# Different approaches to scaling SAD and the logseries

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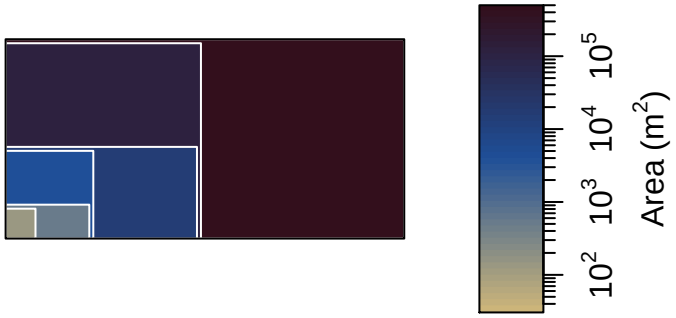
## Intro to scaling

How we do the scaling

```
## calcualte scaling for the two datasets and show plot of colors onto scales
r <- raster(ncols = 1000, nrows = 500, xmn = 0, xmx = 1000, ymn = 0, ymx = 500)
s <- determineScale(r)
col <- quantCol(s[, 1] * s[, 2], pal = hsv(c(0.12, 0.6, 0.94), c(0.4, 0.8, 0.7), c(0.8, 0.6, 0.2)),
                trans = 'log')

layout(matrix(1:2, nrow = 1), widths = c(2, 1))
par(mar = rep(0.5, 4))
plot(1, xlim = c(-100, 1000), ylim = c(-100, 500), type = 'n', asp = 1, axes = FALSE)
for(i in 1:6) {
    rect(0, 0, s[i, 1] - (i-1)*10, s[i, 2] - (i-1)*10, lwd = 1, border = 'white', col = col[(i - 1)*2.5
}
rect(0, 0, s[1, 1], s[1, 2])

par(mar = c(6, 1, 6, 4))
plot(1, xlim = 0:1, ylim = range(s[, 1] * s[, 2]), log = 'y',
     xaxs = 'i', yaxs = 'i', axes = FALSE,
     xlab = '', ylab = '')
rect(xleft = 0, xright = 1,
     ybottom = exp(seq(log(prod(s[1, ])), log(prod(s[nrow(s), ])), length.out = 51))[-51],
     ytop = exp(seq(log(prod(s[1, ])), log(prod(s[nrow(s), ])), length.out = 51))[-1],
     border = colorRampPalette(col)(50),
     col = colorRampPalette(col)(50))
box()
logAxis(4, expLab = TRUE)
mtext(expression('Area ('*m^2*')'), side = 4, line = 2.5)
```



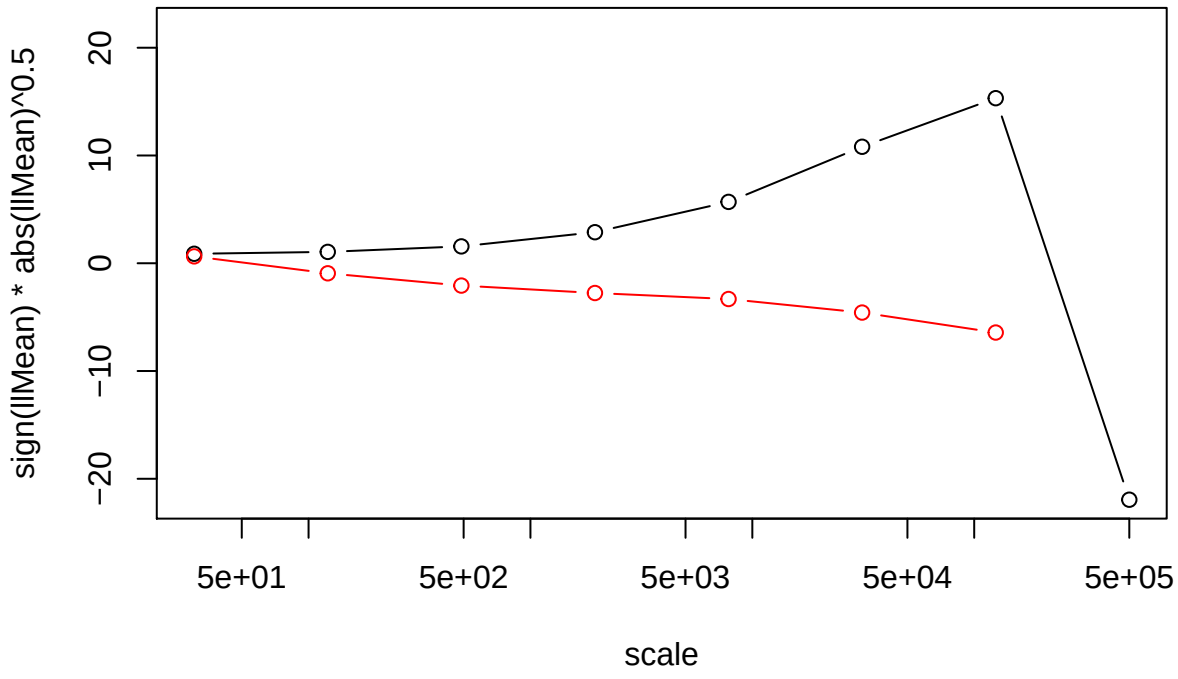
## Scaling z-score

## Scaling relative log likelihood

```
bciScaleRelLL <- read.csv('scaling_fisherRelLL_BCI.csv', as.is = TRUE)
head(bciScaleRelLL)
```

```
##   X       scale      llMean     llCI1     llCI2 llPermMean  llPermCI1
## 1 1 500000.0000 -481.408099        NA        NA          NA         NA
## 2 2 125000.0000  234.643087  60.71839 381.52115 -41.333587 -43.704547
## 3 3  31250.0000  116.809751  14.31343 214.40112 -20.945766 -27.111590
## 4 4   7812.5000   32.407368 -10.20386 127.75920 -11.013540 -15.510288
## 5 5   1953.1250    8.300778 -12.17937  38.38466  -7.621461 -11.570099
## 6 6    488.2812    2.448622  -8.78040  13.94870  -4.291464  -9.398904
##     llPermCI2
## 1          NA
## 2 -38.8220299
## 3 -15.0765709
## 4  -8.0651299
## 5  -4.5570056
## 6  -0.9005714
```

```
with(bciScaleRelLL, {
    plot(scale, sign(llMean) * abs(llMean)^0.5, log = 'x',
         ylim = c(-1, 1) * max(abs(llMean), abs(llPermMean), na.rm = TRUE)^0.5,
         type = 'b')
    points(scale, sign(llPermMean) * abs(llPermMean)^0.5, col = 'red', type = 'b')
})
```



## Scaling singletons