

Examining environmental drivers on greenhouse denitrification potential in a constructed stormwater wetland (aka 2017 CSW)

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Project Description: Analysis of seasonal denitrification potential in a constructed stormwater wetland (Greenville, NC, USA).

```
if(Sys.info()[1] == "Darwin"){
  setwd("~/GitHub/ConstructedStormwaterWetland/analyses/")
} else {
  # setwd(choose.dir())
}
rm(list = ls())

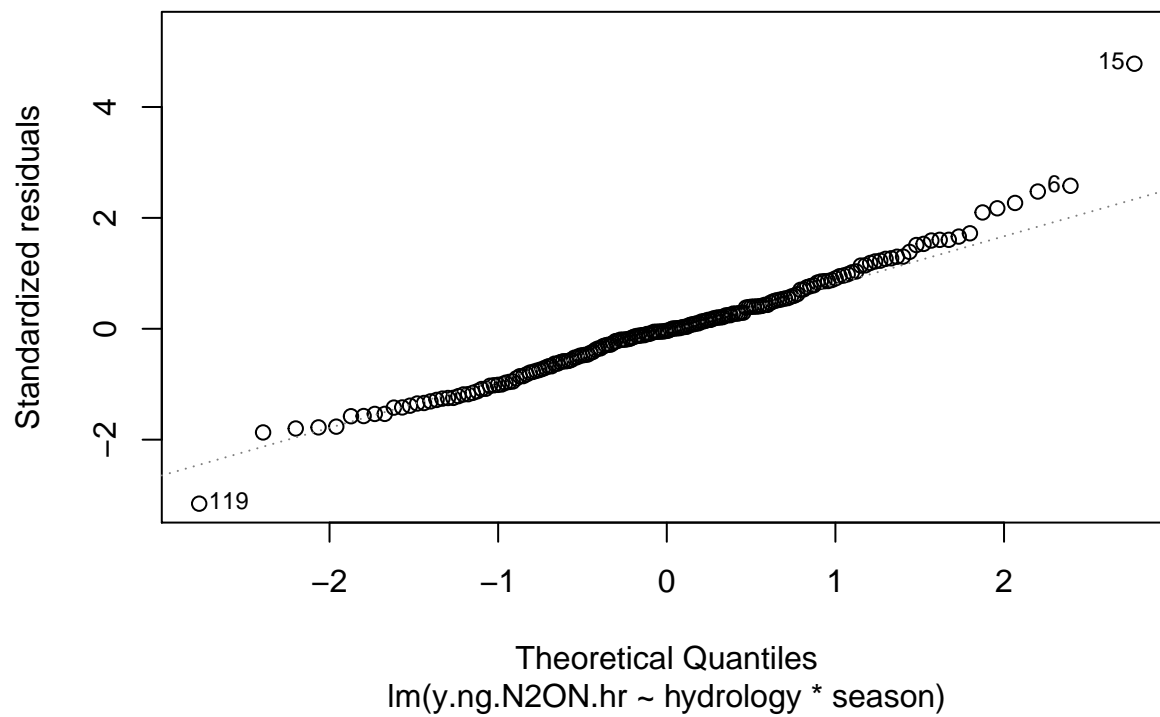
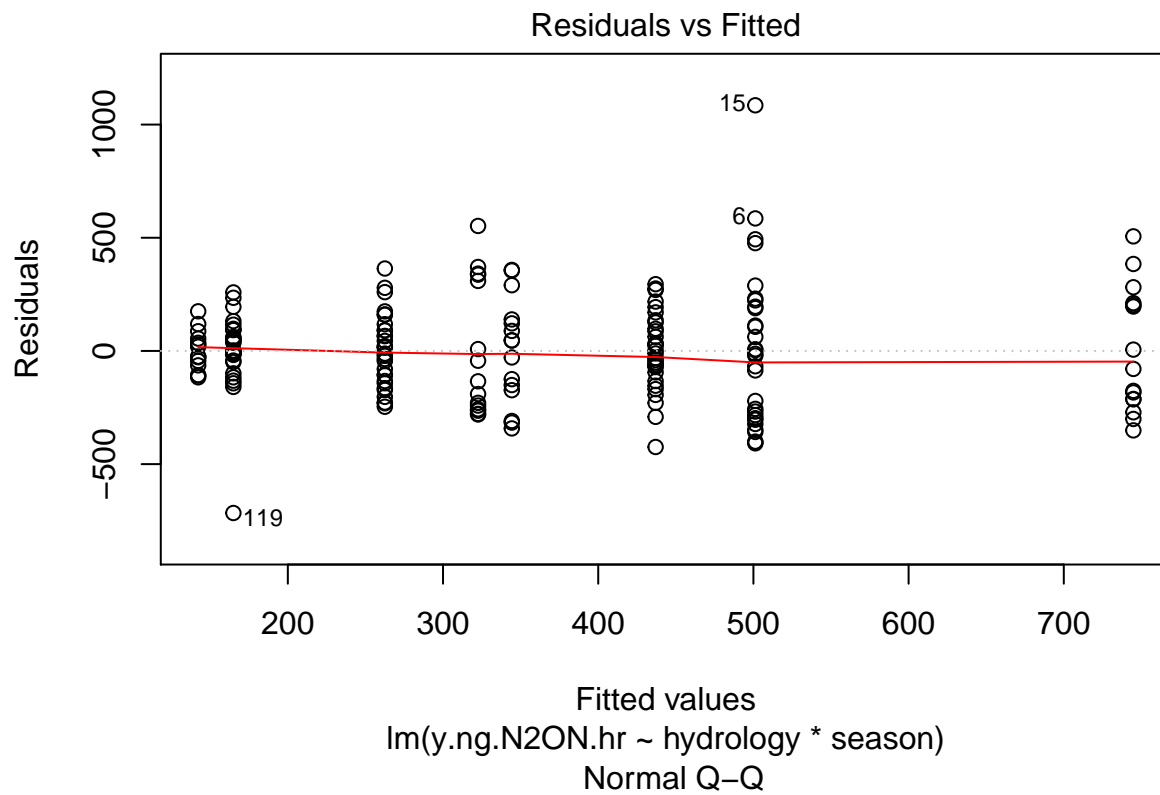
library(ggplot2)
library(psych)

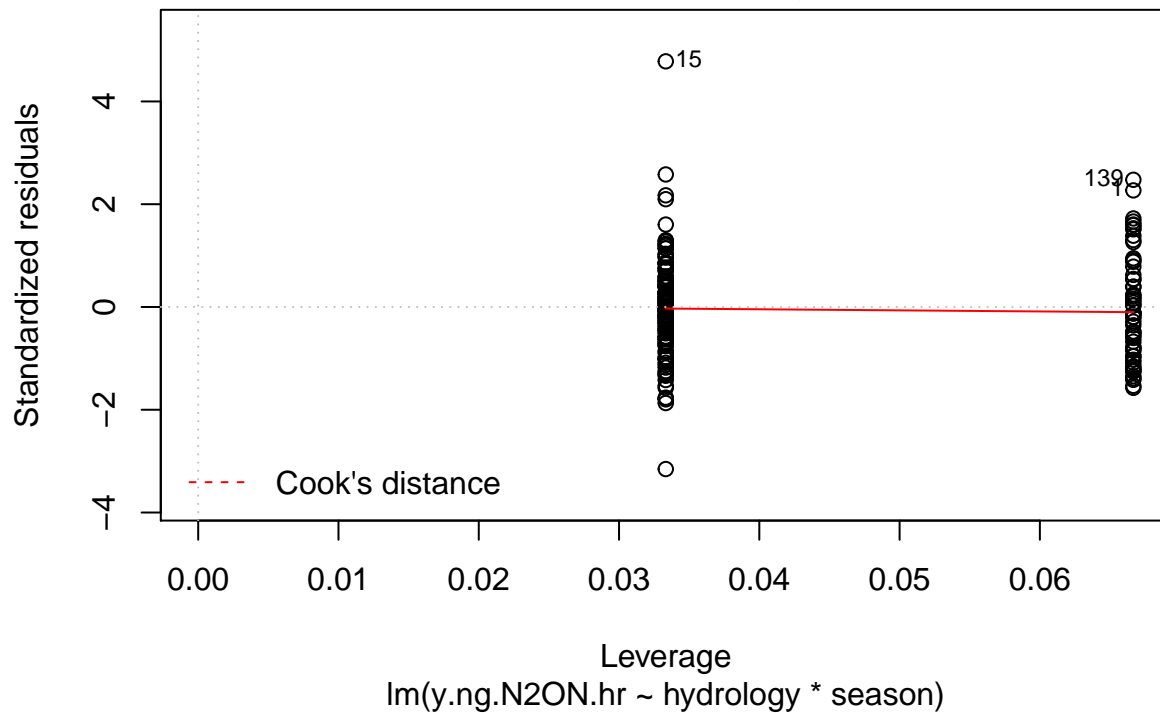
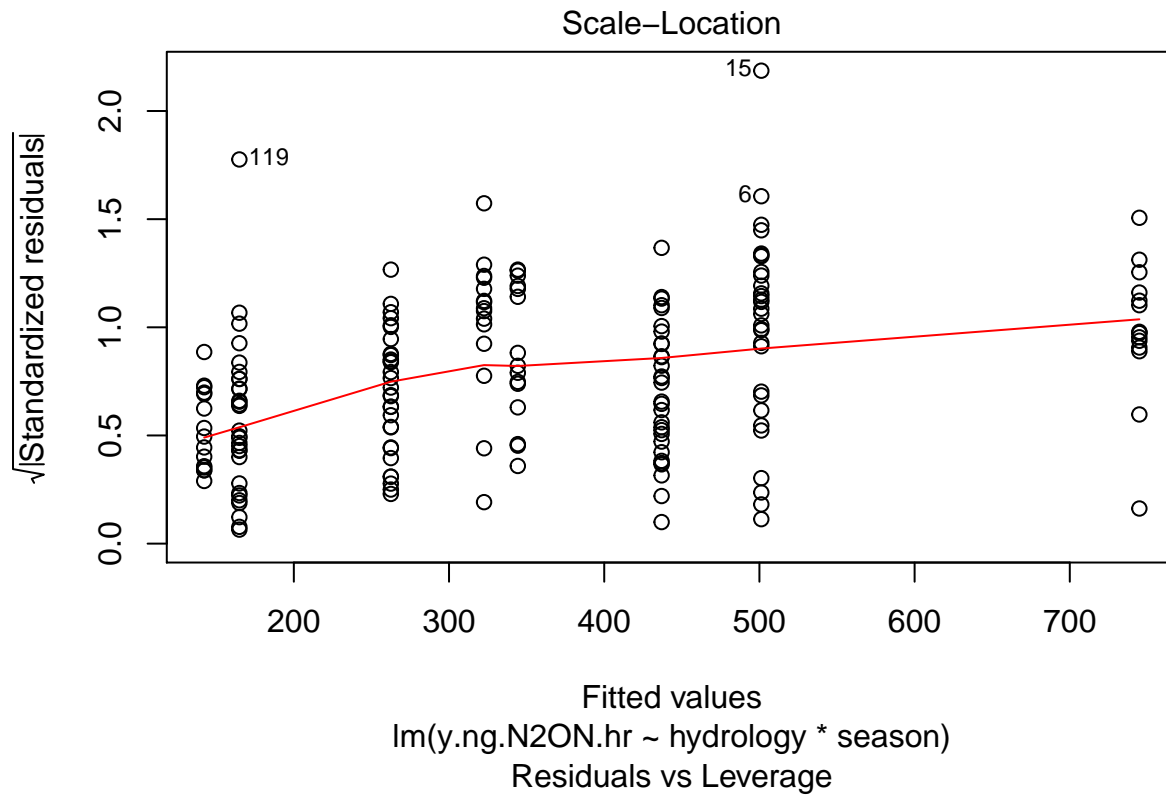
##
## Attaching package: 'psych'

## The following objects are masked from 'package:ggplot2':
##
##    %+%, alpha

#CSW DEA data
DEA <- read.csv("../data/CSW_DEA_Env.csv", header=T)

#linear model for no acetylene/ yes acetylene DEA ratio
DEA.lm <- lm(y.ng.N2ON.hr~hydrology*season,data=DEA)
plot(DEA.lm)
```





```
anova(DEA.lm)
```

```
## Analysis of Variance Table
```

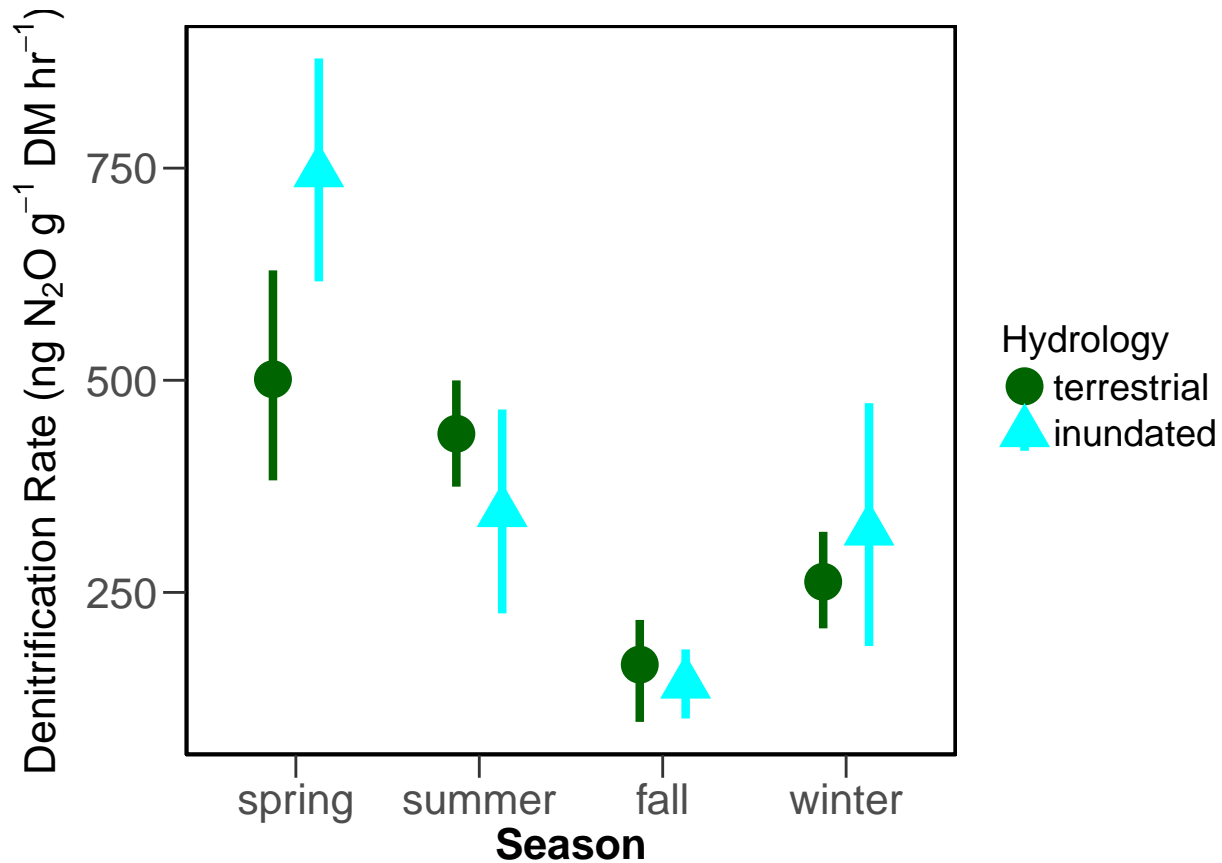
```
##
```

```
## Response: y.ng.N2ON.hr
```

```
##           Df Sum Sq Mean Sq F value    Pr(>F)
```

```
## hydrology          1    88708    88708    1.6643    0.198757
## season             3 4438591 1479530 27.7581 1.087e-14 ***
## hydrology:season   3  631854  210618  3.9515  0.009321 **
## Residuals         172 9167737   53301
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

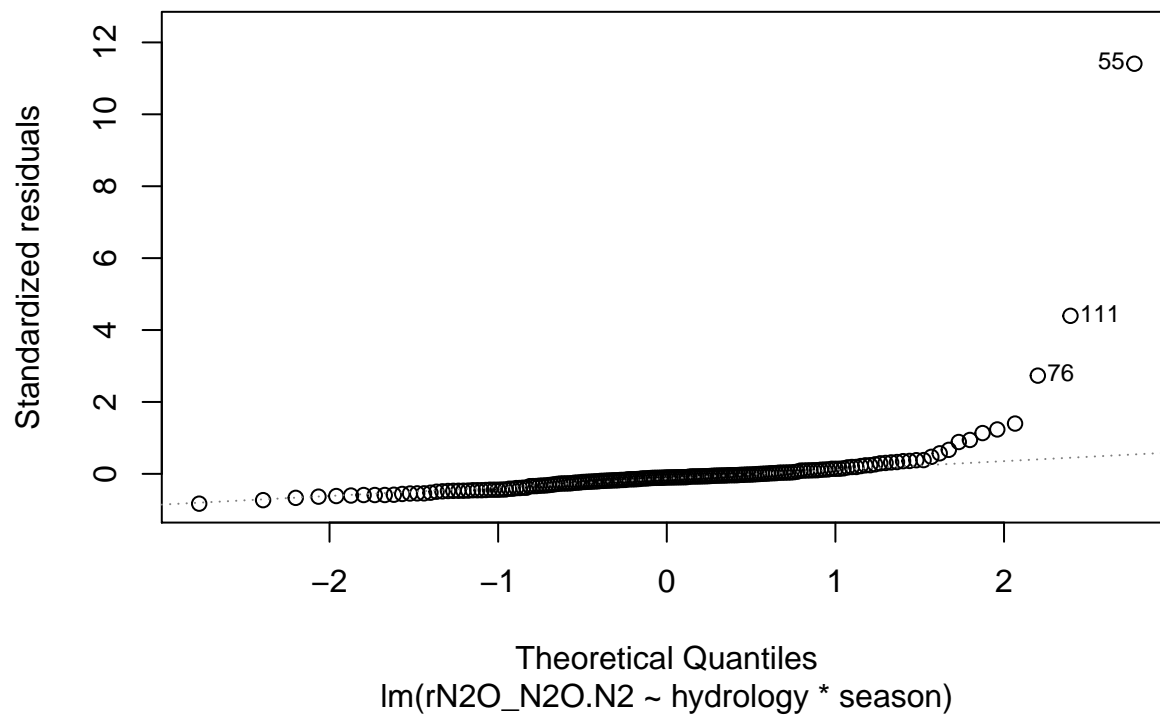
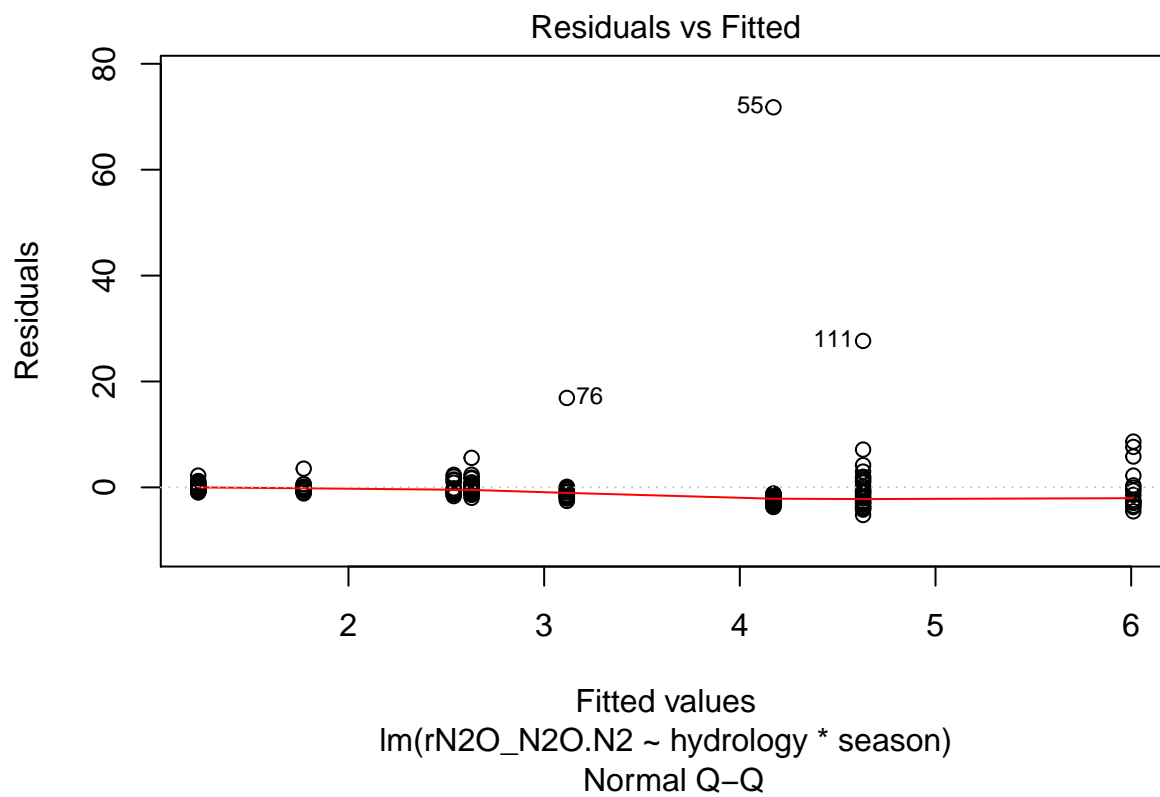
```
p <- ggplot(DEA, aes(x=season, y=y.ng.N2O.hr, color=as.factor(hydrology), shape=as.factor(hydrology)))
p + theme_bw() + theme(panel.grid.major = element_blank(), panel.grid.minor = element_blank(), axis.lin
```

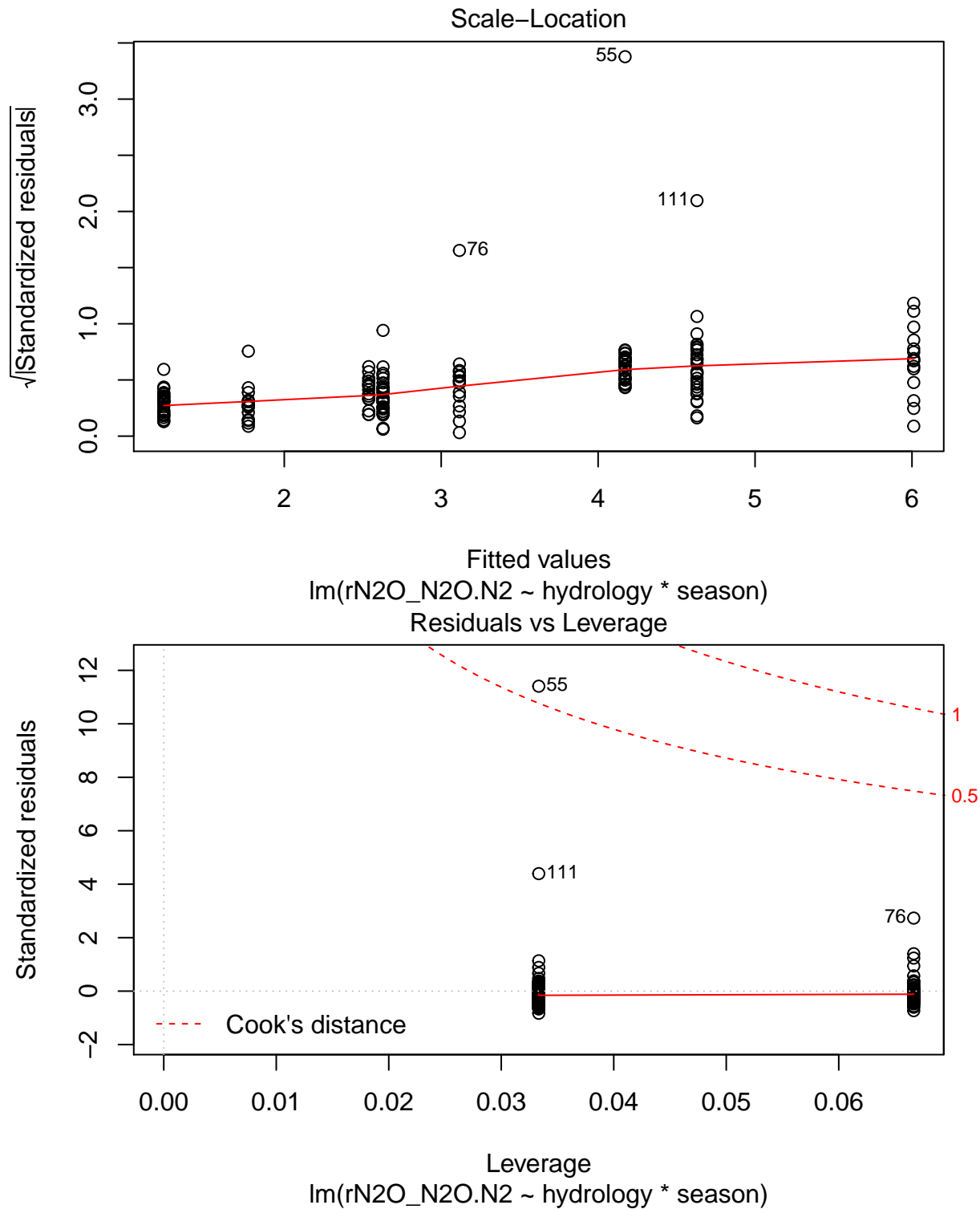


```
ggsave("../figures/DEApotential.pdf", plot=last_plot(), device=NULL, path=NULL, scale=1, width=NA, height=NA)
```

```
## Saving 6.5 x 4.5 in image
```

```
#linear model for no acetylene/ yes acetylene DEA ratio
ratio.lm <- lm(rN20_N20.N2~hydrology*season,data=DEA)
plot(ratio.lm)
```





```
anova(ratio.lm)
```

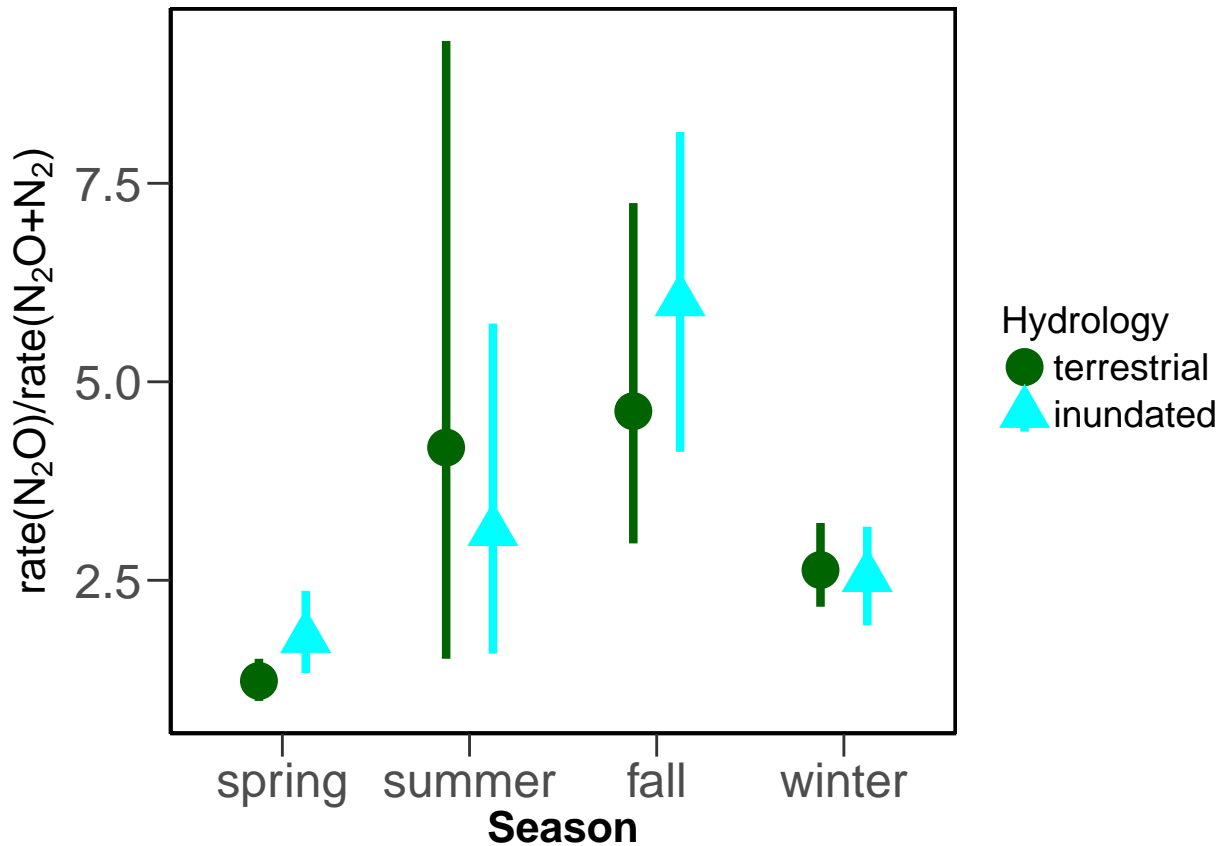
```
## Analysis of Variance Table
##
## Response: rN2O_N2O.N2
##           Df Sum Sq Mean Sq F value Pr(>F)
```

```
## hydrology      1      1.5    1.496  0.0365 0.8487
## season        3    338.1 112.702  2.7510 0.0443 *
## hydrology:season 3     31.7  10.573  0.2581 0.8555
## Residuals     172 7046.3   40.967
```

```
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
p <- ggplot(DEA, aes(x=season, y=rN2O_N2O.N2, color=as.factor(hydrology), shape=as.factor(hydrology)))
p + theme_bw() + theme(panel.grid.major = element_blank(), panel.grid.minor = element_blank(), axis.lin
```



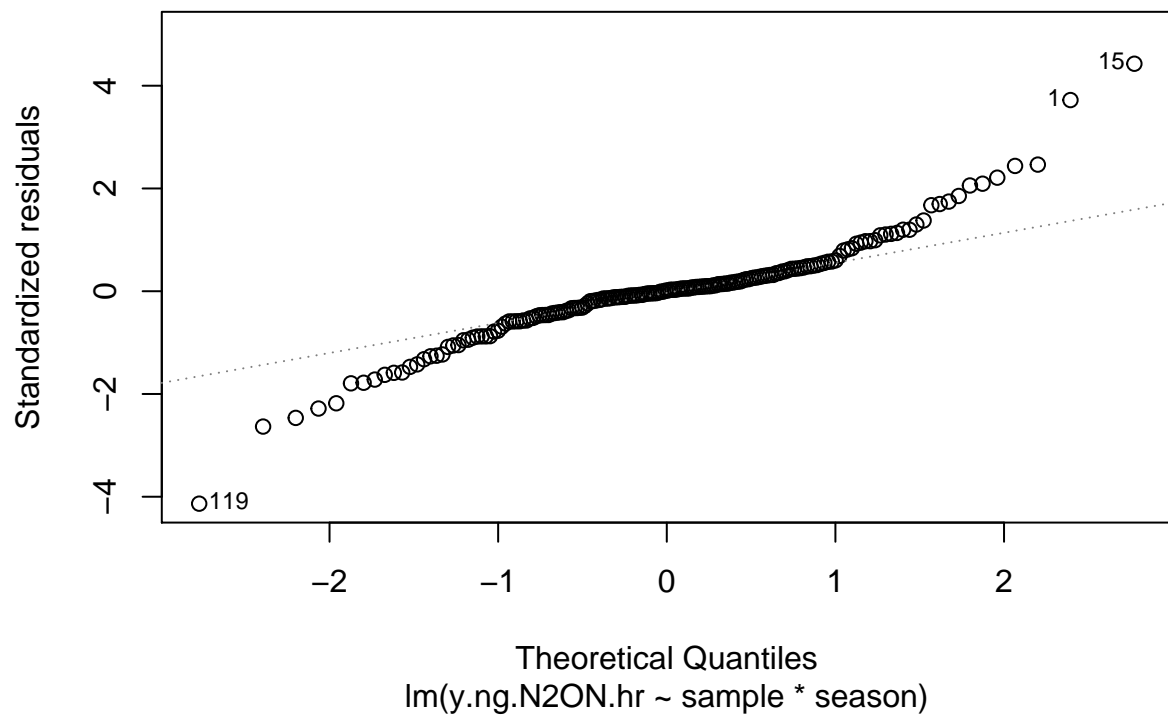
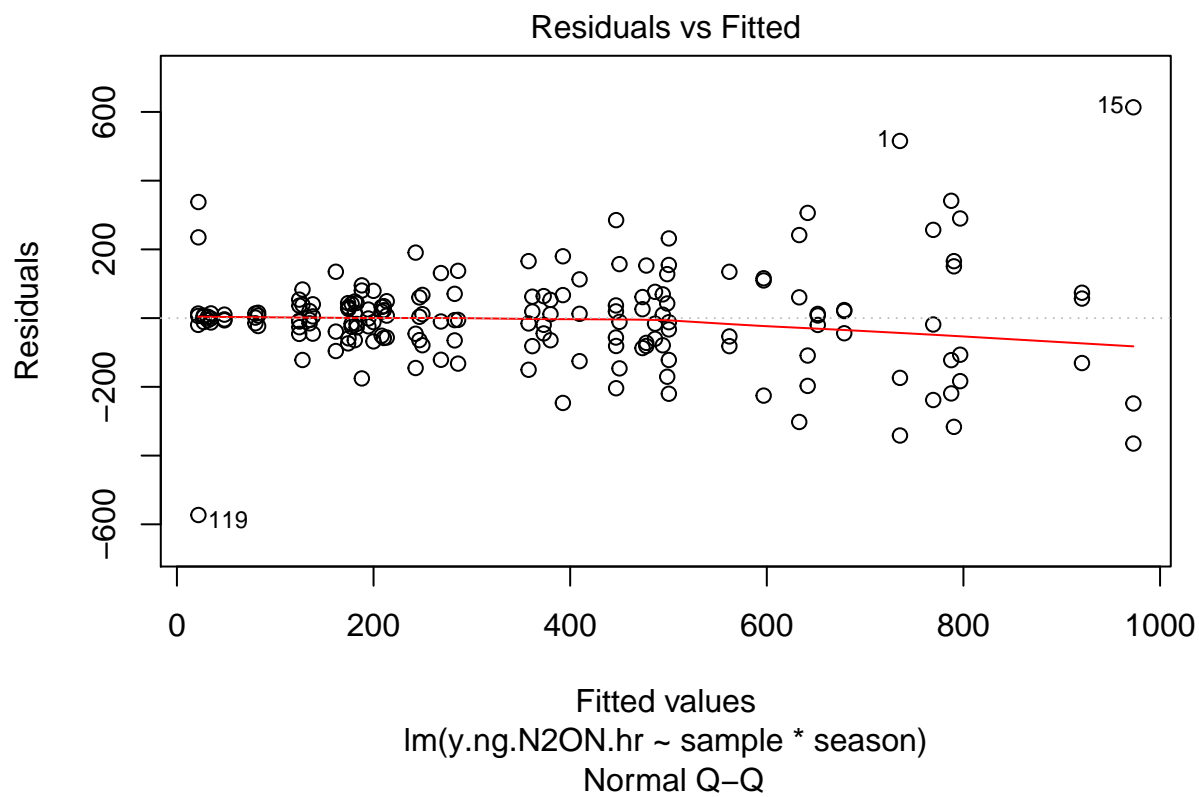
```
ggsave("../figures/DEAratio.pdf", plot=last_plot(), device=NULL, path=NULL, scale=1, width=NA, height=NA)
```

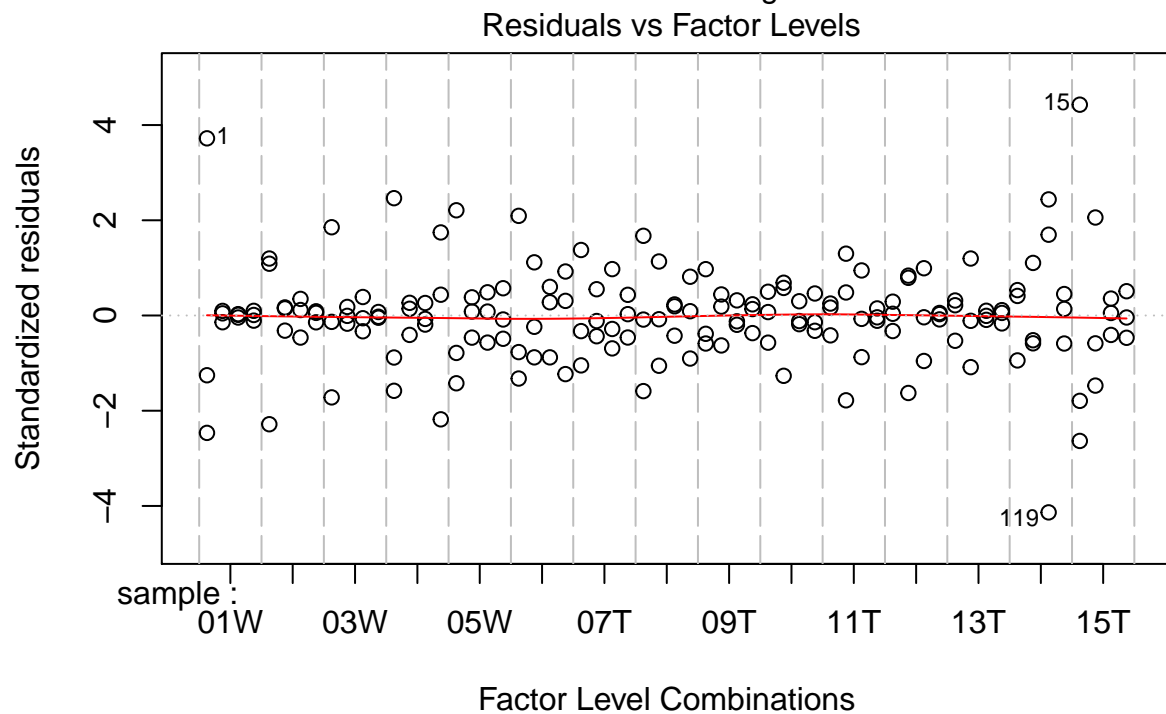
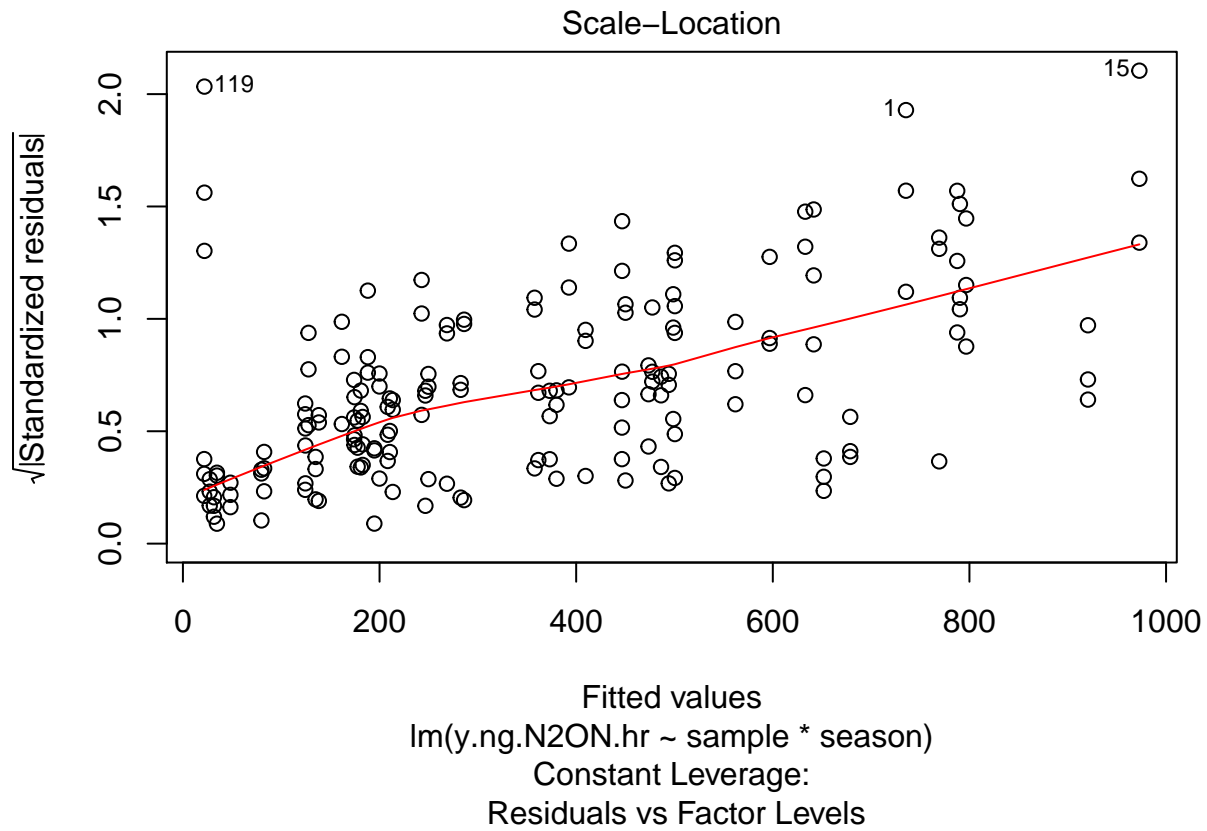
```
## Saving 6.5 x 4.5 in image
```

```
#linear model for no acetylene/ yes acetylene DEA ratio
```

```
DEA.lm <- lm(y.ng.N2ON.hr~sample*season,data=DEA)
```

```
plot(DEA.lm)
```





```
anova(DEA.lm)
```

```
## Analysis of Variance Table
```

```
##
```

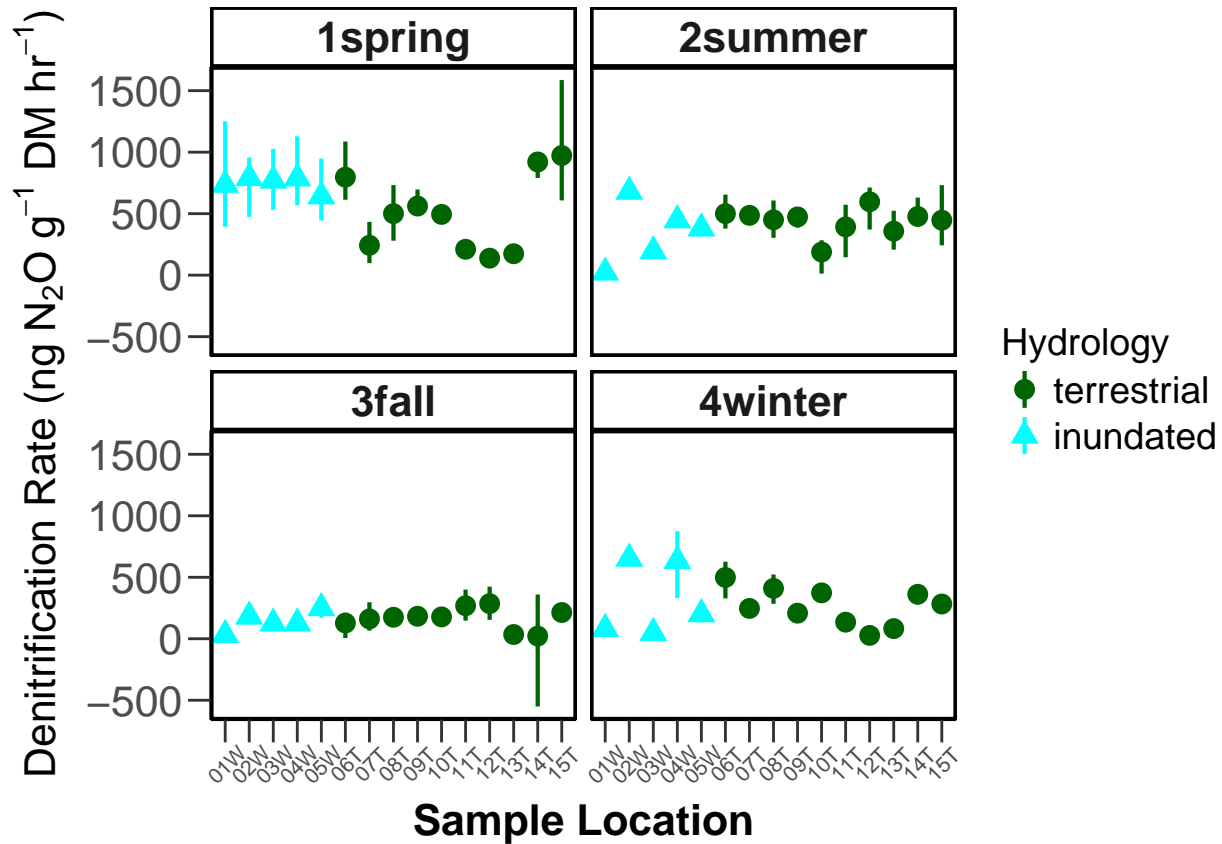
```
## Response: y.ng.N2ON.hr
```

```
##           Df Sum Sq Mean Sq F value    Pr(>F)
```

```
## sample      14 2363658  168833   5.8635 1.243e-08 ***
```

```
## season          3 4438591 1479530 51.3834 < 2.2e-16 ***
## sample:season   42 4069372   96890  3.3649 1.166e-07 ***
## Residuals      120 3455269   28794
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
p <- ggplot(DEA, aes(x=sample, y=y.ng.N2ON.hr, color=as.factor(hydrology), shape=as.factor(hydrology)))
p + theme_bw() + theme(panel.grid.major = element_blank(), panel.grid.minor = element_blank(), axis.lin
```



```
ggsave("../figures/DEApotential_location.pdf", plot=last_plot(), device=NULL, path=NULL, scale=1, width=
```

```
## Saving 6.5 x 4.5 in image
```