Sea level rise pressure procedure

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The Sea Level Rise pressure layer was updated with new data for the year 2013. Previous data went through 2012.

Data

Data for mean sea level rise (in mm) between January 1993 and June 2014 was downloaded on 1/12/15 from AVISO.

```
# The following 3 lines were done once to create raster from downloaded NetCDF. No longer need to run t

    #library(ncdf4)

    #r <- raster('raw/MSL_Map_MERGED_Global_IB_RWT_NoGIA_Adjust.nc')
    #writeRaster(r,'tmp/MSL_Map_MERGED_Global_IB_RWT_NoGIA_Adjust.tif')


# Read in raw data

    r<-raster(file.path(dir_N,'git-annex/globalprep/AVISO-SeaLevelRise_v2015/tmp/MSL_Map_MERGED_Global_

    r = rotate(r)

    plot(r,main='Mean Annual Sea Level Rise (mm)\n1993-2014',col=cols)
```
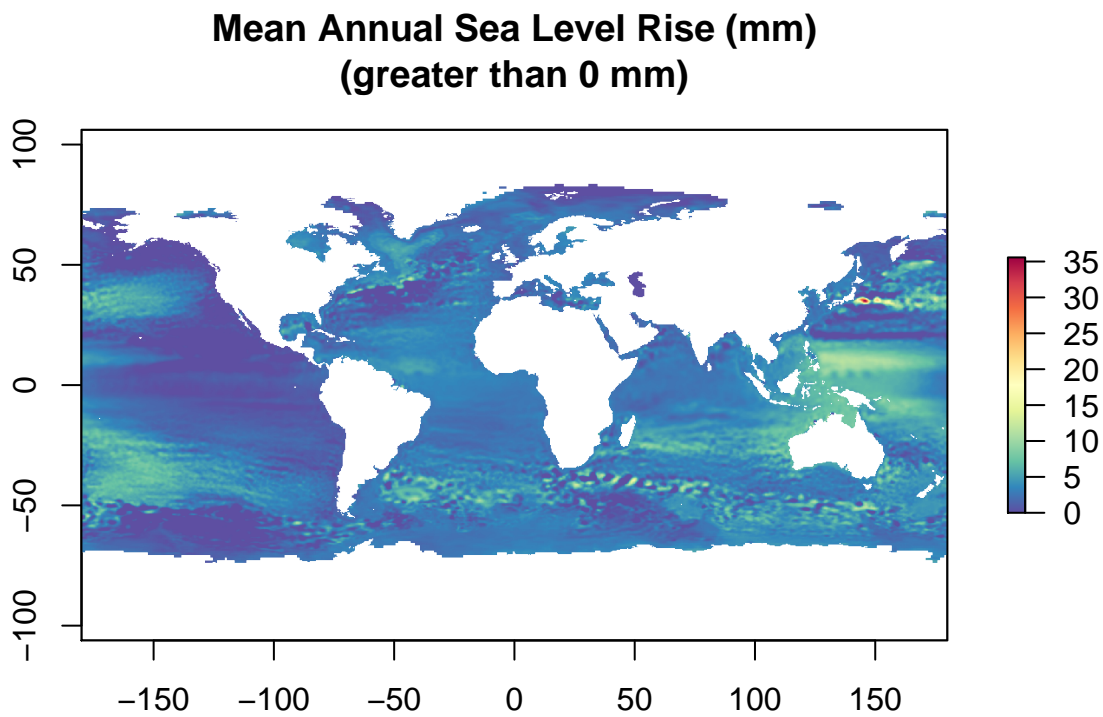

Mean Annual Sea Level Rise (mm)
1993–2014
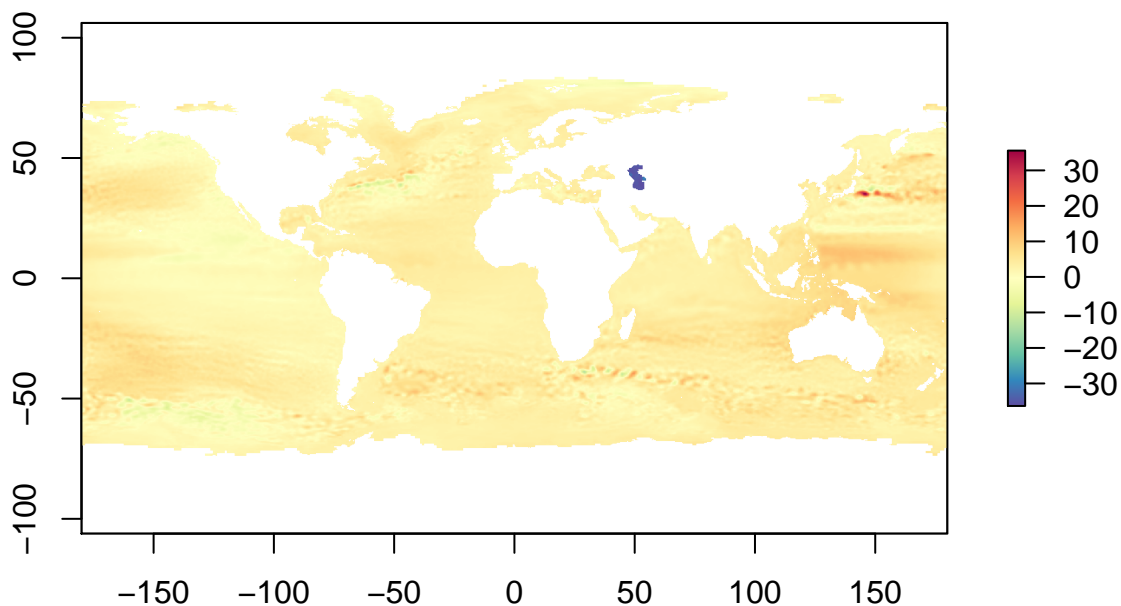
```
cellStats(r,stat='range')
```

[1] -36.37804 35.57271

All values less than 0 set to 0   Since a decrease in sea level rise is not considered a pressure, all values
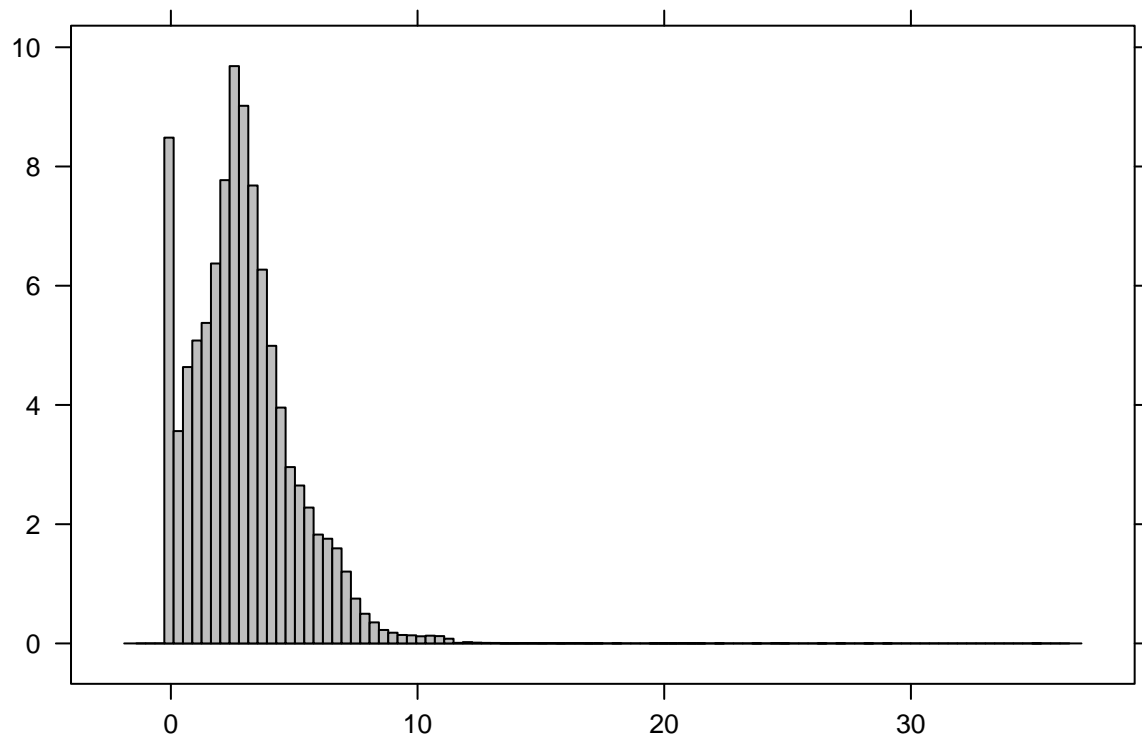less than 0 are clipped to 0.

```
r[r<0]<-0

plot(r,col=cols,main='Mean Annual Sea Level Rise (mm)\n(greater than 0 mm)')
```


Mean Annual Sea Level Rise (mm)
(greater than 0 mm)

Set reference point   The reference point was set by looking at the distribution of values in the data and
choosing an appropriate value to set as 1.

```
histogram(r)
```

2

```r
quantile(r,probs=c(0,0.0001,0.001,0.01,0.1,0.25,0.5,0.75,0.9,0.99,0.999,0.9999))
```

```
##         0%       0.01%       0.1%          1%          10%         25%
##  0.0000000   0.0000000   0.0000000   0.0000000   0.2895556   1.4843723
##        50%         75%         90%         99%        99.9%       99.99%
##  2.7231191   3.9701382   5.6493594   8.8635352  11.5661561  24.0321697
```

The 99.99th percentile (24.0321697) was chosen as the reference point with a 10% buffer for an actual reference point of **26.43539**. After normalizing data by this value, all values greater than 1 were set equal to 1.

```r
#get reference point
ref = 24.0321697*1.1

#normalize by the reference point
r_norm <- r/ref

# since some values are still above the reference point (greater than 1) cap these to 1.
r_norm[r_norm>1]<-1

plot(r_norm,main='Normalized Sea Level Rise',col=cols)
```

Normalized Sea Level Rise