Low values of in situ Chlorophyll

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This is an R Markdown document.

NASA has adopted the OCI chlorophyll algorithm

Hu, C., Z. Lee, and B.A. Franz (2012). Chlorophyll-a algorithms for oligotrophic oceans: A novel approach based on three-band reflectance difference, J. Geophys. Res., 117, C01011, doi:10.1029/2011JC007395.http://oceancolor.gsfc.nasa.gov/staff/franz/papers/hu_et_al_2012_jgr.pdf

Comapred to the current OCX alorithm, this will result in lower `chlor_a` values when `chlor_a < 0.4 mg/m^3` (`log(chlor_a) < -0.9162907`), so it is interesting to know how often in situ measurements fall below this value.

```
setwd("/Volumes/System-ambrosia-10.6/Users/gwhite/OP/XA/A2013.1/data/insitu")
cp.df = read.csv("cp-20141117-AC.csv")
str(cp.df)
```

```
## 'data.frame':    1583 obs. of  16 variables:
##  $ lat    : num  54.5 53 53 53.9 53.8 ...
##  $ lon    : num  -56.4 -55 -55 -52.7 -53.1 ...
##  $ dn     : int  185 130 130 133 134 134 190 191 104 105 ...
##  $ day    : int  3 9 9 12 13 13 9 10 13 14 ...
##  $ mon    : int  7 5 5 5 5 5 7 7 4 4 ...
##  $ year   : int  1984 1988 1988 1988 1988 1988 1985 1985 1984 1984 ...
##  $ h      : num  16.6 435.5 446.5 928.1 607.3 ...
##  $ sigma  : num  3.58 17.07 15.24 20.06 11.05 ...
##  $ zm     : num  8.37 13.06 10.31 -3.86 19.73 ...
##  $ Bo     : num  0.793 2.19 0.114 0.185 0.943 ...
##  $ rho    : num  0.7 0.82 0.99 0.99 0.96 0.89 0.92 0.67 0.86 0.27 ...
##  $ dataset: Factor w/ 65 levels "   90001","   91001",..: 5 8 8 8 8 8 53 53 4 4 ...
##  $ stn    : Factor w/ 669 levels "     3 ","     9 ",..: 65 19 19 43 44 44 78 80 47 47 ...
##  $ chlsur : num  0.913 9.786 9.412 18.304 5.396 ...
##  $ tempsur: num  -1.2 0 0 -0.9 -0.6 -0.6 1 6.3 0.7 0.7 ...
##  $ tz     : num  9 10 10 10 10 10 1 1 10 10 ...
```

```
sum(cp.df$chlsur < 0.4)
```

```
## [1] 448
```

```
log(0.4)
```

```
## [1] -0.9162907
```

Clearly a significant fraction of the measurements will be affected by this change.

```r
hist(log(cp.df$chlsur))
```