

DHS analysis comparing the base analysis to outlier Filtering with loess baseline

```
library(DSIWastewater)

data(wastewater_data, package = "DSIWastewater")

workset4_data <- buildWorkSheet4(wastewater_data)

#Only show Site with more than 180 measurements for vignette for brevity
workset4_data <- workset4_data[workset4_data$n >= 180,]

workset4_Smooth_data <- do.call(rbind,
                                lapply(
                                  split(workset4_data,~WWTP),
                                  LoessSmoothMod))

filter_outliers <- function(df, n){
  df_data <- computeJumps(df)
  ranked_data <- rankJumps(df_data)
  ranked_quantile_data <- computeRankQuantiles(ranked_data)
  classied_data <- flagOutliers(ranked_quantile_data, n)
  created_data <- RemoveOutliers(classied_data)
}

created_data <- filter_outliers(workset4_Smooth_data, 9)

reg_estimates_data <- buildRegressionEstimateTable(created_data,
                                                    RunOn = c("sars_cov2_adj_load_log10",
                                                            "sars_adj_log10_Filtered",
                                                            "Loess"))

head(reg_estimates_data)

## # A tibble: 6 x 9
##   WWTP      Method date      days_elapsed lmreg_n lmreg_slope  lmreg_sig
##   <chr>      <chr> <date>          <dbl>   <int>      <dbl>      <dbl>
## 1 Green Bay MSD Loess  2020-09-06         14     5      0.0211 0.0000000256
## 2 Green Bay MSD Loess  2020-09-07         14     5      0.0212 0.00000000977
## 3 Green Bay MSD Loess  2020-09-13         14     5      0.0210 0.000000510
## 4 Green Bay MSD Loess  2020-09-14         14     5      0.0208 0.000000516
## 5 Green Bay MSD Loess  2020-09-20         14     5      0.0212 0.000000529
## 6 Green Bay MSD Loess  2020-09-21         14     5      0.0214 0.000000557
## # ... with 2 more variables: modeled_percentchange <dbl>, Category <fct>

createConfMatrix_Plot(reg_estimates_data,
                      "sars_cov2_adj_load_log10",
                      "Loess")

createConfMatrix_Plot(reg_estimates_data,
                      "Loess",
                      "sars_adj_log10_Filtered")

createMethodCompareBar_Plot(reg_estimates_data)

createDHSMethod_Plot(reg_estimates_data, created_data,
                     PointVal = c( "sars_cov2_adj_load_log10",
                                   "sars_adj_log10_Filtered"),
                     LineVal = "Loess")
```

