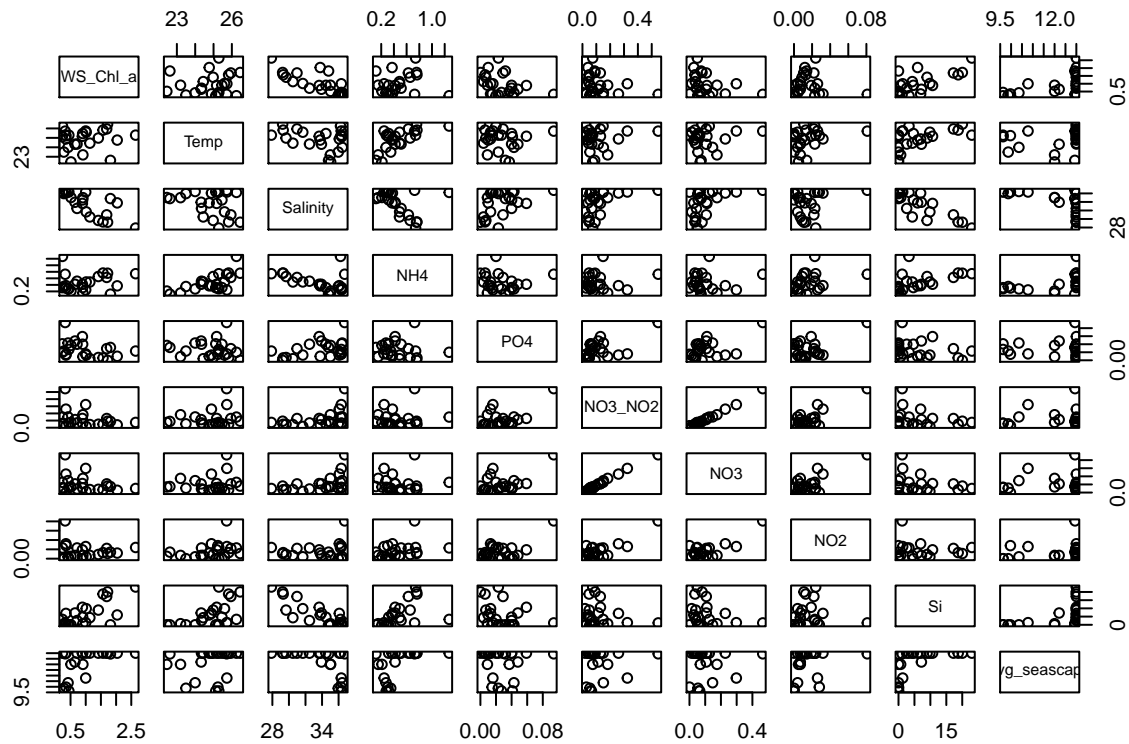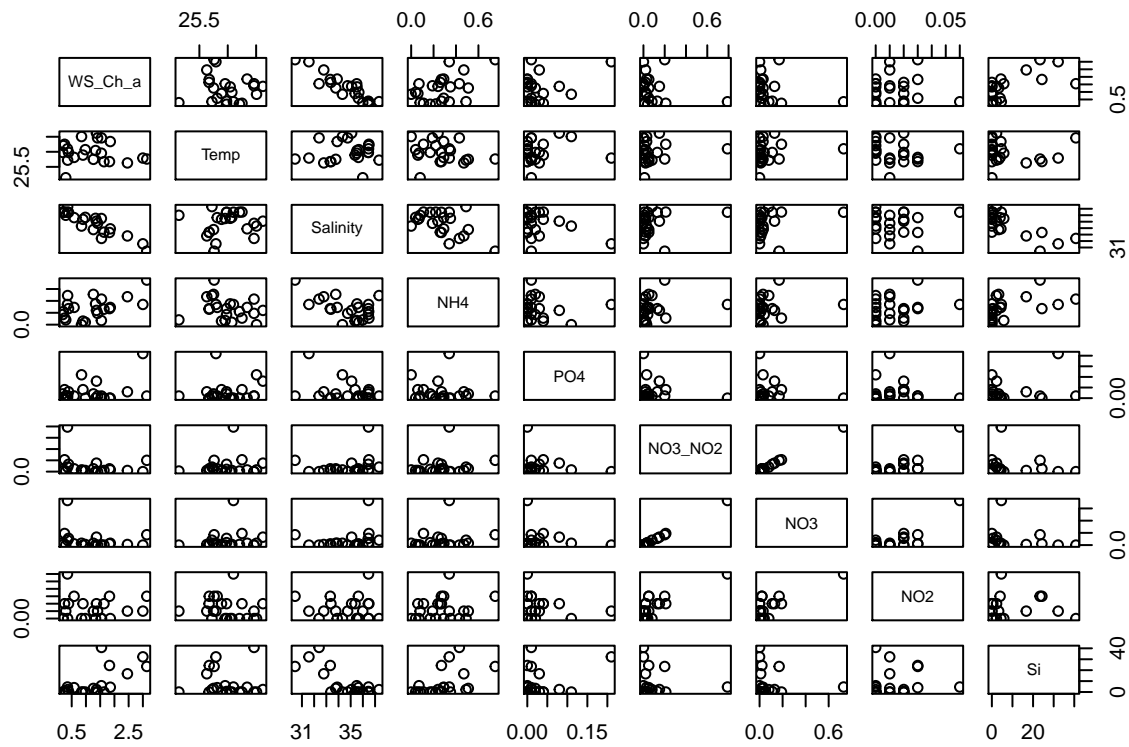# HPLC

Anni Djurhuus

24 January 2017

Analysis of HPLC data for Enrique

## Exploratory analysis

March

May

Dendrograms

For the different seascapes I used the "rounded average" of sescape assigned to a given sample. Using the sescape "median" added seascape 9, in total 5 sescapes, to the mix, but didn't really change the pattern. Dendrograms were made on all pigments and all spectral data. REMEMBER to take out column 799 and 800 for aph
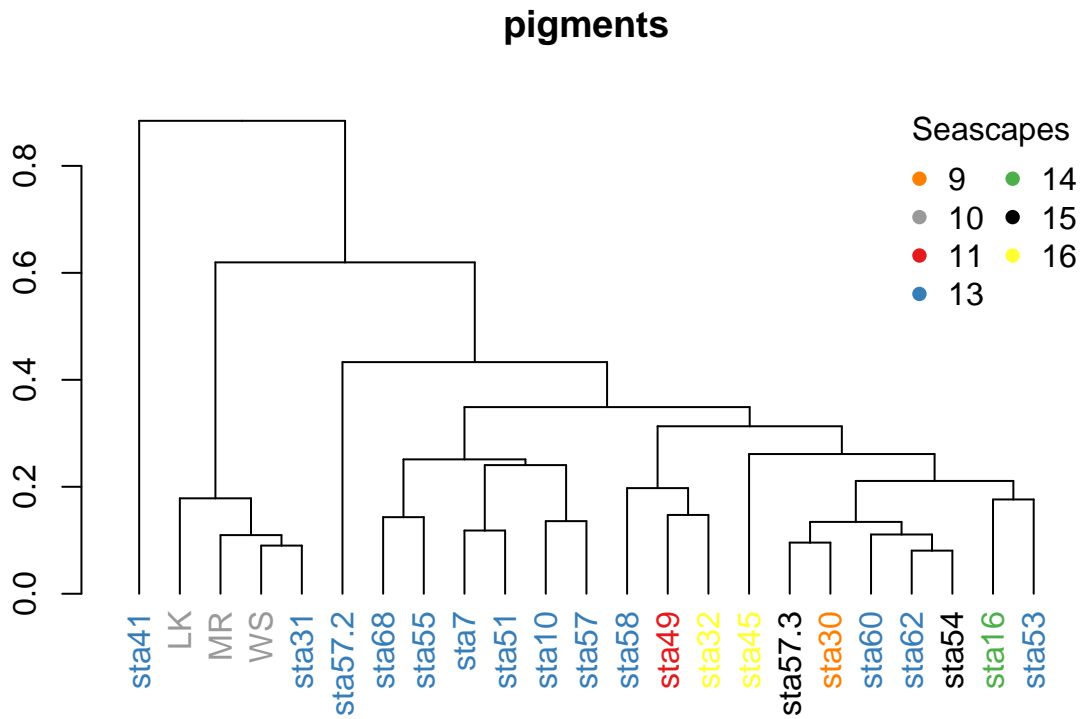
March

Pigments

Pigments

Spectral data

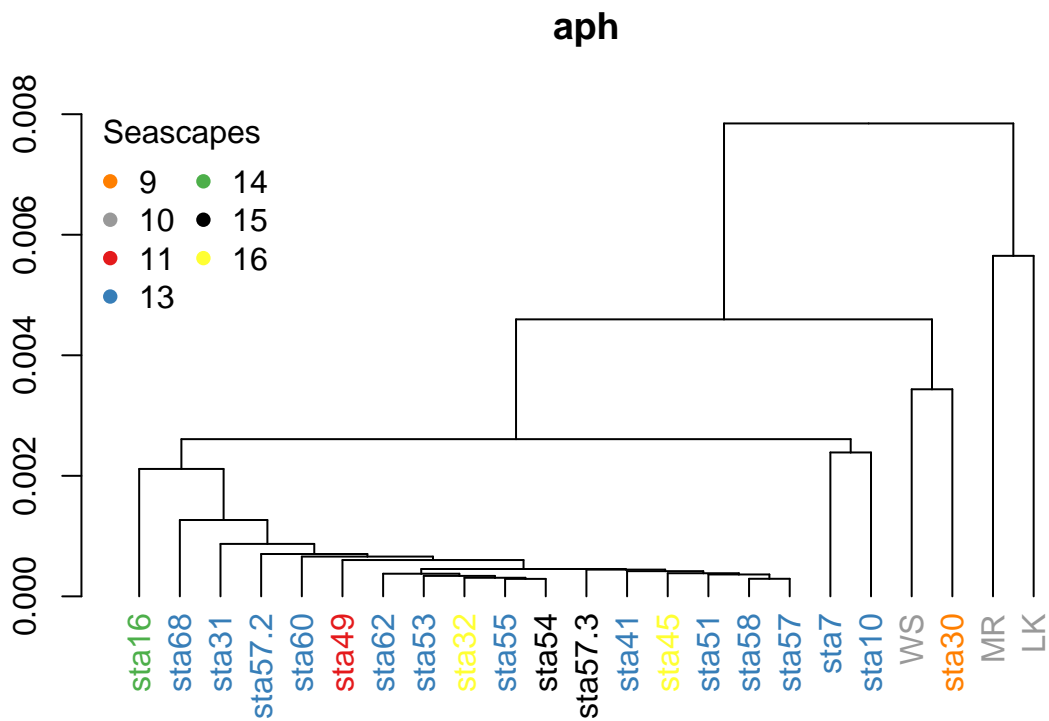## aph

**May**

Pigments

pigments

Spectral data

aph
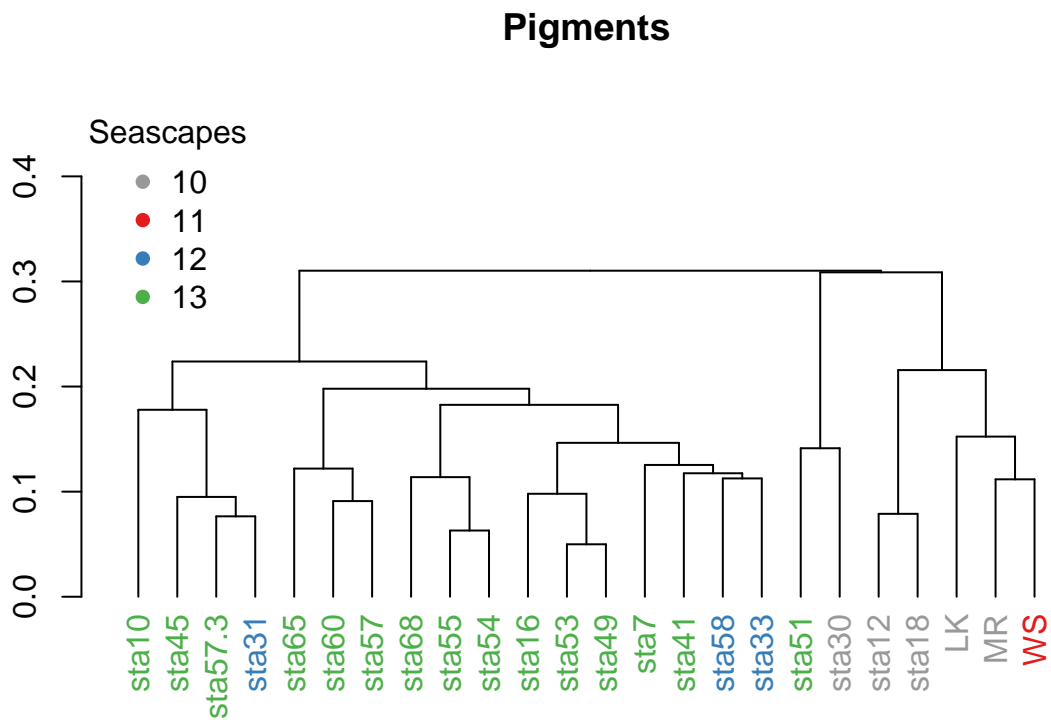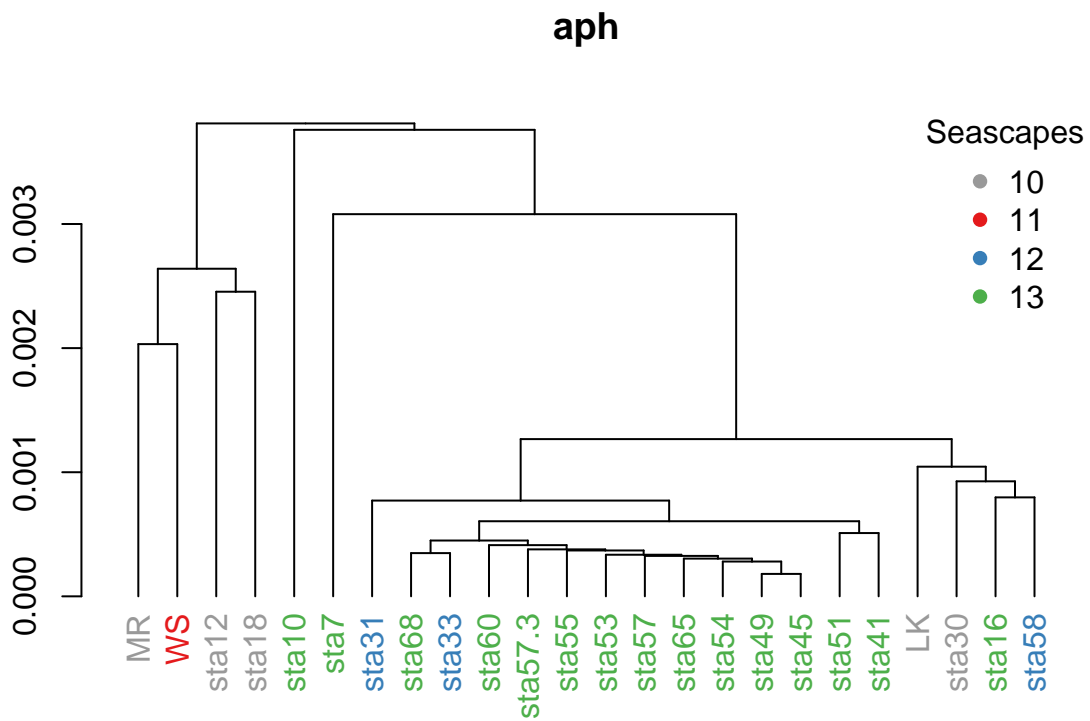
Ordination plots

NMDS plots were made using the metaMDS function. Use vegdist too?? vegdist takes too long for aph. The ellipses are the 95% confidence interval. To test for statistical significance a permutation test was performed using the adonis function, see below. The clustering clearly separates into two clusters, 10 + 11 and 12 + 13. I normalized aph data like so: $Z=X-min(X)/max(X)-min(X)$.
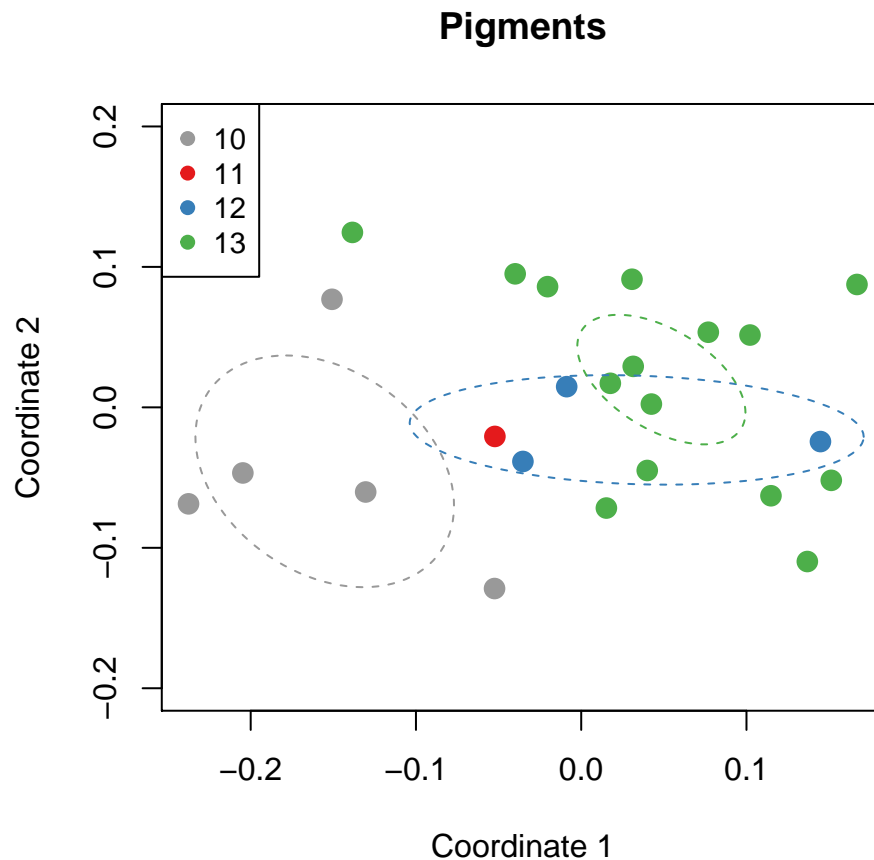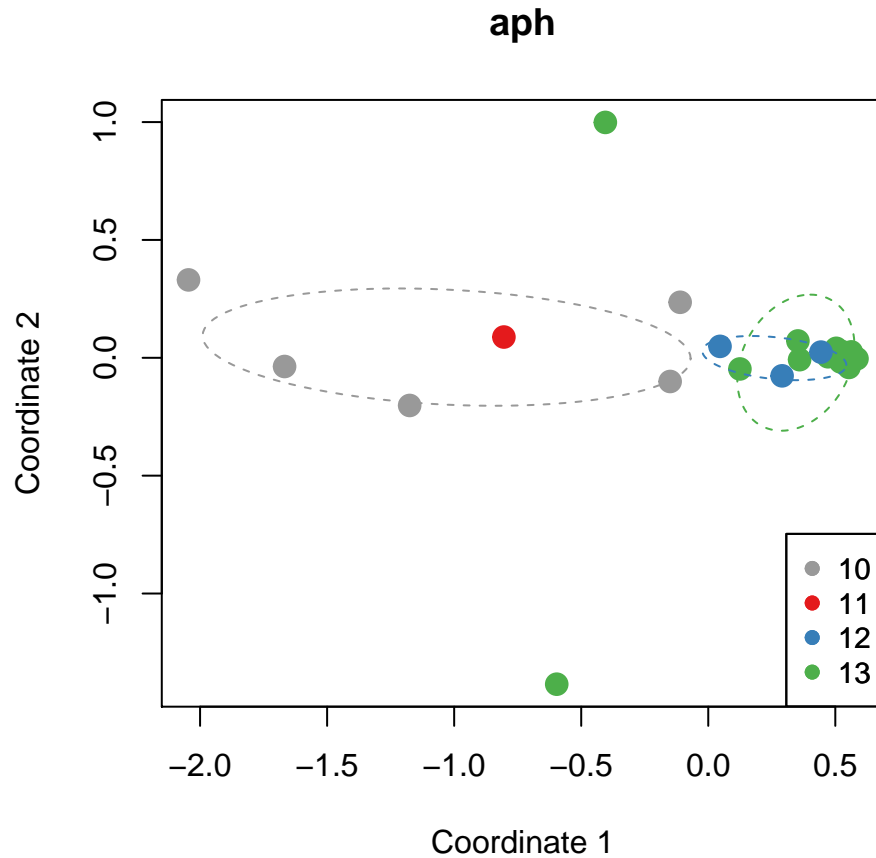
March

Pigments


```
## Permutation test for adonis under reduced model
## Terms added sequentially (first to last)
## Permutation: free
## Number of permutations: 999
##
## adonis2(formula = pigments_march ~ hydro_march$round_avg_seascape)
##                                Df SumOfSqs      F Pr(>F)
## hydro_march$round_avg_seascape  3  0.12072 3.3763  0.001 ***
## Residual                       20  0.23838
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```
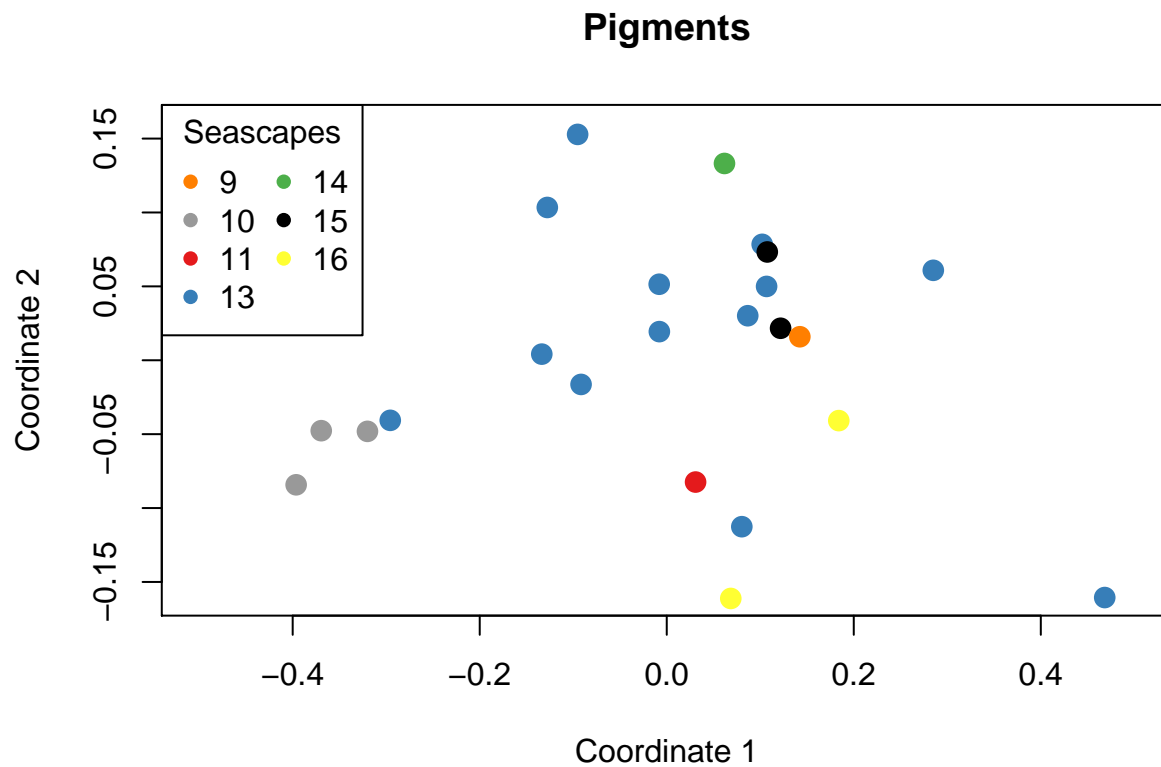
Spectral


```
## Permutation test for adonis under reduced model
## Terms added sequentially (first to last)
## Permutation: free
## Number of permutations: 999
##
## adonis2(formula = aph2 ~ hydro_march$round_avg_seascape)
##                               Df  SumOfSqs      F Pr(>F)
## hydro_march$round_avg_seascape  3 0.0057630 4.5751  0.007 **
## Residual                       20 0.0083976
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```
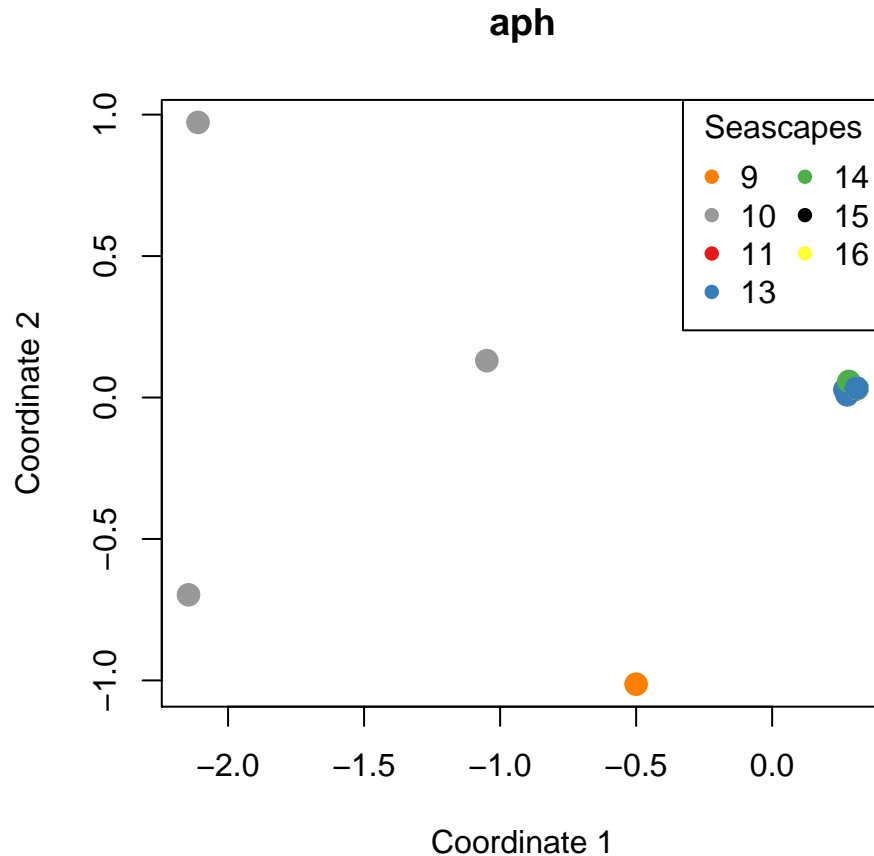
May

Pigments

Pigments


```
## Permutation test for adonis under reduced model
## Terms added sequentially (first to last)
## Permutation: free
## Number of permutations: 999
##
## adonis2(formula = pigments_may ~ hydro_may$avg_seascape_rounded)
##                               Df SumOfSqs      F Pr(>F)
## hydro_may$avg_seascape_rounded  6  0.37970 2.458   0.01 **
## Residual                       16  0.41193
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Spectral

aph


```
## Permutation test for adonis under reduced model
## Terms added sequentially (first to last)
## Permutation: free
## Number of permutations: 999
##
## adonis2(formula = aph2_may ~ hydro_may$avg_seascape_rounded)
##                              Df  SumOfSqs      F Pr(>F)
## hydro_may$avg_seascape_rounded  6 0.0073878 7.3185  0.003 **
## Residual                      16 0.0026919
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

## Community analyses with environmental drivers.

CCA plot from the environmental parameters on the community clustering from the pigments. Multiple plots including different variables: Firstly, nitrite+nitrate, Ammonia, Silicate, Salinity and Phosphate are included, secondly the same model with ammonia, nitrate+nitrite, Phosphate, and silicate. The results are not impacted by taking out on or two environmental variables. It is very clear that the higher seascapes (12, 13) are affected by higher nutrients. However, one cannot say that these communities are affected by Chlorophyll, so I would stand by the second analysis (plot 2). What do you think? first analysis explains approximately 43.4% of the variance and the second plot explains about 36%. The percentage decreases significantly when we take out more variables. It is abundantly clear that Silicate and Salinity are negatively correlated. Salinity

is not directly positively correlated to the oligotrophic stations, but is negatively correlated to the "fresher" stations, less so station 7, 10 and 16, than the other ones. Which makes sense.
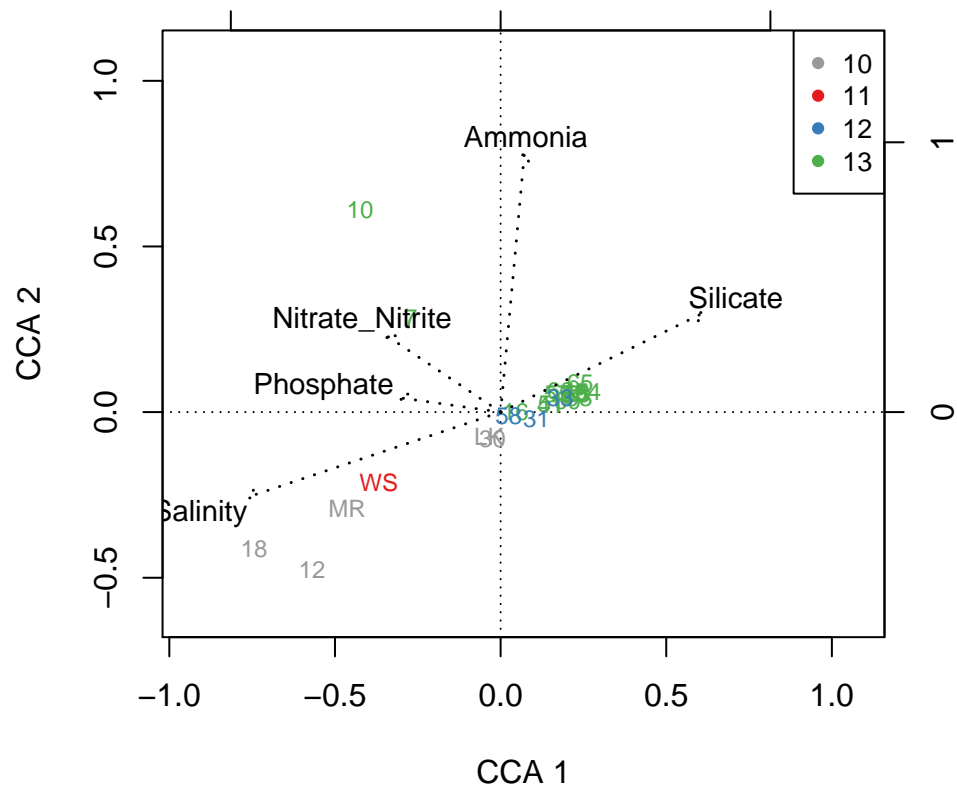
March
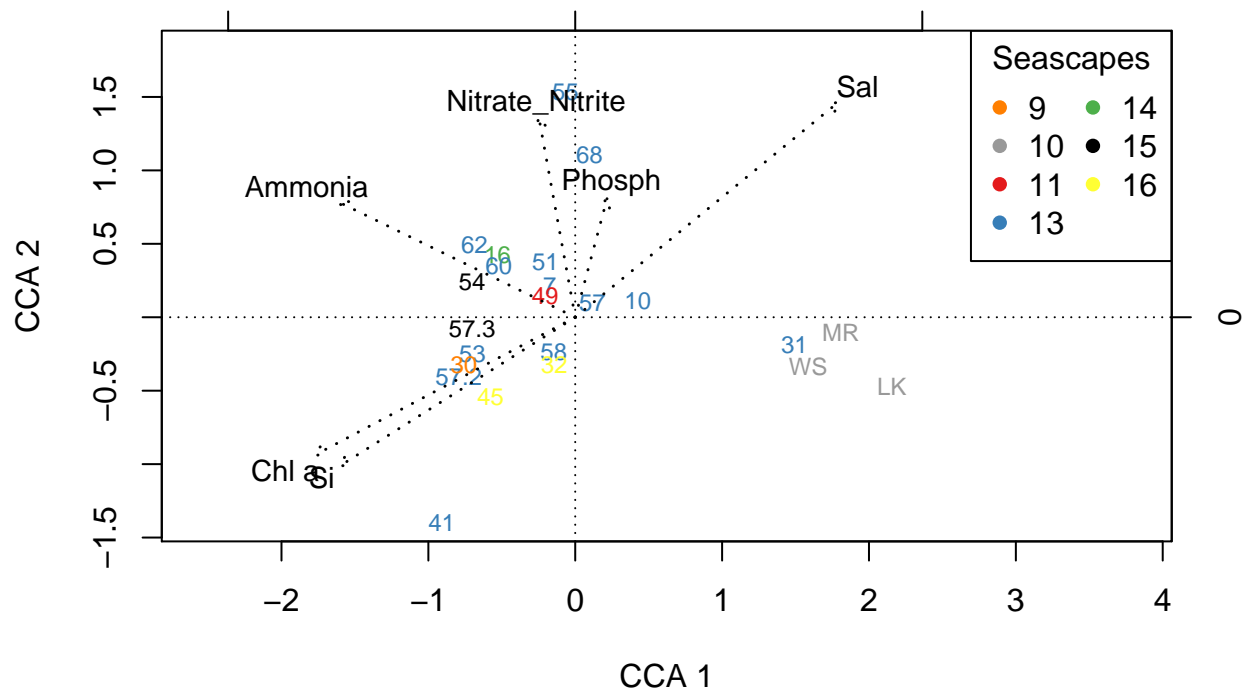
Pigments
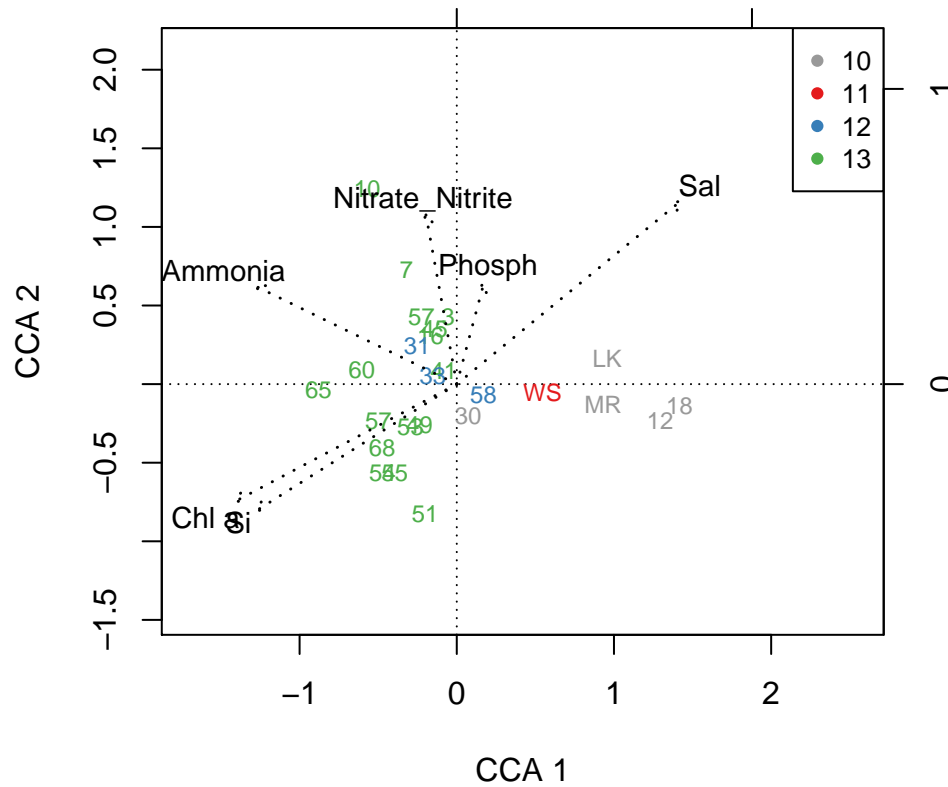
Spectral

From the aph analysis we see a similar clustering as the pigments analyses. However, the salinity is more correlated with the oligotrophic stations and negatively correlated with the silicate. 49.2% of the variance is

explained here.

May

Pigments

Spectral CCA analysis May