

```

library(plyr)
library(dplyr)

##
## Attaching package: 'dplyr'
## The following objects are masked from 'package:plyr':
##
##   arrange, count, desc, failwith, id, mutate, rename, summarise,
##   summarize
## The following objects are masked from 'package:stats':
##
##   filter, lag
## The following objects are masked from 'package:base':
##
##   intersect, setdiff, setequal, union

library(tidyr)
library(lubridate)

##
## Attaching package: 'lubridate'
## The following object is masked from 'package:plyr':
##
##   here
## The following object is masked from 'package:base':
##
##   date

library(ggplot2)
library(grid)

library(MMWRweek)
library(cdcfluvview)

get_legend_grob <- function(x) {
  data <- ggplot2:::ggplot_build(x)

  plot <- data$plot
  panel <- data$panel
  data <- data$data
  theme <- ggplot2:::plot_theme(plot)
  position <- theme$legend.position
  if (length(position) == 2) {
    position <- "manual"
  }

  legend_box <- if (position != "none") {
    ggplot2:::build_guides(plot$scales, plot$layers, plot$mapping,
      position, theme, plot$guides, plot$labels)
  }
}

```

```

} else {
  ggplot2:::zeroGrob()
}
if (ggplot2:::is.zero(legend_box)) {
  position <- "none"
}
else {
  legend_width <- gtable:::gtable_width(legend_box) + theme$legend.margin
  legend_height <- gtable:::gtable_height(legend_box) + theme$legend.margin
  just <- valid.just(theme$legend.justification)
  xjust <- just[1]
  yjust <- just[2]
  if (position == "manual") {
    xpos <- theme$legend.position[1]
    ypos <- theme$legend.position[2]
    legend_box <- editGrob(legend_box, vp = viewport(x = xpos,
      y = ypos, just = c(xjust, yjust), height = legend_height,
      width = legend_width))
  }
  else {
    legend_box <- editGrob(legend_box, vp = viewport(x = xjust,
      y = yjust, just = c(xjust, yjust)))
  }
}
return(legend_box)
}

```

```

regionflu <- get_flu_data("hhs",
  sub_region = 1:10,
  data_source = "ilinet",
  years=1997:2017)
usflu <- get_flu_data("national",
  sub_region = NA,
  data_source = "ilinet",
  years=1997:2017)

flu_merged <- rbind.fill(usflu, regionflu) %>%
  transmute(
    region_type = `REGION TYPE`,
    region = REGION,
    year = YEAR,
    week = WEEK,
    wILI = as.numeric(`% WEIGHTED ILI`),
    ILI = as.numeric(`%UNWEIGHTED ILI`),
    total_ILI = as.numeric(ILITOTAL),
    total_patients = as.numeric(`TOTAL PATIENTS`)
  ) %>%

```

```

mutate(
  time = MMWRweek2Date(year, week)
)

## Warning in evalq(as.numeric(c("1.10148", "1.20007", "1.37876", "1.1992", : NAs introduced by coercion
## Warning in evalq(as.numeric(c("1.21686", "1.28064", "1.23906", "1.14473", : NAs introduced by coercion
## Warning in evalq(as.numeric(c("570", "615", "681", "653", "700", "655", : NAs introduced by coercion
## Warning in evalq(as.numeric(c("46842", "48023", "54961", "57044", "55506", : NAs introduced by coercion

flu_merged$season <- ifelse(
  flu_merged$week <= 30,
  paste0(flu_merged$year - 1, "/", flu_merged$year),
  paste0(flu_merged$year, "/", flu_merged$year + 1)
)

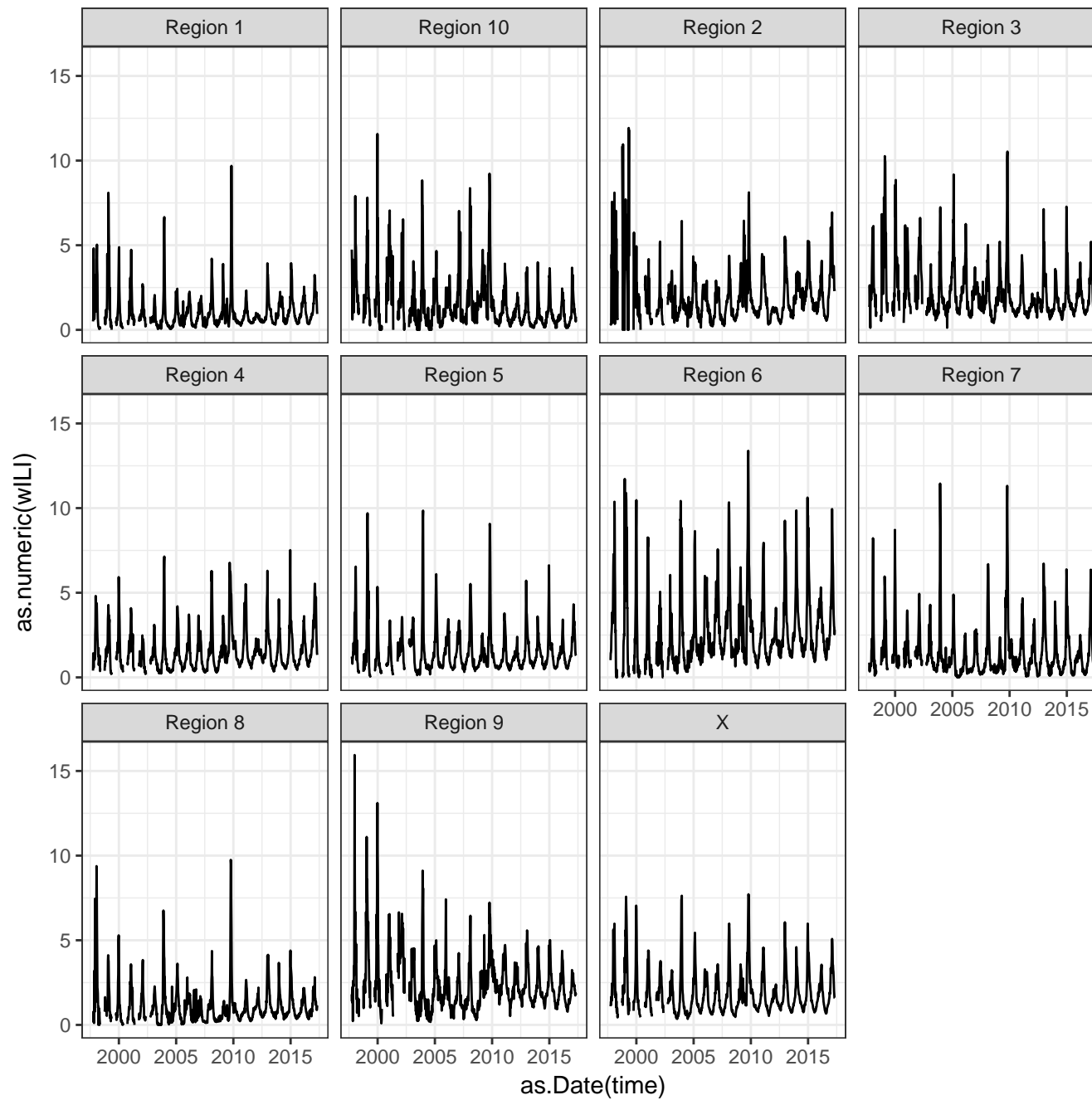
## Season week column: week number within season
## weeks after week 30 get season_week = week - 30
## weeks before week 30 get season_week = week + (number of weeks in previous year) - 30
## This computation relies on the start_date function in package MMWRweek,
## which is not exported from that package's namespace!!!
flu_merged$season_week <- ifelse(
  flu_merged$week <= 30,
  flu_merged$week + MMWRweek(MMWRweek::start_date(flu_merged$year) - 1)$MMWRweek - 30,
  flu_merged$week - 30
)

```

```

palette <- c("#000000", "#E69F00", "#56B4E9", "#009E73", "#F0E442", "#0072B2", "#D55E00", "#CC79A7", rainbow(3))
ggplot(flu_merged) +
  geom_line(aes(x = as.Date(time), y = as.numeric(wILI))) +#, colour = region, linetype = region)) +
# scale_colour_manual(breaks = c("X", paste0("Region ", 1:10)), values = palette) +
  facet_wrap(~ region) +
  theme_bw()

```

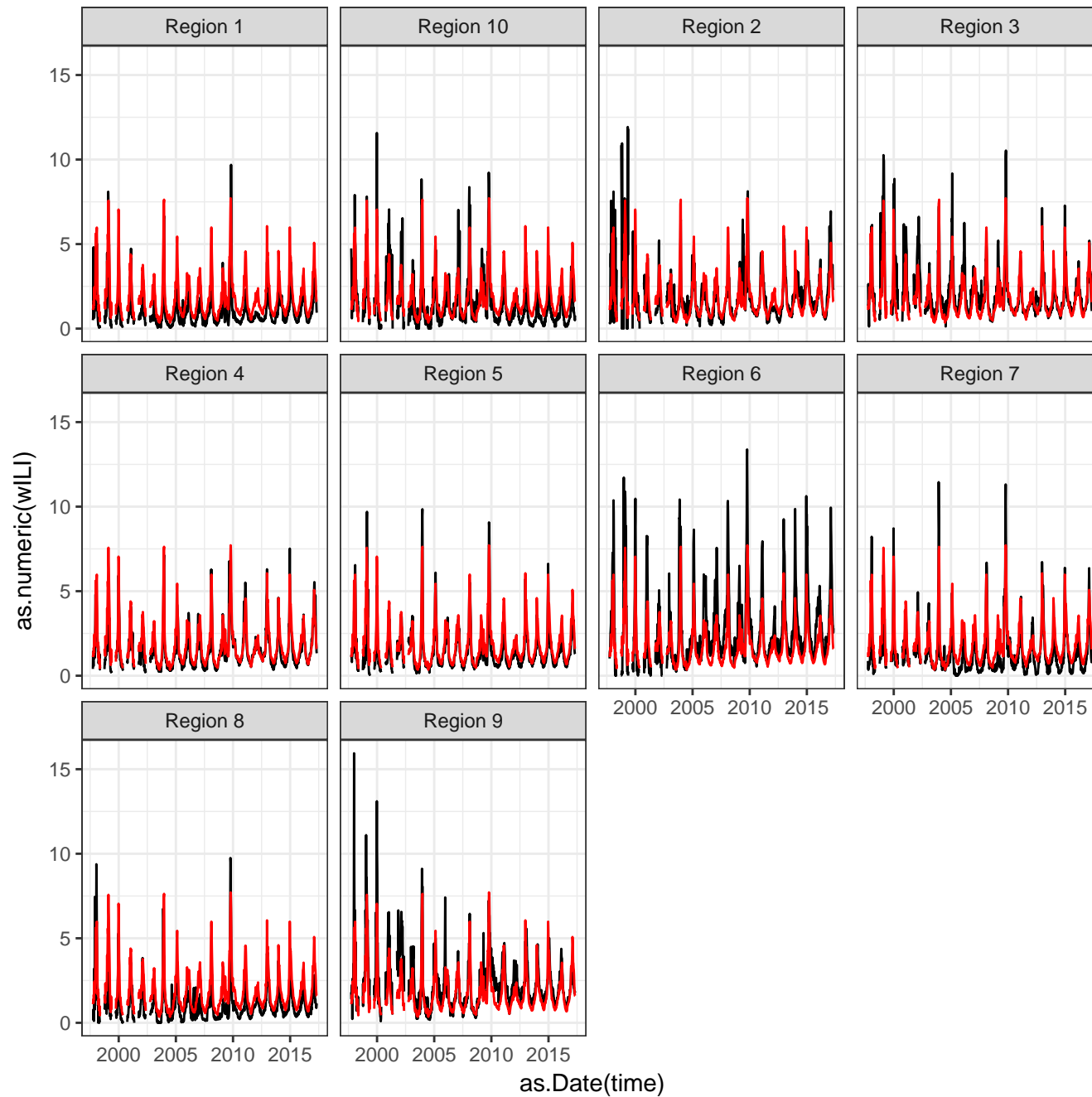


```
palette <- c("#000000", "#E69F00", "#56B4E9", "#009E73", "#F0E442", "#0072B2", "#D55E00", "#CC79A7", rainbow(3))
ggplot() +
  geom_line(aes(x = as.Date(time), y = as.numeric(wILI)),
    data = flu_merged %>% filter(region != "X")) +
  geom_line(aes(x = as.Date(time), y = as.numeric(wILI)),
```

```

colour = "red",
data = flu_merged %>% filter(region == "X") %>% select(-region)) +
# scale_colour_manual(breaks = c("X", paste0("Region ", 1:10)), values = palette) +
facet_wrap(~ region) +
theme_bw()

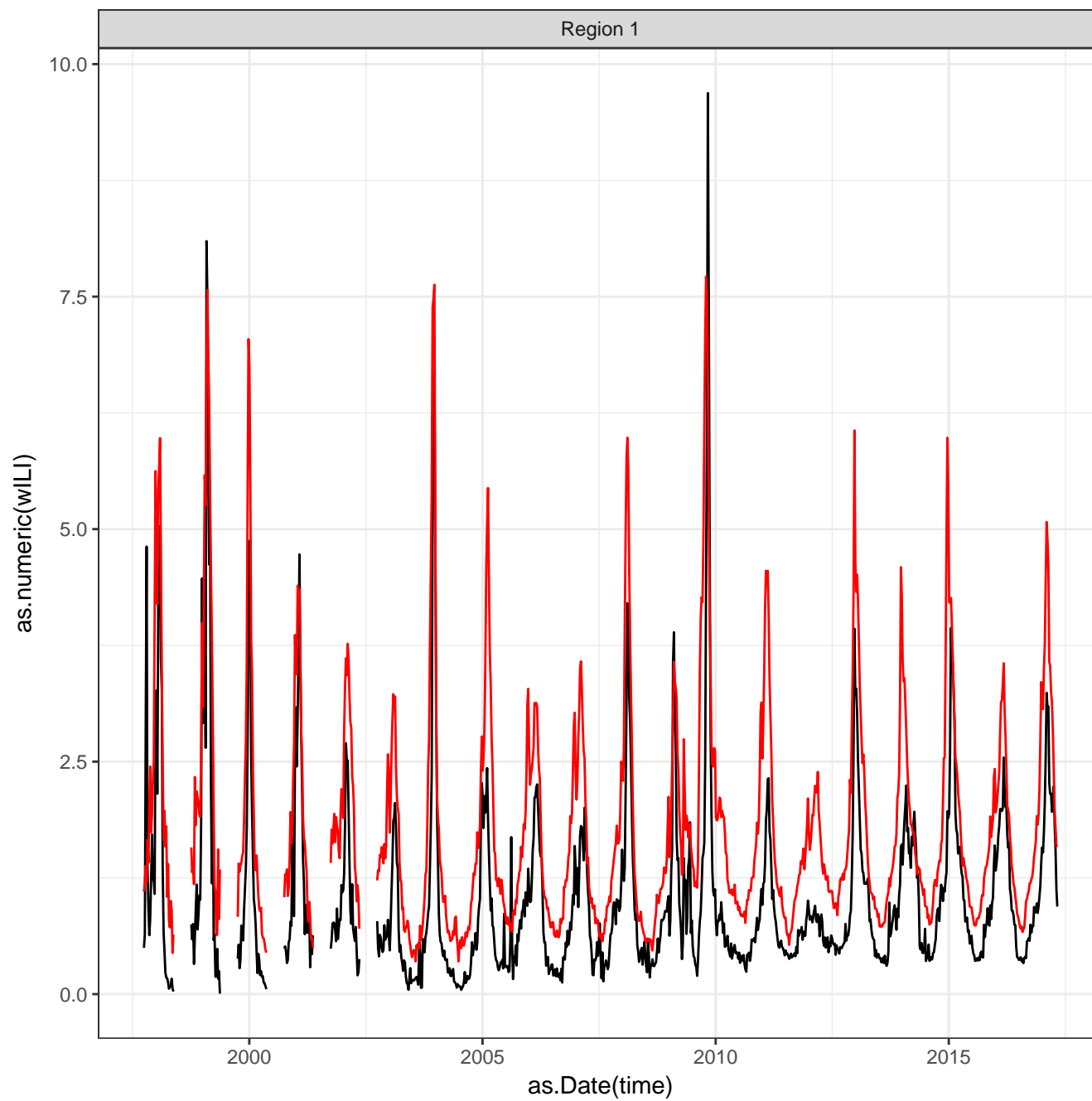
```

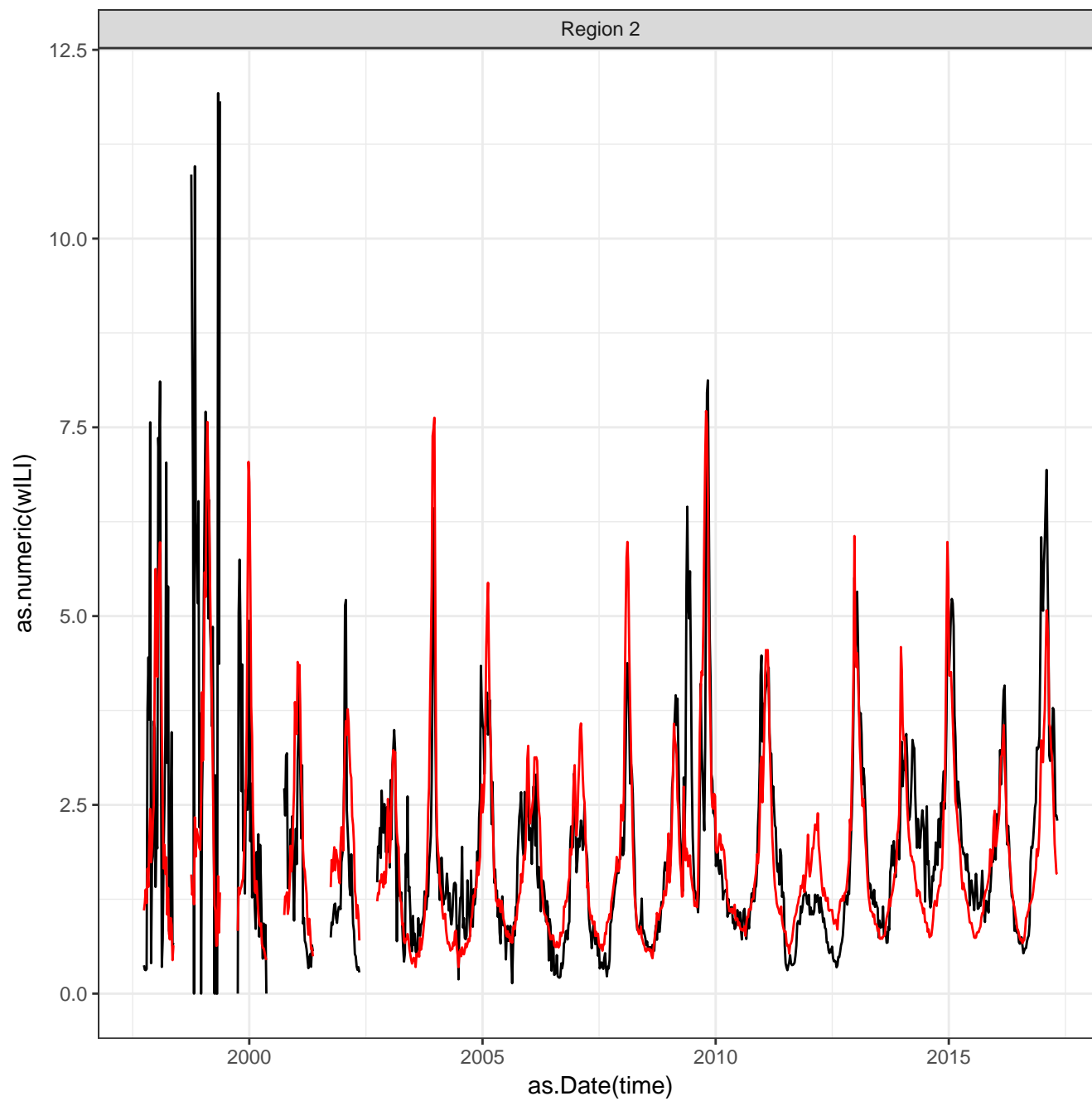


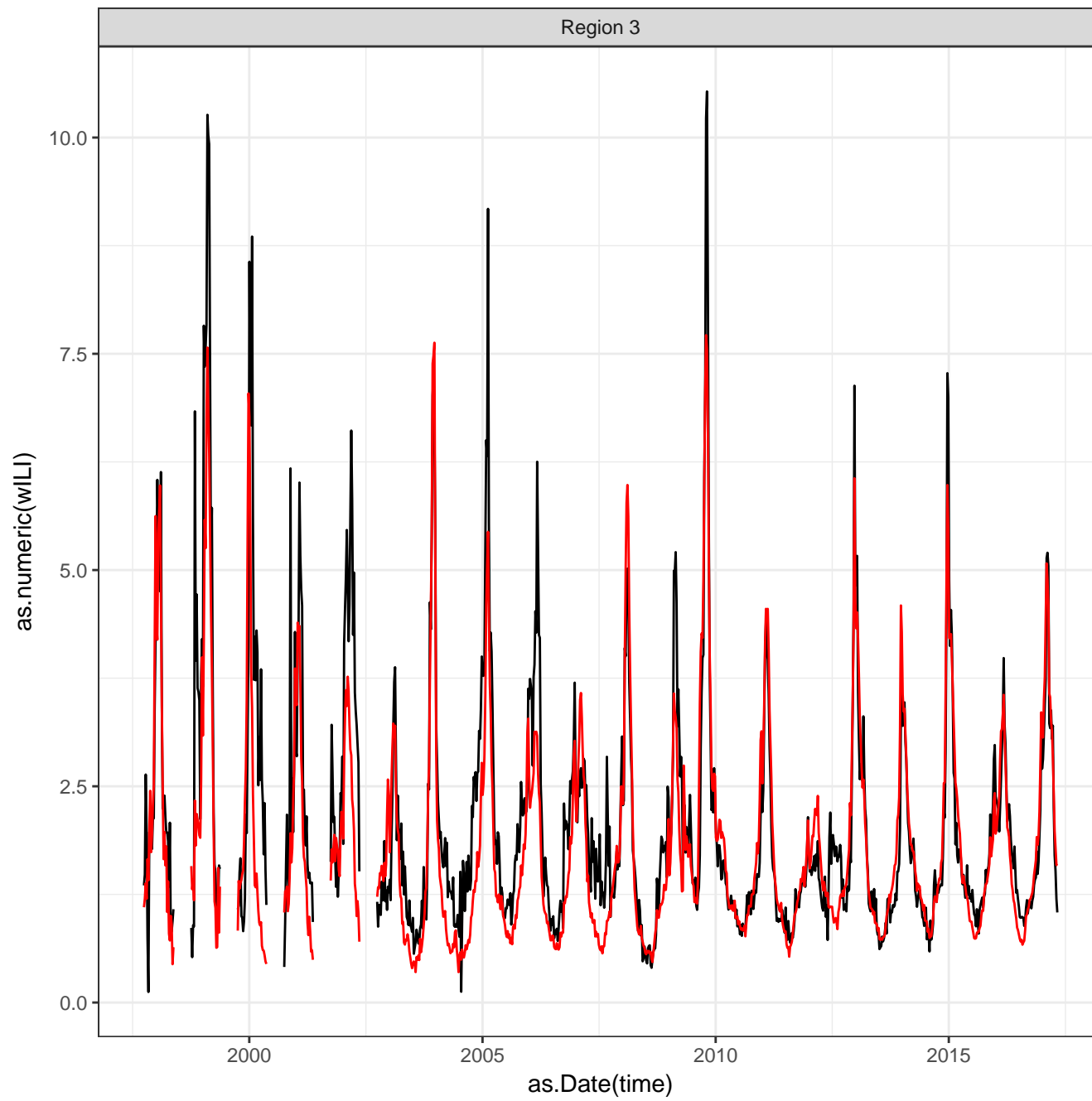
```

palette <- c("#000000", "#E69F00", "#56B4E9", "#009E73", "#F0E442", "#0072B2", "#D55E00", "#CC79A7", rainbow(3))
for(region_val in unique(flu_merged$region)) {
  if(region_val != "X") {
    p <- ggplot() +
      geom_line(aes(x = as.Date(time), y = as.numeric(wILI)),
        data = flu_merged %>% filter(region == region_val)) +
      geom_line(aes(x = as.Date(time), y = as.numeric(wILI)),
        colour = "red",
        data = flu_merged %>% filter(region == "X") %>% select(-region)) +
      # scale_colour_manual(breaks = c("X", paste0("Region ", 1:10)), values = palette) +
      facet_wrap(~ region) +
      theme_bw()
    print(p)
  }
}

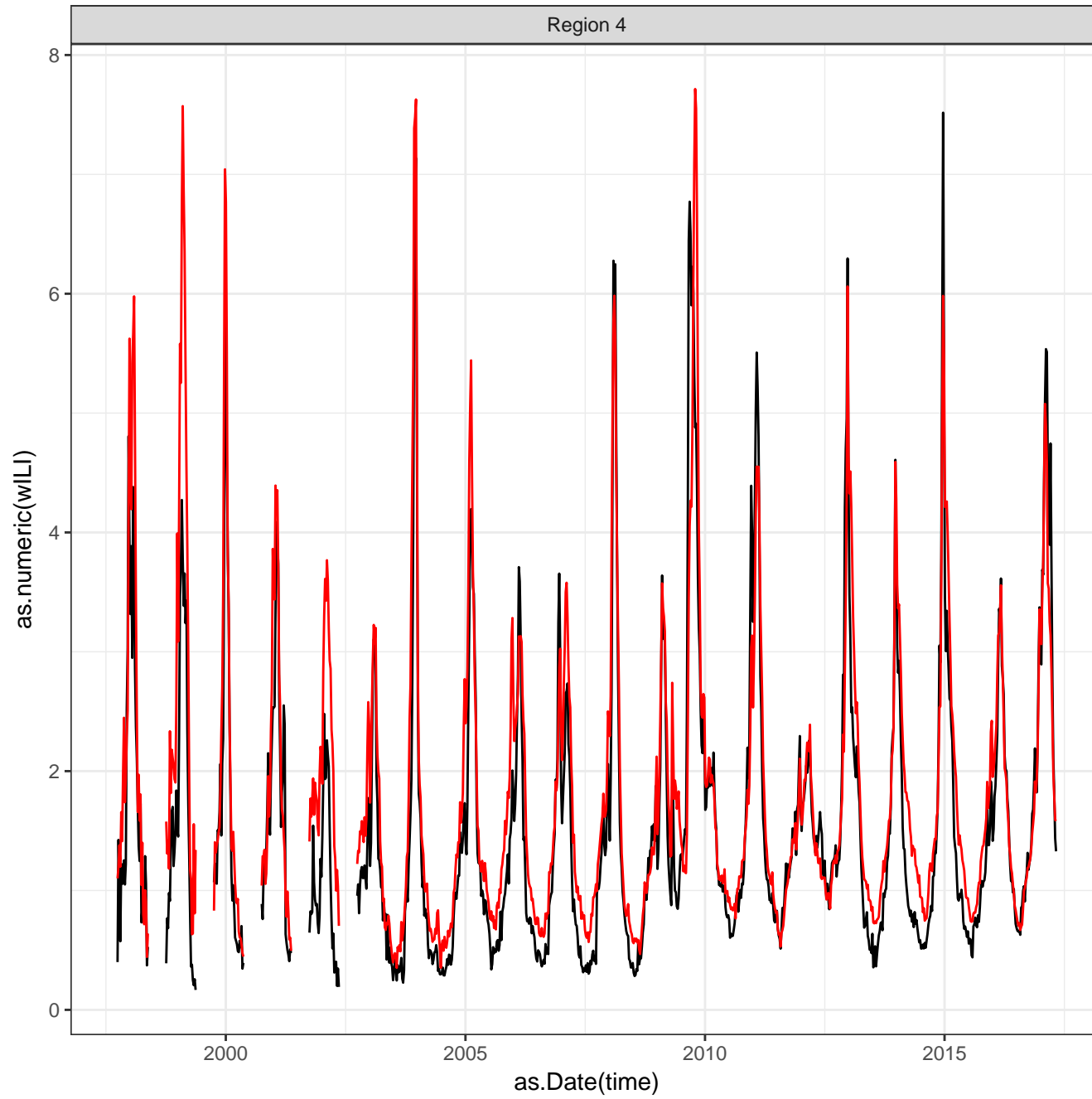
```

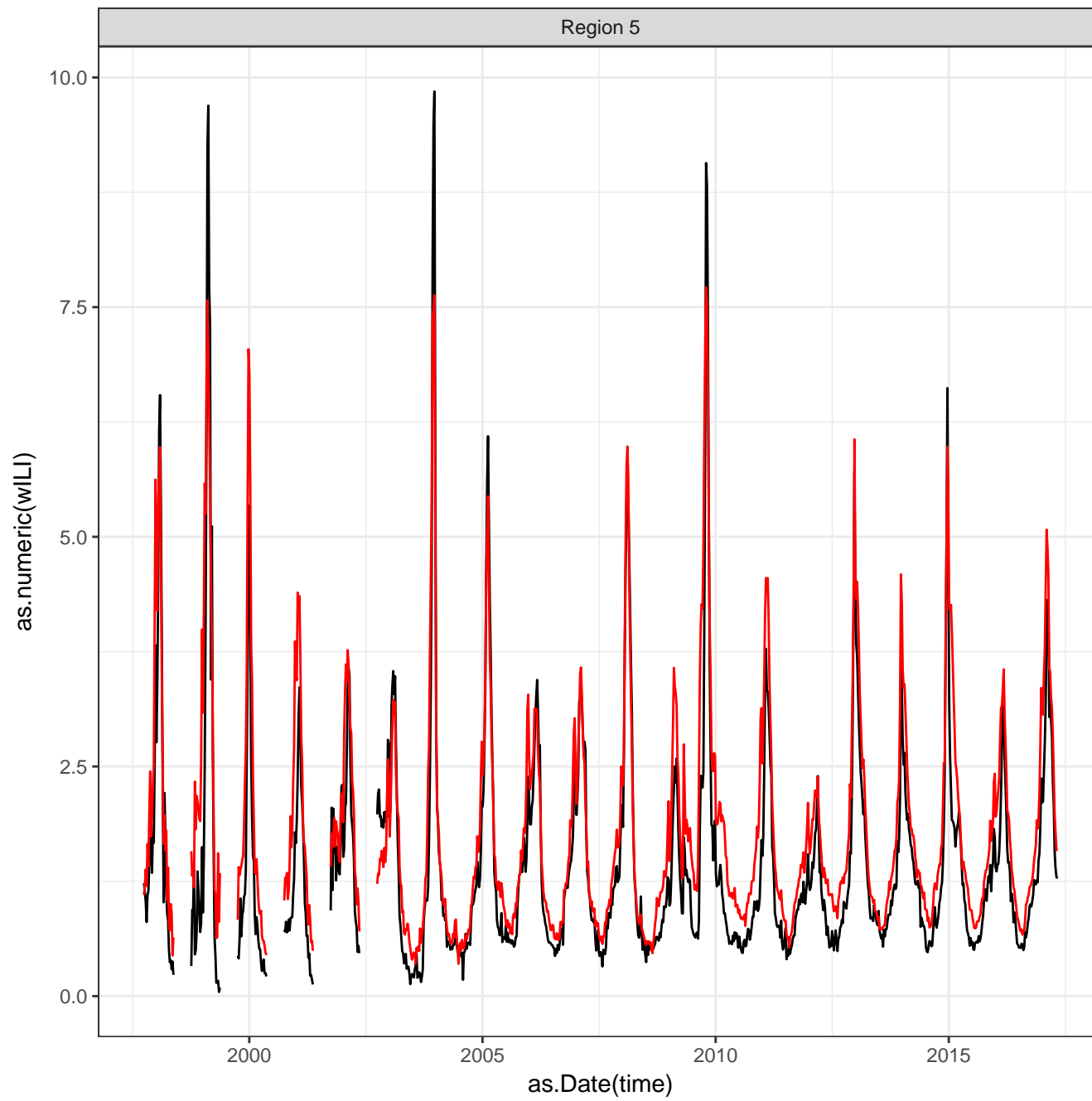




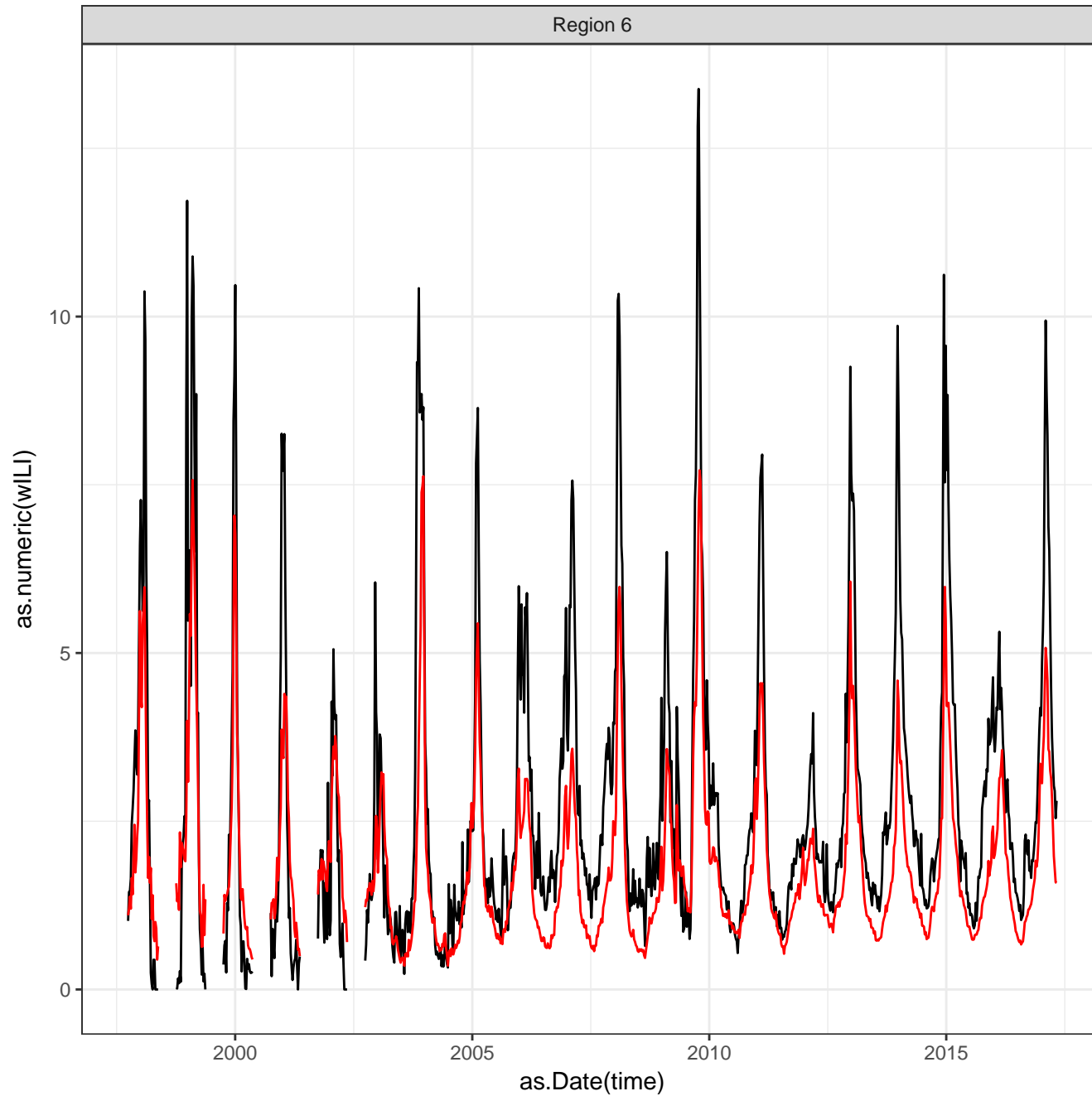


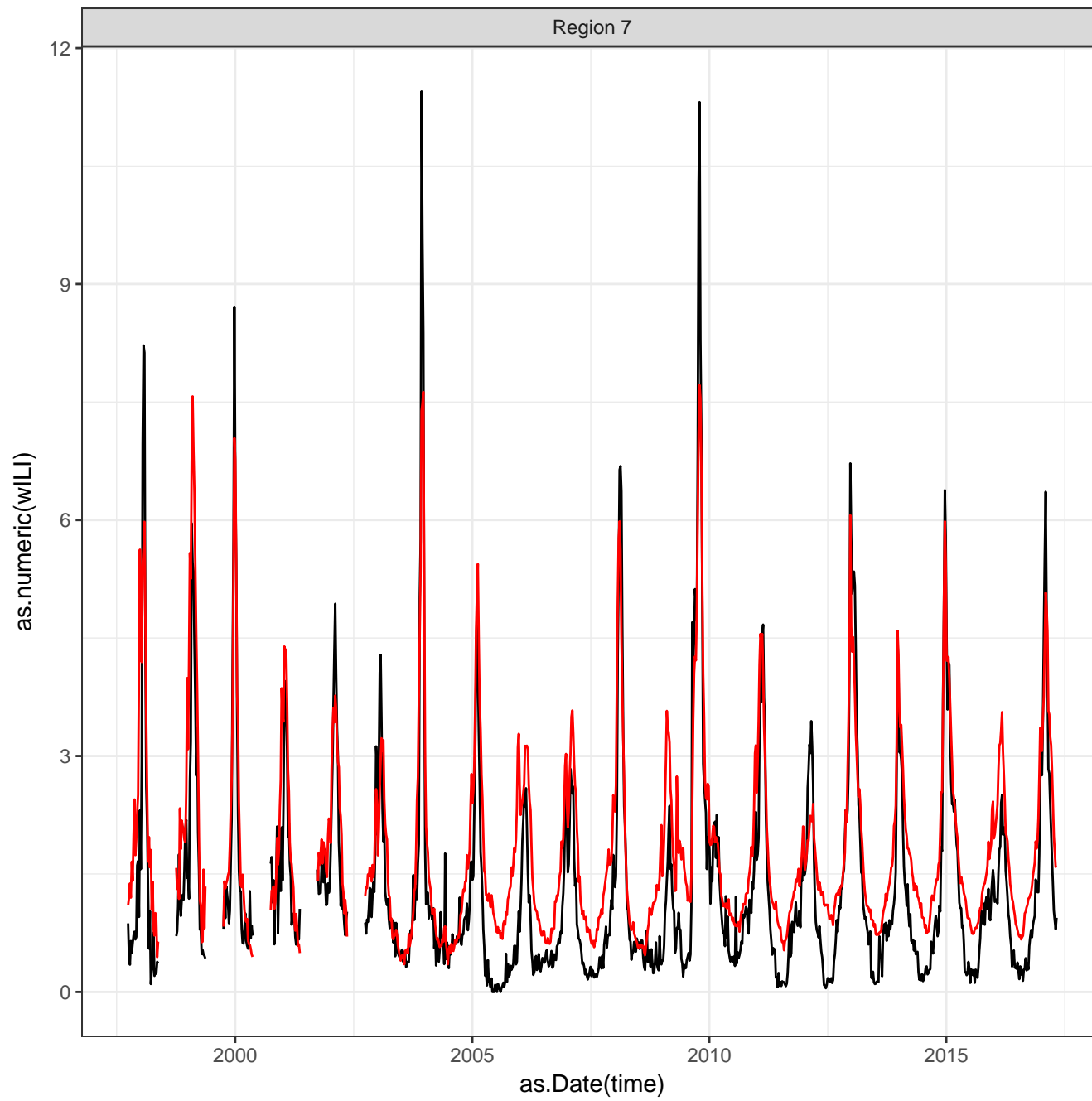
Region 4

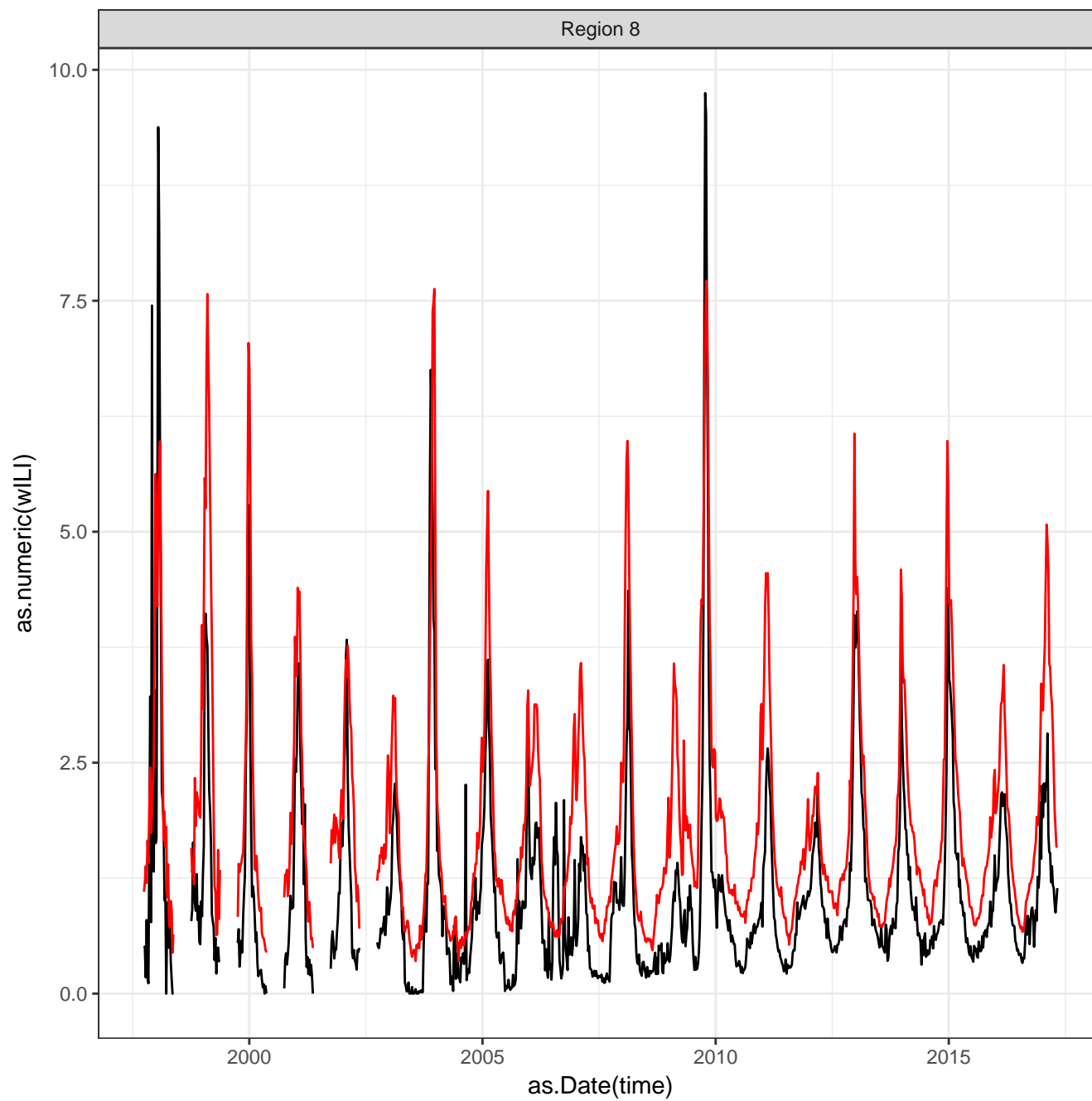




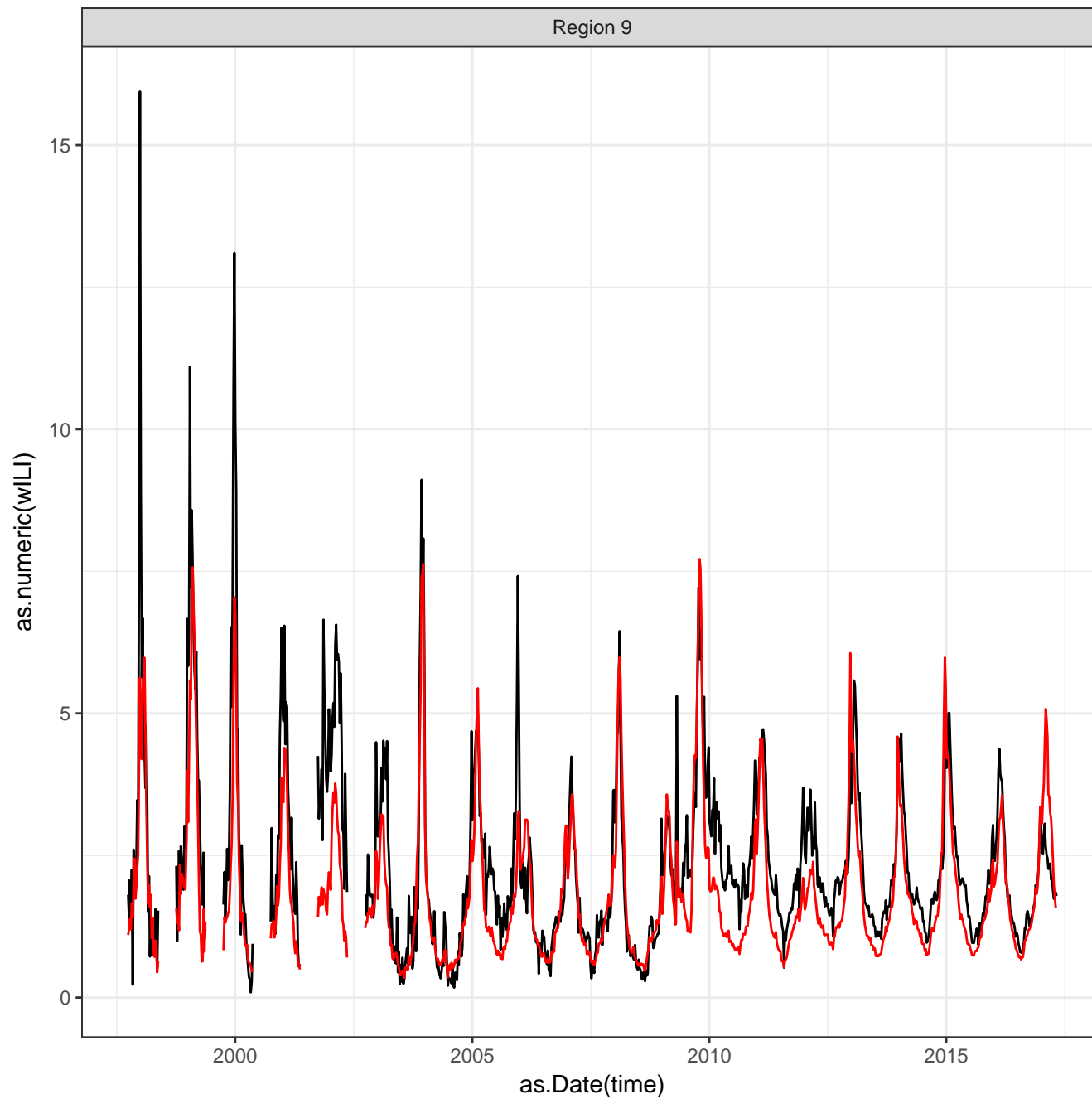
Region 6

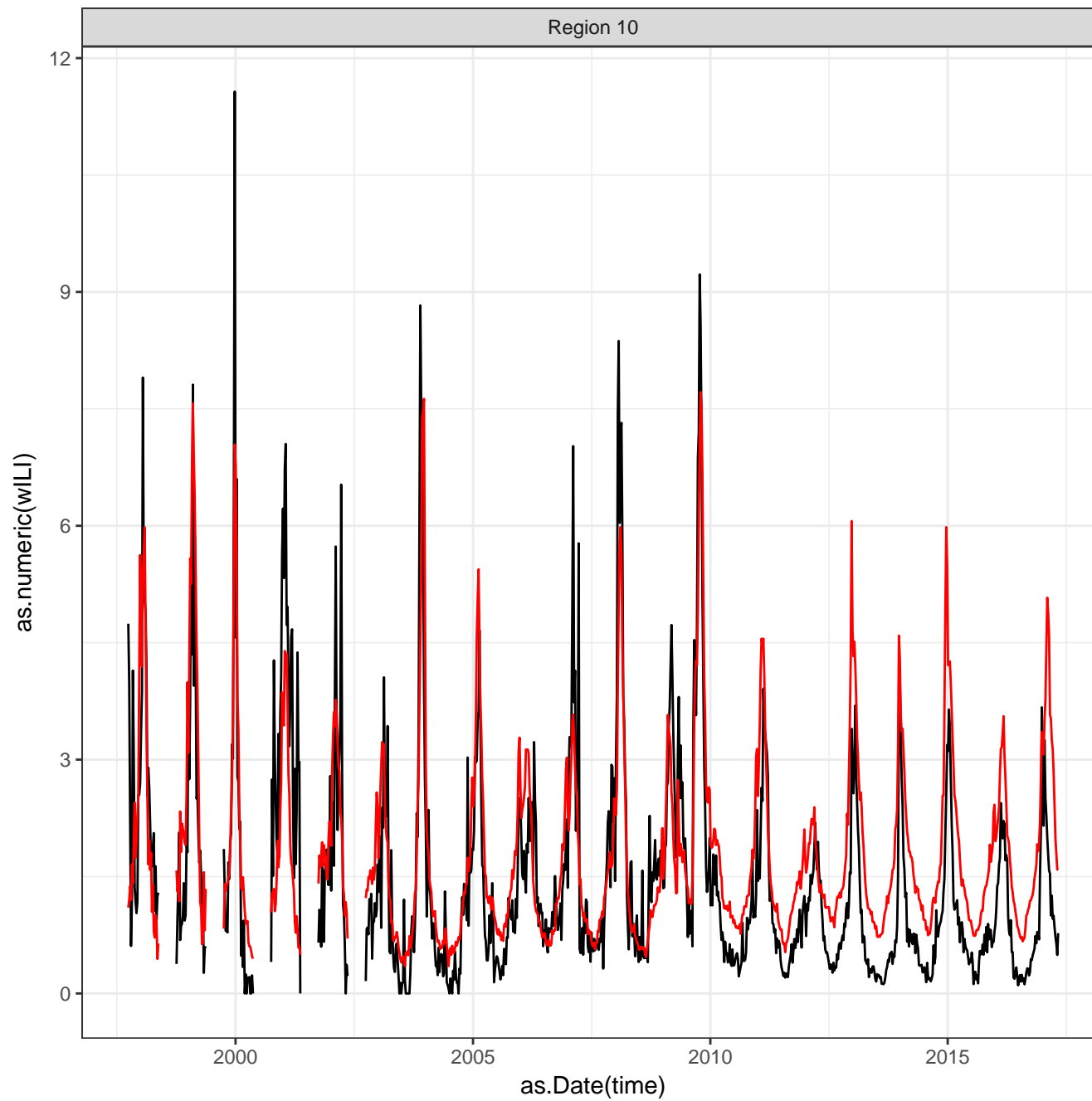






Region 9



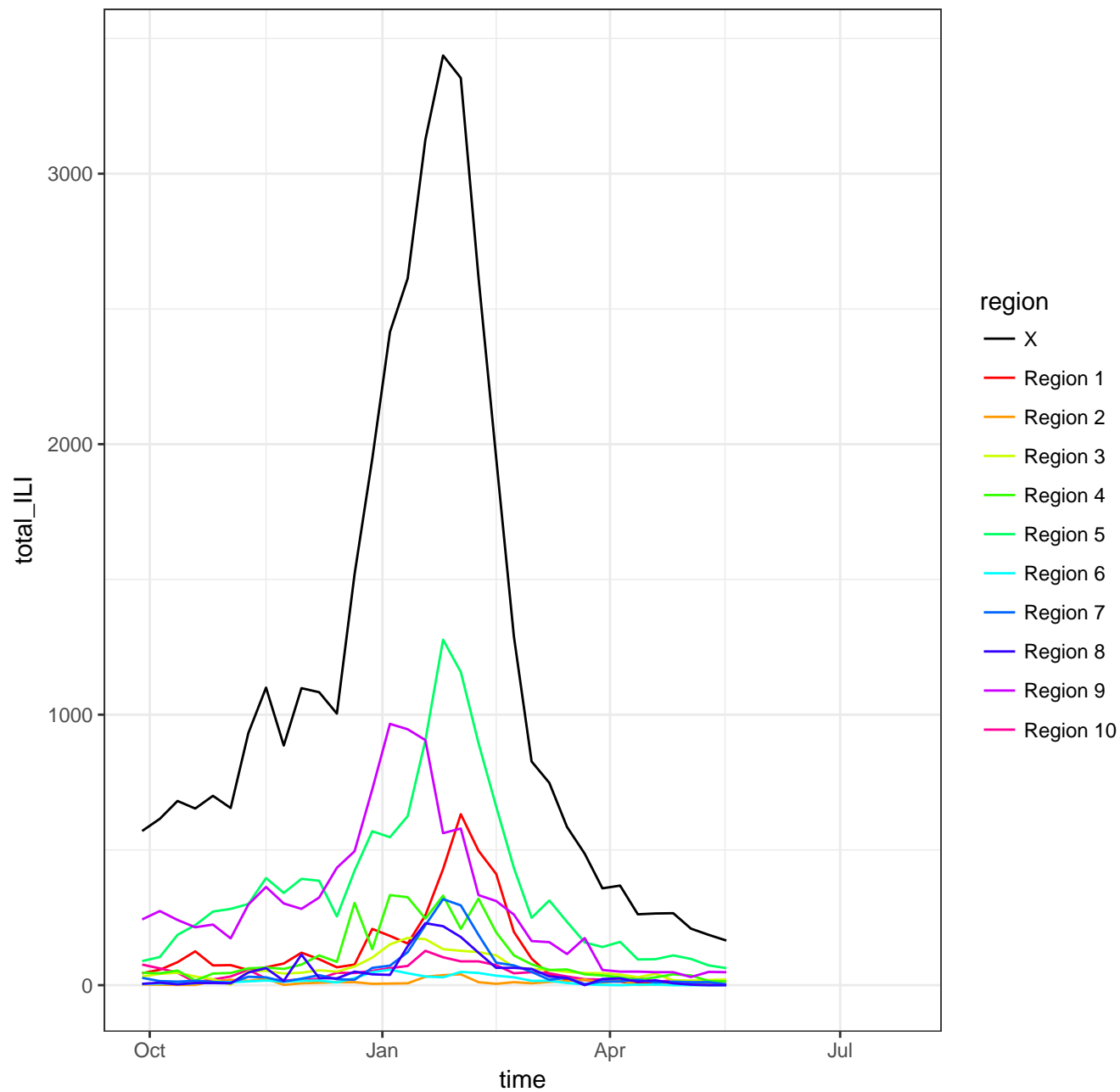


```
palette <- c("#000000", rainbow(10))
for(season_val in unique(flu_merged$season)) {
  p <- ggplot() +
    geom_line(aes(x = time, y = total_ILI, colour = region),
      data = flu_merged %>% filter(season == season_val)) +
```

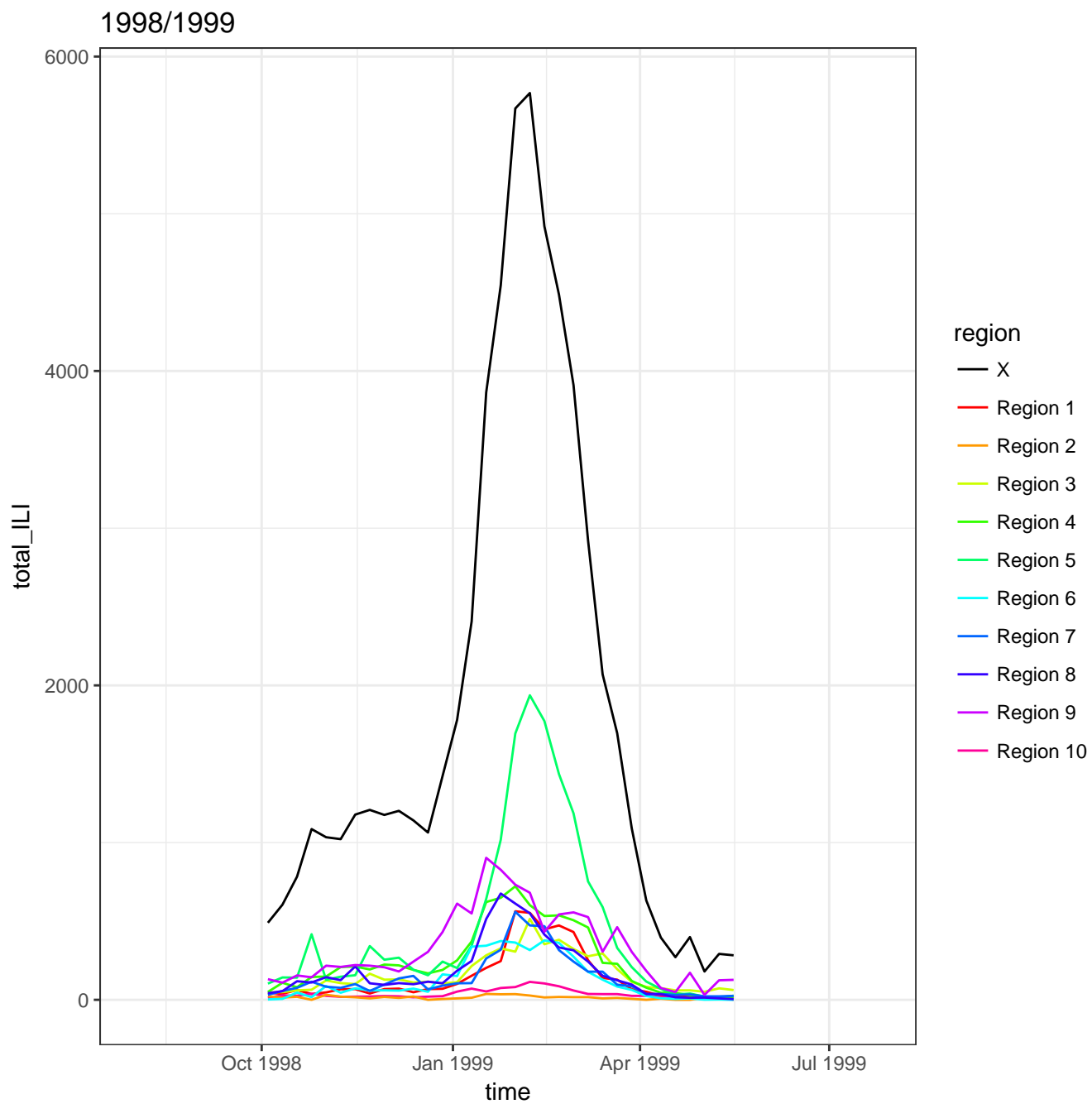


```
scale_colour_manual(  
  breaks = c("X", paste0("Region ", 1:10)),  
  limits = c("X", paste0("Region ", 1:10)),  
  values = palette) +  
  ggtitle(season_val) +  
  theme_bw()  
print(p)  
}  
  
## Warning: Removed 110 rows containing missing values (geom_path).
```

1997/1998

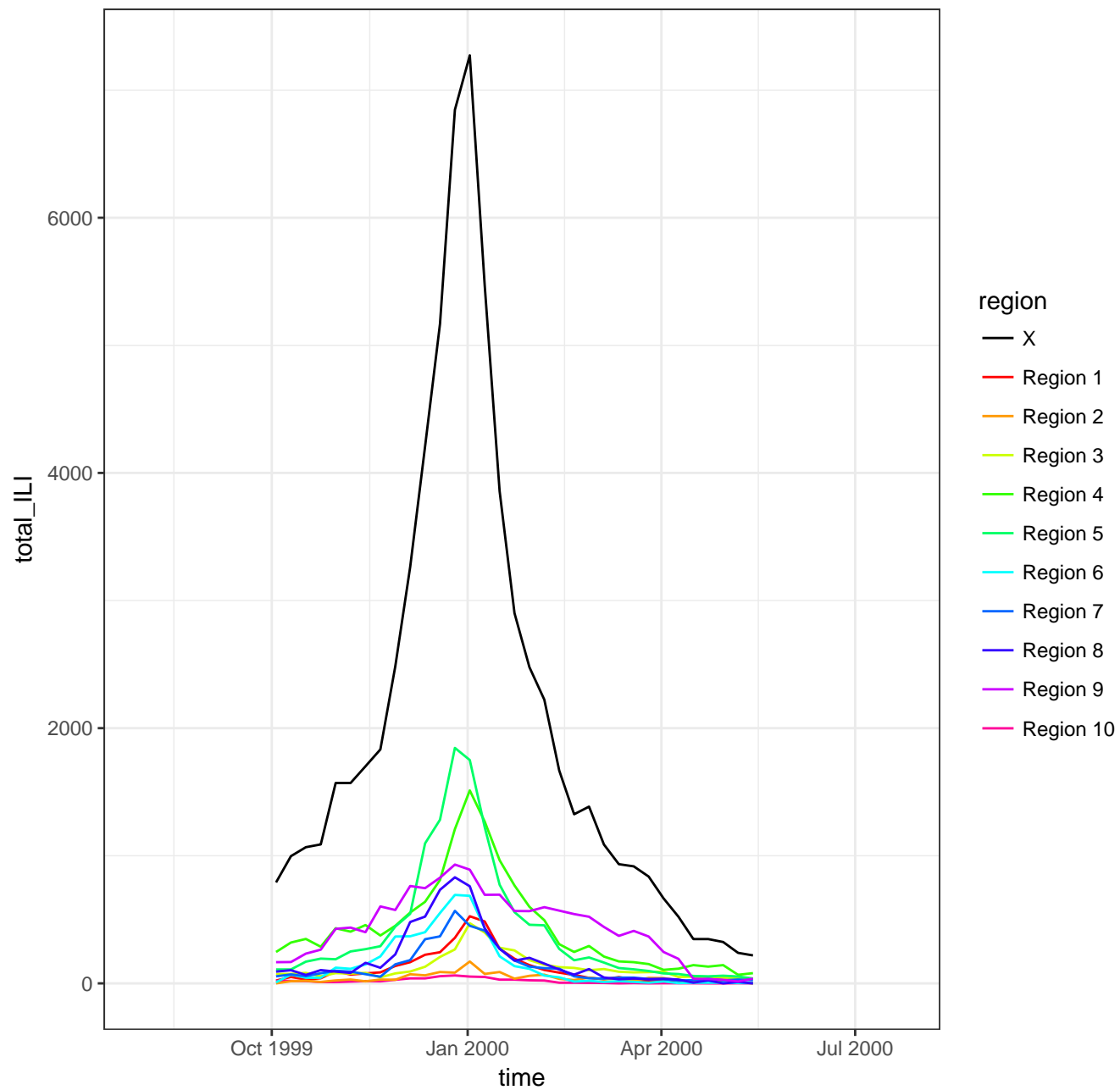


Warning: Removed 209 rows containing missing values (geom_path).



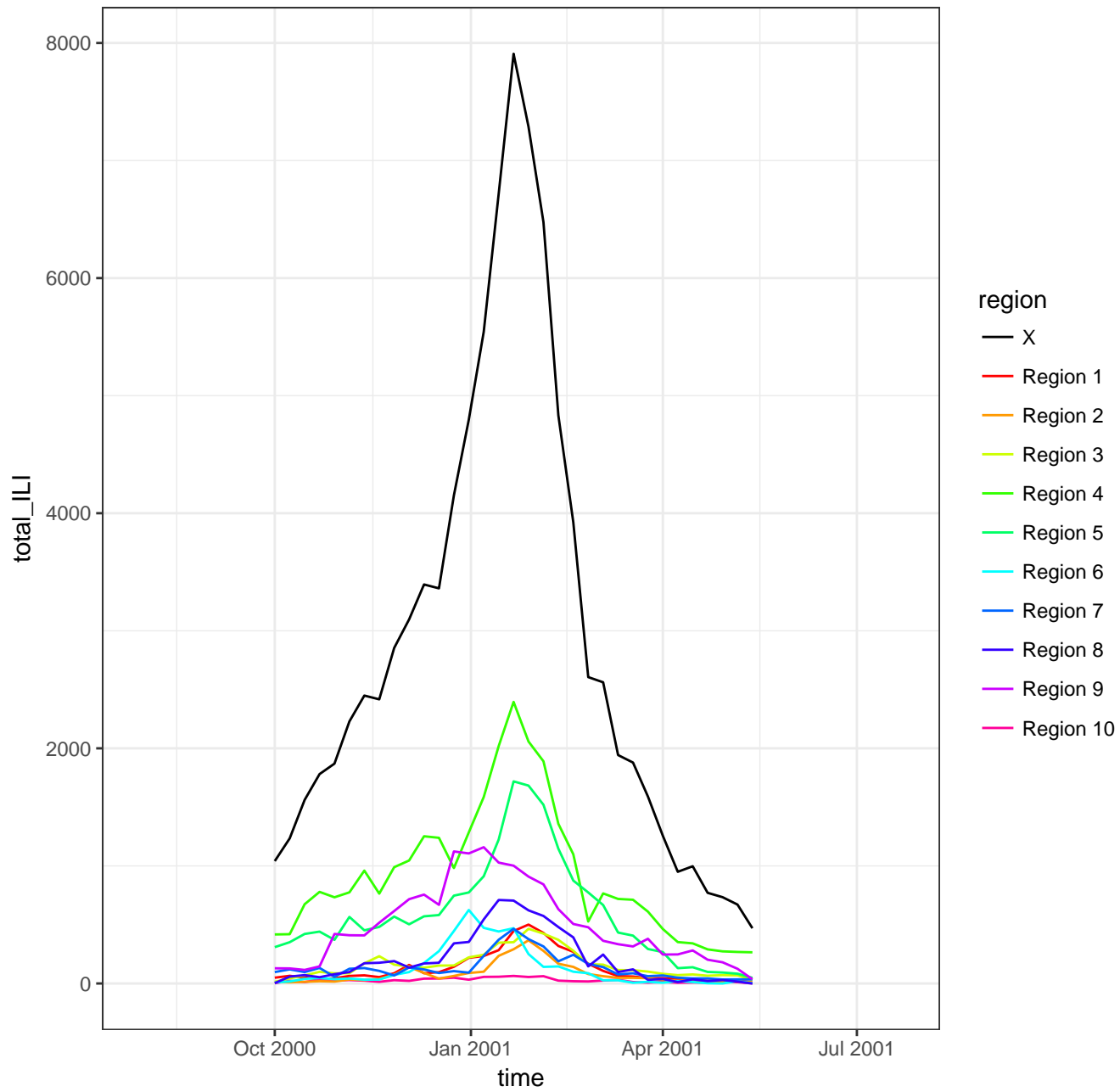
Warning: Removed 209 rows containing missing values (geom_path).

1999/2000



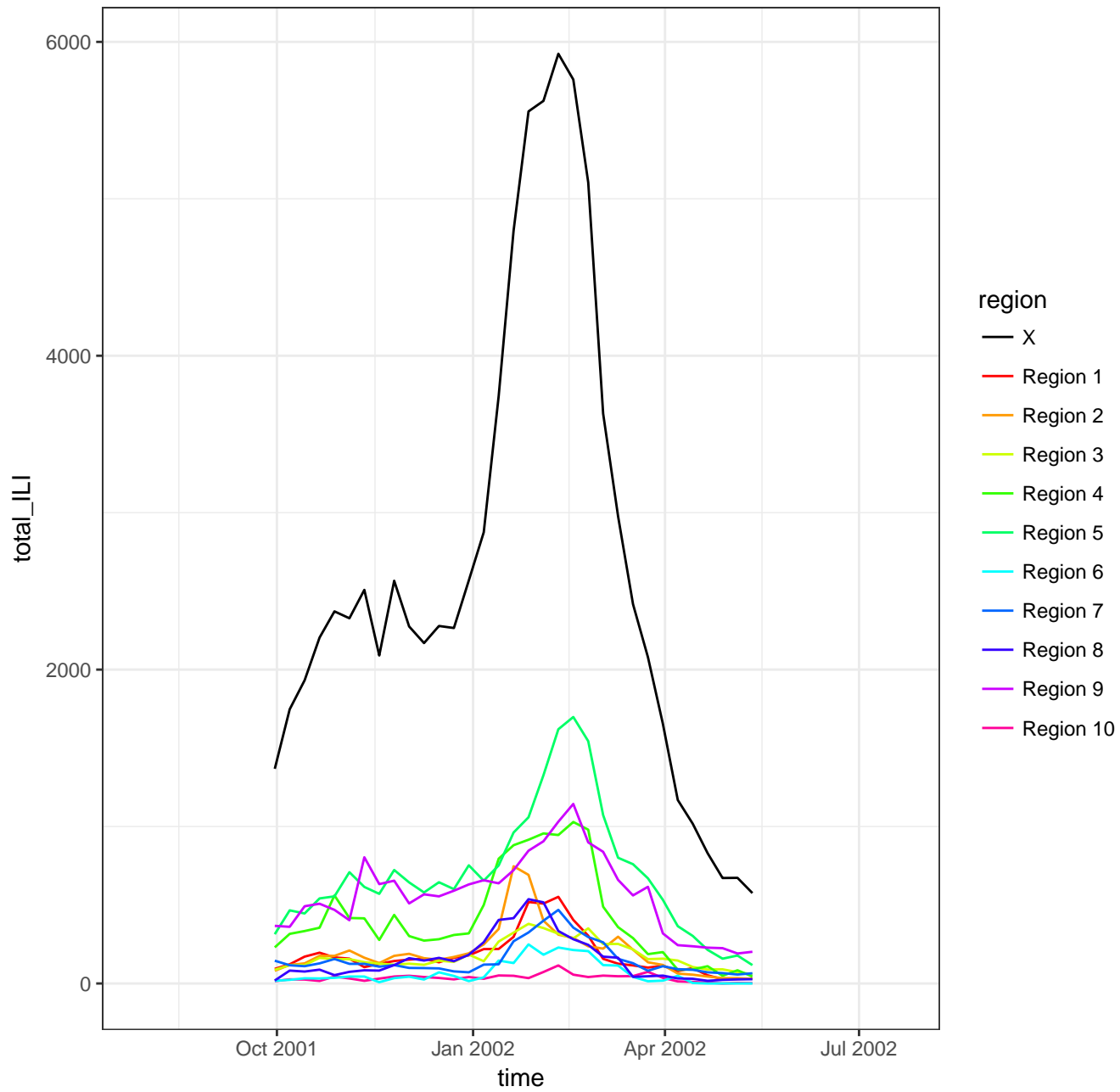
Warning: Removed 209 rows containing missing values (geom_path).

2000/2001



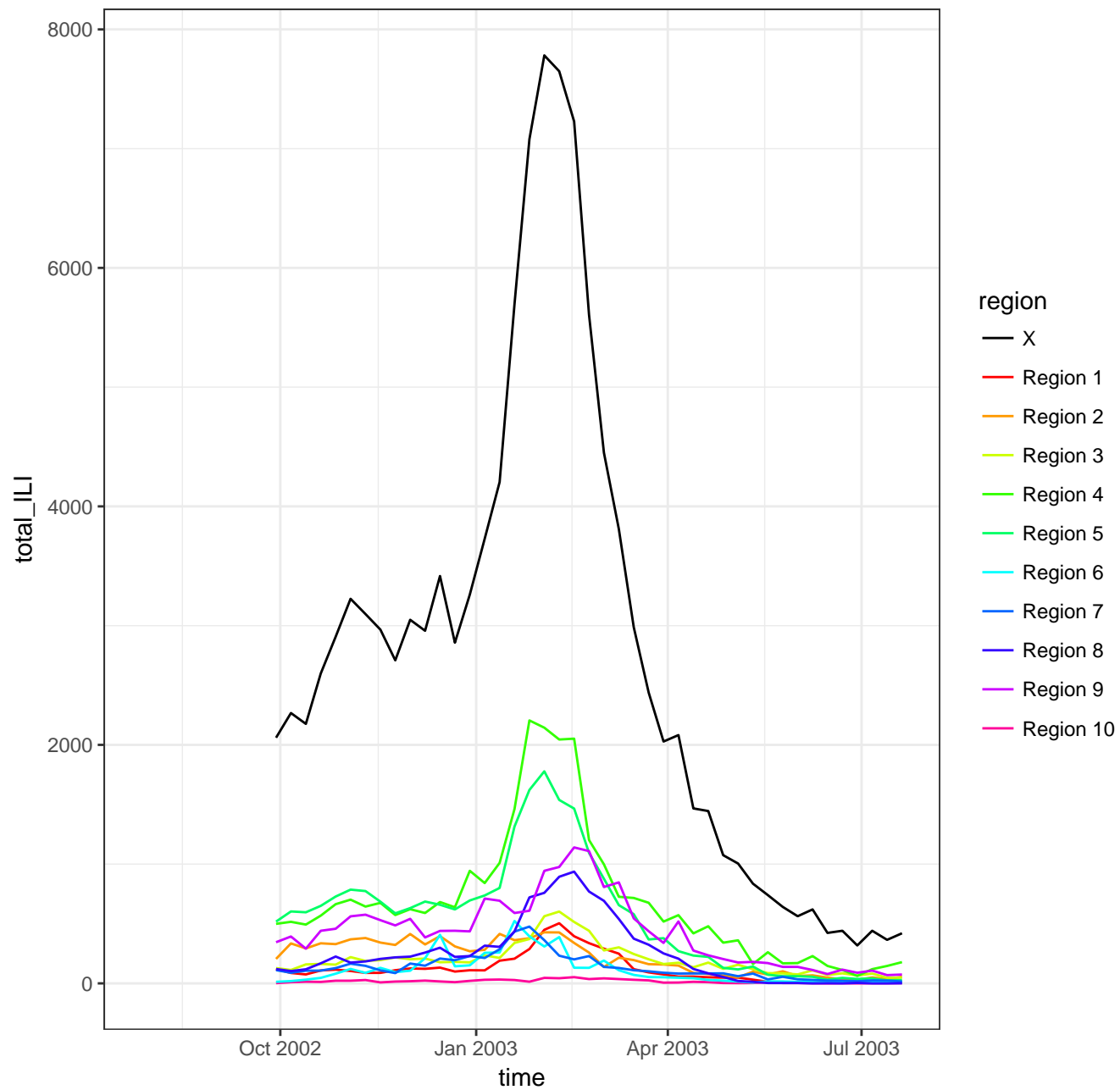
Warning: Removed 209 rows containing missing values (geom_path).

2001/2002

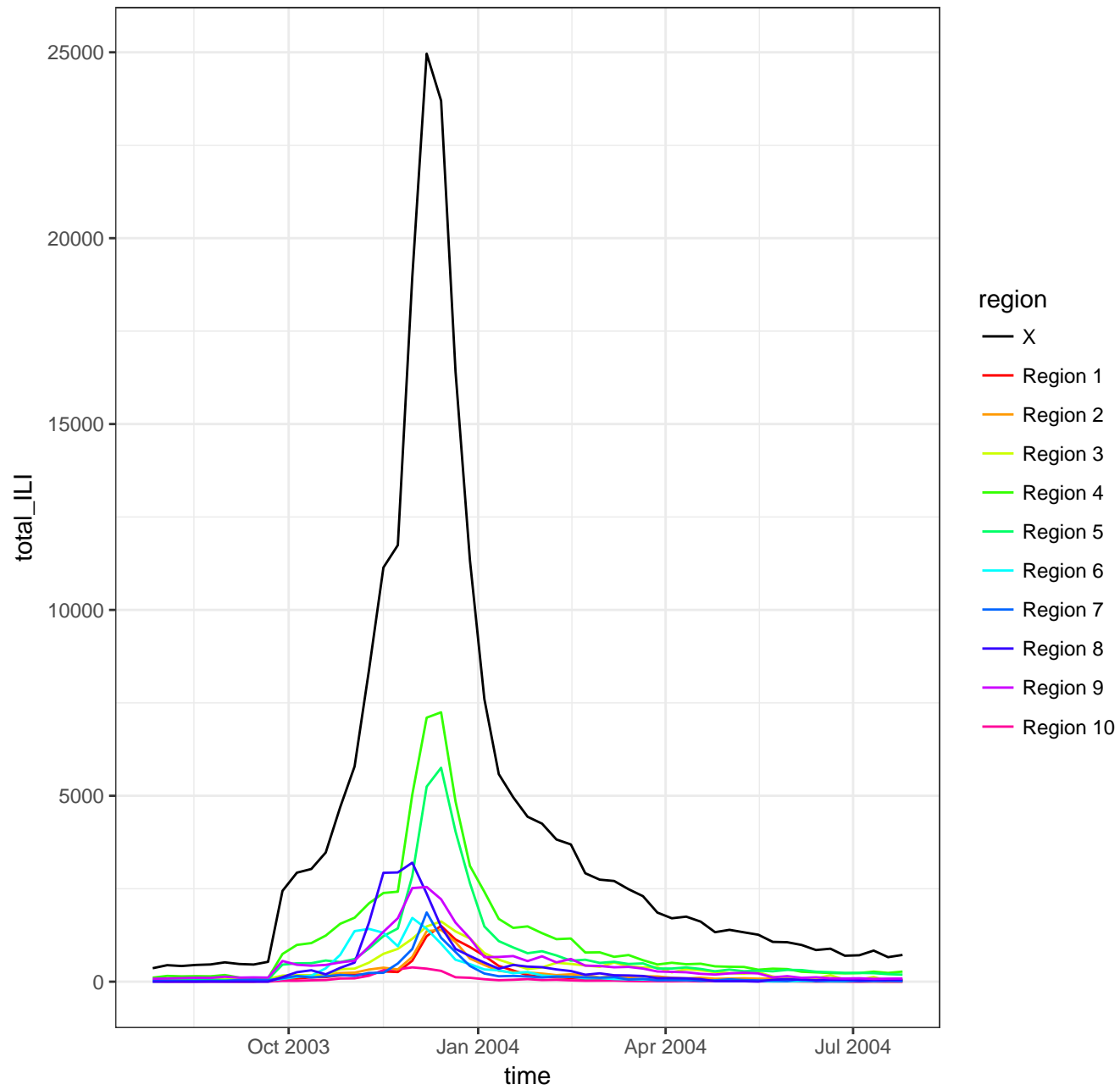


Warning: Removed 99 rows containing missing values (geom_path).

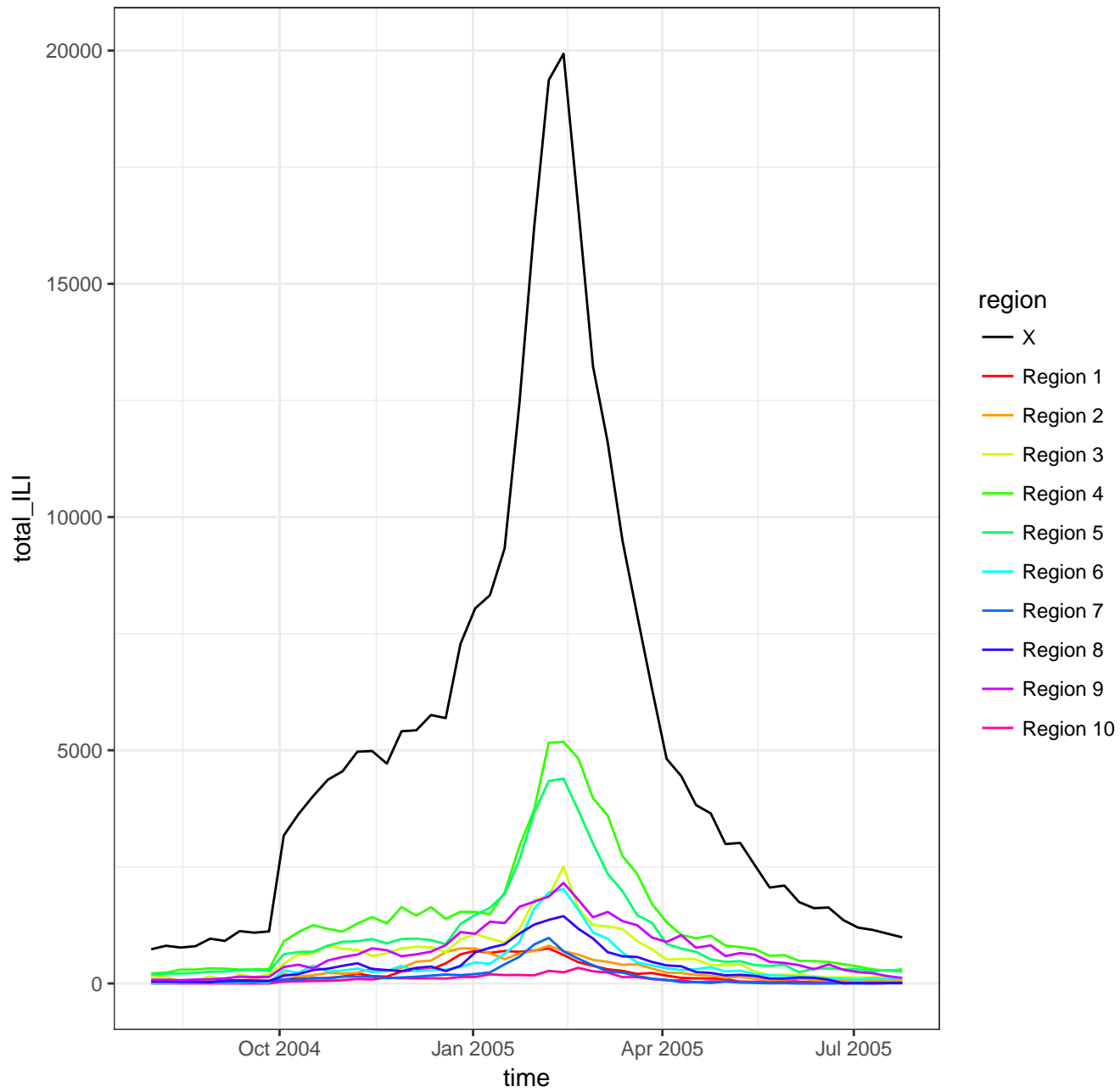
2002/2003



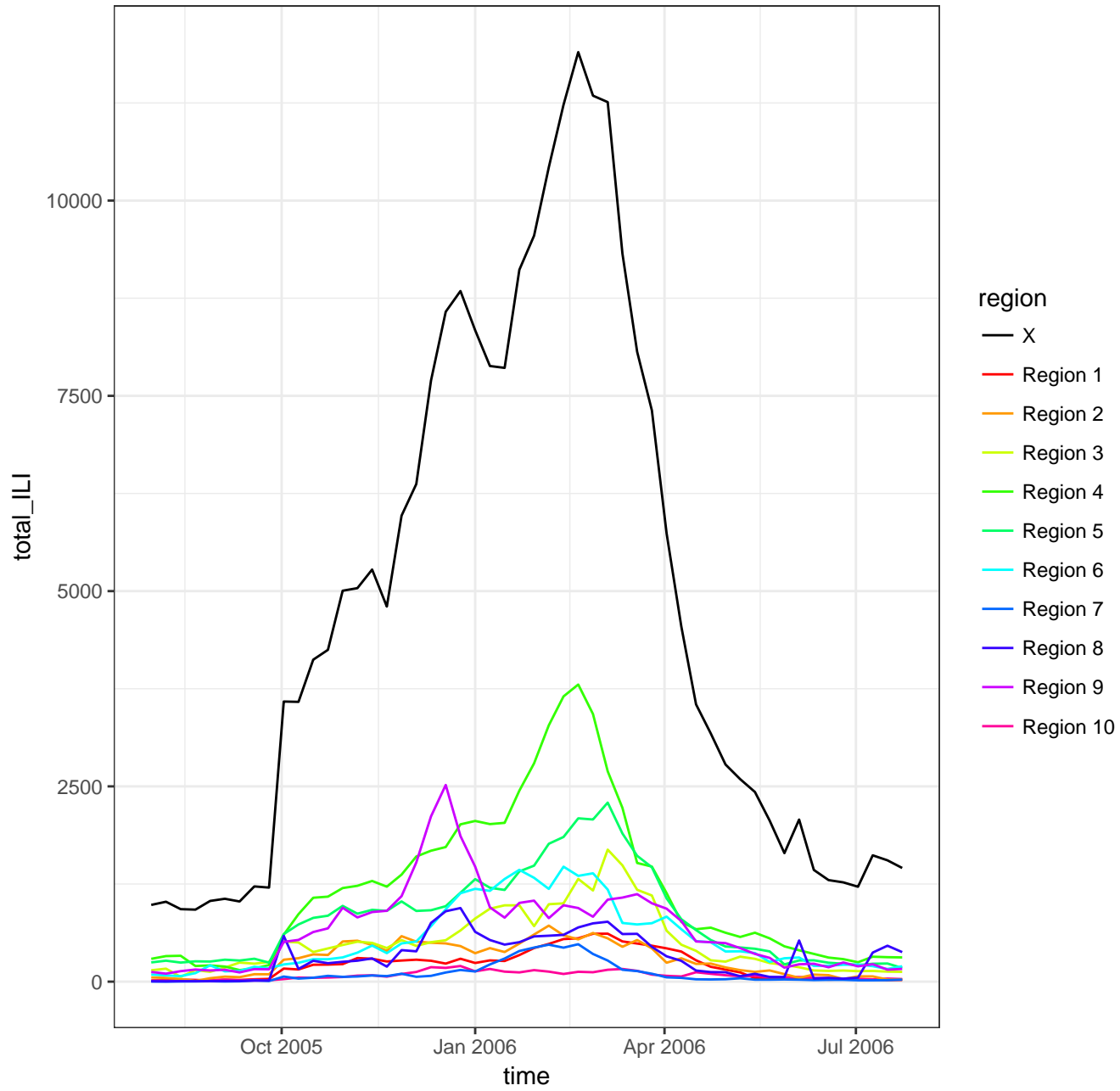
2003/2004



2004/2005



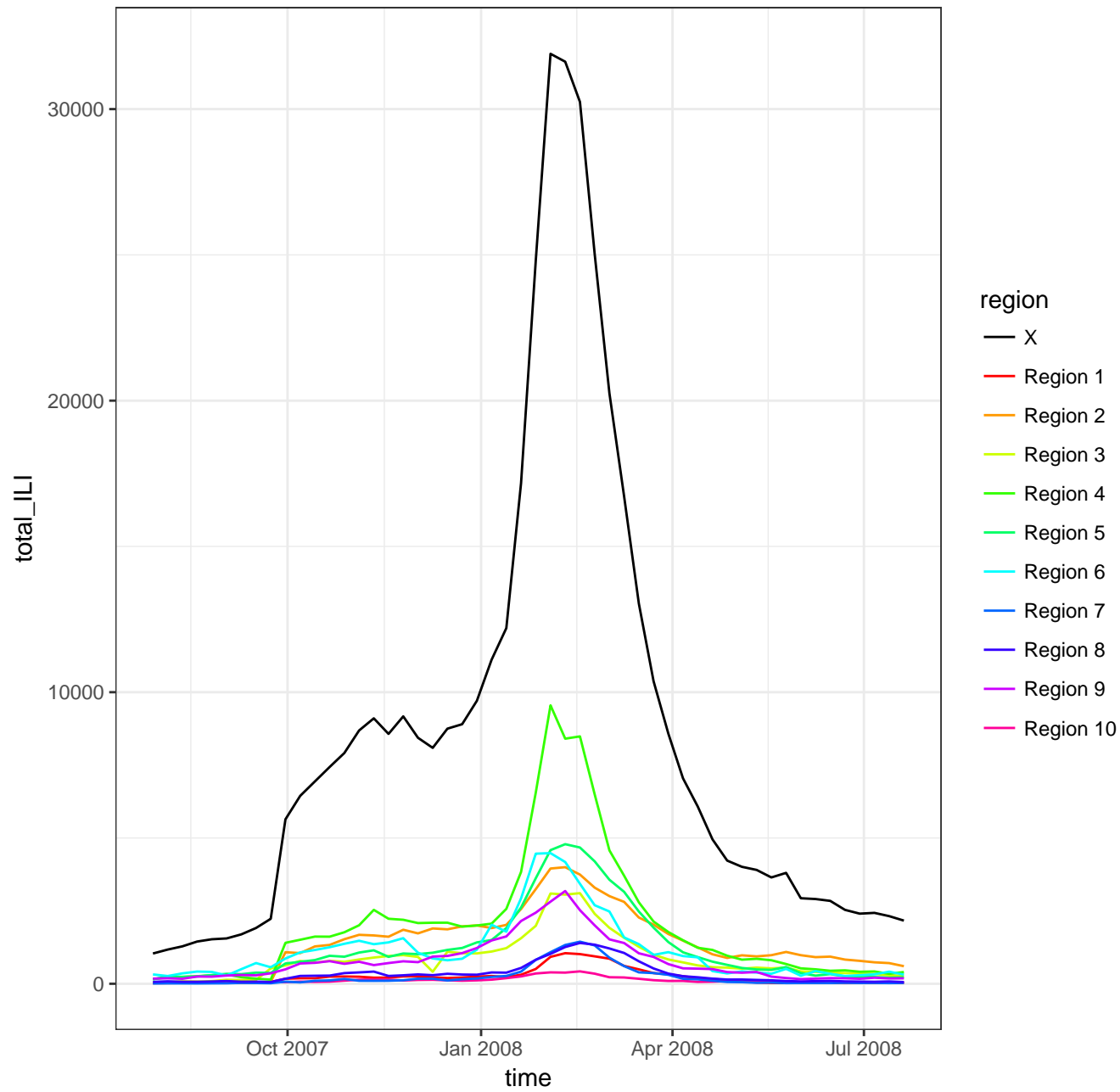
2005/2006



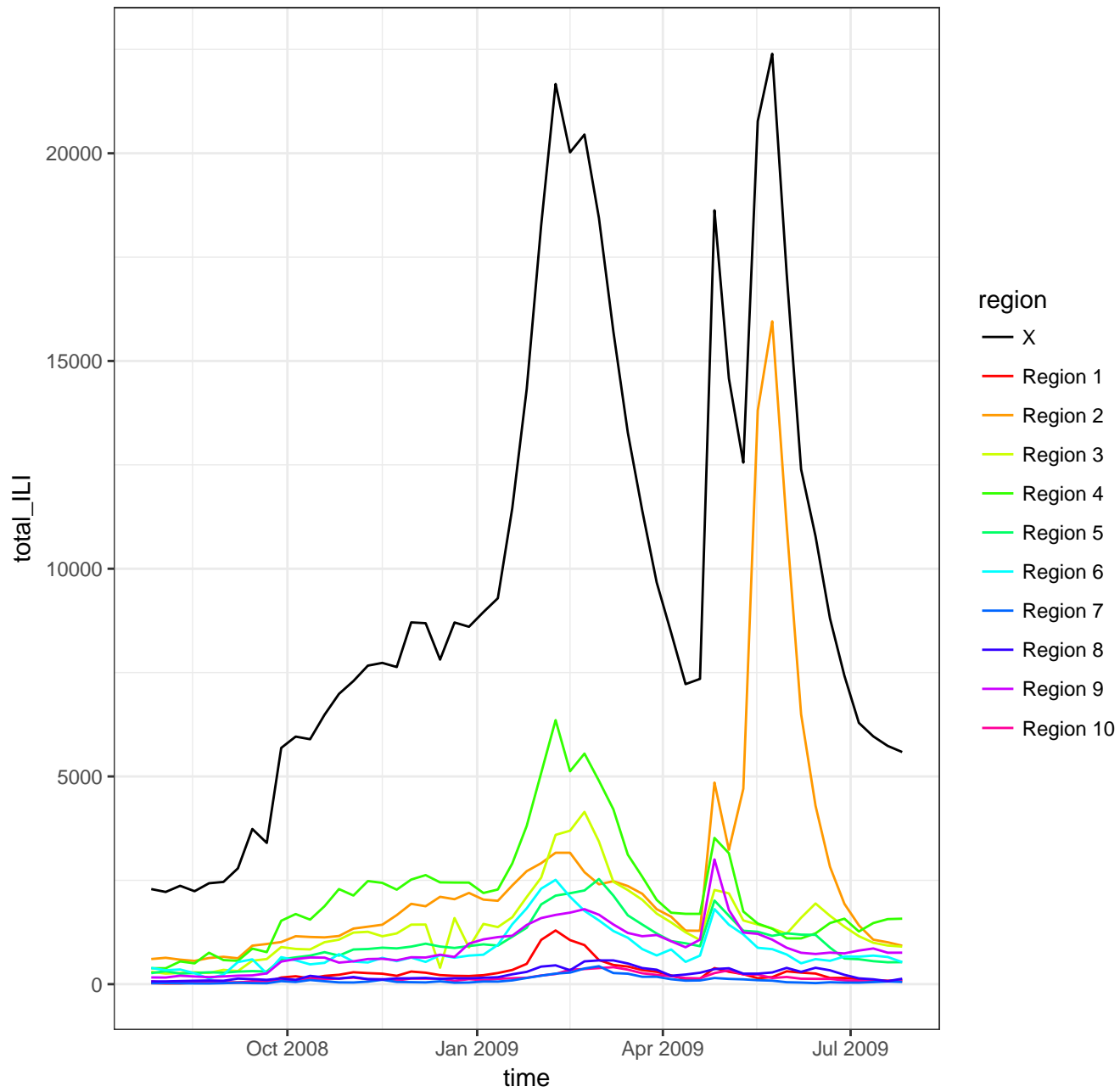
The graph displays the distribution of the number of children per woman for various countries. The x-axis represents the number of children (0 to 10), and the y-axis represents the percentage of women. The black line represents the total distribution, which is highly skewed to the right, peaking at 1 child. Other colored lines represent individual countries, showing much narrower distributions centered around 1 child.

— X
— Region 1
— Region 2
— Region 3
— Region 4
— Region 5
— Region 6
— Region 7
— Region 8
— Region 9
— Region 10

2007/2008



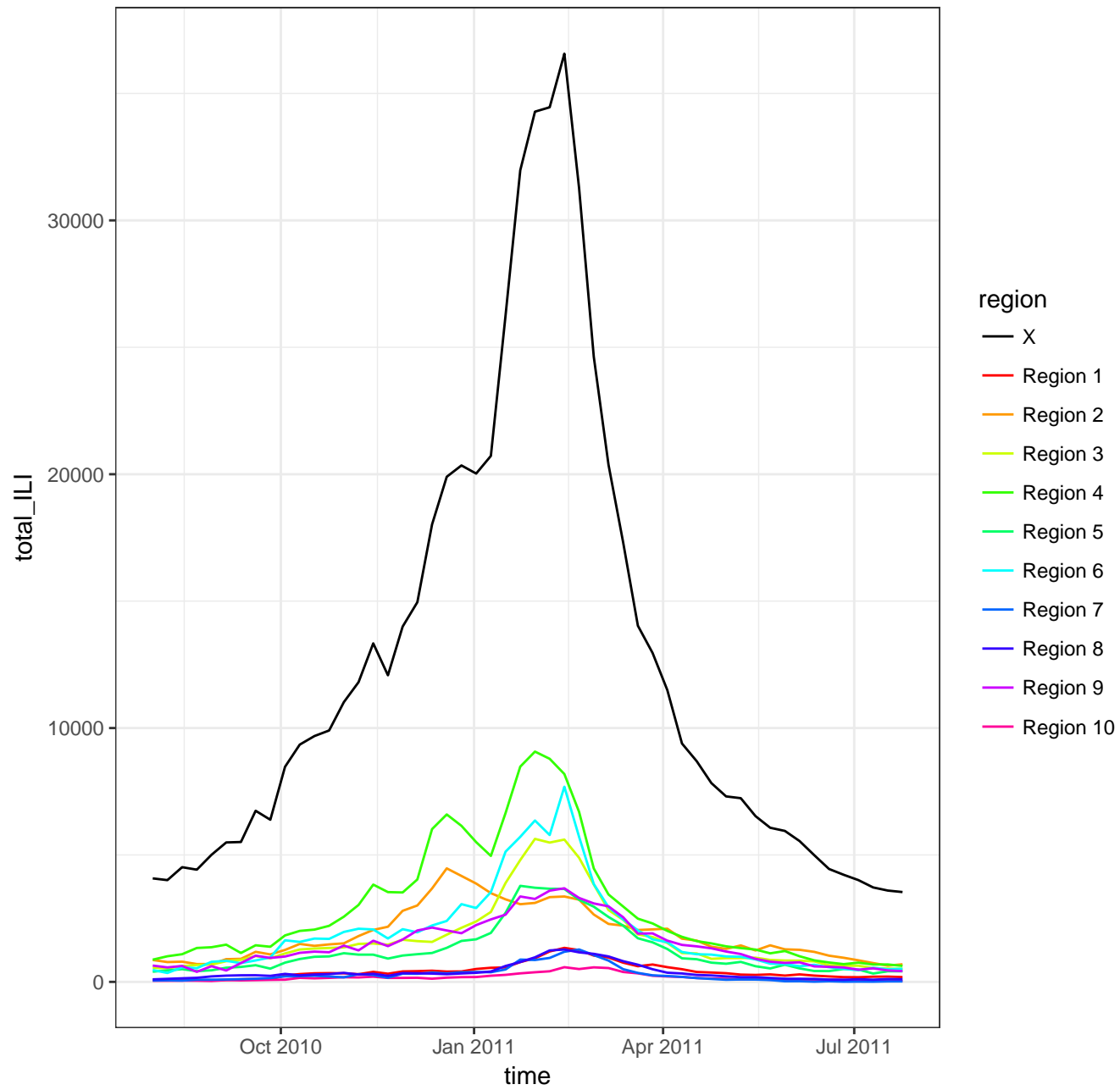
2008/2009



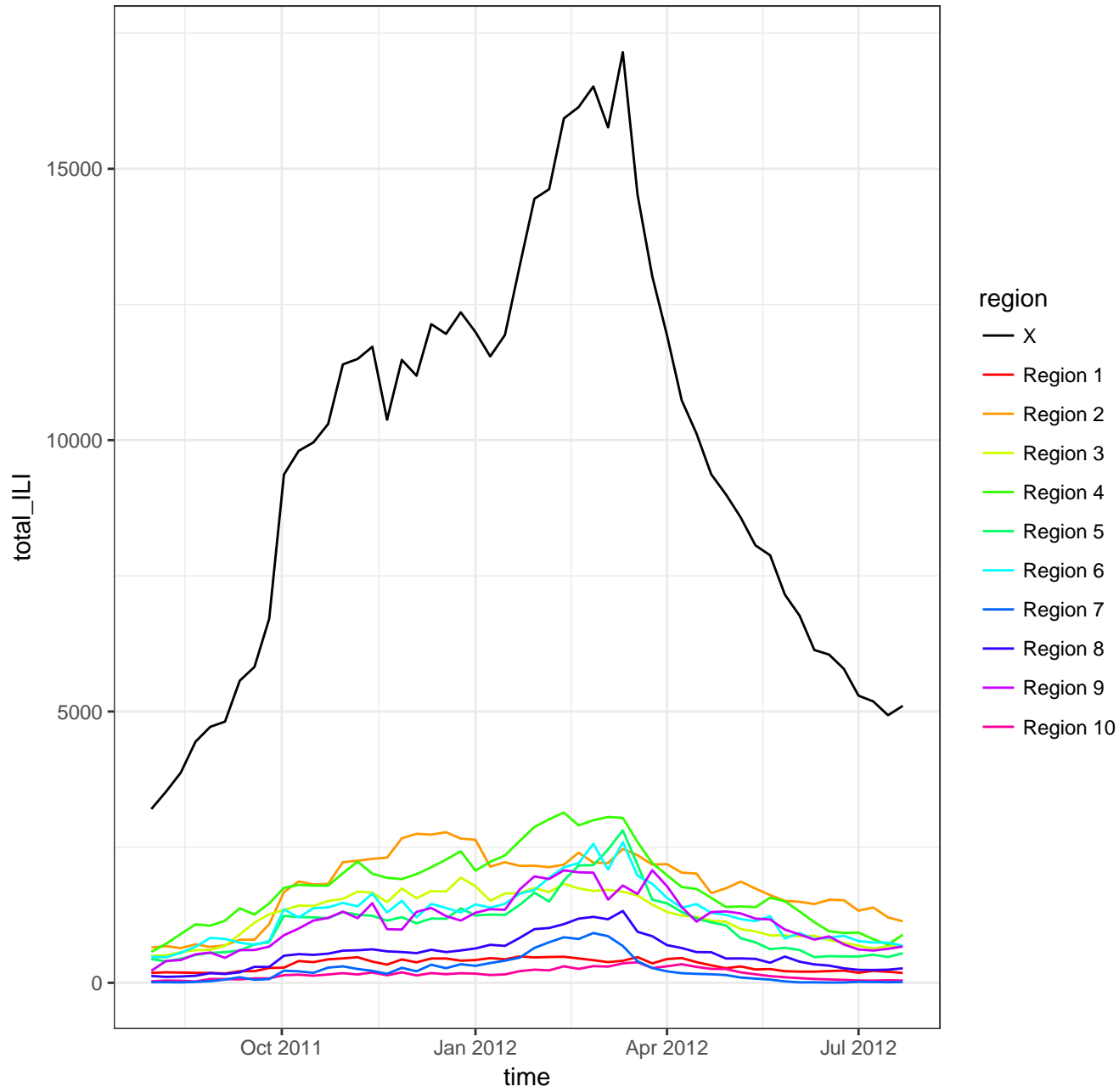
The graph displays the mass spectrum of a sample, with the x-axis representing the mass-to-charge ratio (m/z) and the y-axis representing relative intensity. The base peak is at m/z 43. Other labeled peaks include m/z 15, 29, 41, 55, 69, 83, 97, and 111. The spectrum shows a characteristic fragmentation pattern, with peaks at m/z 15, 29, 41, 55, 69, 83, 97, and 111, which are typical for the compound being analyzed.

— X
— Region 1
— Region 2
— Region 3
— Region 4
— Region 5
— Region 6
— Region 7
— Region 8
— Region 9
— Region 10

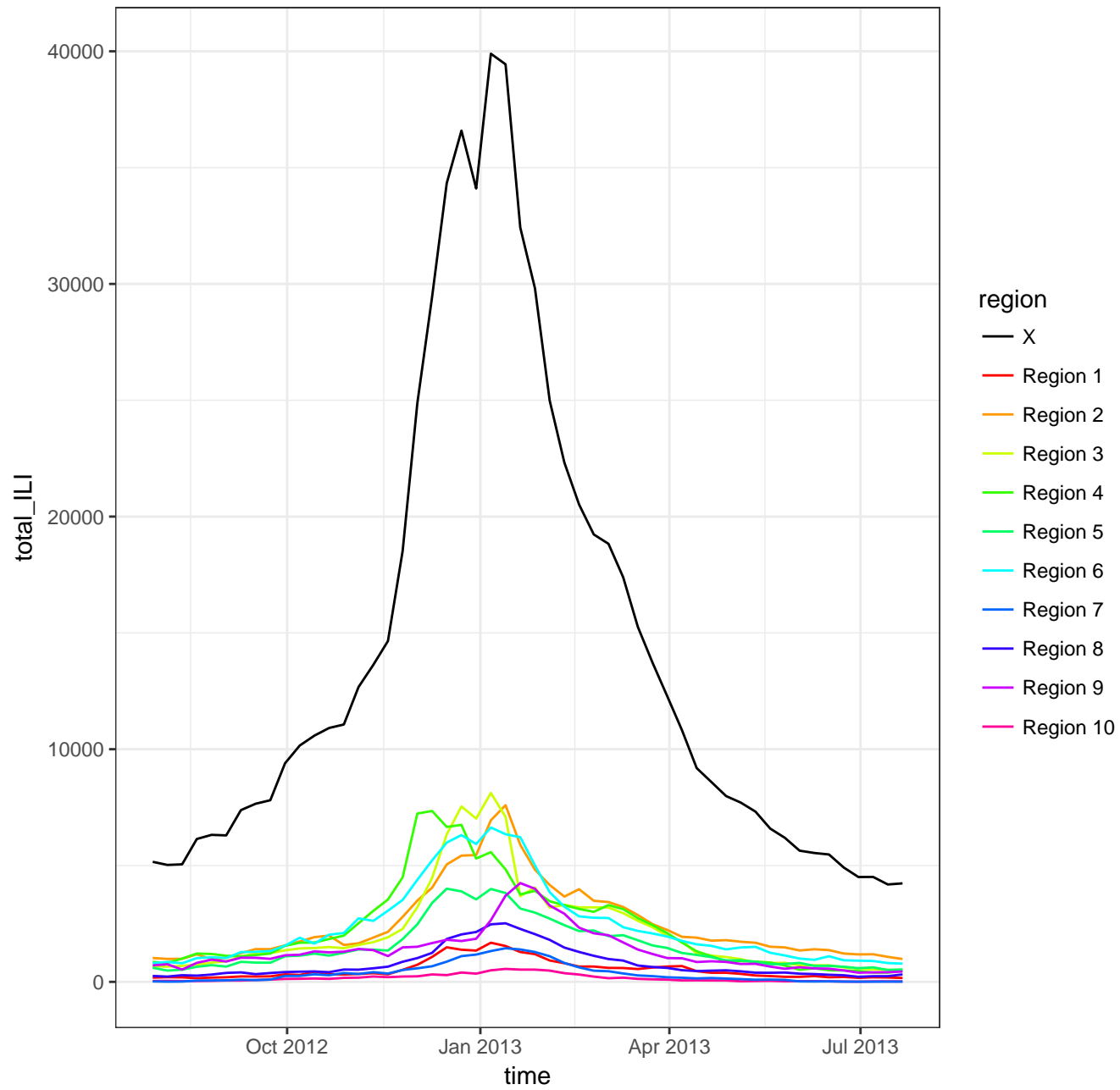
2010/2011



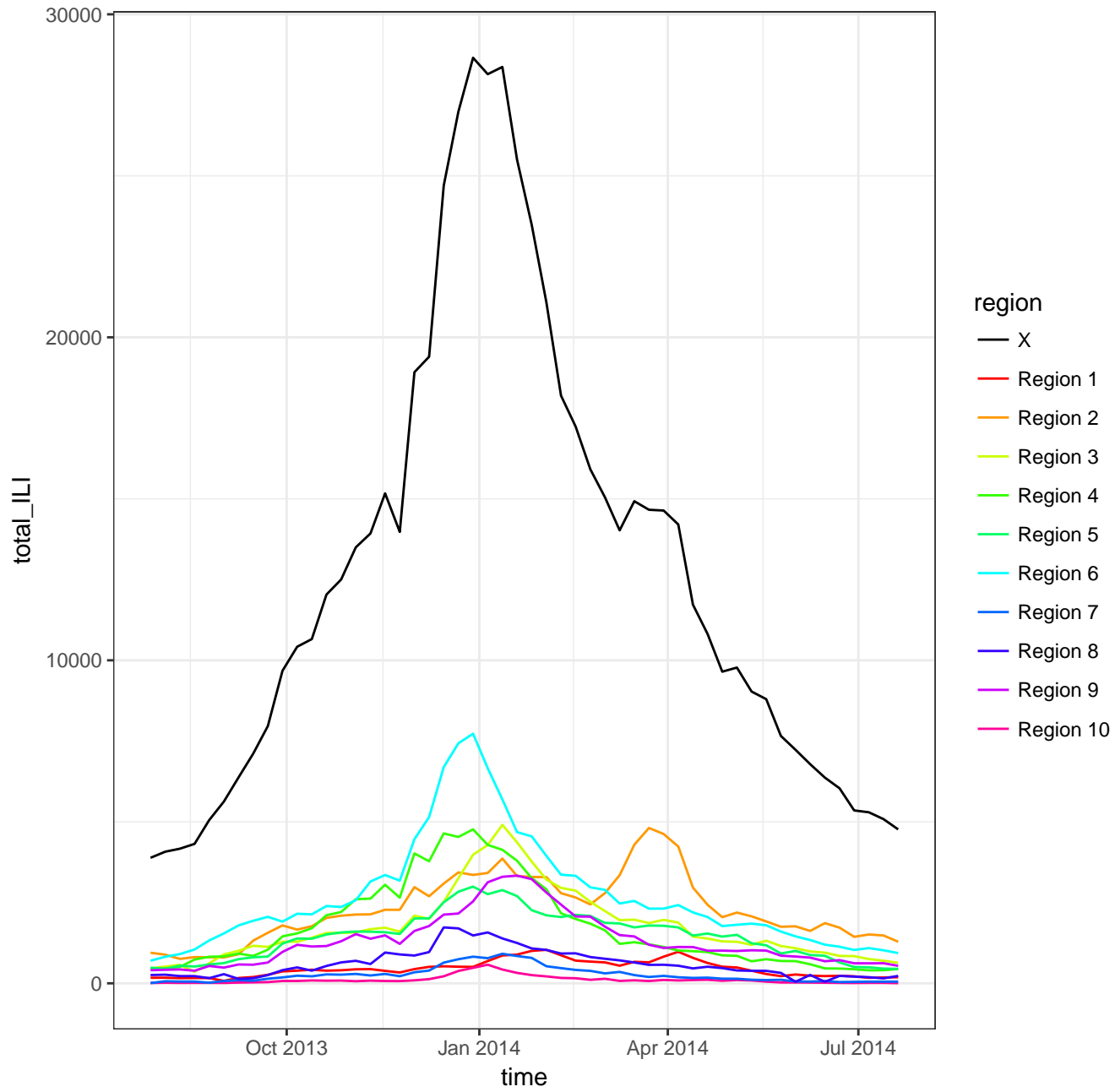
2011/2012



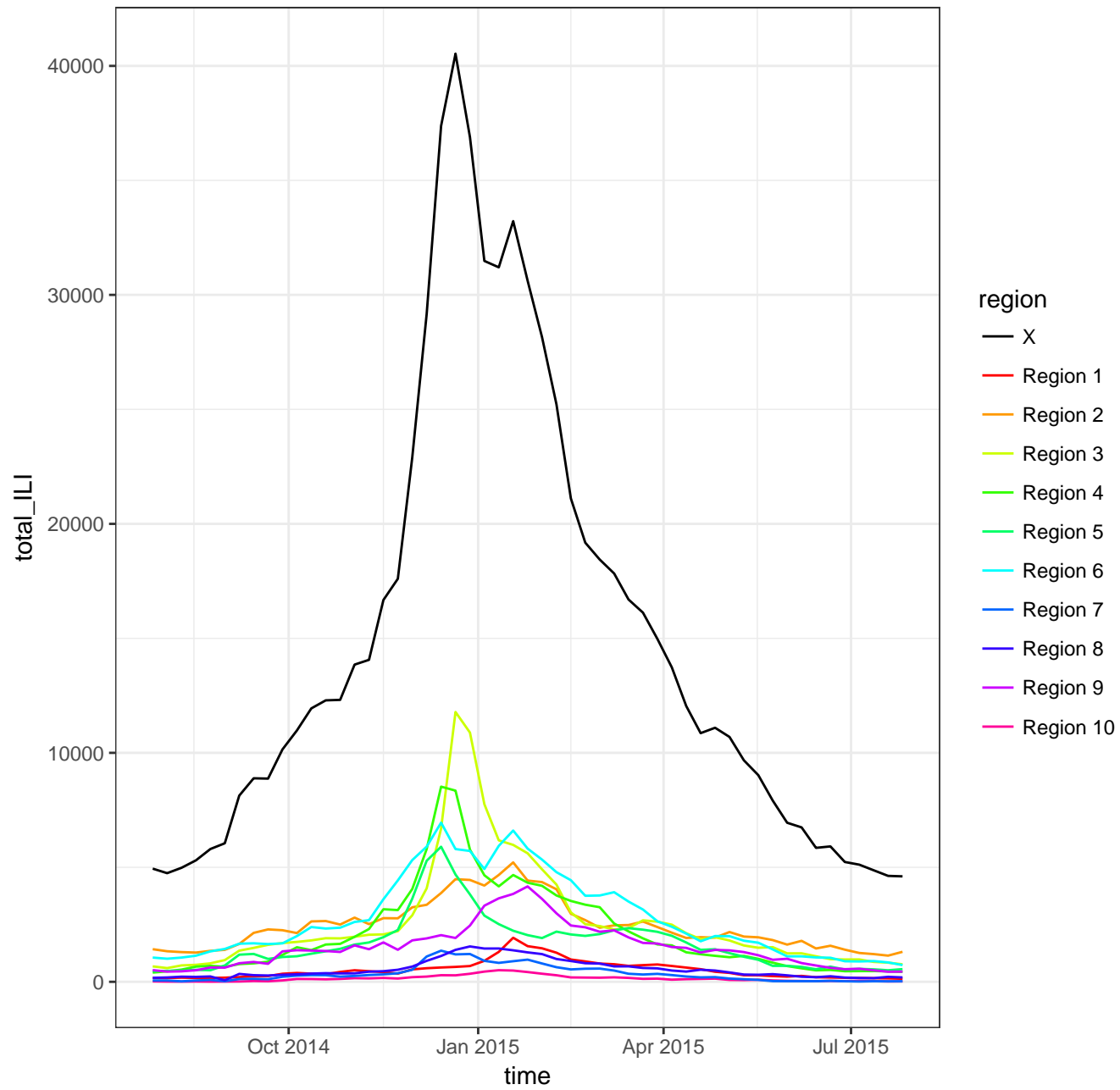
2012/2013



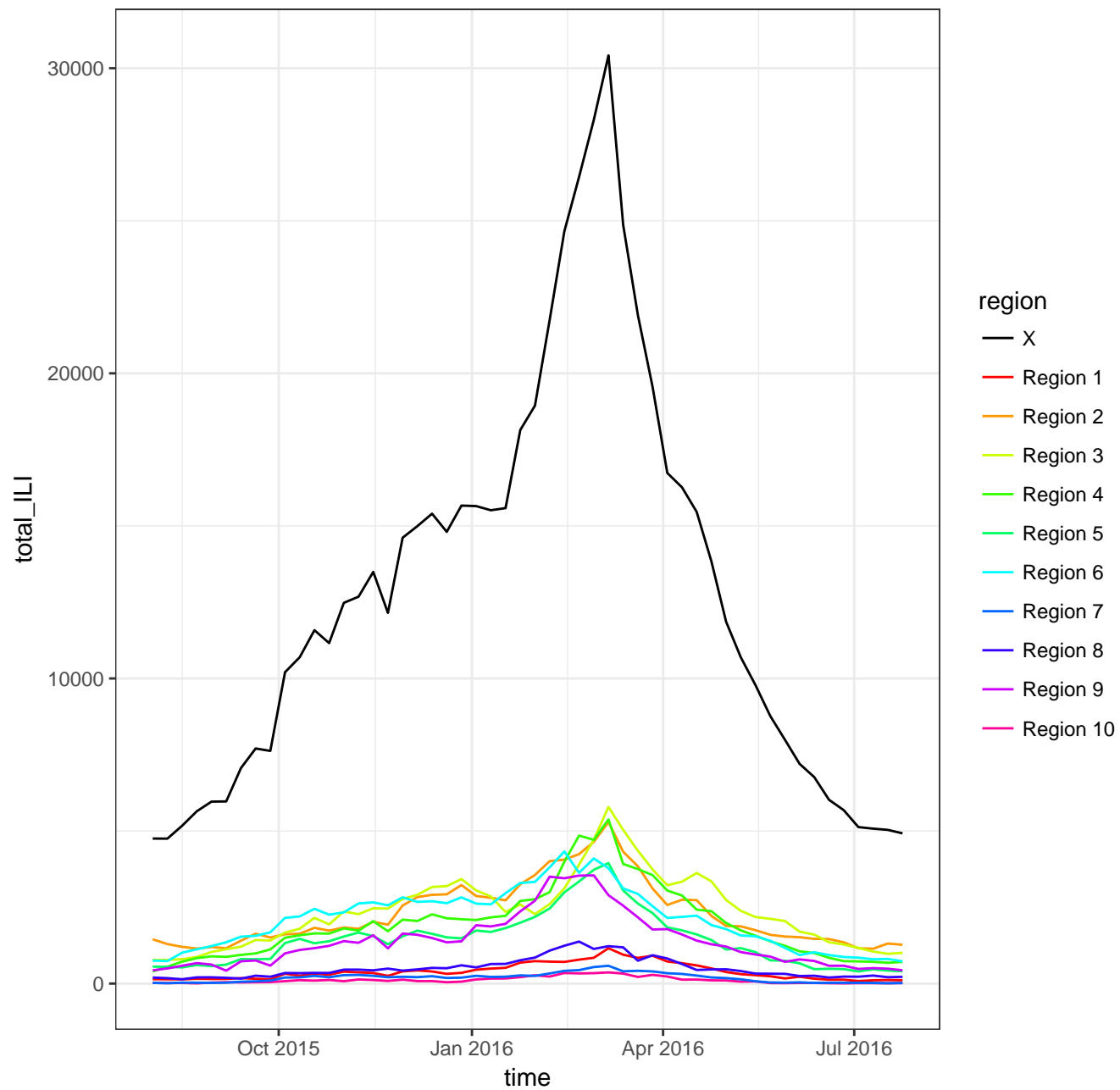
2013/2014



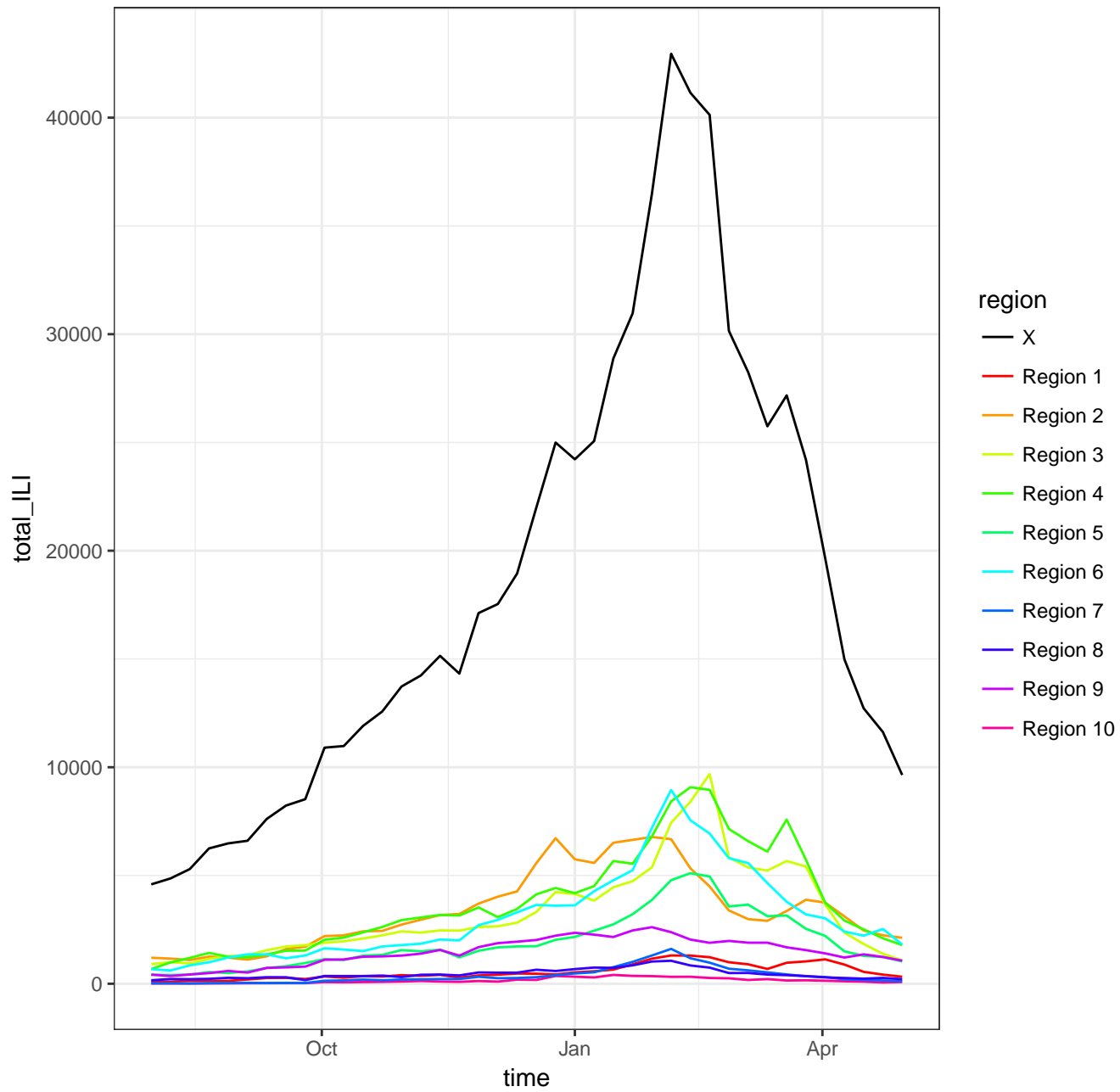
2014/2015



2015/2016



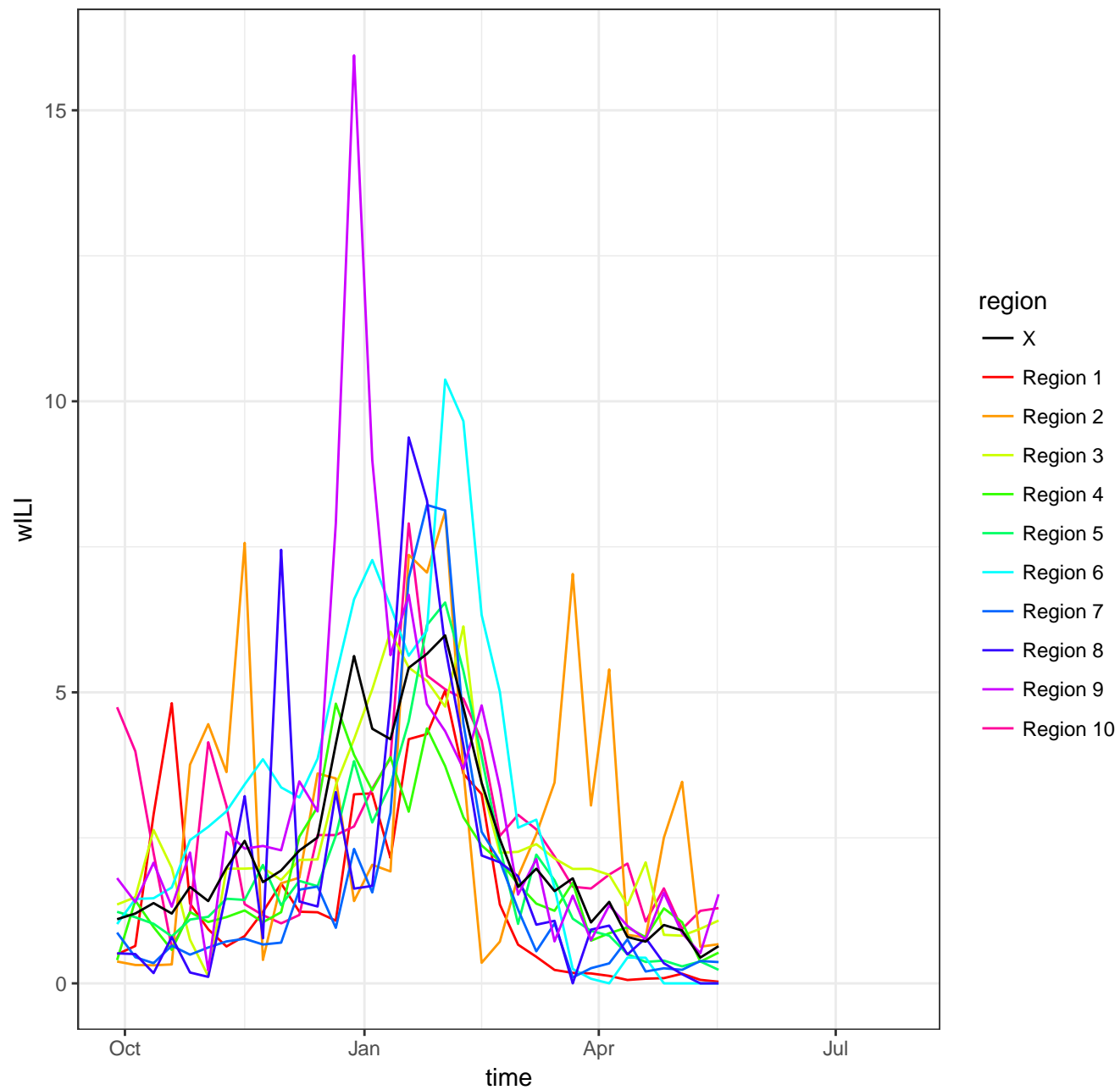
2016/2017



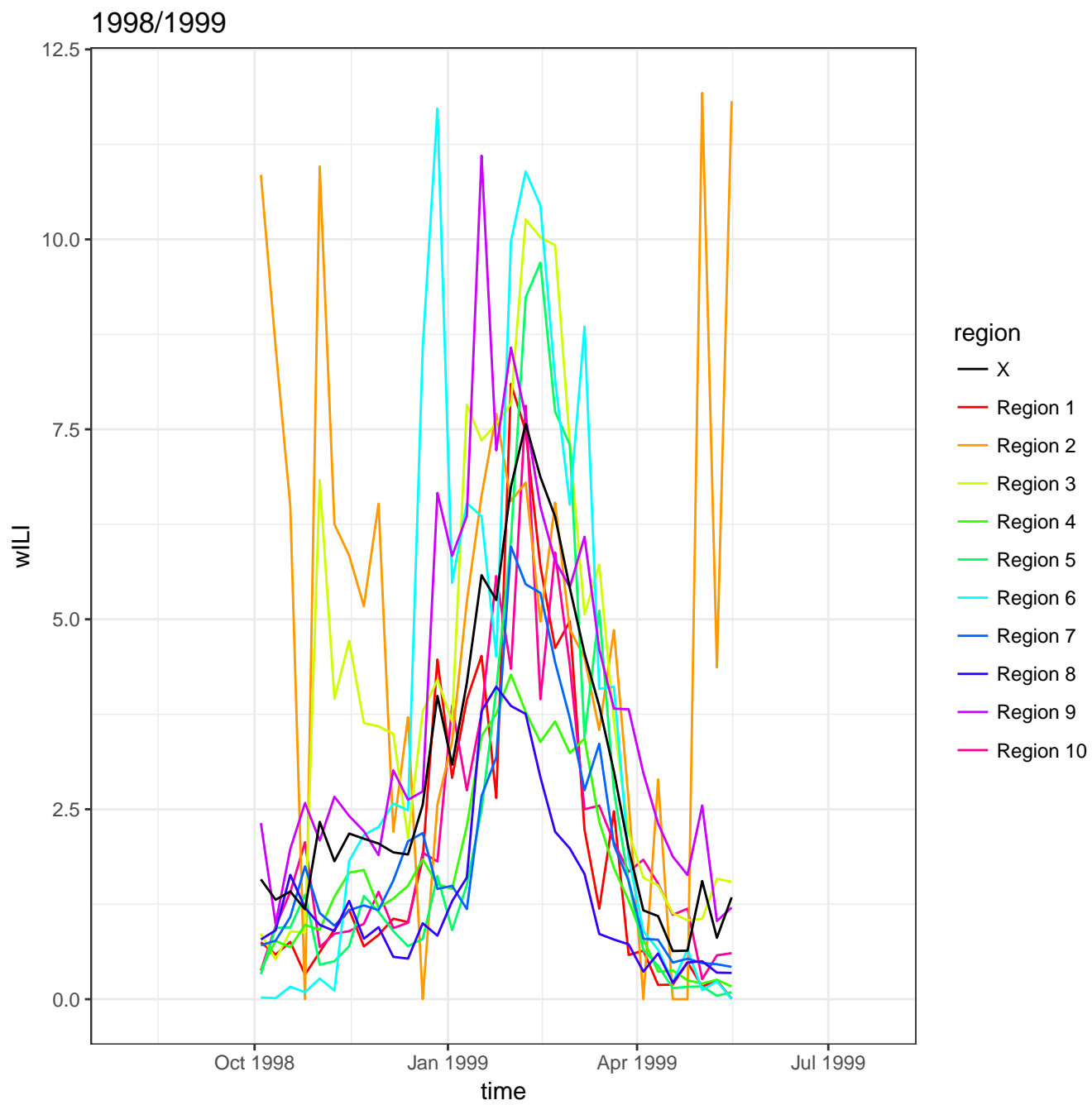
```
palette <- c("#000000", rainbow(10))
for(season_val in unique(flu_merged$season)) {
  p <- ggplot() +
    geom_line(aes(x = time, y = wILI, colour = region),
      data = flu_merged %>% filter(season == season_val)) +
```

```
    scale_colour_manual(  
      breaks = c("X", paste0("Region ", 1:10)),  
      limits = c("X", paste0("Region ", 1:10)),  
      values = palette) +  
    ggtitle(season_val) +  
    theme_bw()  
  print(p)  
}  
  
## Warning: Removed 110 rows containing missing values (geom_path).
```

1997/1998

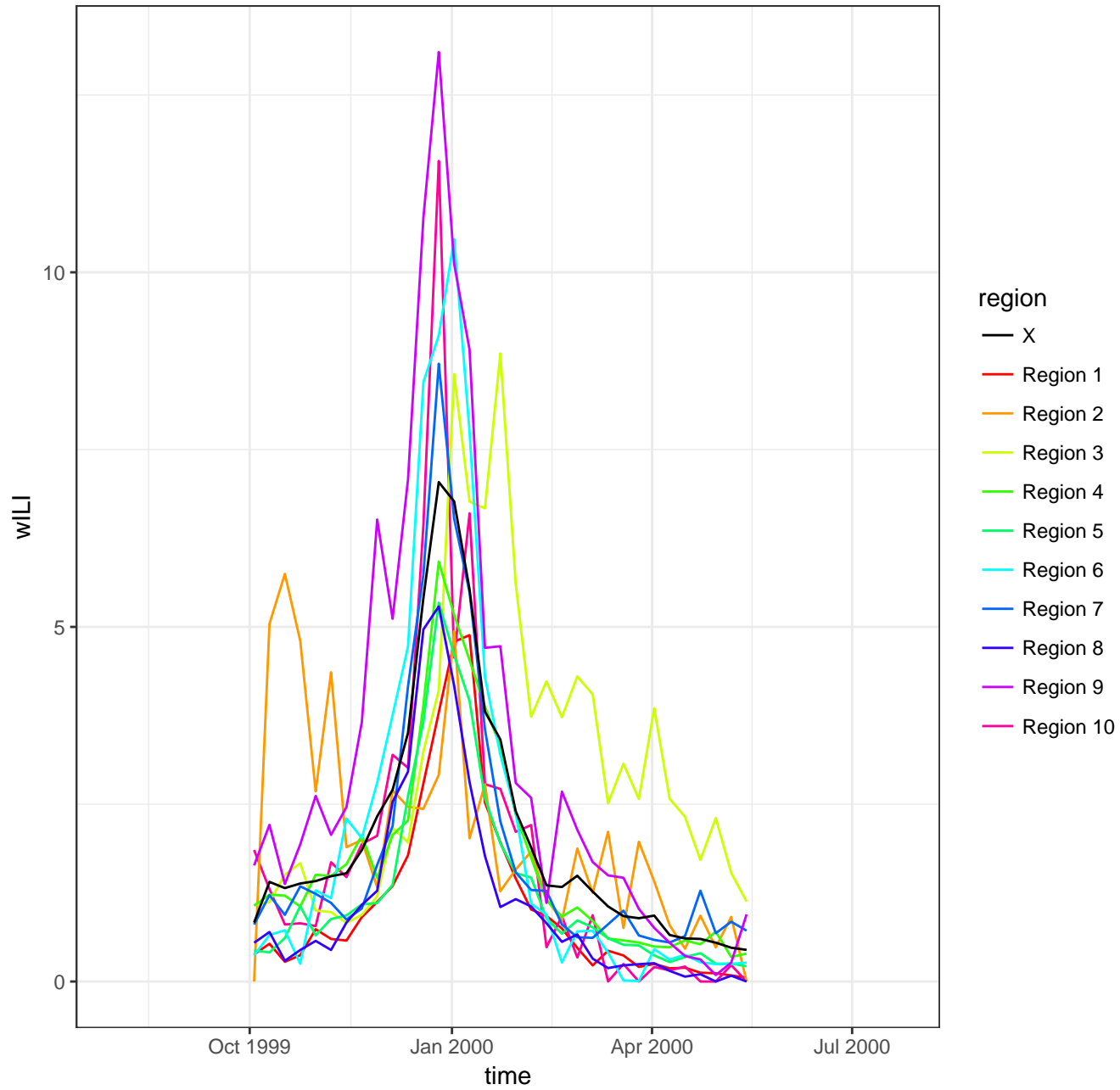


Warning: Removed 209 rows containing missing values (geom_path).



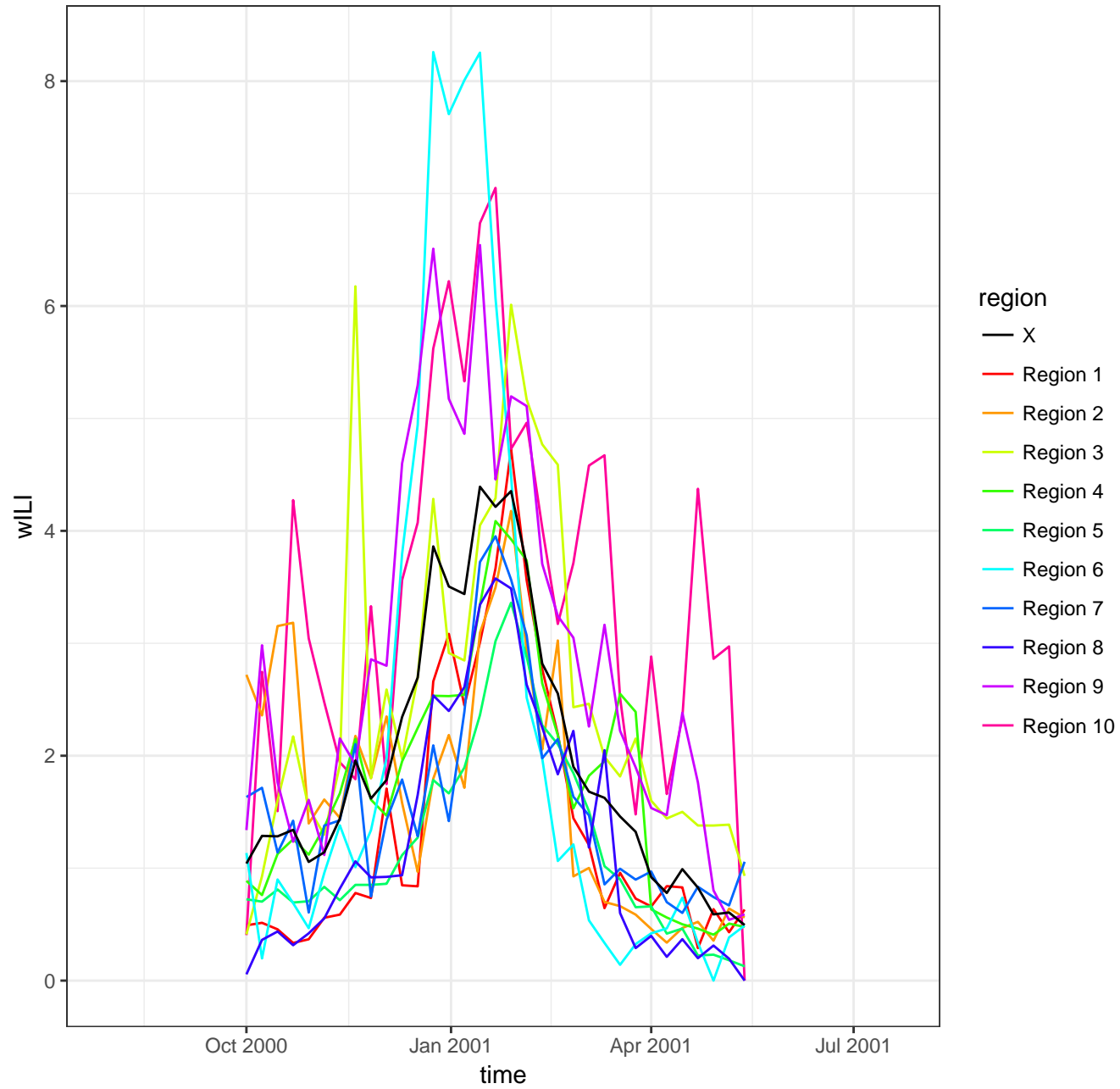
Warning: Removed 209 rows containing missing values (geom_path).

1999/2000



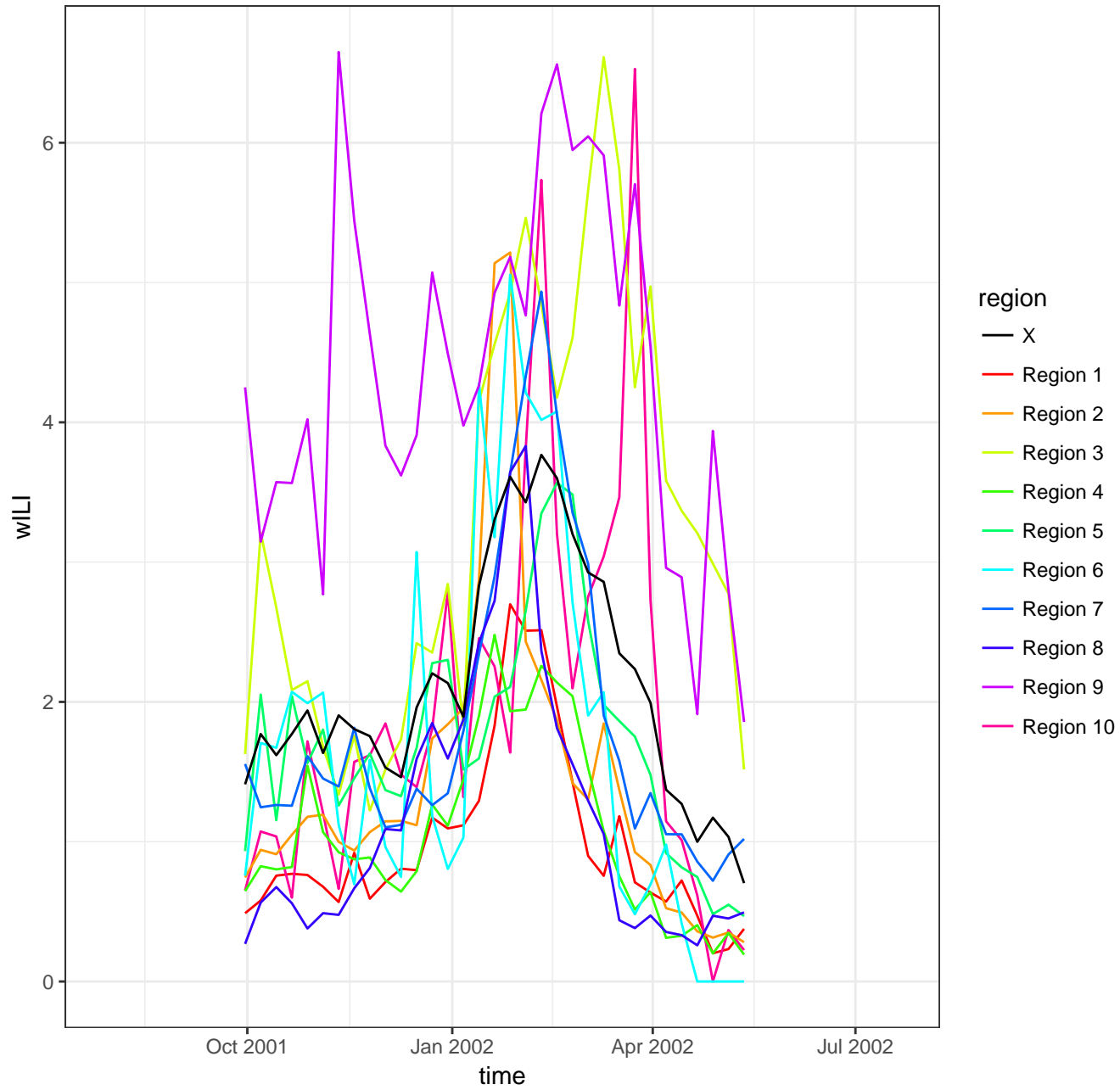
Warning: Removed 209 rows containing missing values (geom_path).

2000/2001



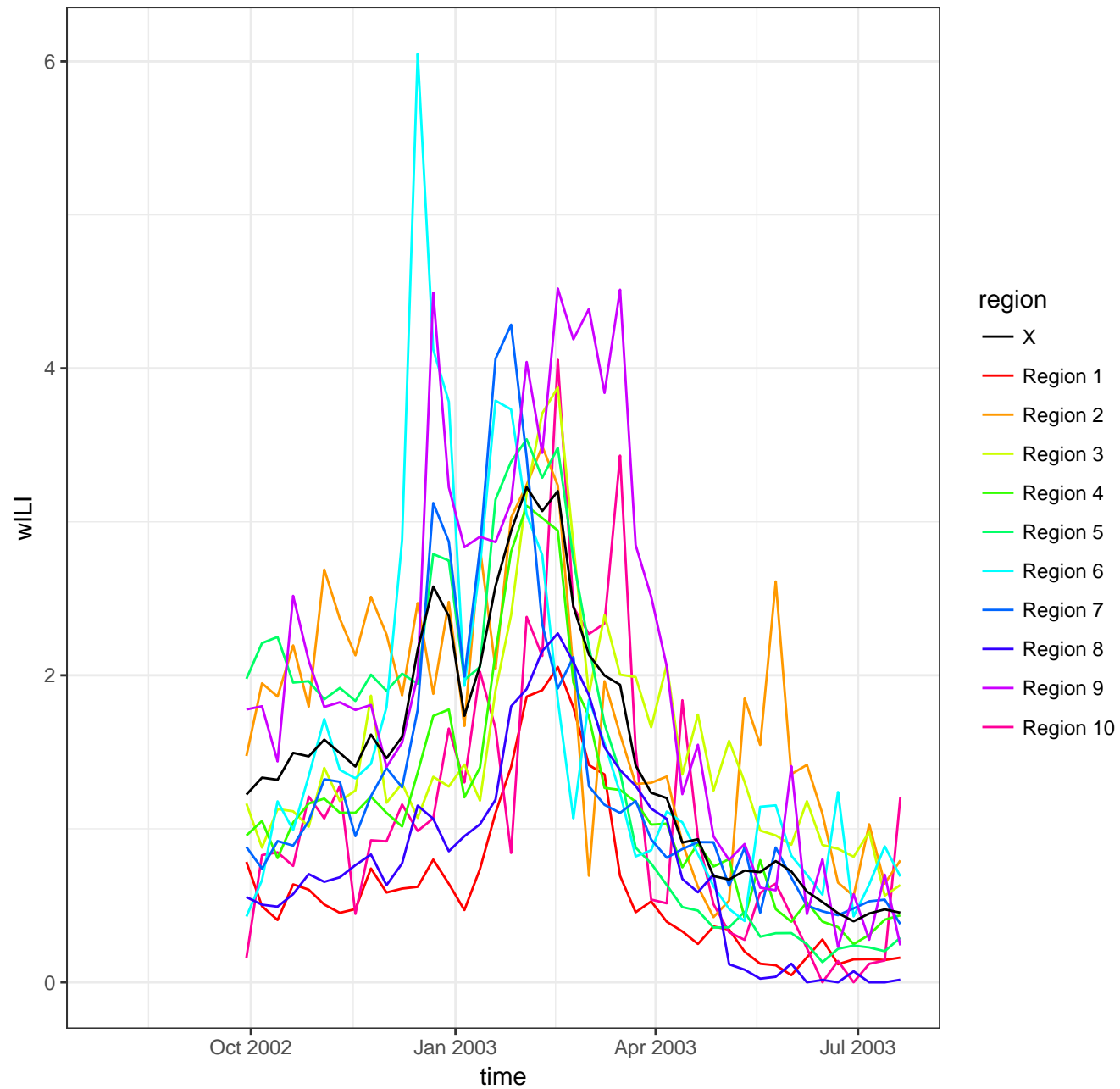
Warning: Removed 209 rows containing missing values (geom_path).

2001/2002



Warning: Removed 99 rows containing missing values (geom_path).

2002/2003



— X

— Region 1

— Region 2

— Region 3

— Region 4

— Region 5

— Region 6

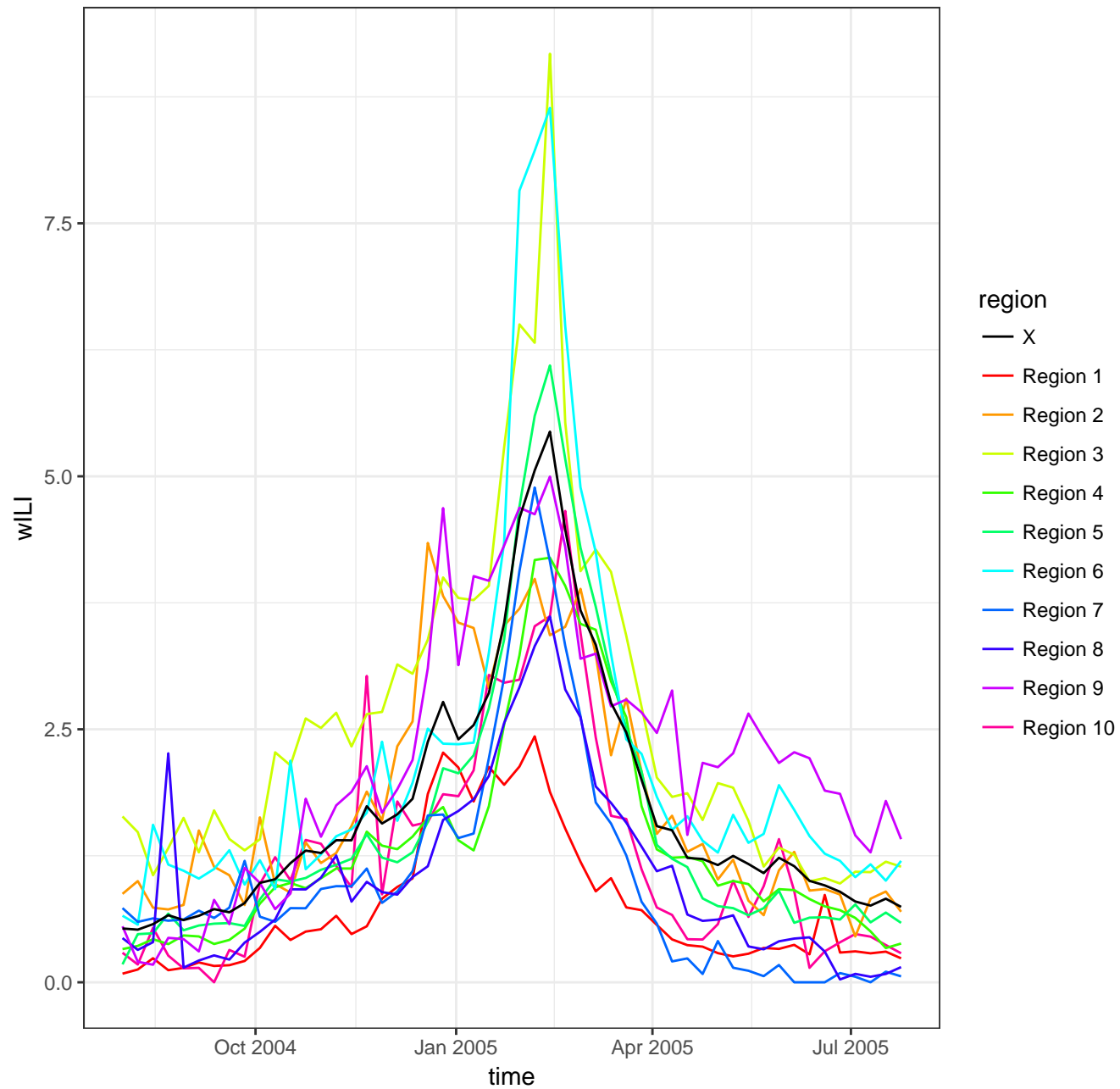
— Region 7

— Region 8

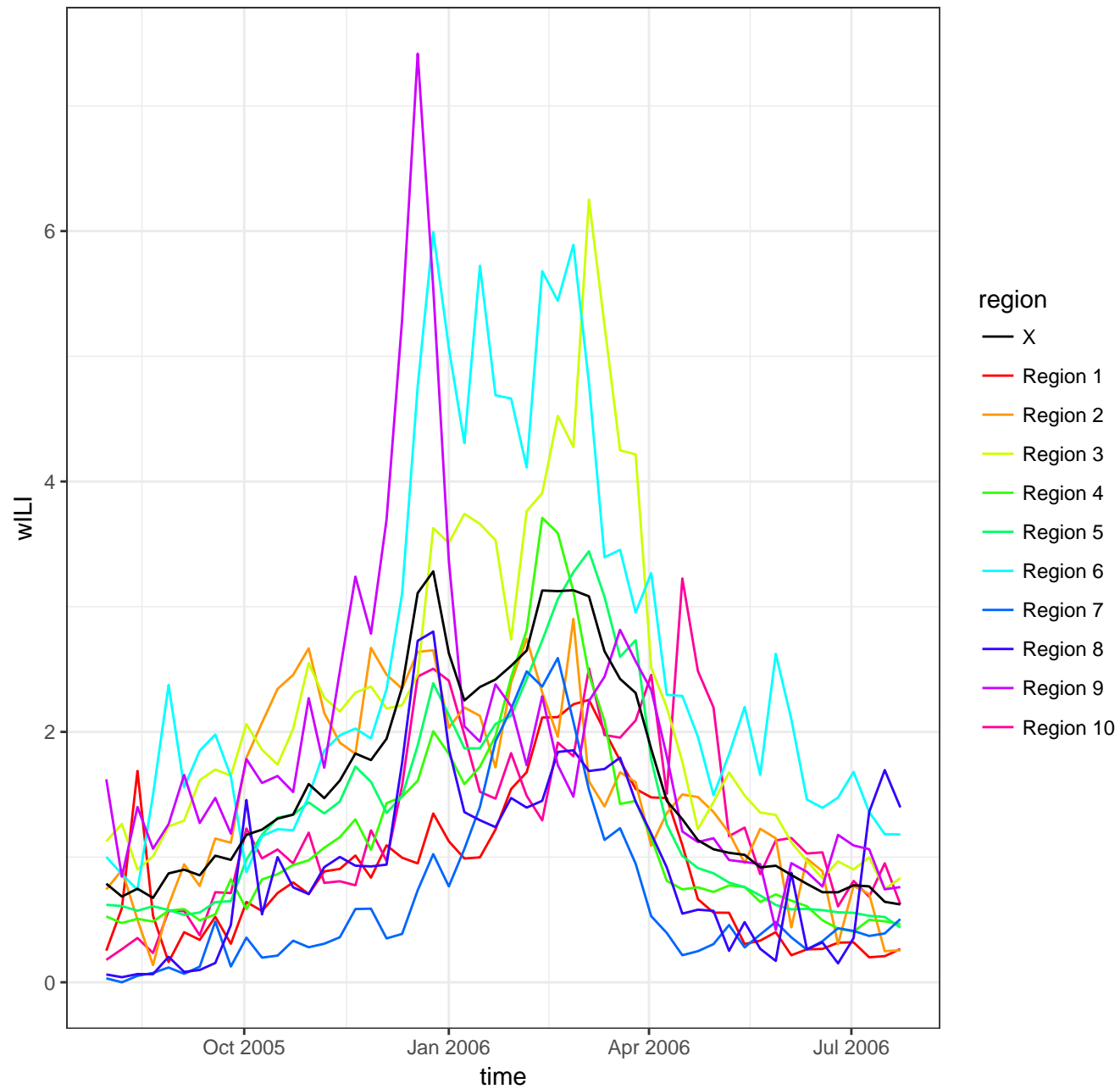
— Region 9

— Region 10

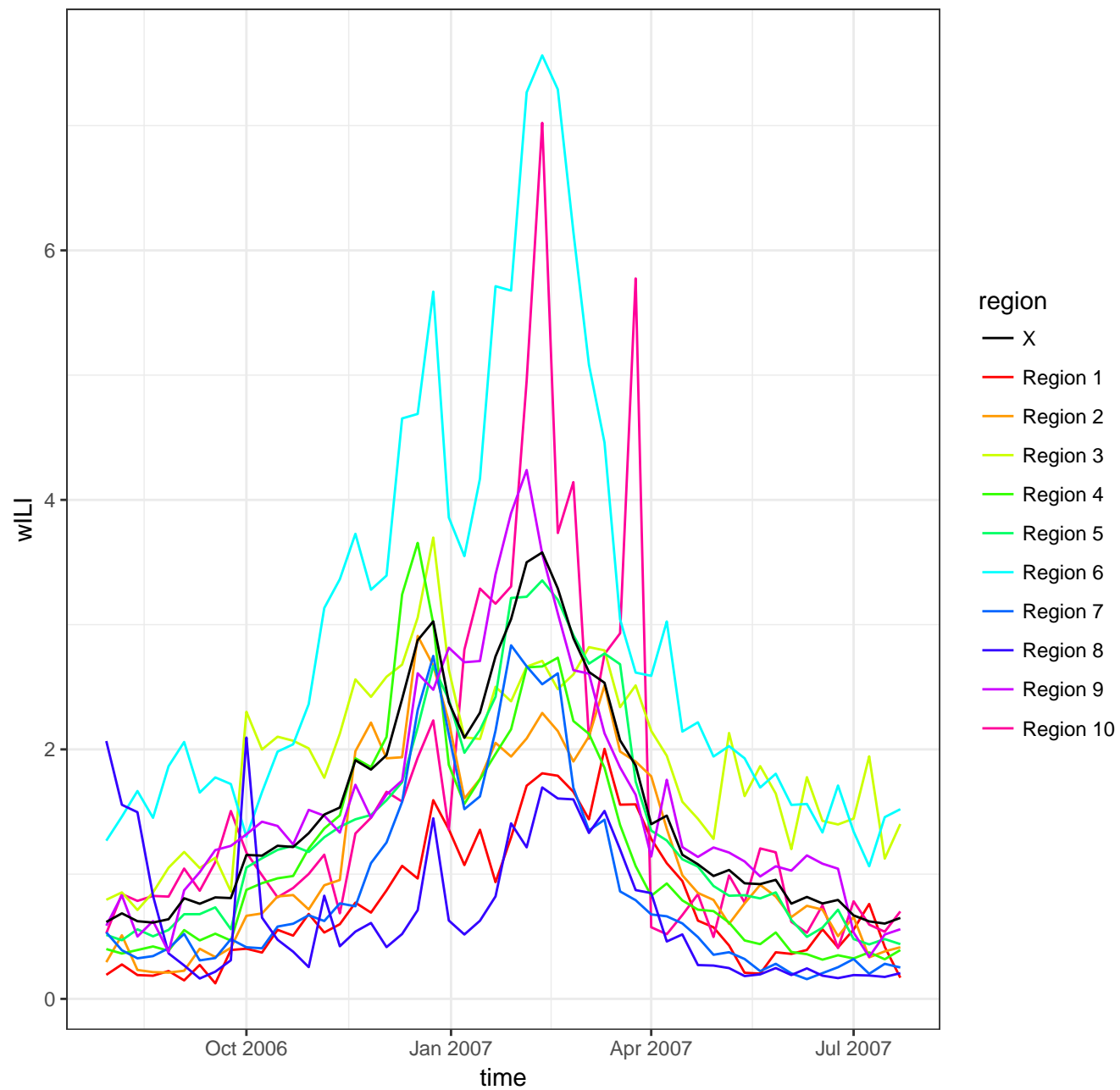
2004/2005



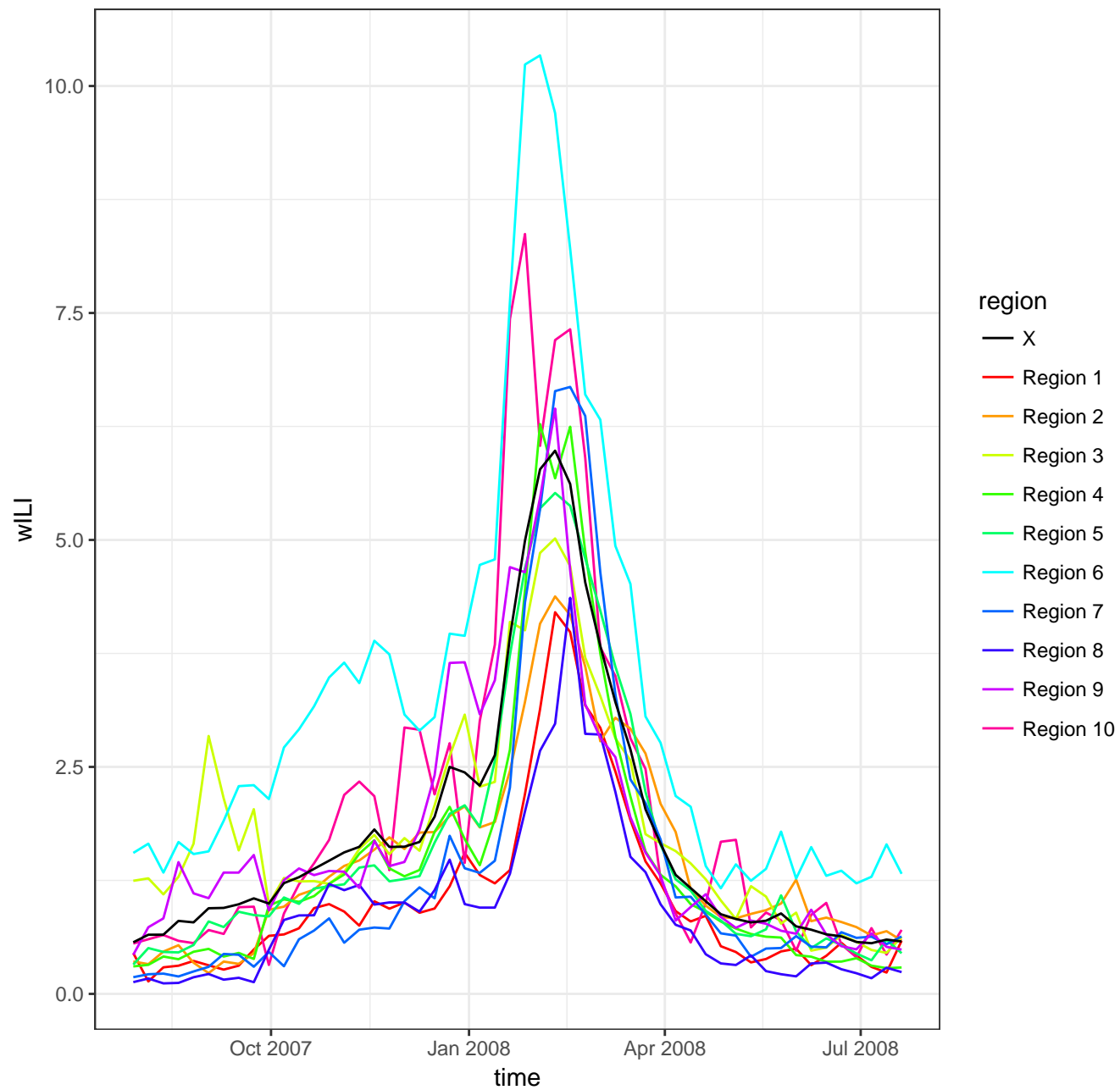
2005/2006



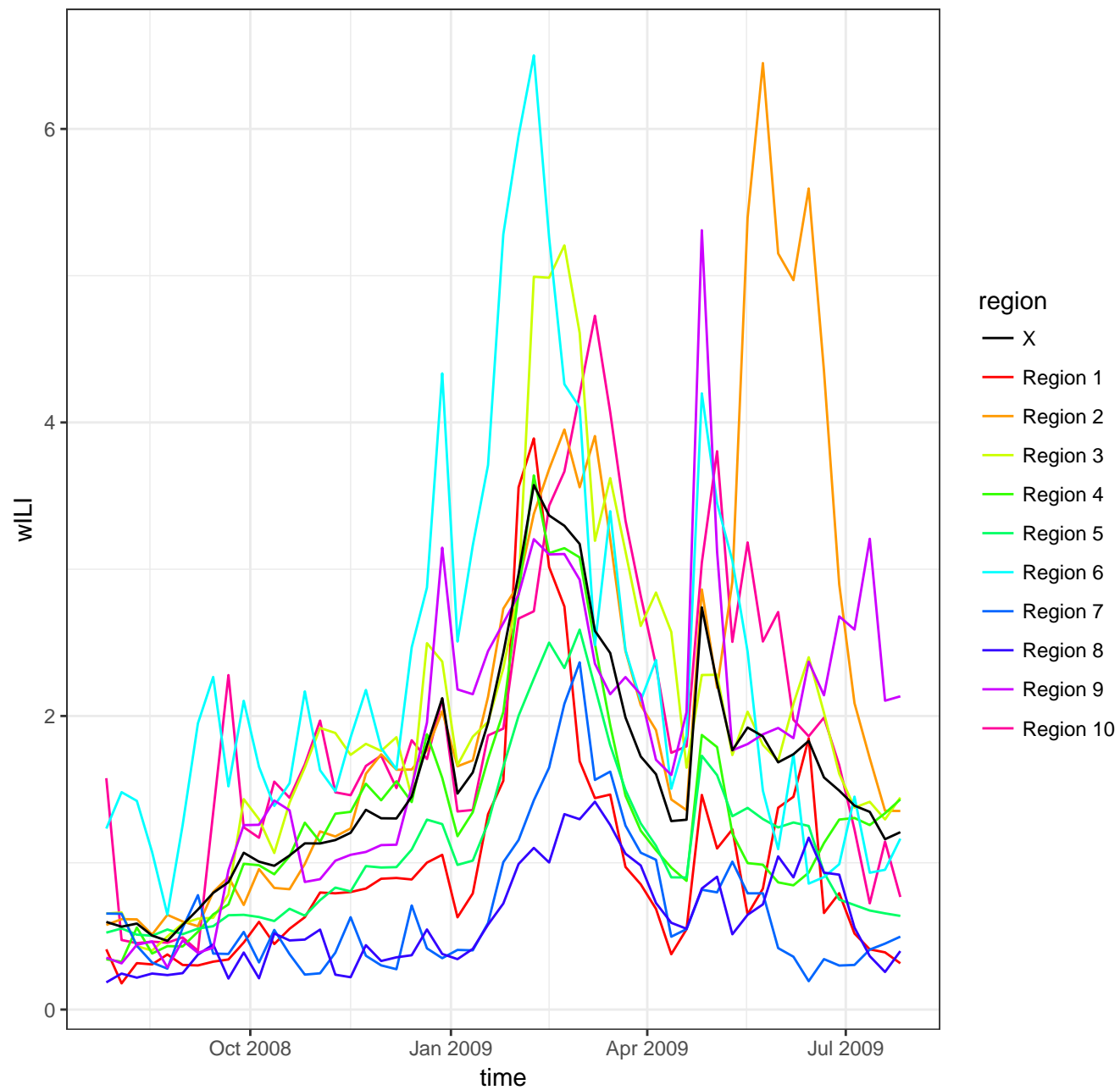
2006/2007



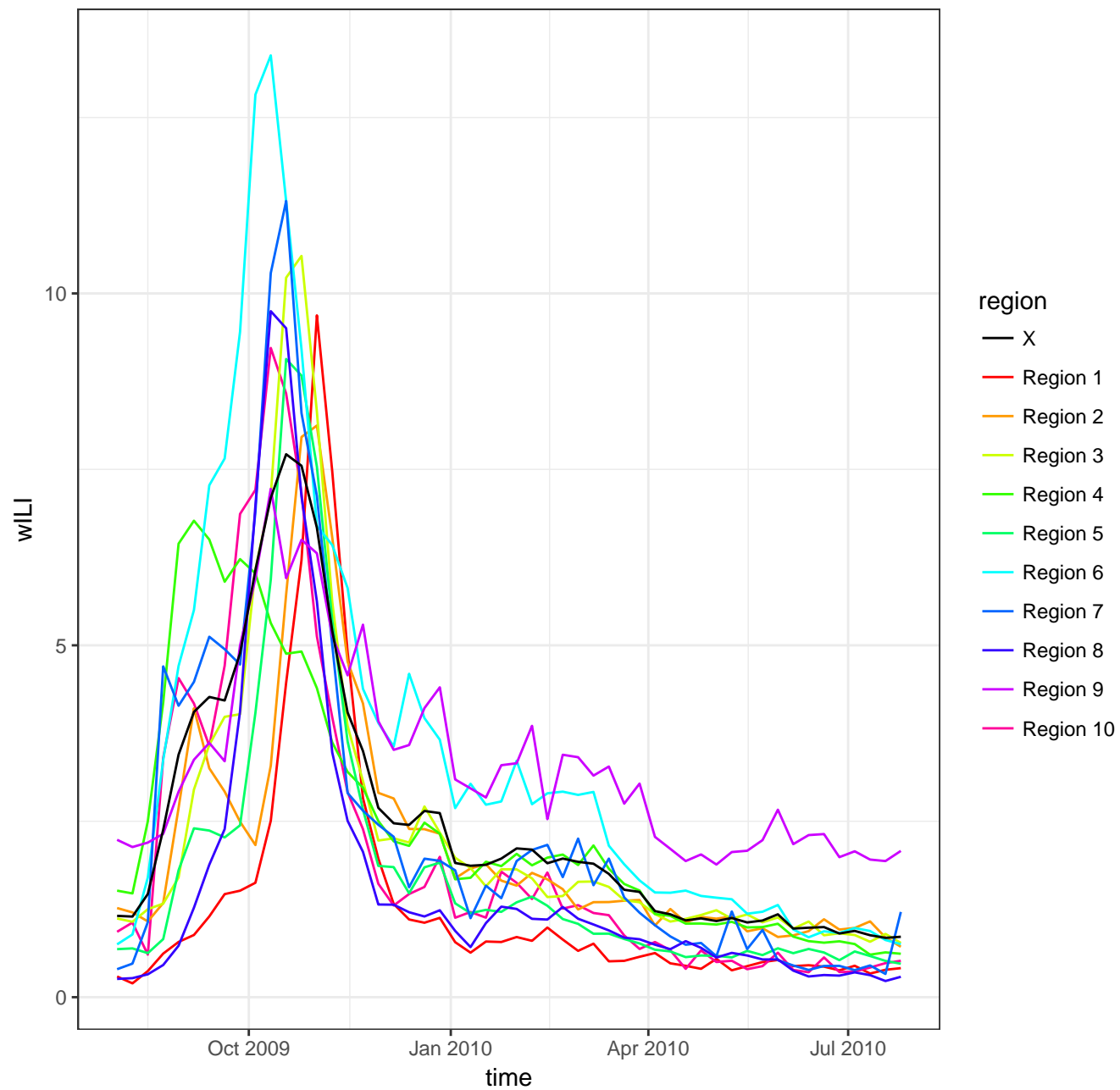
2007/2008



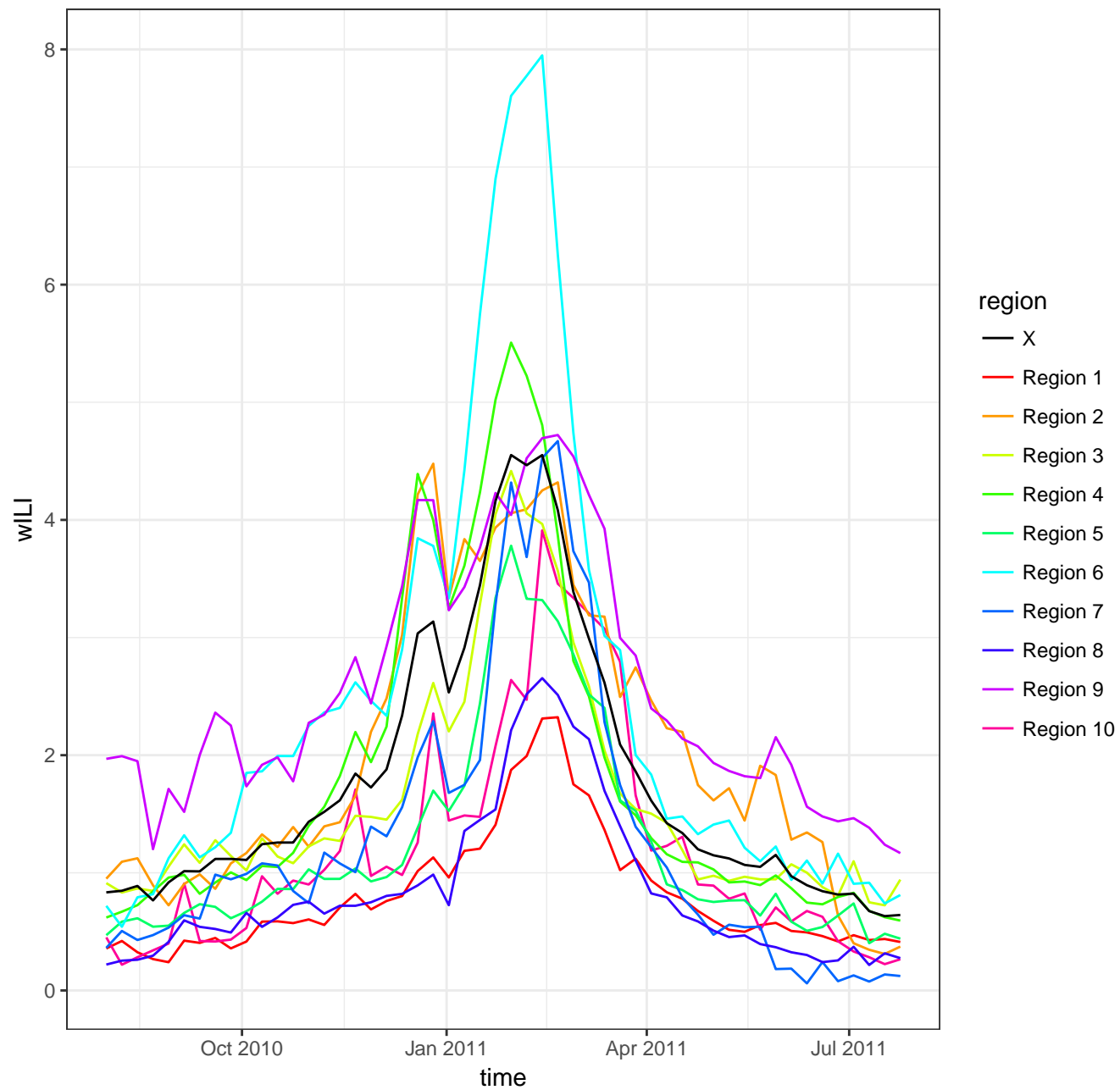
2008/2009



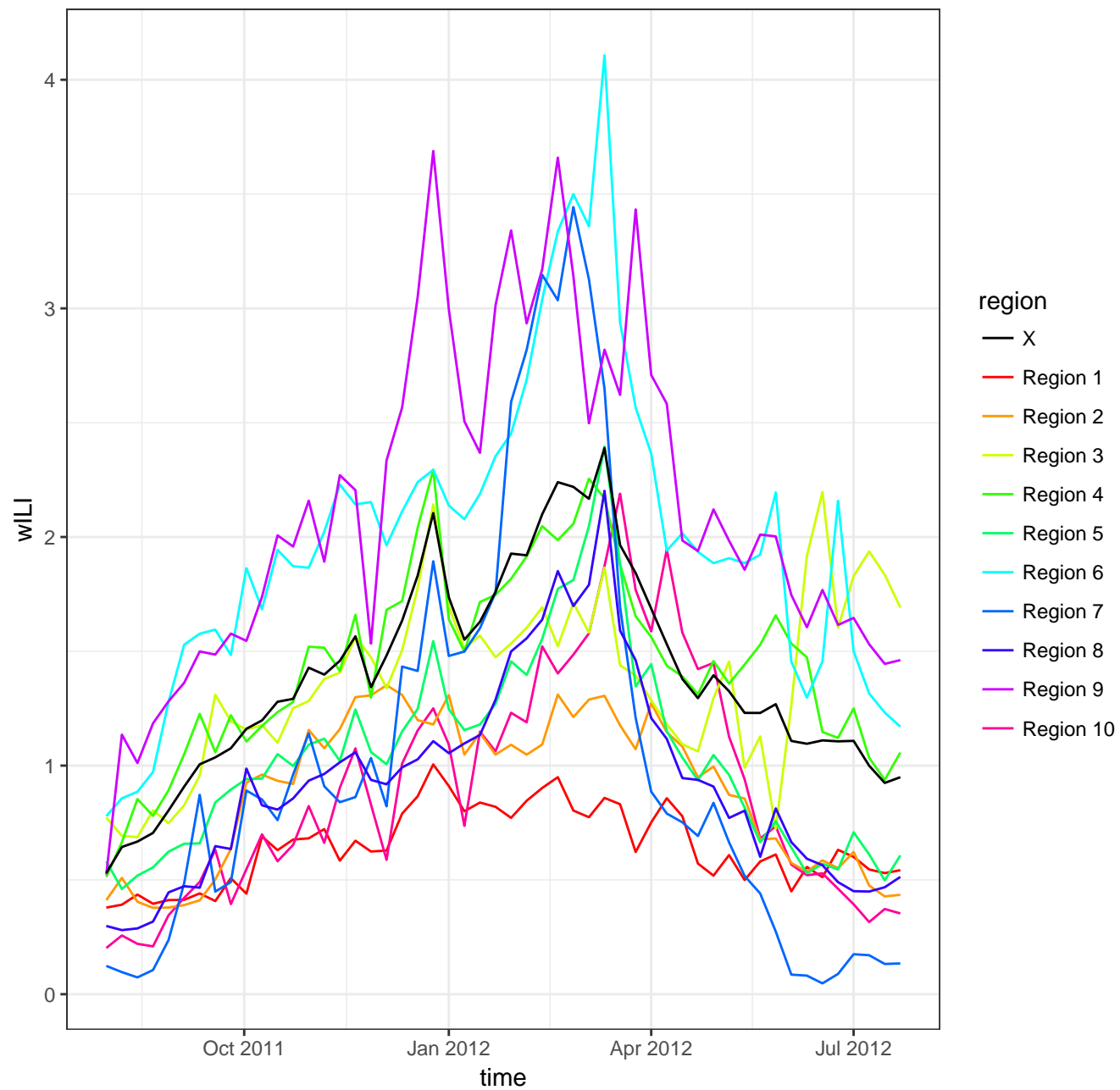
2009/2010



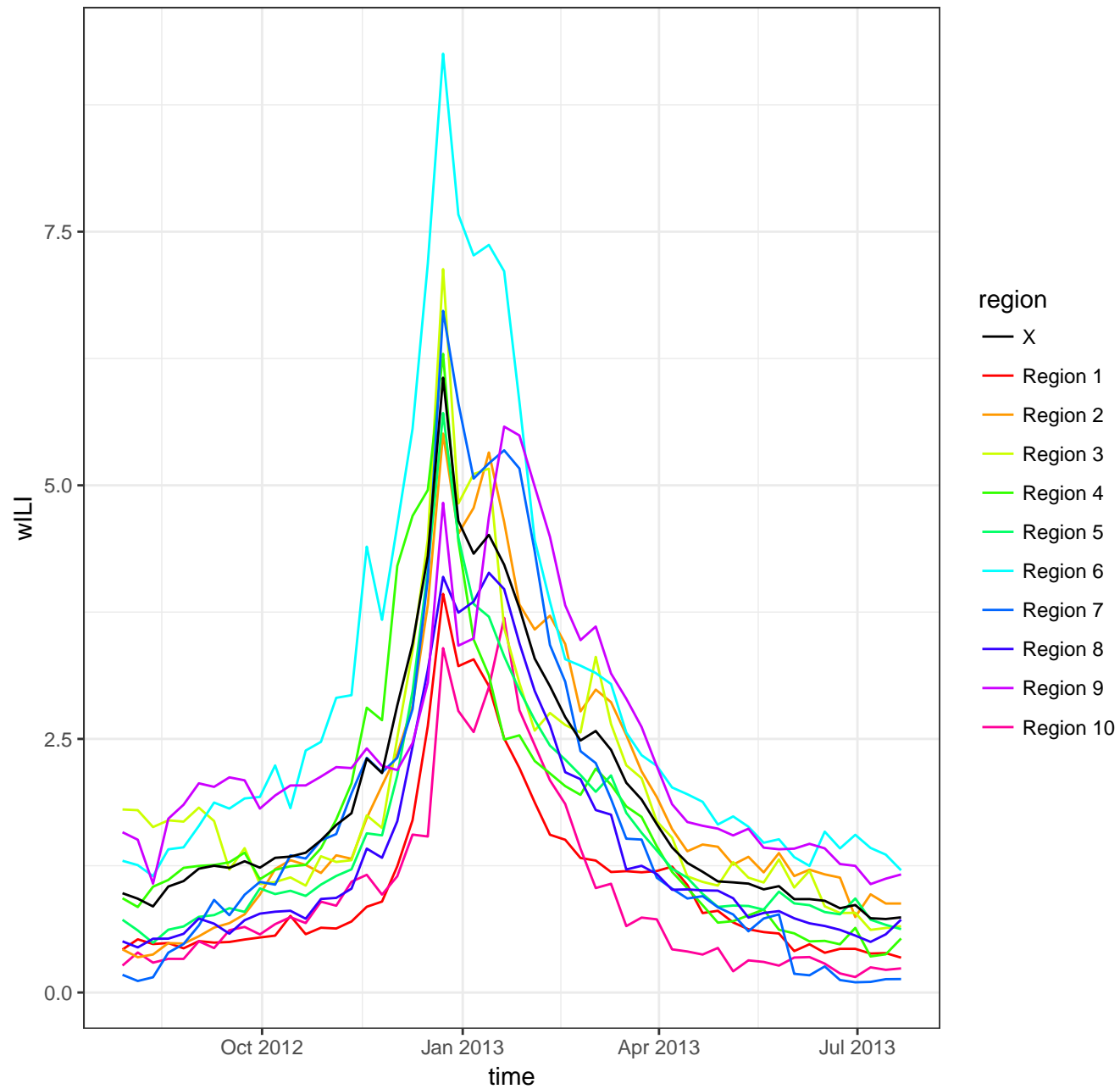
2010/2011



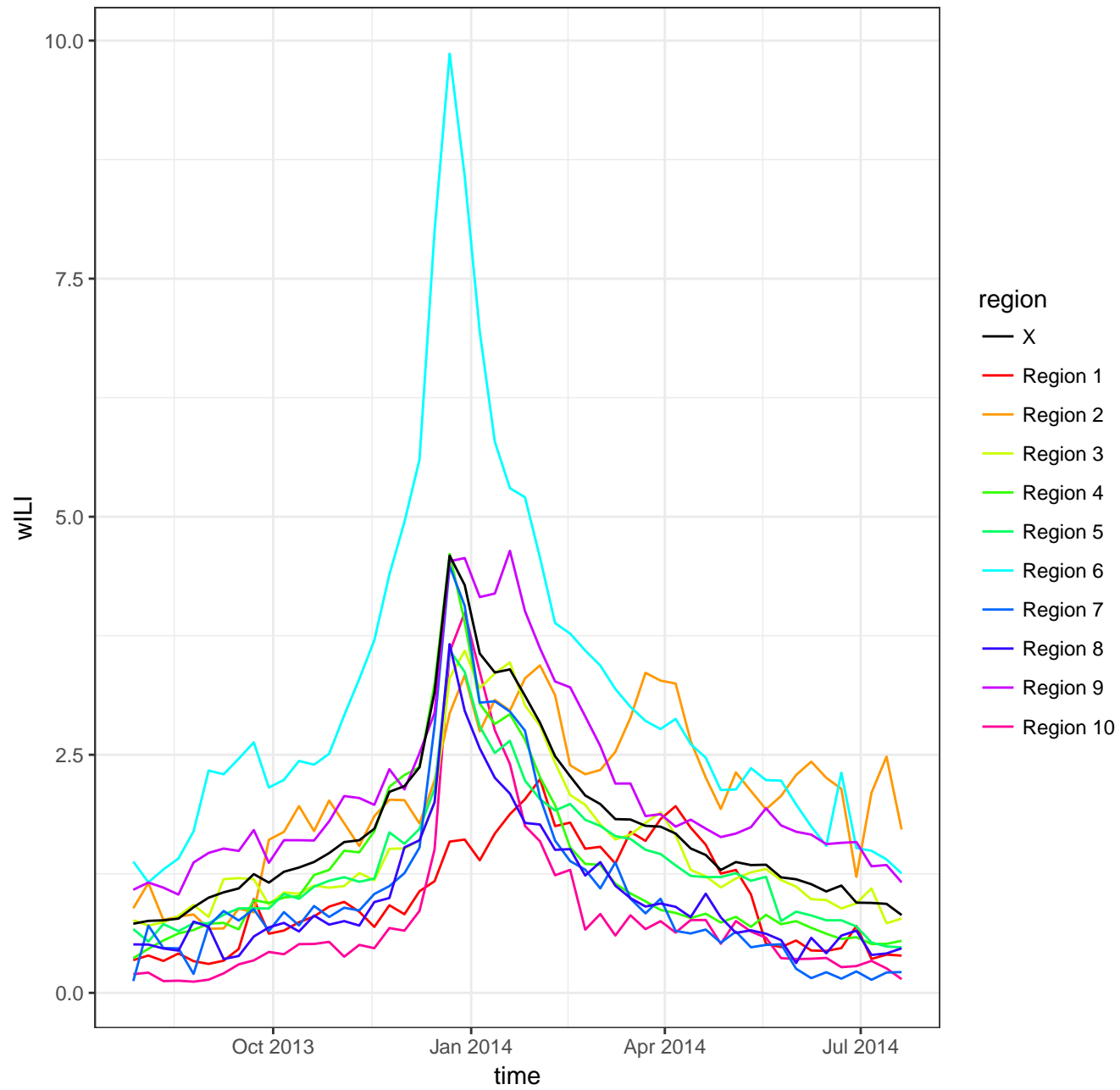
2011/2012



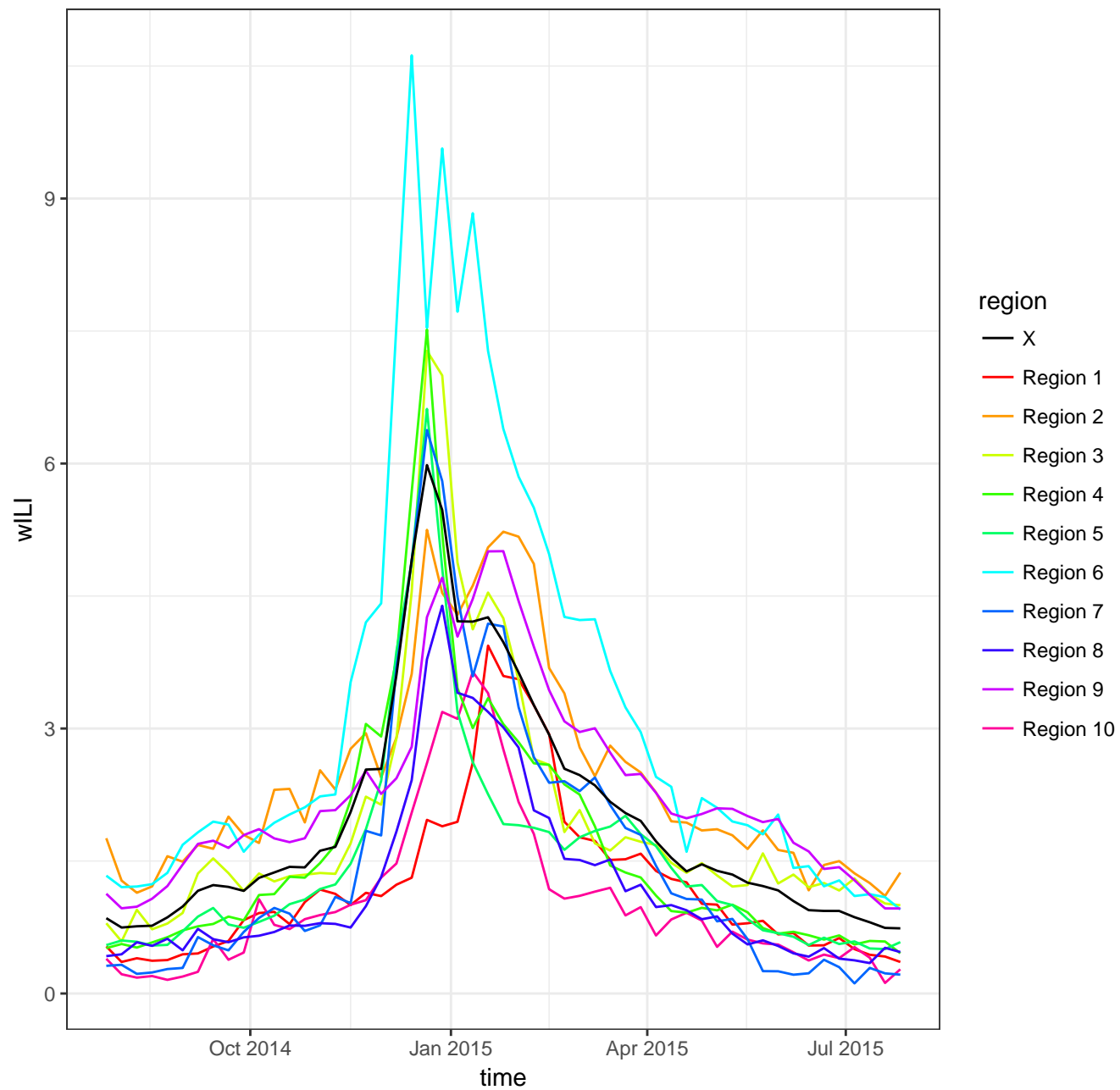
2012/2013



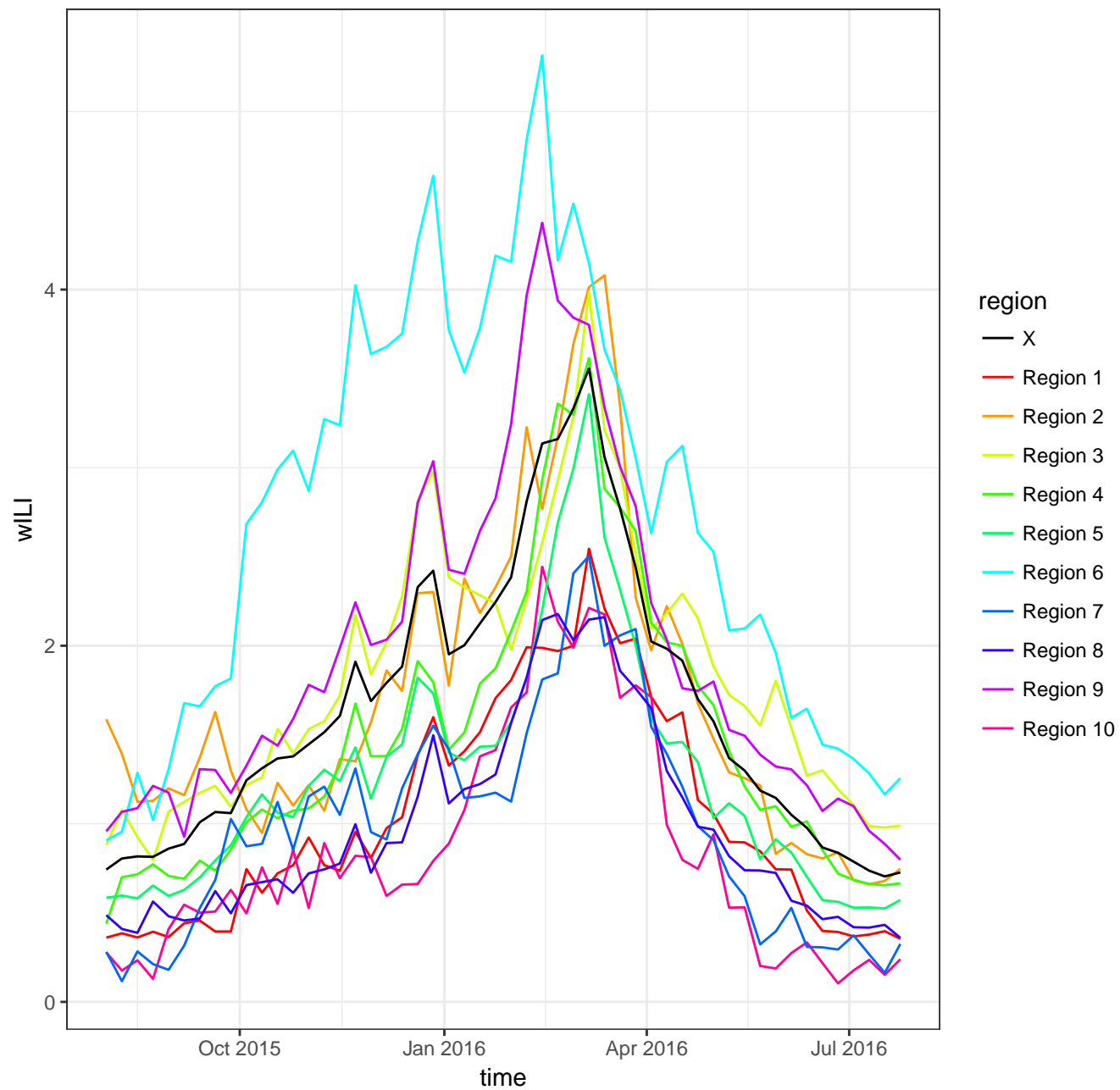
2013/2014



2014/2015



2015/2016



2016/2017

