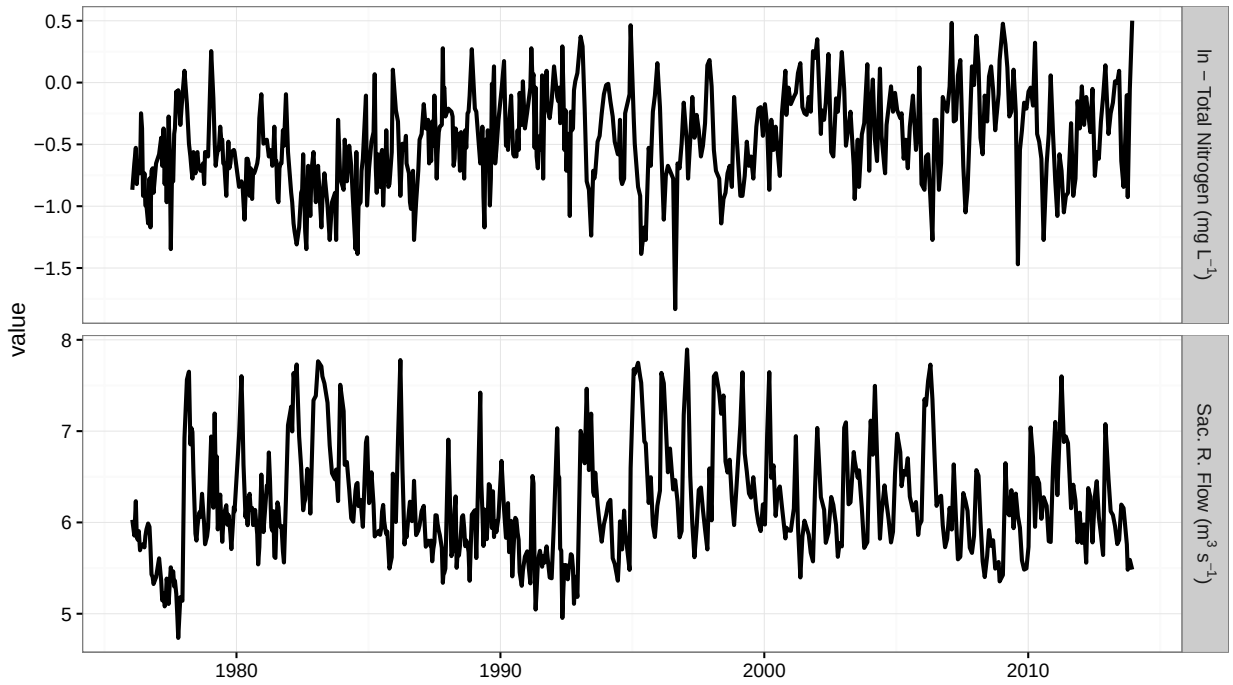
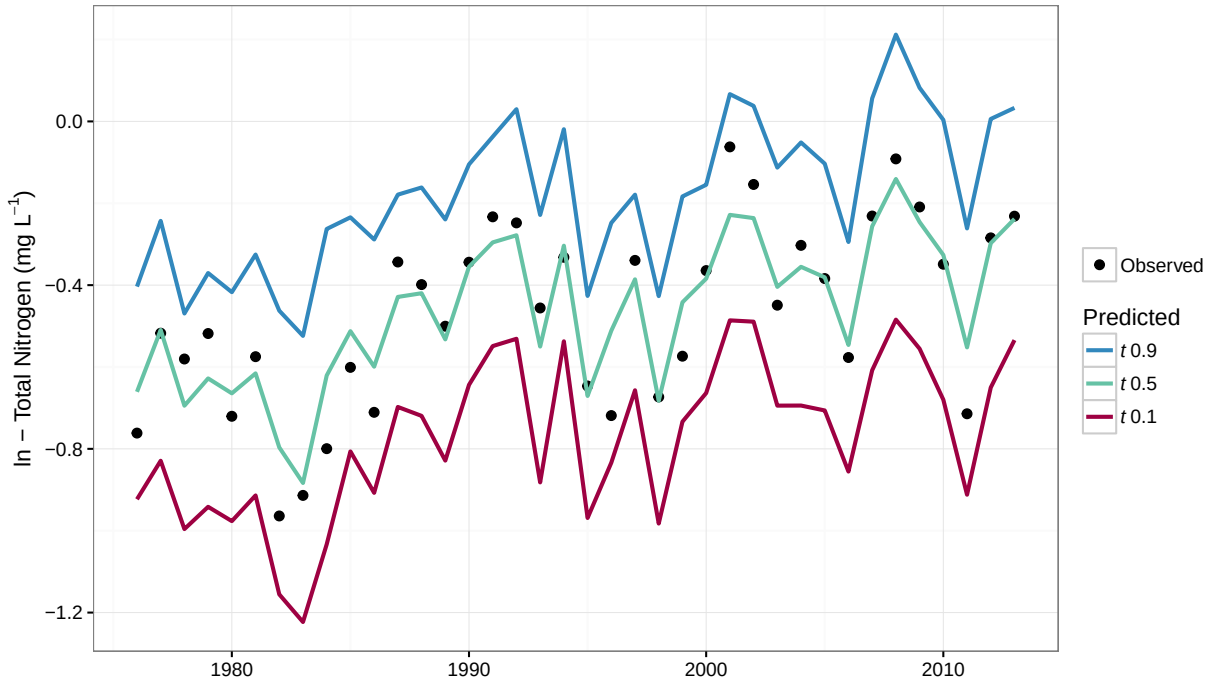
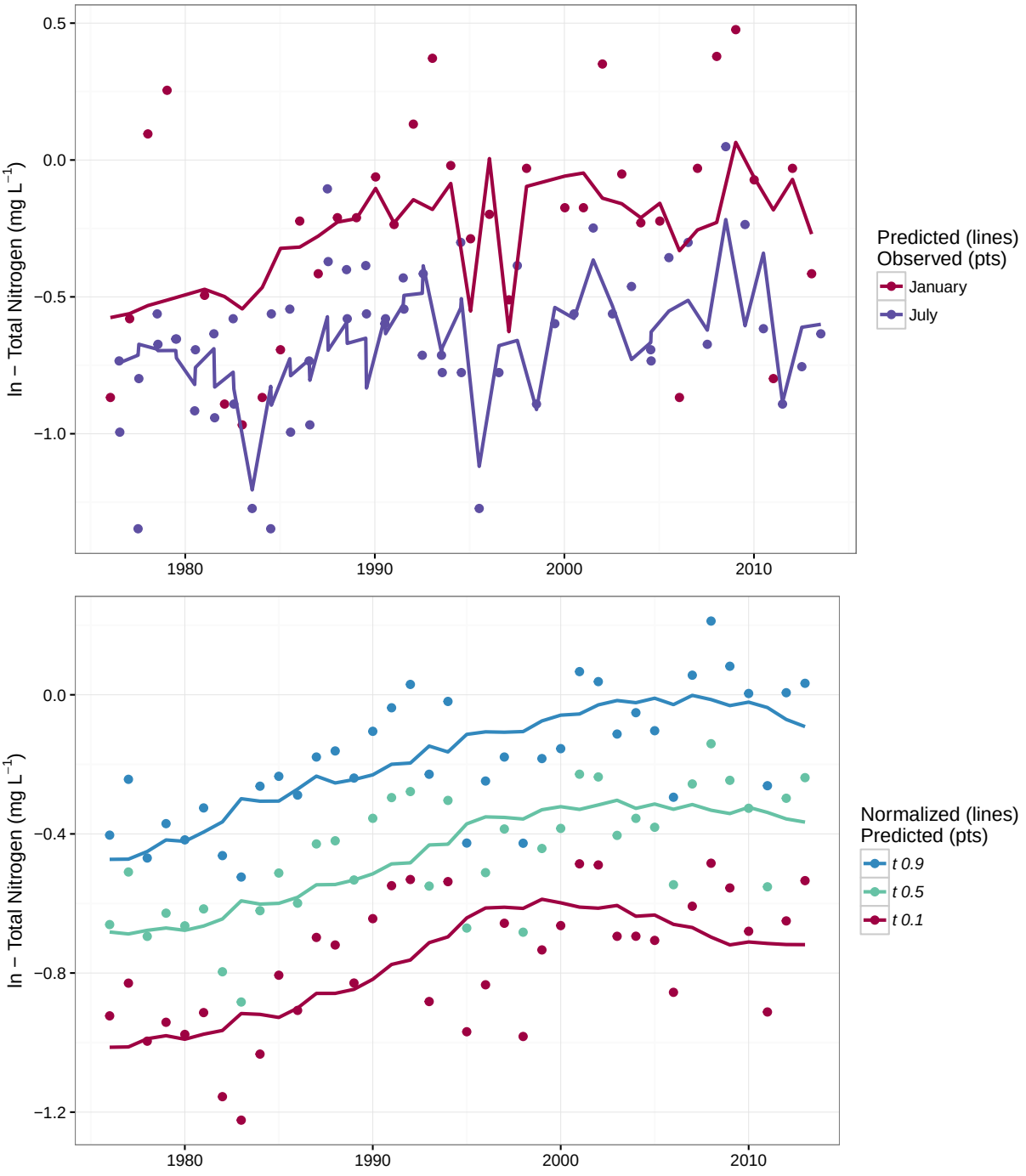
Example results for C3 station

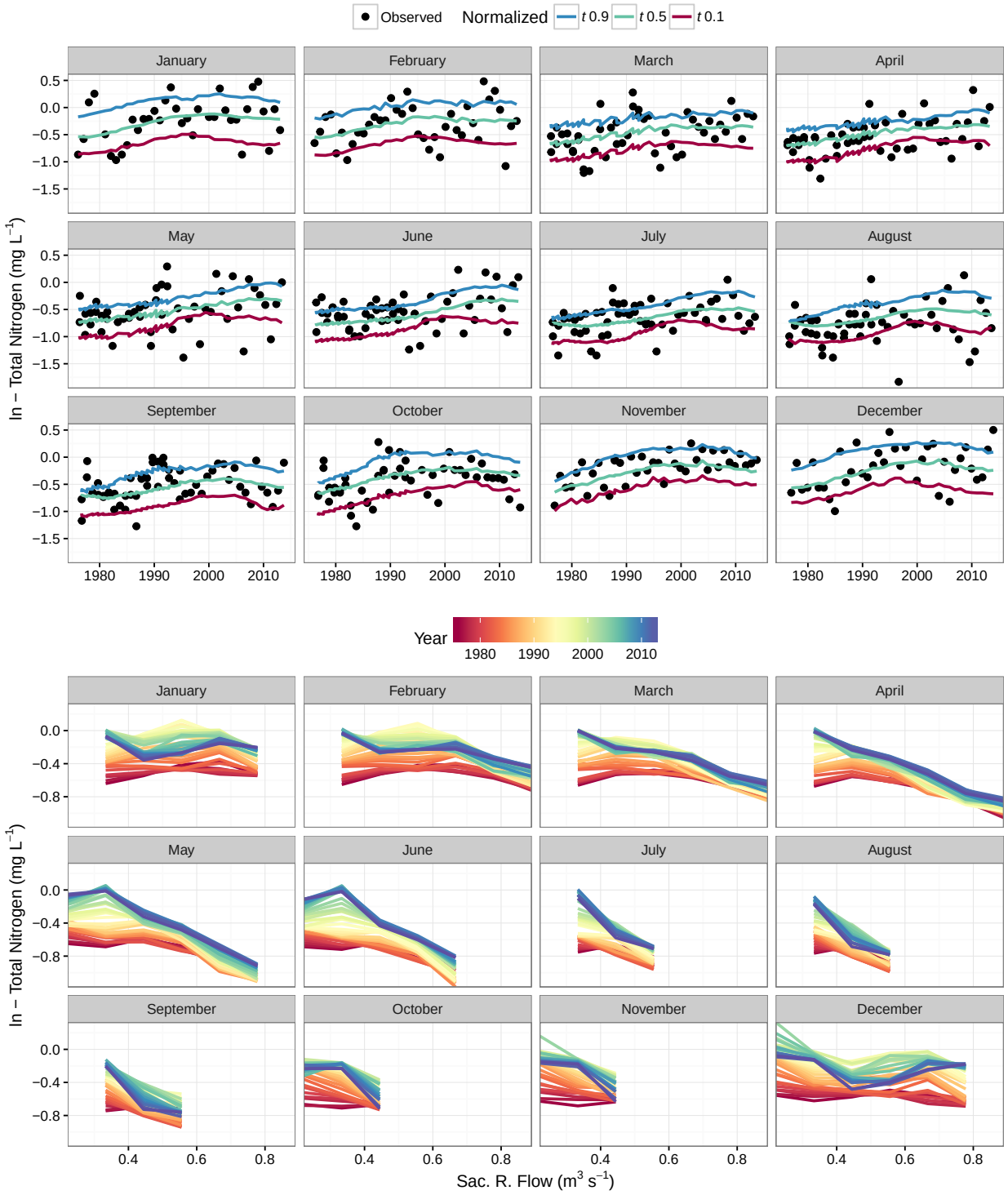
Marcus Beck

February 1, 2016






0.5
0.0
−0.5
−1.0
ln − Total Nitrogen (mg L^{-1})
1980
1990
2000
2010
Predicted (lines)
Observed (pts)
January
July
0.0
−0.4
−0.8
−1.2
ln − Total Nitrogen (mg L^{-1})
1980
1990
2000
2010
Normalized (lines)
Predicted (pts)
t 0.9
t 0.5
t 0.1



Results from winsrch_optim

```
library(ggplot2)
library(dplyr)
library(WRTDStidal)
library(tidyr)
```

```r
library(lubridate)

load(file = 'data/delt_dat.RData')
load(file = 'data/flow_dat.RData')

# left five-day moving window average for flow
flow_dat <- group_by(flow_dat, var) %>%
  mutate(val = stats::filter(val, sides = 1, filter = rep(1, 5)/5, method = 'convolution')) %>%
  spread(var, val)

# combine flow w/ wq dat
# select C3 station, sac river flow, and TN
# use only complete years (1976 - 2014)
dat <- left_join(delt_dat, flow_dat, by = 'Date') %>%
  filter(Site_Code %in% 'C3') %>%
  select(Date, tn, sac) %>%
  mutate(
    sac = log(sac),
    tn = log(tn),
    lim = -Inf
    ) %>%
  rename(
    date = Date,
    res = tn,
    flo = sac
  ) %>%
  filter(year(date) < 2014 & year(date) > 1975) %>%
  as.data.frame %>%
  na.omit

plot(res ~ date, data = dat)

# fit wrtds model
res <- modfit(dat,
  tau = c(0.1, 0.5, 0.9),
  reslab = expression(paste('ln - Total Nitrogen (mg ', L^-1, ')')),
  flolab = expression(paste('Sac. R. Flow (', m^3, s^-1, ')')),
  min_obs = 150
)




library(doParallel)
ncores <- detectCores() - 1
registerDoParallel(cores = ncores)

# run search function - takes a while
datin <- tidal(dat,
  reslab = expression(paste('ln - Total Nitrogen (mg ', L^-1, ')')),
  flolab = expression(paste('Sac. R. Flow'))
  )
```

```
res <- winsrch_optim(datin)


Trying 0.4700152 9.137279 0.1

 Fold  1 0.0955
 Fold  2 0.0565
 Fold  3 0.0599
 Fold  4 0.0740
 Fold  5 0.0818
 Fold  6 0.0588
 Fold  7 0.0782
 Fold  8 0.0504
 Fold  9 0.0715
 Fold  10 0.0806

Overall error 0.07072478
Time difference of 2.479217 mins
```