
# bd <- maptools::map2SpatialPolygons(Califor
#       proj4string=sp::CRS("+proj=longlat +d
# bndary <- bd@polygons[[1]]@Polygons[[1]]@co
# bndary_plot <- data.frame(bndary)
# names(bndary_plot) <- c("lon", "lat")
# #generate the regular grid
# res = 0.2
# x1 <- seq(-124.02, -114.1, by = res)
# y1 <- seq(42.05, 32.40, by = -res)
# loc1 <- expand.grid(x1,y1) #regular grid
# loc_reg <- loc1[which(sp::point.in.polygon(point.x = loc1[,1],
#    point.y = loc1[,2], pol.x = bndary[,1], pol.y = bndary[,2])==1),]
```

```
# #generate all points following original, i.e., most gran
# x2 <- seq(-124.02, -114.1, by = 0.04)
# y2 <- seq(42.05, 32.40, by = -0.04)
# loc2 <- expand.grid(x2,y2) #PSM3 grid
# loc_irreg <- loc2[which(sp::point.in.polygon(point.x = l
#    point.y = loc2[,2], pol.x = bndary[,1], pol.y = bndar
# loc_irreg <- loc_irreg[sample(x = 1:nrow(loc_irreg), siz
#              nrow(loc_reg), replace = FALSE),]
#
# ##########################################################
# #plot
# data_plot <- data.frame(lon = append(loc_reg[,1], loc_ir
#                         lat = append(loc_reg[,2], loc_ir
#                         group = c(rep('regular', nrow(lo
#                         rep('irregular', nrow(loc_irreg)
# p <- ggplot() +
#      geom_point(data=data_plot,aes(x=lon,y=lat), size =
#      geom_polygon(data=bndary_plot,aes(x=lon,y=lat), siz
#                   color = 'red', fill = NA)+gy_2017c_Enti
#      facet_wrap(~group) +
#      coord_fixed() +
#      scale_x_continuous(limits=c(-124.5, -114), expand =
#      scale_y_continuous(limits=c(32, 42.5), expand = c(0
#      xlab(expression(paste("Longitude [", degree, "]", s
#      ylab(expression(paste("Latitude [", degree, "]", se
#      theme_gray() +
#      theme(plot.margin = unit(c(0.5,0.5,0,0), "lines"),
#            panel.spacing = unit(0.1, "lines"),
#            text = element_text(size = 7),
#            legend.position = "none")
# options(repr.plot.width=7, repr.plot.height=3) #This is
# p
```

```
##########################################################
#install.packages("devtools", repos = "http://cran.us.r-pr
#library("devtools")
#install_github("dazhiyang/SolarData")
#library("SolarData") #load the package
# get PSM data for two locations
# loc <- matrix(c(42.05, 44, -124.02, -120), nrow = 2)
# PSM.get(lat = loc[,1], lon = loc[,2],
#         api_key = "FVltdchrxzBCHiSNF6M7R4ua6BFe4j81fbPp8
#         attributes = "ghi,dhi,dni",
#         name = "John+Smith", affiliation = "Some+Institu
#         year = "2016", leap_year = "true", interval = '3
#         utc = "false", reason_for_use = "research",
#         email = "email@gmail.com", mailing_list = "false
#
# setwd()
```

Including Plots

Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.