

## 분석

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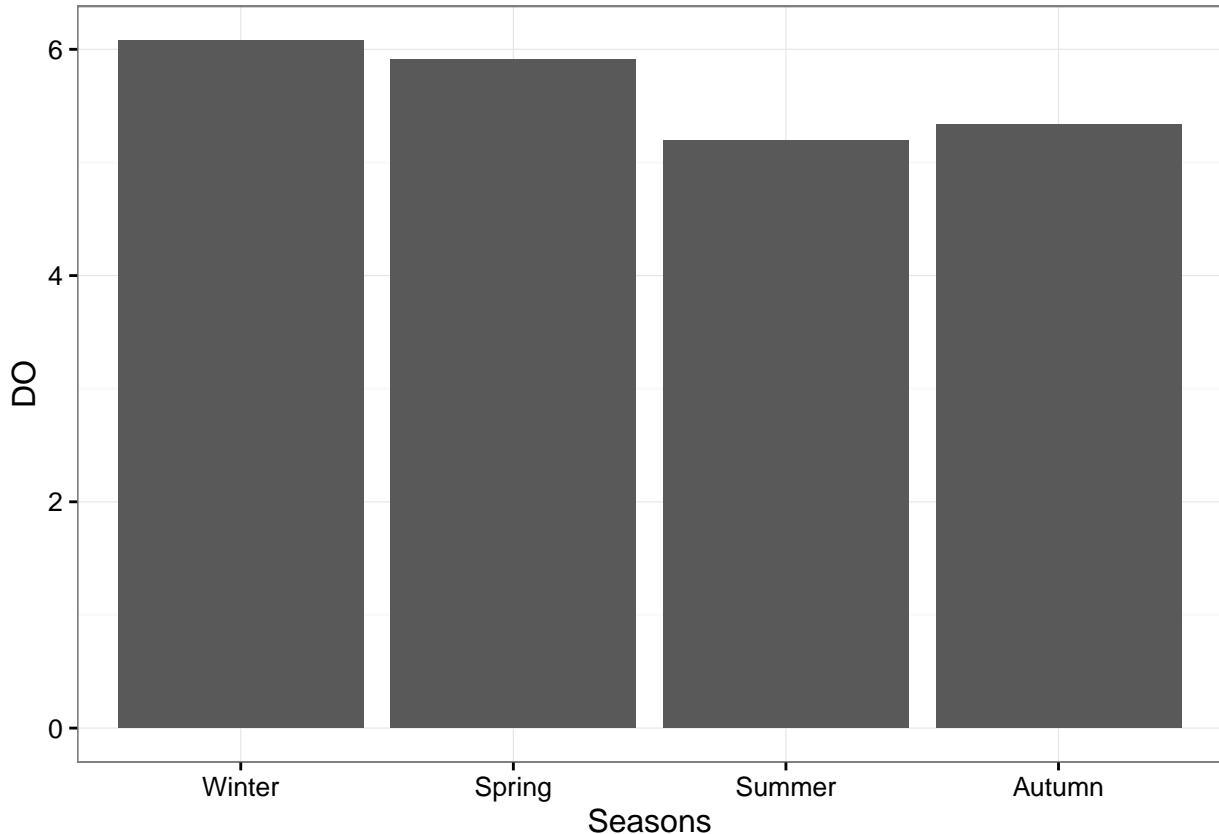
require(ggplot2)
require(reshape2)
require(plyr)
require(lubridate)
require(cowplot)

# Seasons = quarter(obsTime) 열 생성, 즉 계절 열 생성
nfrdi.wq01 <- nfrdi.wq %>% mutate(Seasons=quarter(obsTime), date=format(nfrdi.wq$obsTime, "%Y-%m-%d"))

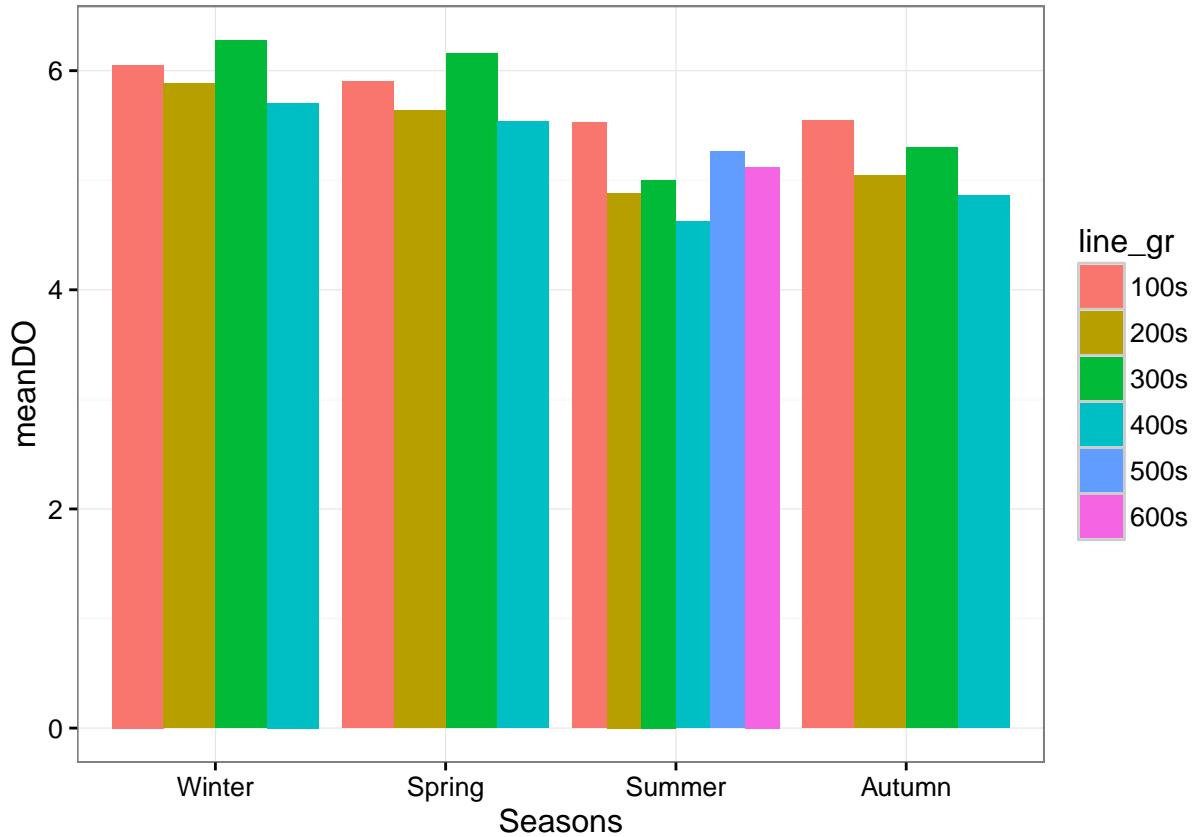
# format 함수는 time class 값을 다양한 포맷으로 변경시켜줌
# as.Date는 문자든 숫자든 관계없이 자료의 포맷을 그대로 설정하면 date class로 반환해줌
# strftime는 문자든 숫자든 관계없이 자료의 포맷을 그대로 설정하면 time class로 반환해줌
# as.POSIXct와 as.POSIXlt는 상호간의 변환을 반환해줌

# 계절에 따른 평균 DO
ggplot(nfrdi.wq01, aes(x=factor(Seasons), y=DO)) +
  geom_bar(stat="summary", fun.y="mean") + theme_bw() +
  scale_x_discrete("Seasons", labels=c("Winter", "Spring", "Summer", "Autumn"))

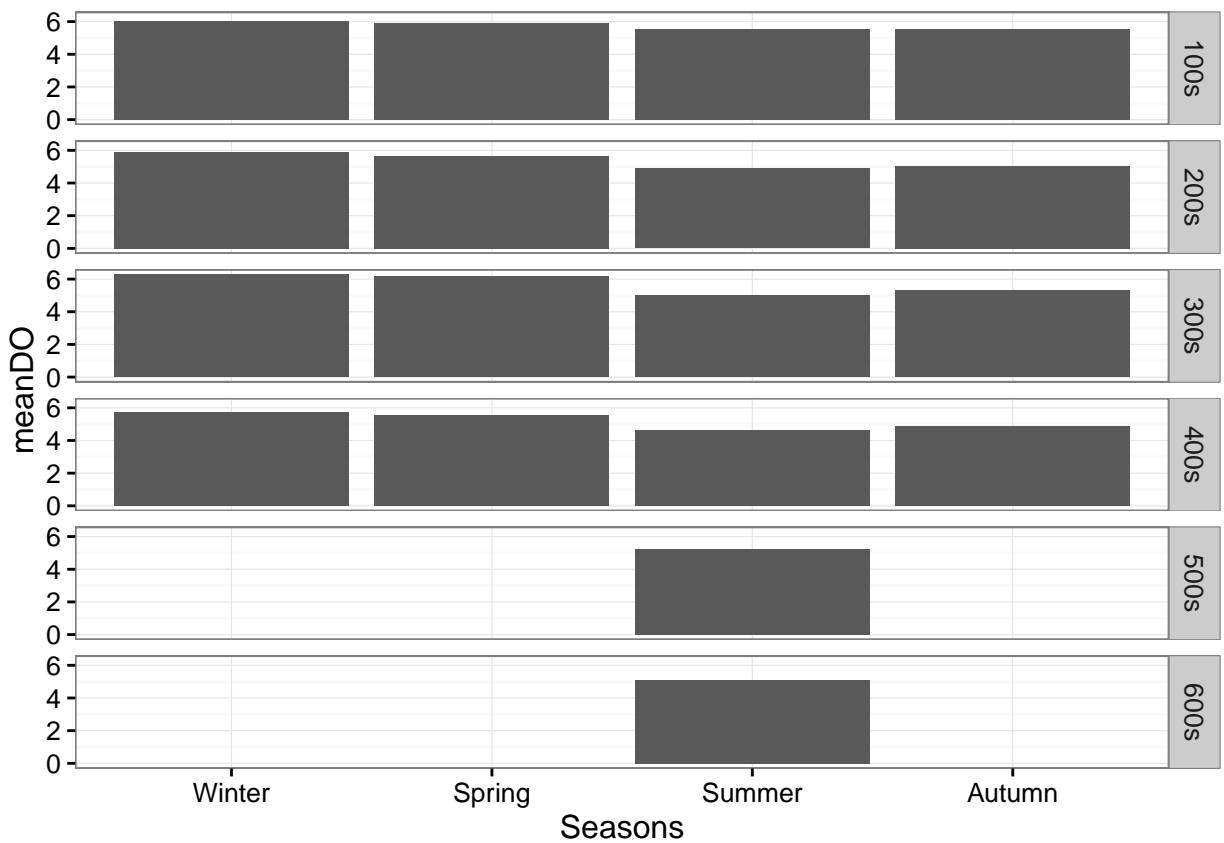
```



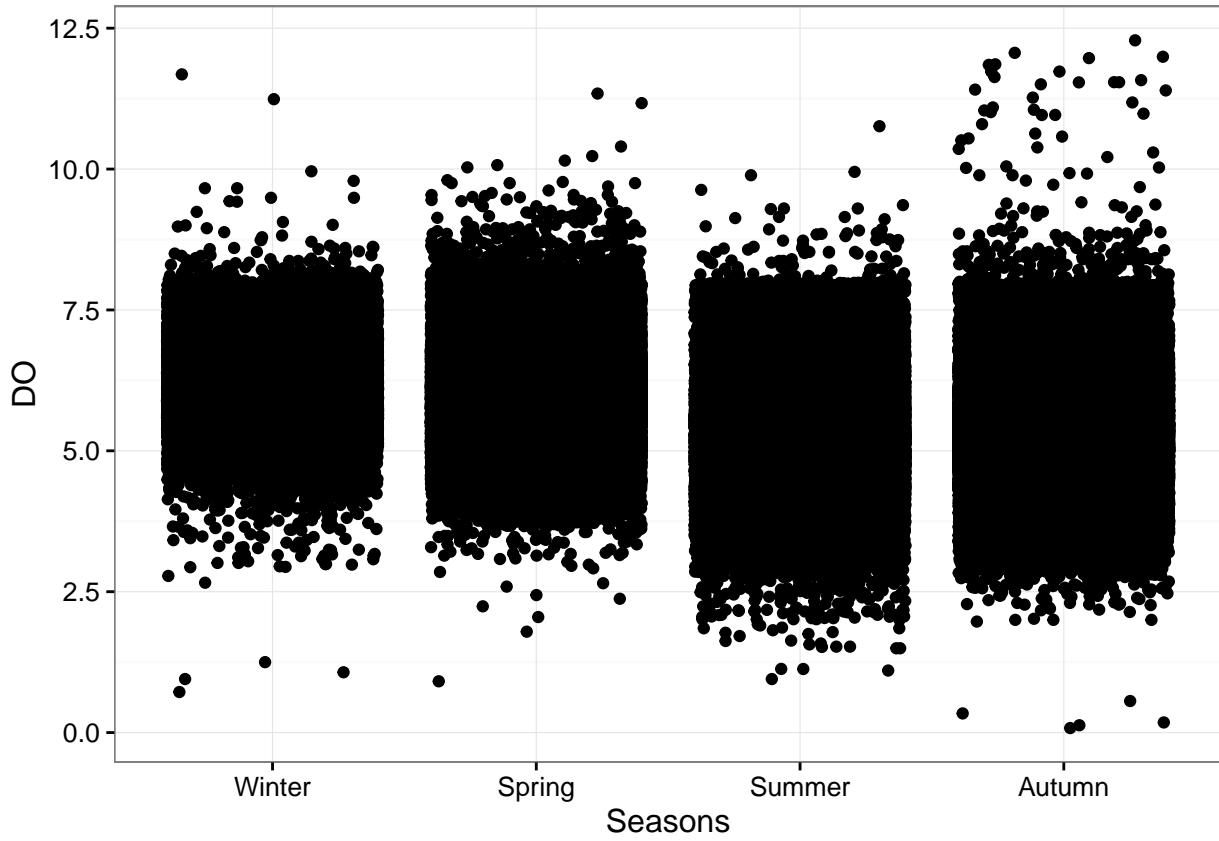
```
# (계절*해역)에 대한 평균 DO 데이터프레임
mDO <- ddply(nfrdi.wq01, c("Seasons", "line_gr"), summarise, meanDO = mean(DO, na.rm = T))
# 해역(line_gr)별 계절에 따른 bar plot
ggDO <- ggplot(mDO, aes(x=factor(Seasons), y=meanDO, fill=line_gr))
ggDO+ geom_bar(stat="summary", fun.y="mean", position="dodge") + theme_bw() +
  scale_x_discrete("Seasons", labels=c("Winter", "Spring", "Summer", "Autumn"))
```



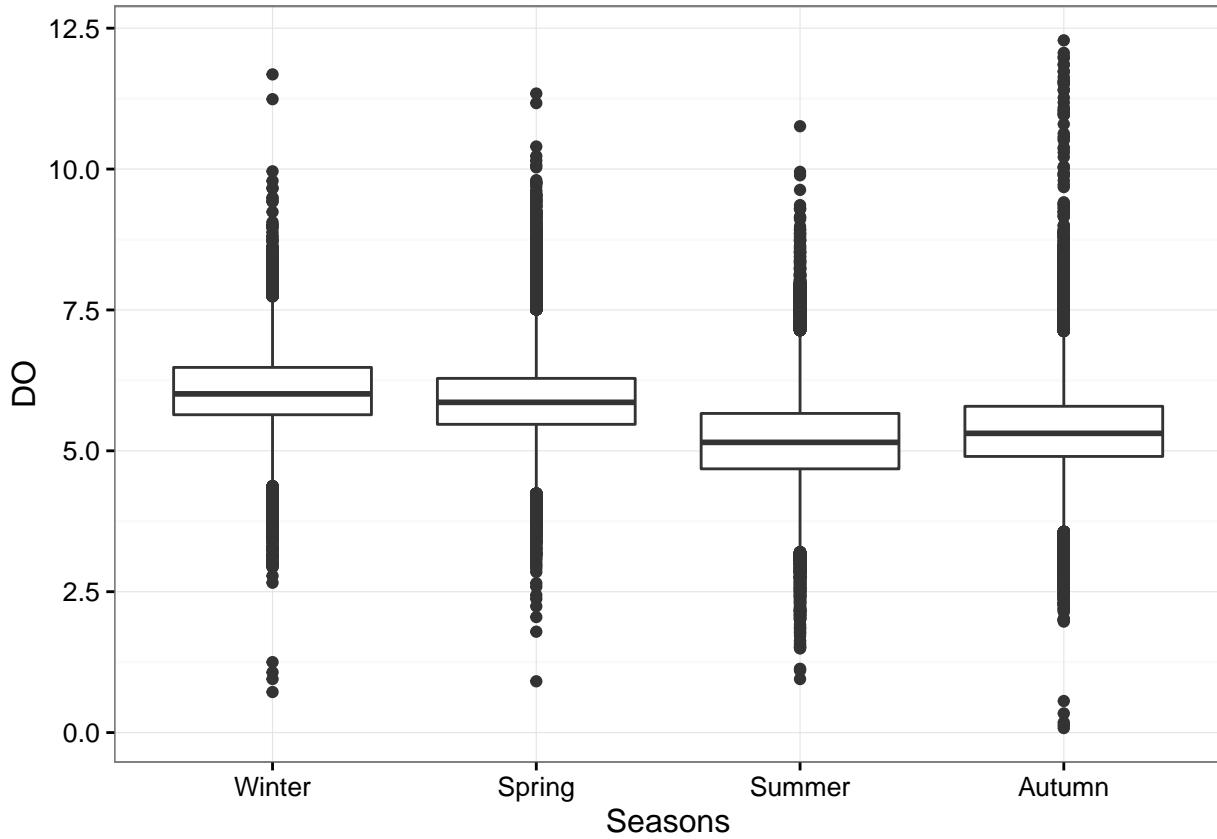
```
ggD0 <- ggplot(mD0, aes(x=factor(Seasons), y=meanDO))
ggD0+ geom_bar(width=0.9, stat="summary", fun.y="mean", position="dodge") + theme_bw() +
  scale_x_discrete("Seasons", labels=c("Winter", "Spring", "Summer", "Autumn")) +
  facet_grid(line_gr ~ .) + scale_fill_brewer(palette="Pastel1")
```



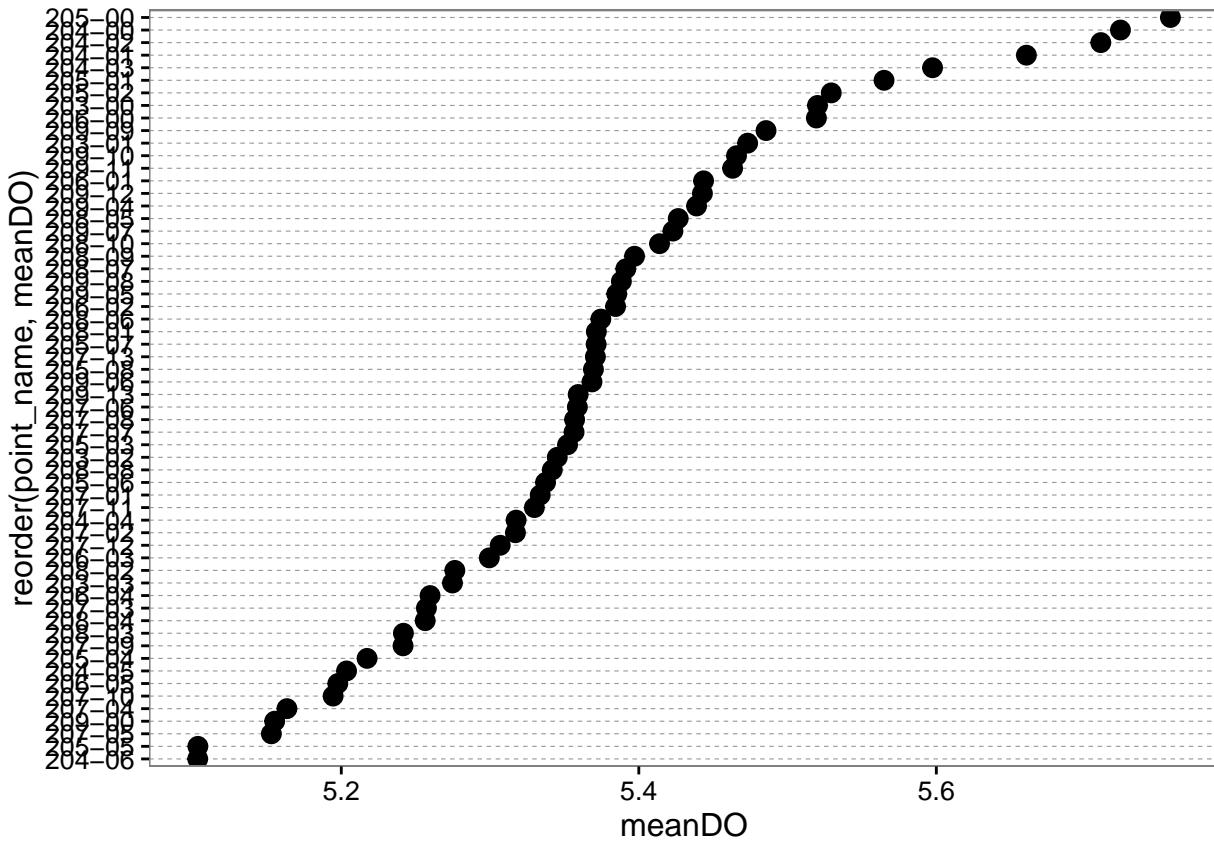
```
# jitter plot
ggplot(nfrdi.wq01, aes(x=factor(Seasons), DO)) + geom_jitter() +
  theme_bw() + scale_x_discrete("Seasons", labels=c("Winter", "Spring", "Summer", "Autumn"))
```



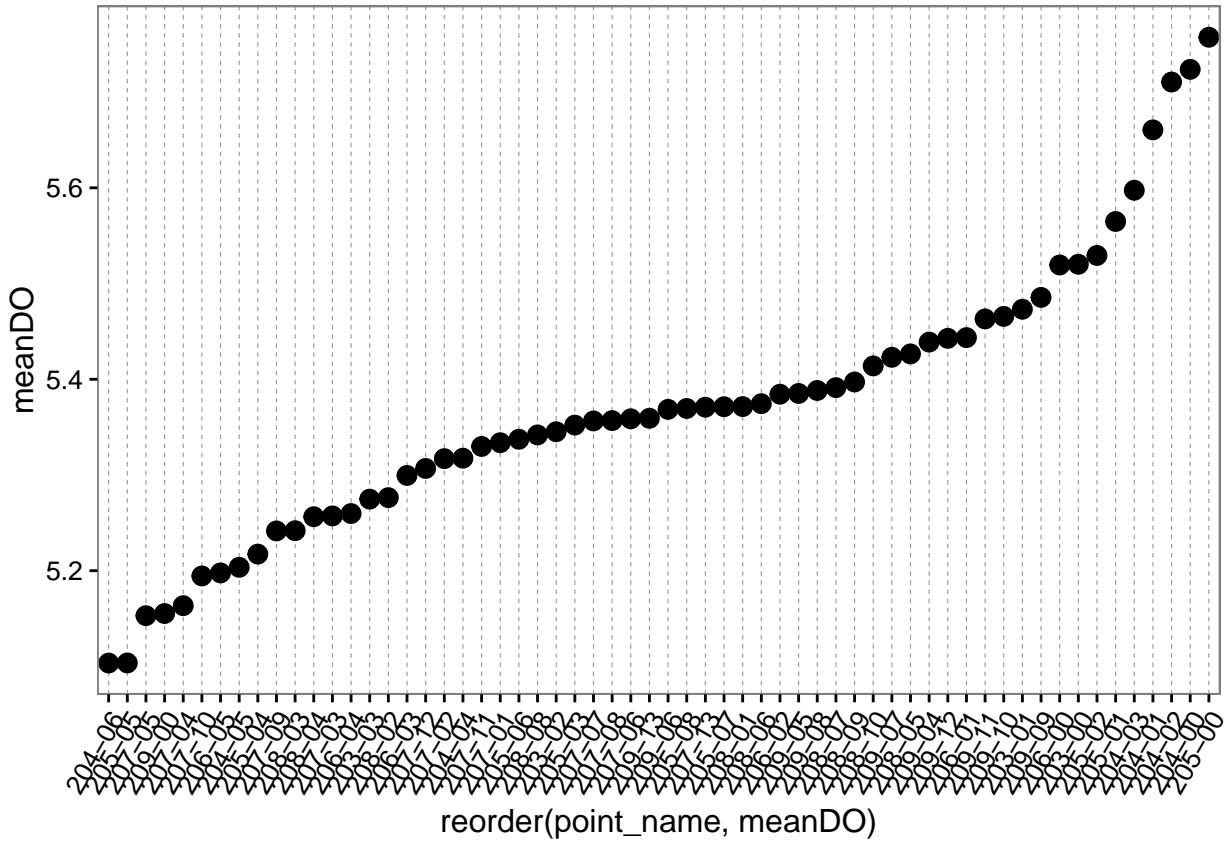
```
# boxplot
ggplot(nfrdi.wq01, aes(x=factor(Seasons), DO)) + geom_boxplot() +
  theme_bw() + scale_x_discrete("Seasons", labels=c("Winter", "Spring", "Summer", "Autumn"))
```



```
# 연도별 정점의 DO dotplot
mD01 <- filter(nfrdi.wq01, line_gr=="200s") %>% ddply("point_name", summarise, meanDO= mean(DO, na.rm=T))
ggplot(mD01, aes(x=meanDO, y=reorder(point_name, meanDO))) +
  geom_point(size=3) +
  theme_bw() +
  theme(panel.grid.major.x=element_blank(),
        panel.grid.minor.x=element_blank(),
        panel.grid.major.y=element_line(colour="grey60", linetype="dashed"))
```



```
## 연도별 정점의 DO dotplot - vertical
ggplot(mD01, aes(x=reorder(point_name, meanDO), y=meanDO)) +
  geom_point(size=3) +
  theme_bw() +
  theme(axis.text.x = element_text(angle=60, hjust=1),
        panel.grid.major.y=element_blank(),
        panel.grid.minor.y=element_blank(),
        panel.grid.major.x=element_line(colour="grey60", linetype="dashed"))
```



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# 연도별 DO의 산포도
# DO 수직 프로파일

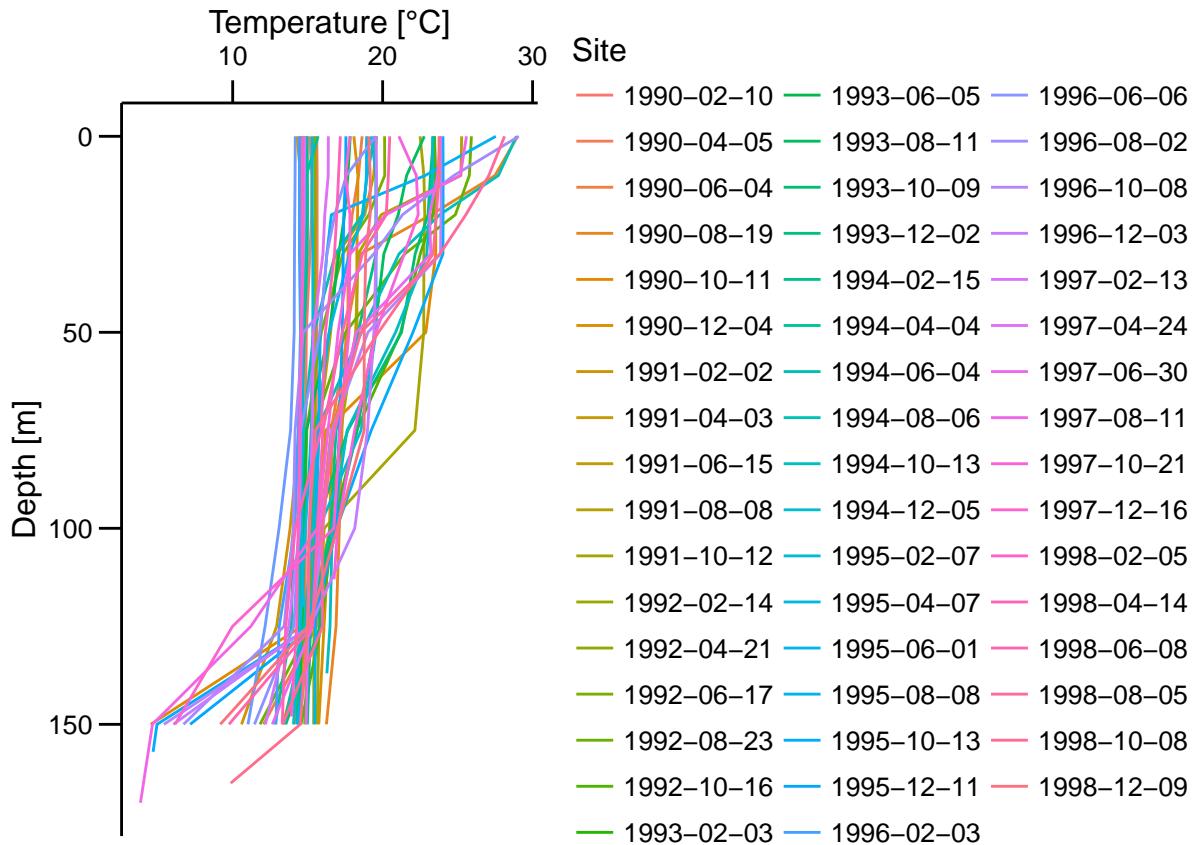
mD02 <- filter(nfrdi.wq01, sline=="207" & date >= "1990-01-01" & date <= "2014-01-01")
mD02 <- mD02 %>% filter(point_name=="207-05")
# 수온, 염분의 수직프로파일 (고정점인 경우 관측시간)

theme_set(theme_cowplot(font_size=12))

p1 <- ggplot(mD02, aes(x=temp, y=obs_depth)) +
  geom_path(aes(colour=factor(date))) +
  scale_y_reverse() + theme_classic()+
  labs(x = "Temperature [°C]", y = "Depth [m]", colour = "Site")

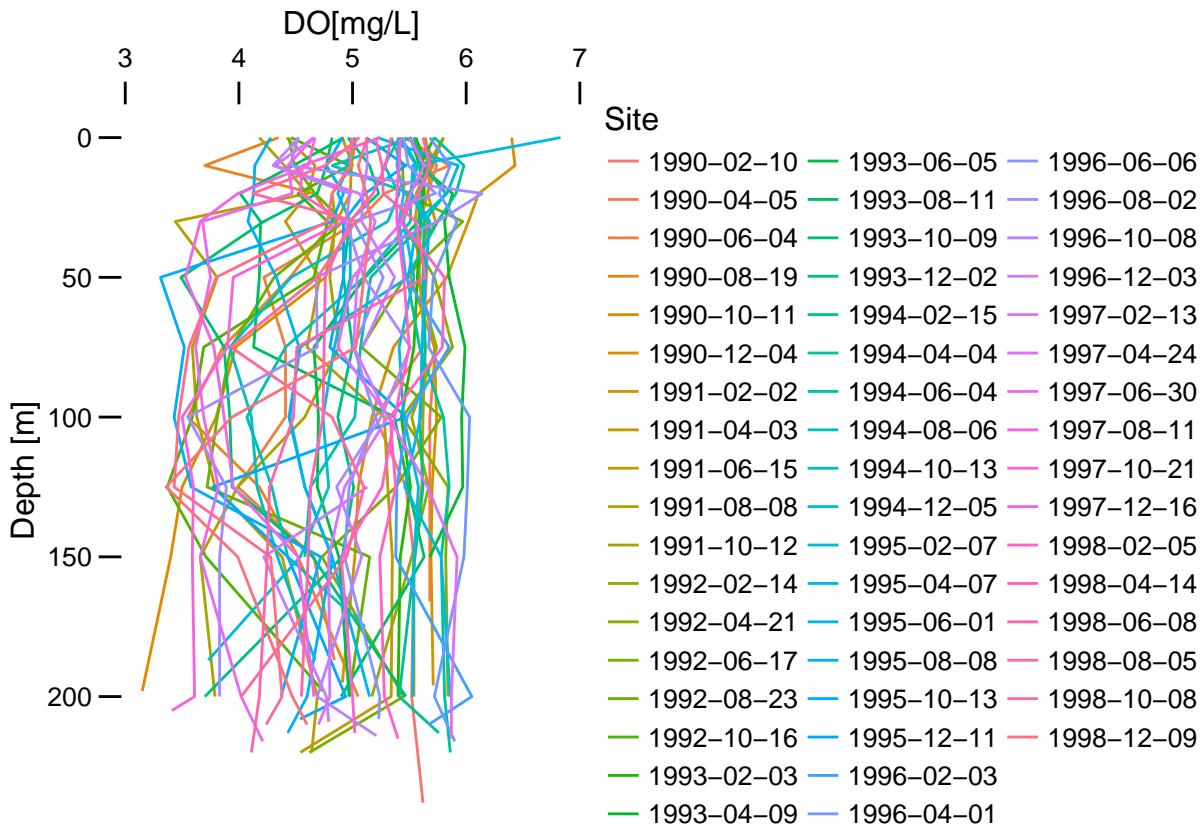
ggdraw(switch_axis_position(p1+theme(axis.ticks.length=unit(0.3, "cm")),
                           axis.text.x=element_text(margin=margin(0.2, unit="cm"))), axis='x')

```



```
# 날짜별 용존산소농도 수직프로파일
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```
mD02 <- filter(nfrdi.wq01, point_name=="207-04" & date >= "1990-01-01" & date <= "2014-01-01")
p1 <- ggplot(mD02, aes(x=D0, y=obs_depth)) +
  geom_path(aes(colour=factor(date))) +
  scale_y_reverse() +
  labs(x = "D0 [mg/L]", y = "Depth [m]", colour = "Site")
ggdraw(switch_axis_position(p1+theme(axis.ticks.length=unit(0.3, "cm")),
                           axis.text.x=element_text(margin=margin(0.2, unit="cm"))), axis='x')
```



## 사용자 그래프 작성순서

- 차트유형 선택 > 관측변수선택 > 명목변수(정점, 시간) > 기타설정옵션(색상, 문자크기 등등)
- 자료의 특성을 잘 표현하려면? 명목변수 옵션을 다양화해야...
- 명목변수: 정점선택, 시간(월별, 계절별, 연별...), 수심(표층, 저층, 표준수심...)