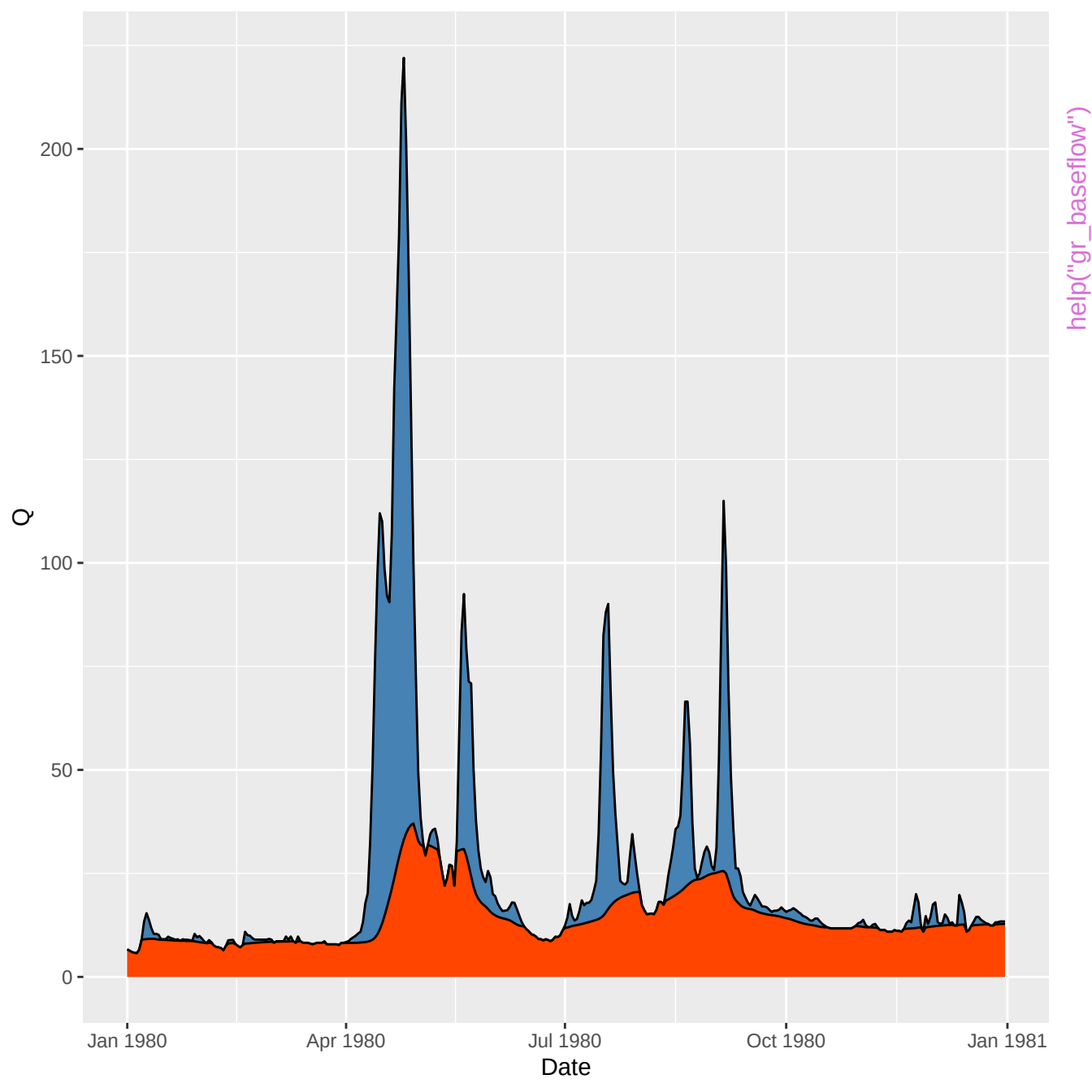
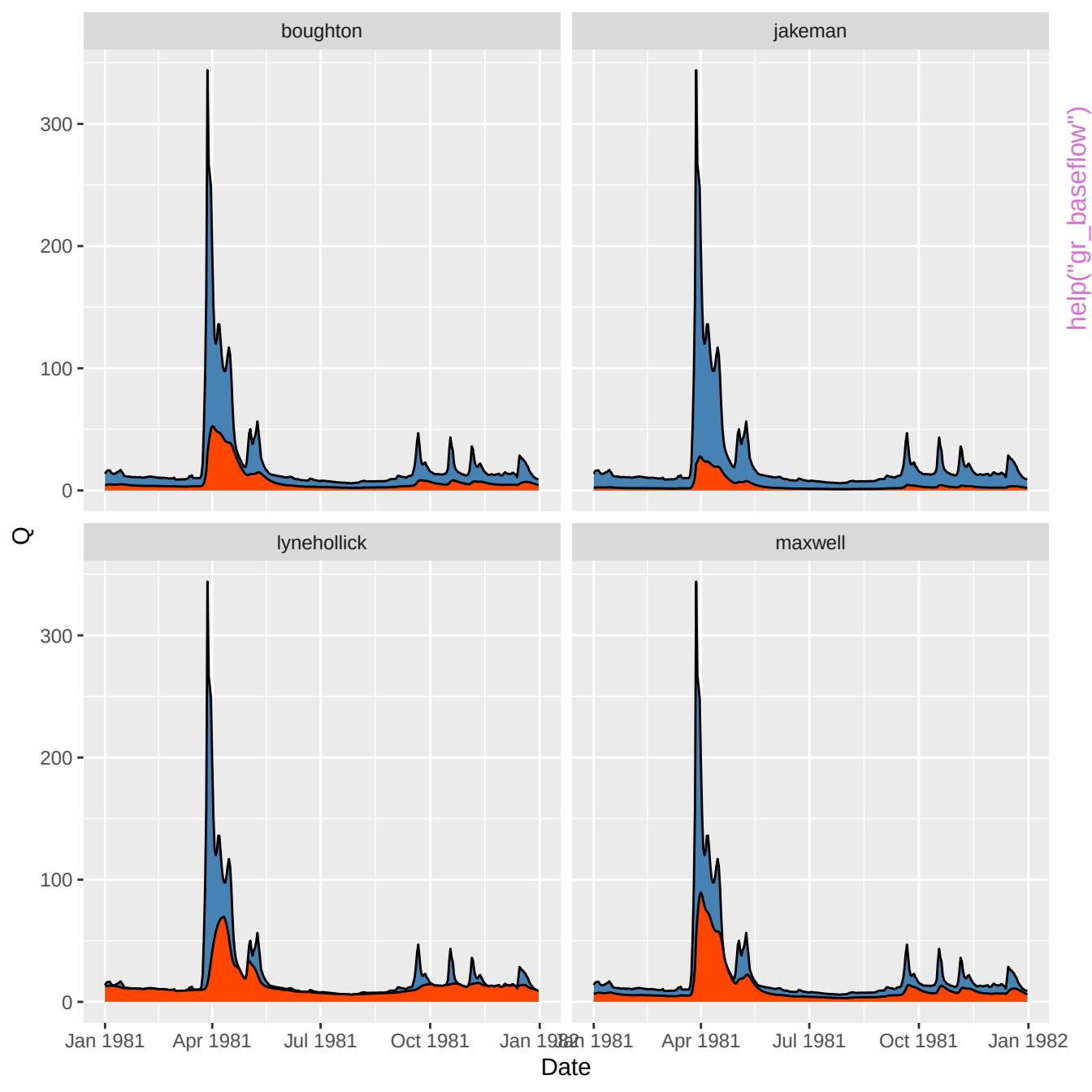
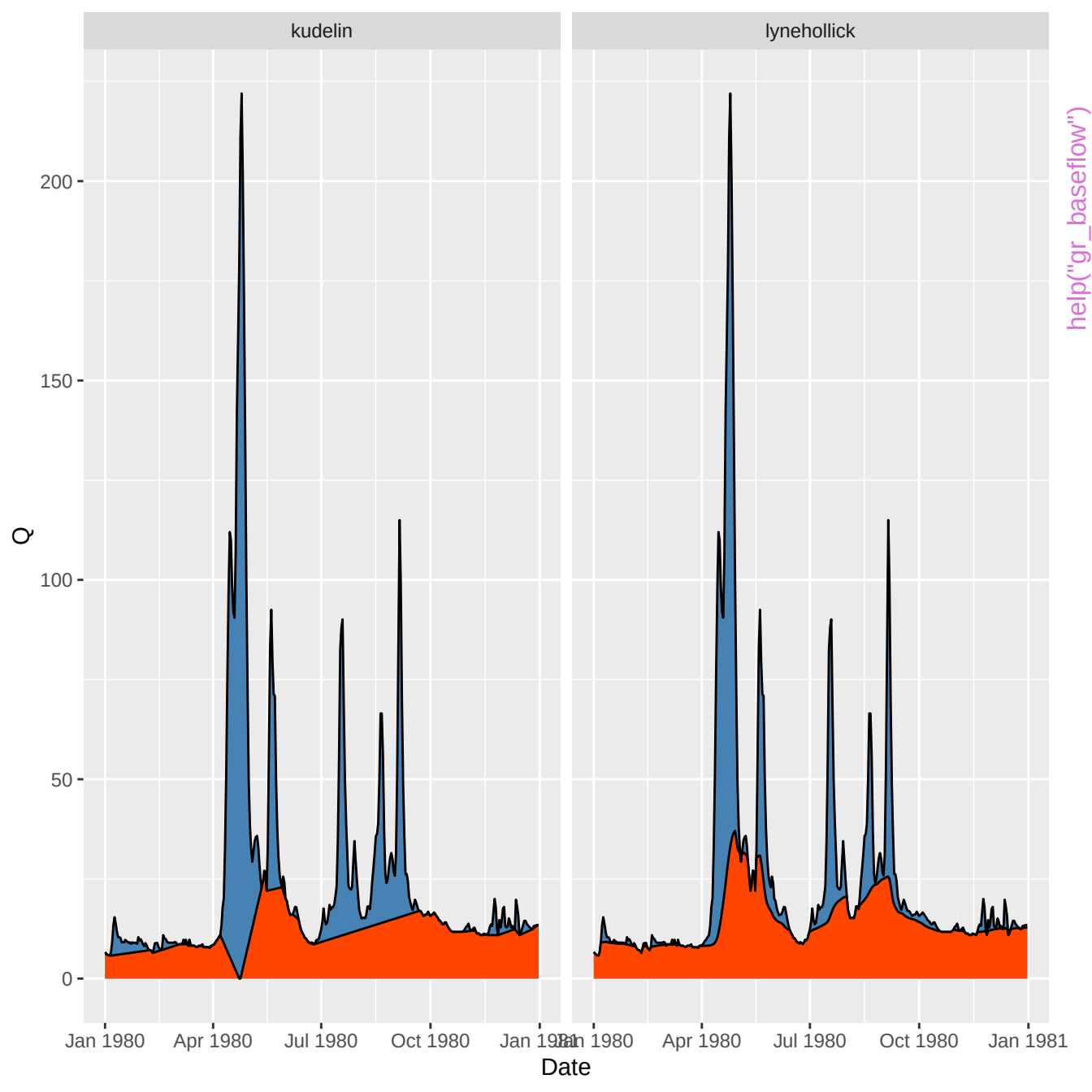
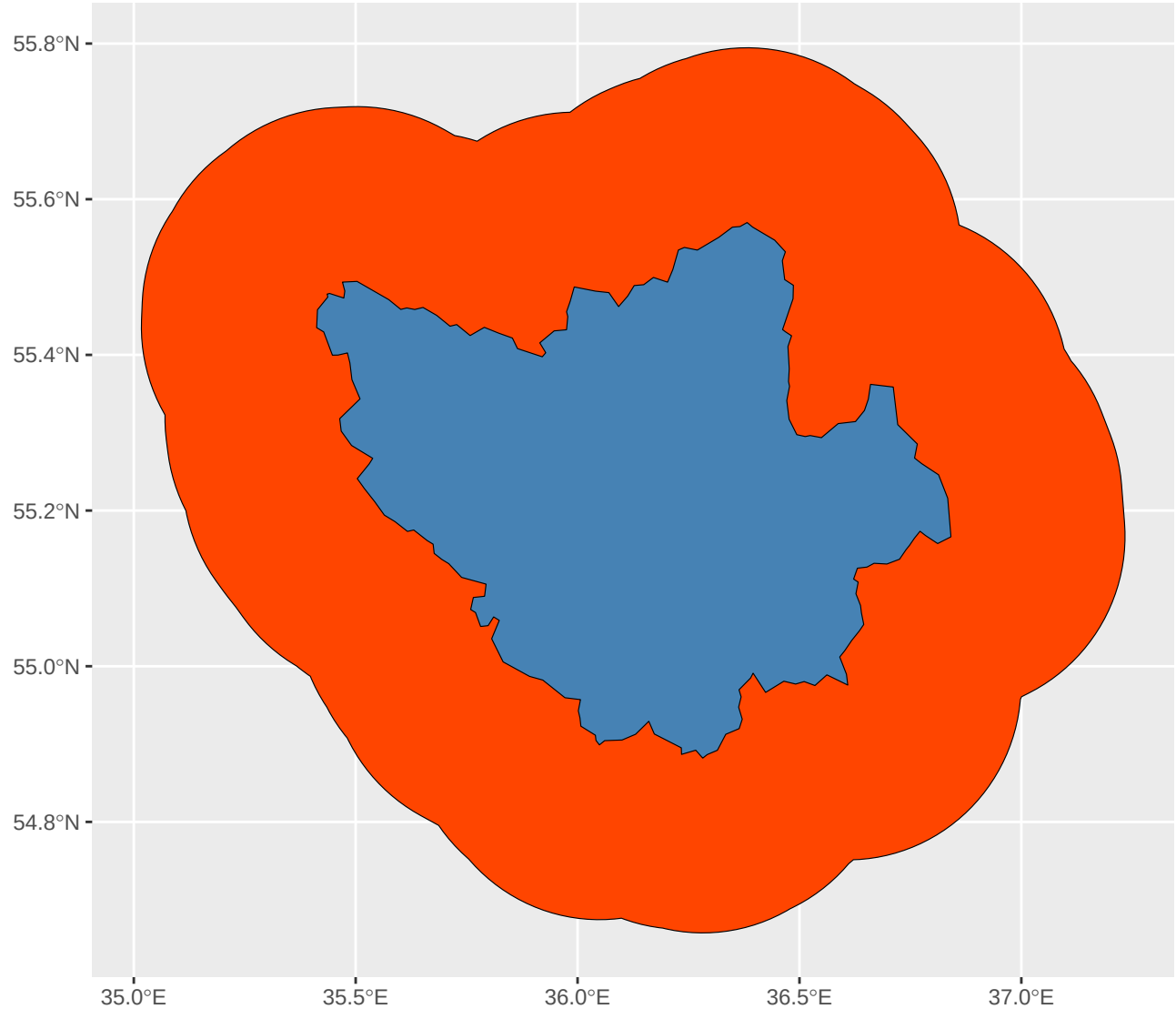
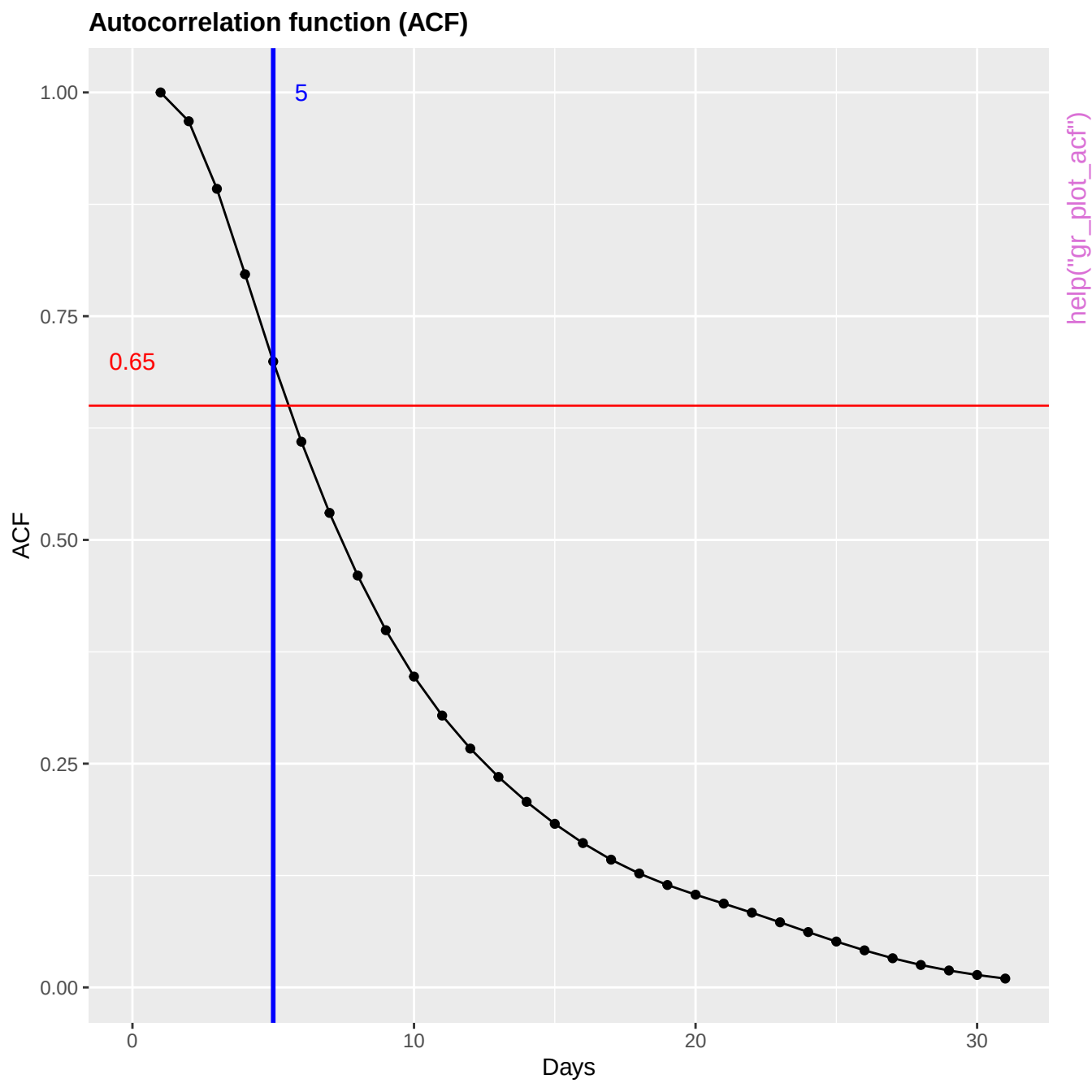
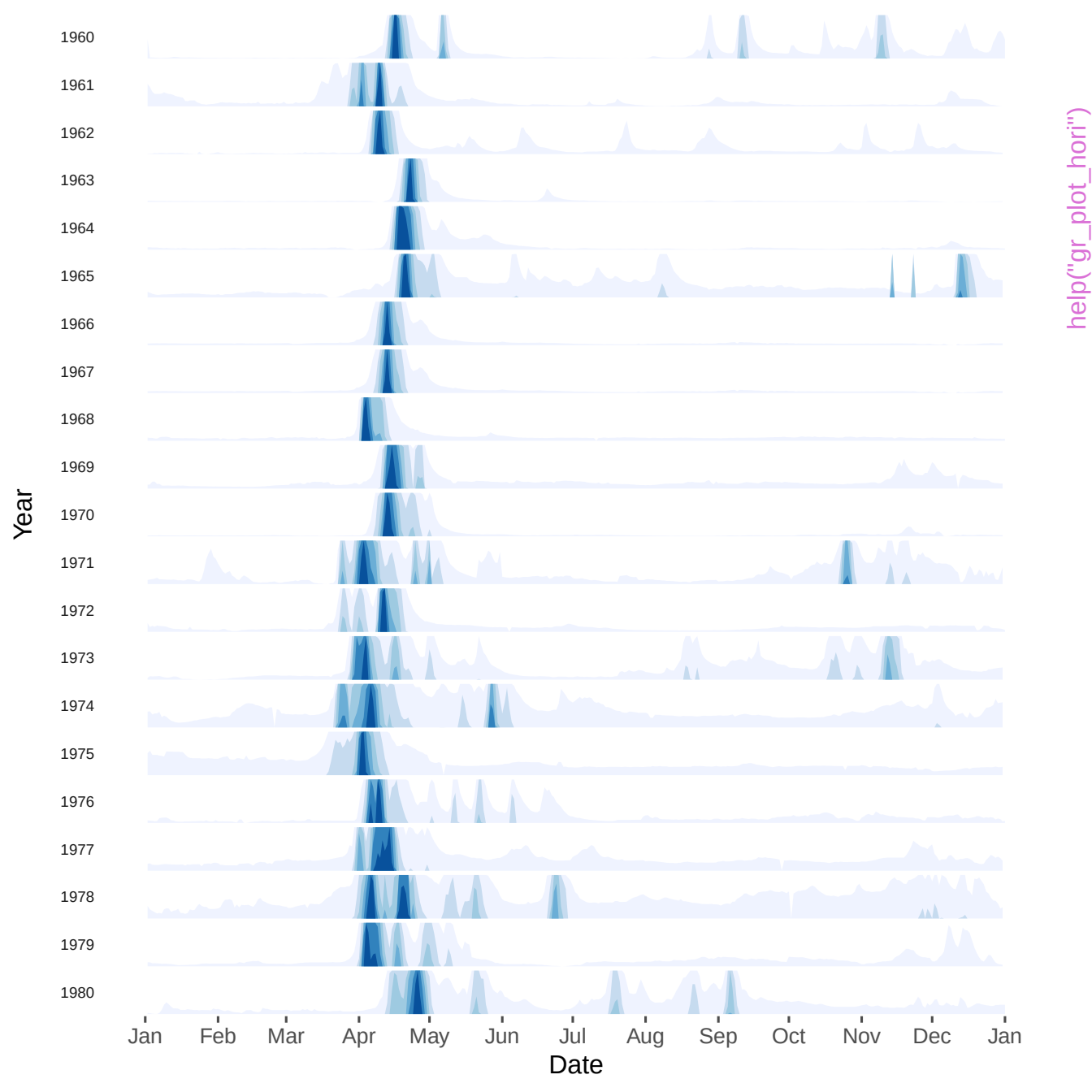

200
150
100
50
0
Q
Jan 1980
Apr 1980
Jul 1980
Oct 1980
Jan 1981
Date
help("gr_baseflow")

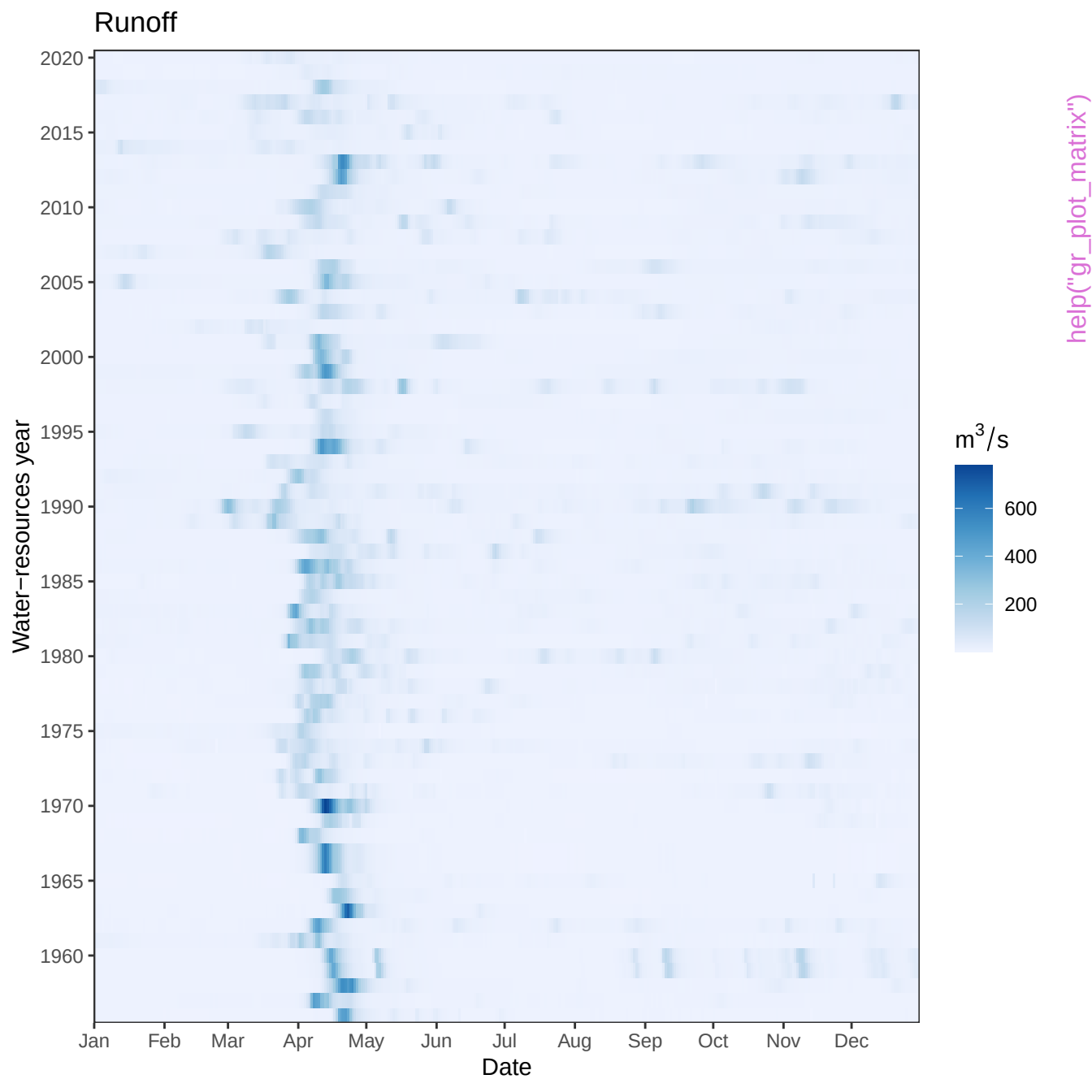

boughton
jakeman
lynehollick
maxwell
300
200
100
0
Q
Jan 1981
Apr 1981
Jul 1981
Oct 1981
Jan 1982
Date
help("gr_baseflow")

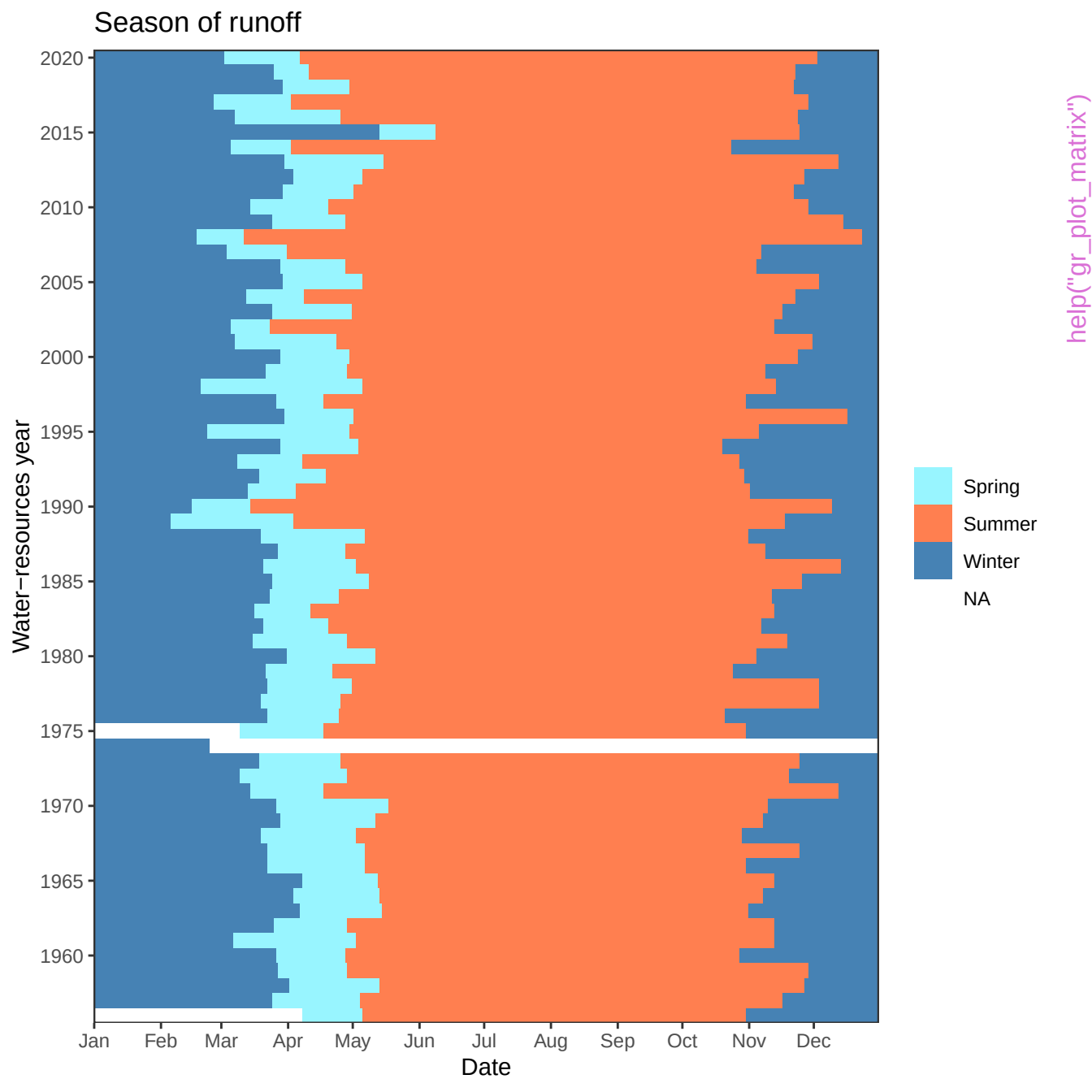

kudelin
lyneholick
200
150
100
50
0
Q
Jan 1980
Apr 1980
Jul 1980
Oct 1980
Jan 1981
Date
help("gr_baseflow")

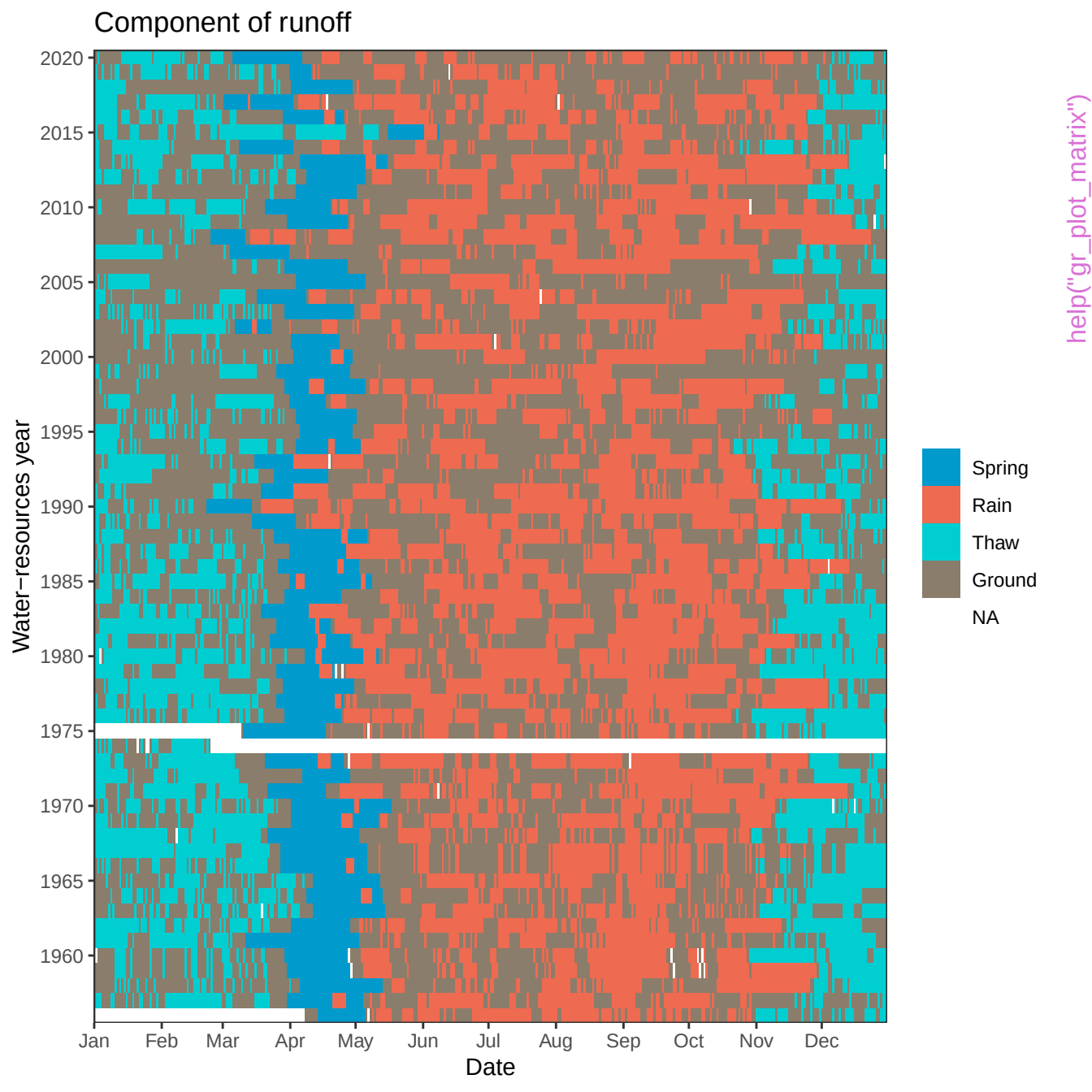

55.8°N
55.6°N
55.4°N
55.2°N
55.0°N
54.8°N
35.0°E
35.5°E
36.0°E
36.5°E
37.0°E
help("gr_buffer_geo")

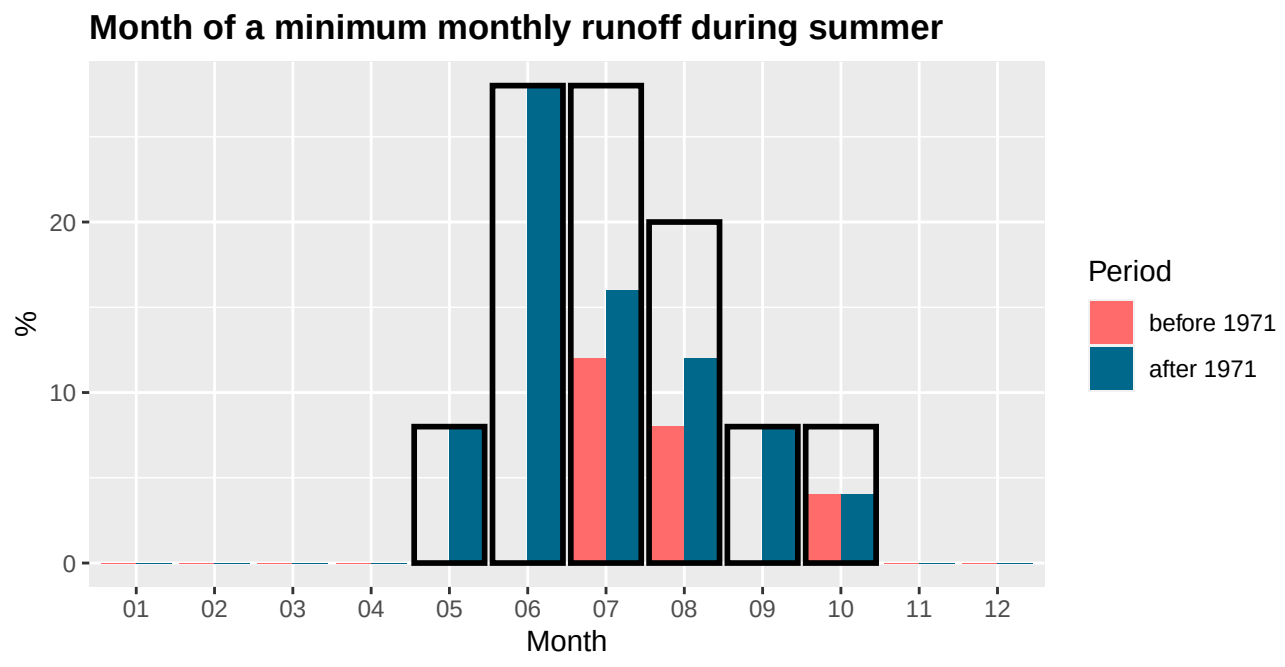

Autocorrelation function (ACF)
1.00
0.75
0.50
0.25
0.00
ACF
5
0.65
0
10
20
30
Days
help("gr_plot_acf")


1960
1961
1962
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
Year
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Date
help("gr_plot_hori")

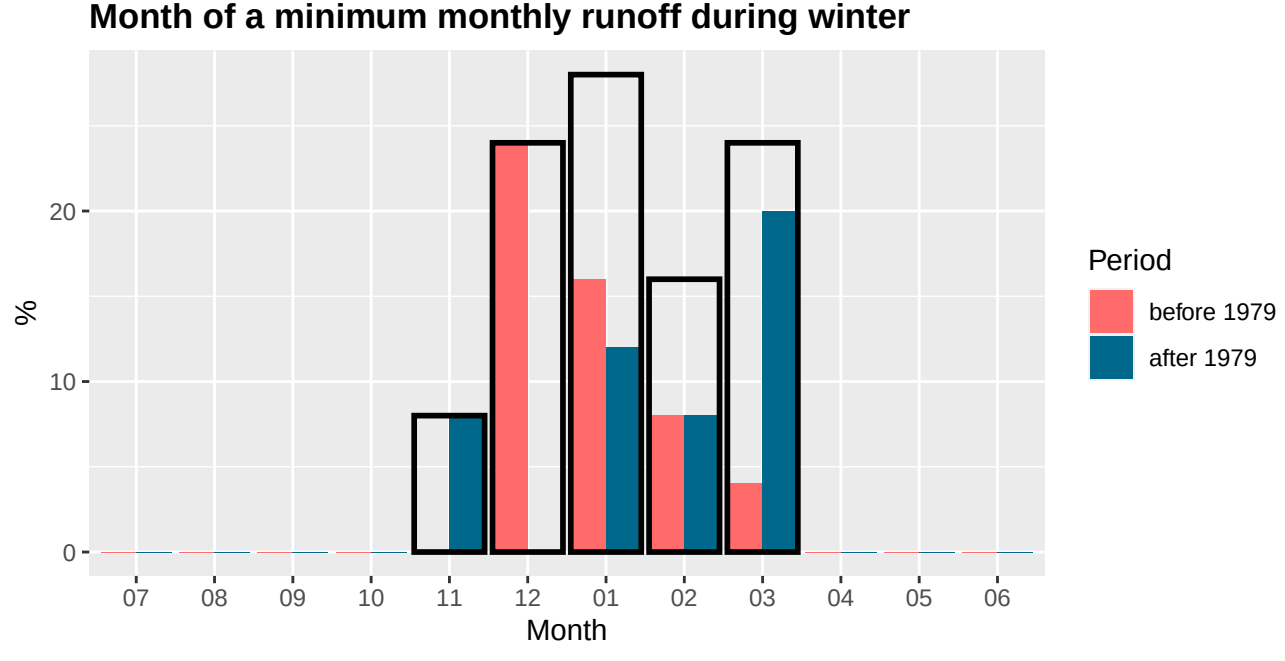

Runoff
Water−resources year
2020
2015
2010
2005
2000
1995
1990
1985
1980
1975
1970
1965
1960
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Date
m3/s
600
400
200
help("gr_plot_matrix")

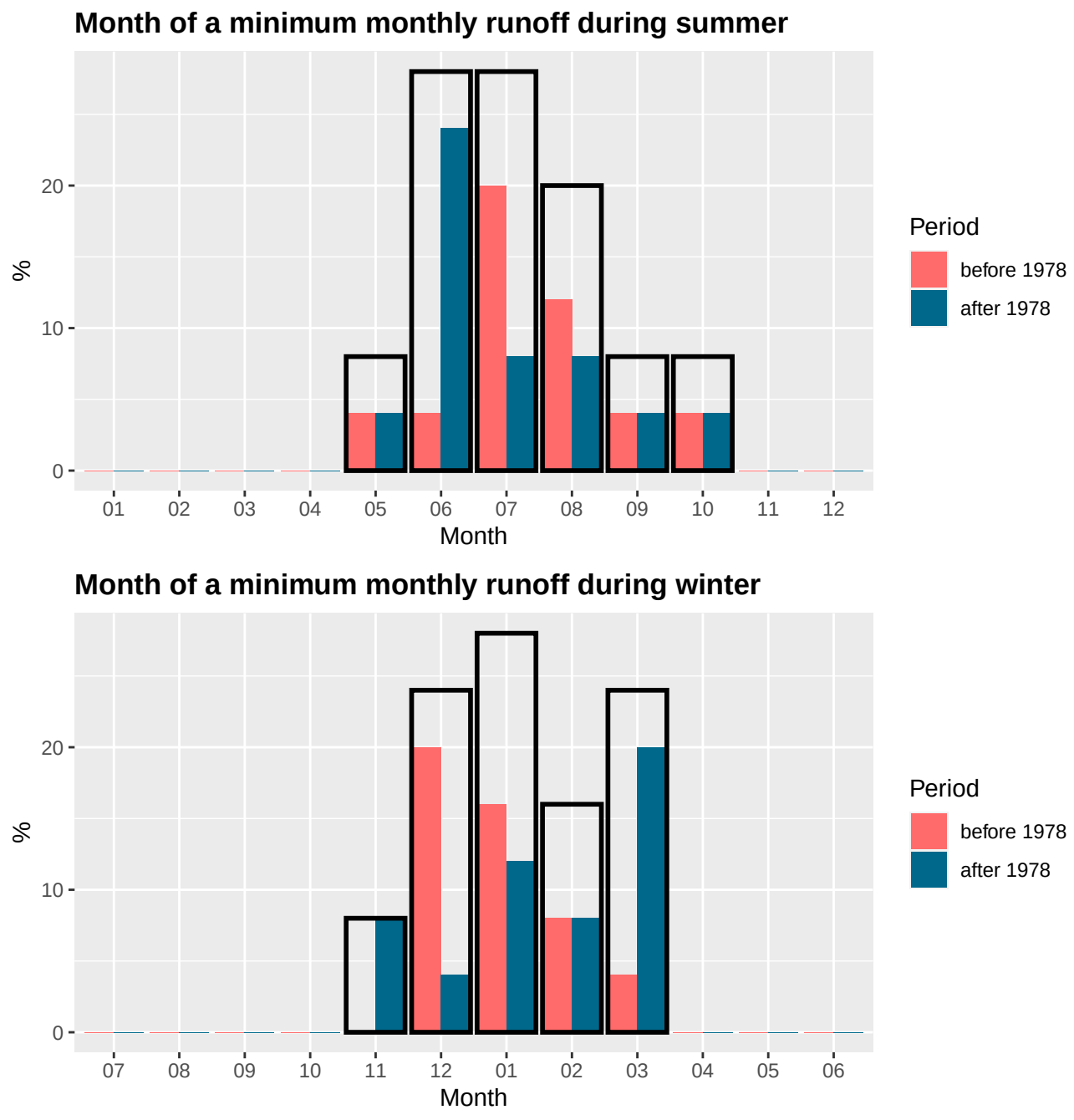

Season of runoff
Water−resources year
2020
2015
2010
2005
2000
1995
1990
1985
1980
1975
1970
1965
1960
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Date
Spring
Summer
Winter
NA
help("gr_plot_matrix")

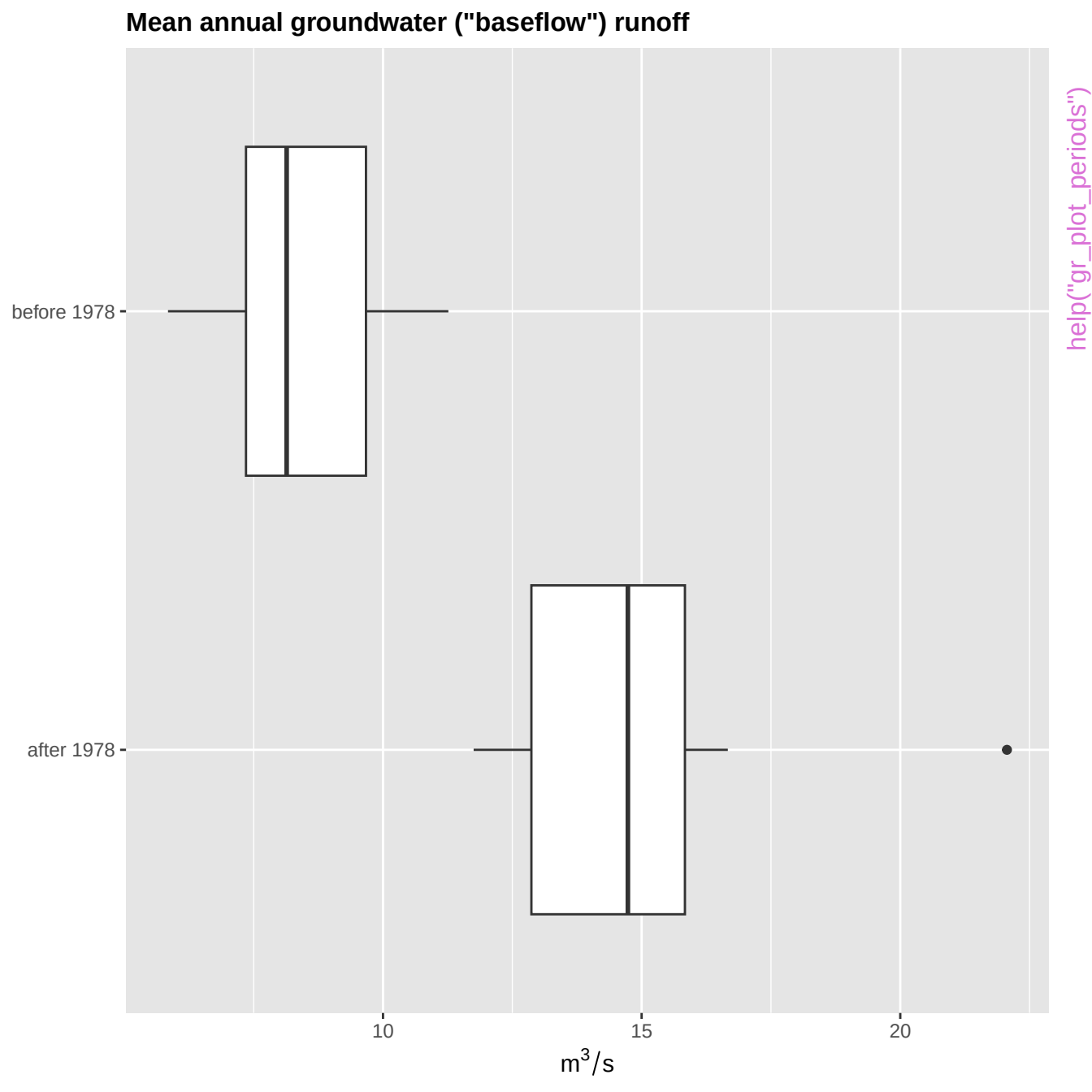

Component of runoff
Water−resources year
2020
2015
2010
2005
2000
1995
1990
1985
1980
1975
1970
1965
1960
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Date
Spring
Rain
Thaw
Ground
NA
help("gr_plot_matrix")



help("gr_plot_minmonth")

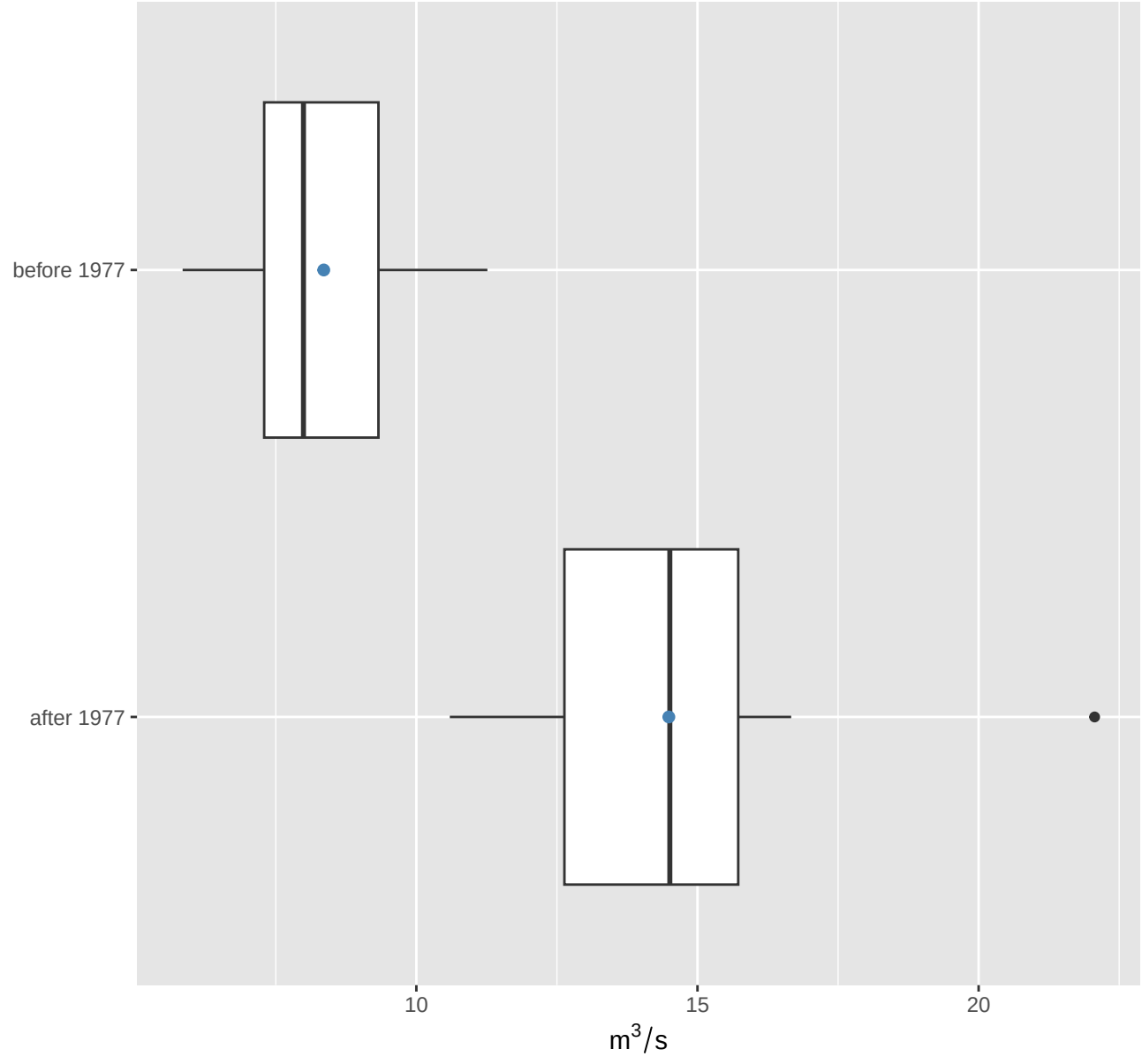



Month of a minimum monthly runoff during summer
%
20
10
0
01
02
03
04
05
06
07
08
09
10
11
12
Month
Period
before 1978
after 1978
Month of a minimum monthly runoff during winter
%
20
10
0
07
08
09
10
11
12
01
02
03
04
05
06
Month
Period
before 1978
after 1978
help("gr_plot_minmonth")


Mean annual groundwater ("baseflow") runoff
before 1978
after 1978
10
15
20
m3/s
help("gr_plot_periods")

Mean annual groundwater ("baseflow") runoff

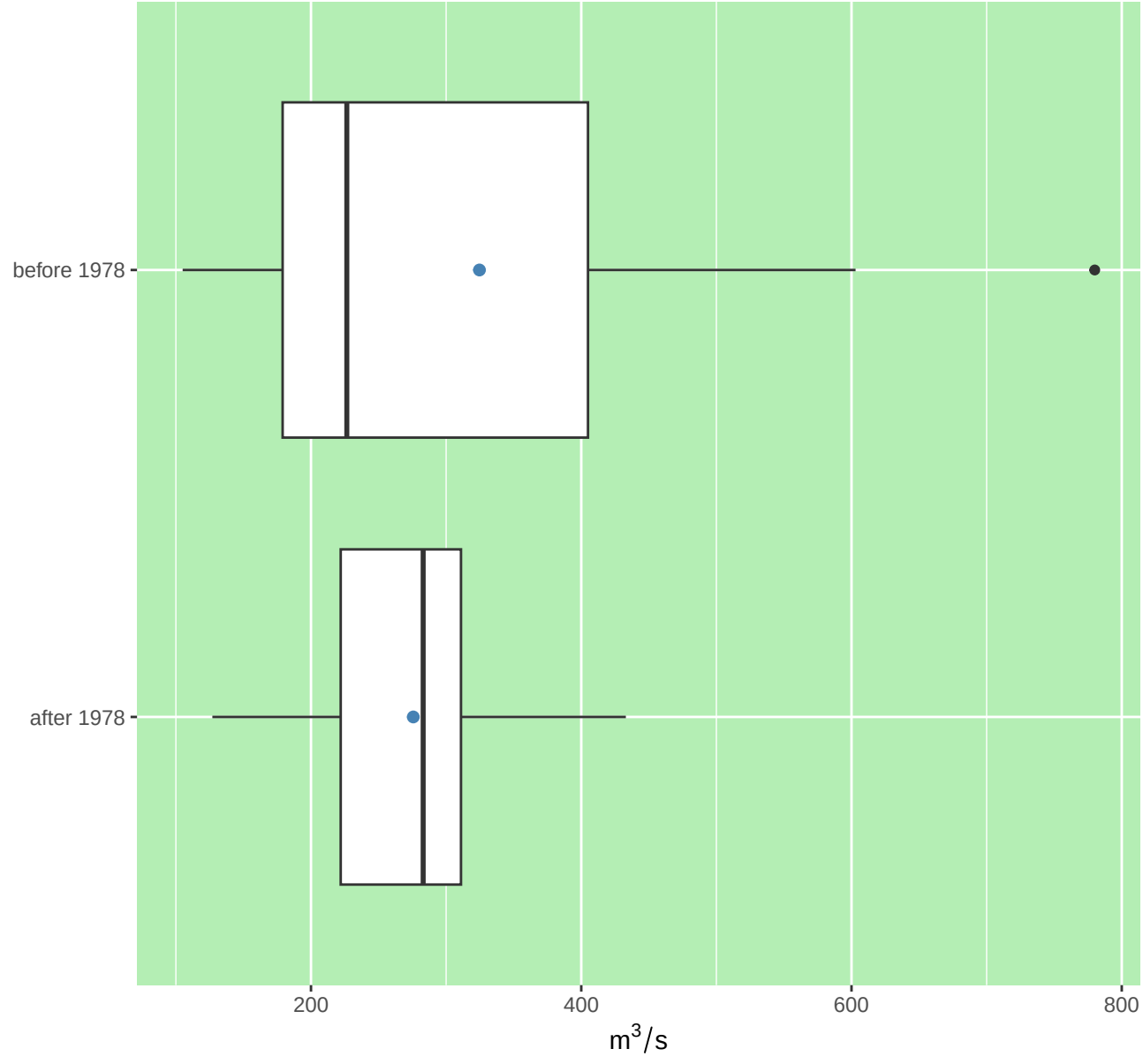
Student: t = −6.816, p = 0, m1 = 8.353, m2 = 14.49
Fisher: F = 0.312, p = 0.07206, cv1 = 0.191, cv2 = 0.197



help("gr_plot_periods")

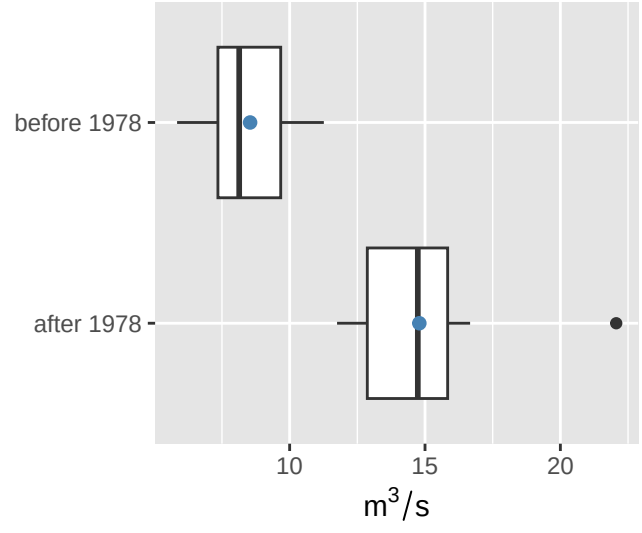
Maximum spring flood runoff

Student: t = −3.451, p = 0.00219, m1 = 324.667, m2 = 275.692
Fisher: F = 0.722, p = 0.59732, cv1 = 0.668, cv2 = 0.34



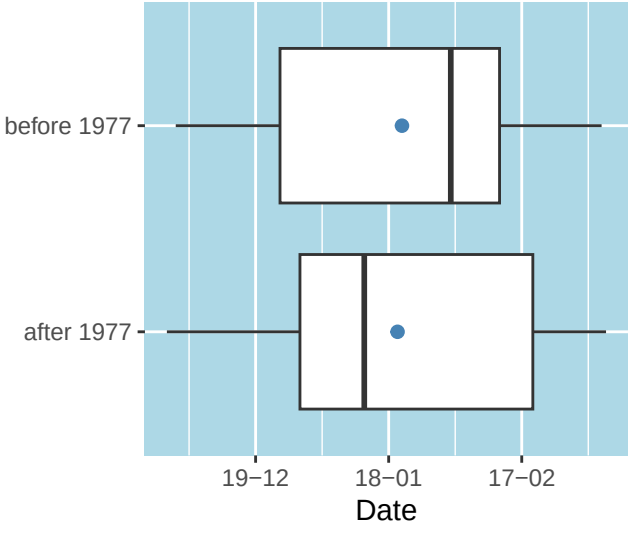
Mean annual groundwater ("base

Student: t = −3.451, p = 0.00219, m1 =
Fisher: F = 0.722, p = 0.59732, cv1 = (



First date of minimum 10−day avera

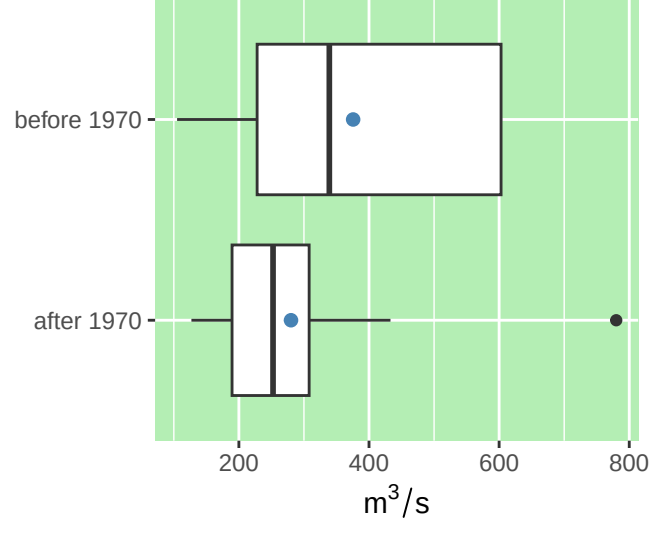
Student: t = −6.566, p = 0, m1 = 21−Jan,
Fisher: F = 0.197, p = 0.01452, cv1 = 0.0



help("gr_plot_periods")

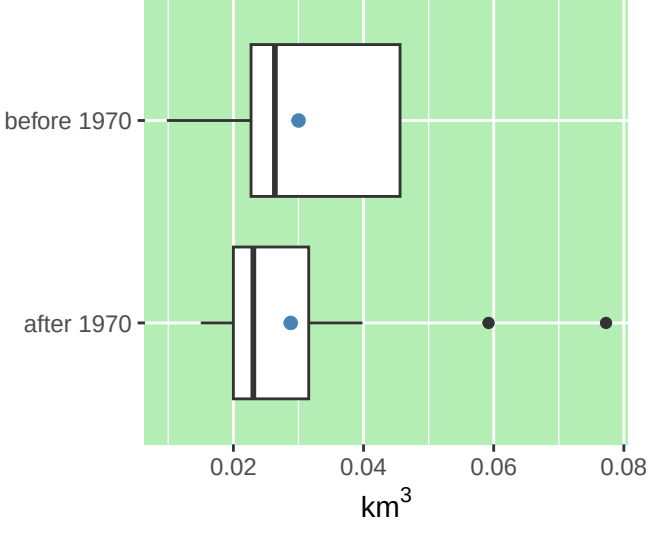
Maximum spring flood runoff

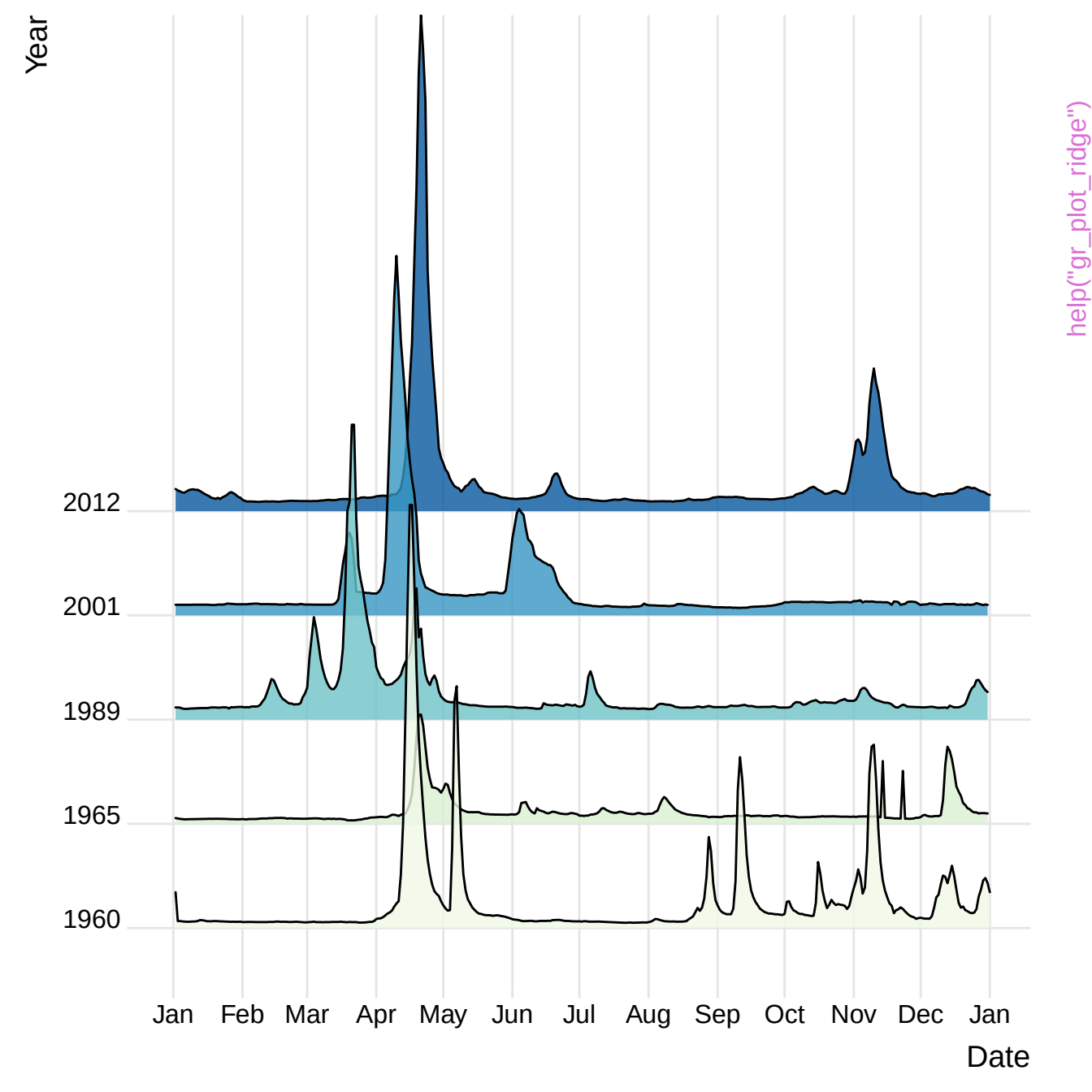
Student: t = 0.567, p = 0.59219, m1 =
Fisher: F = 1.265, p = 0.63668, cv1 = (

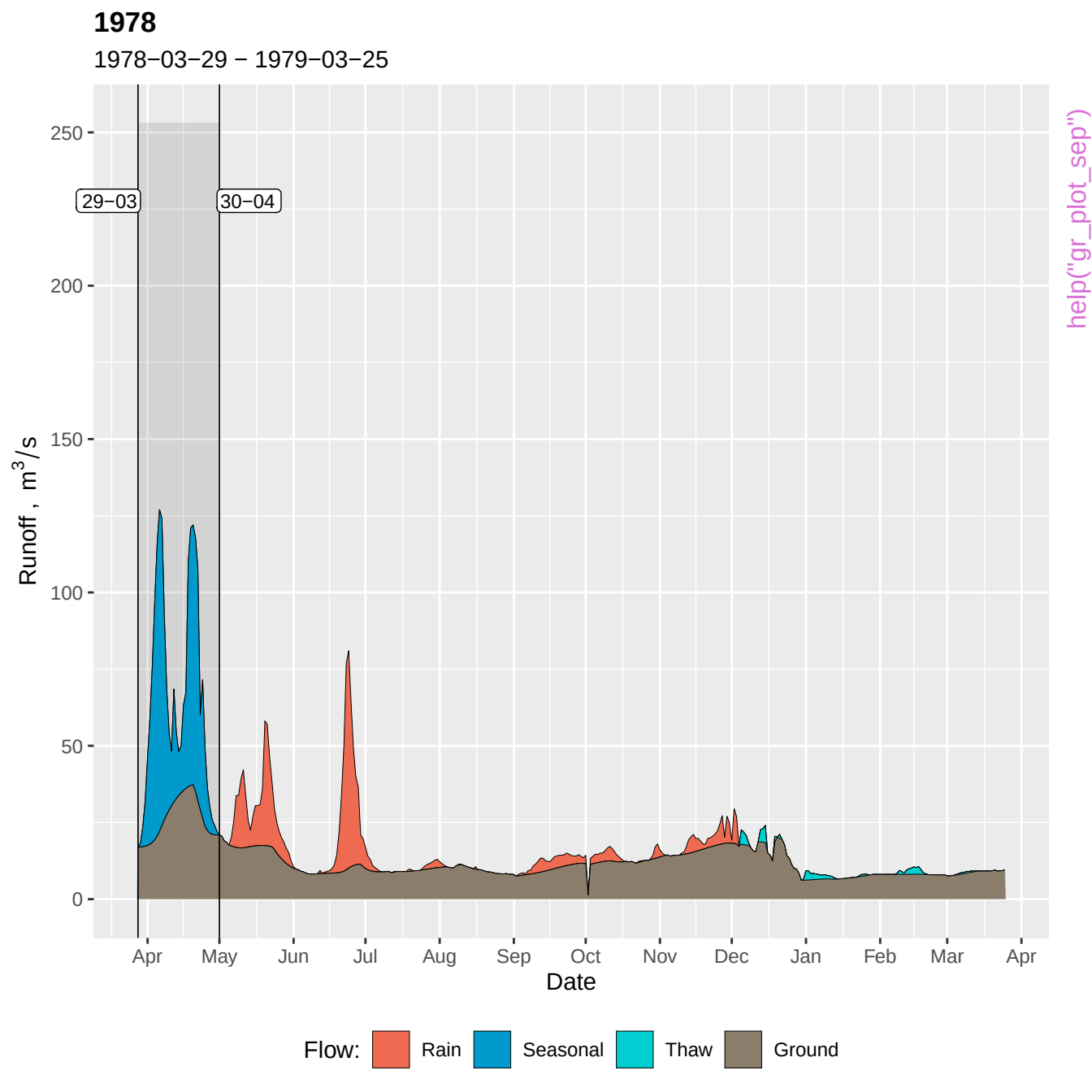


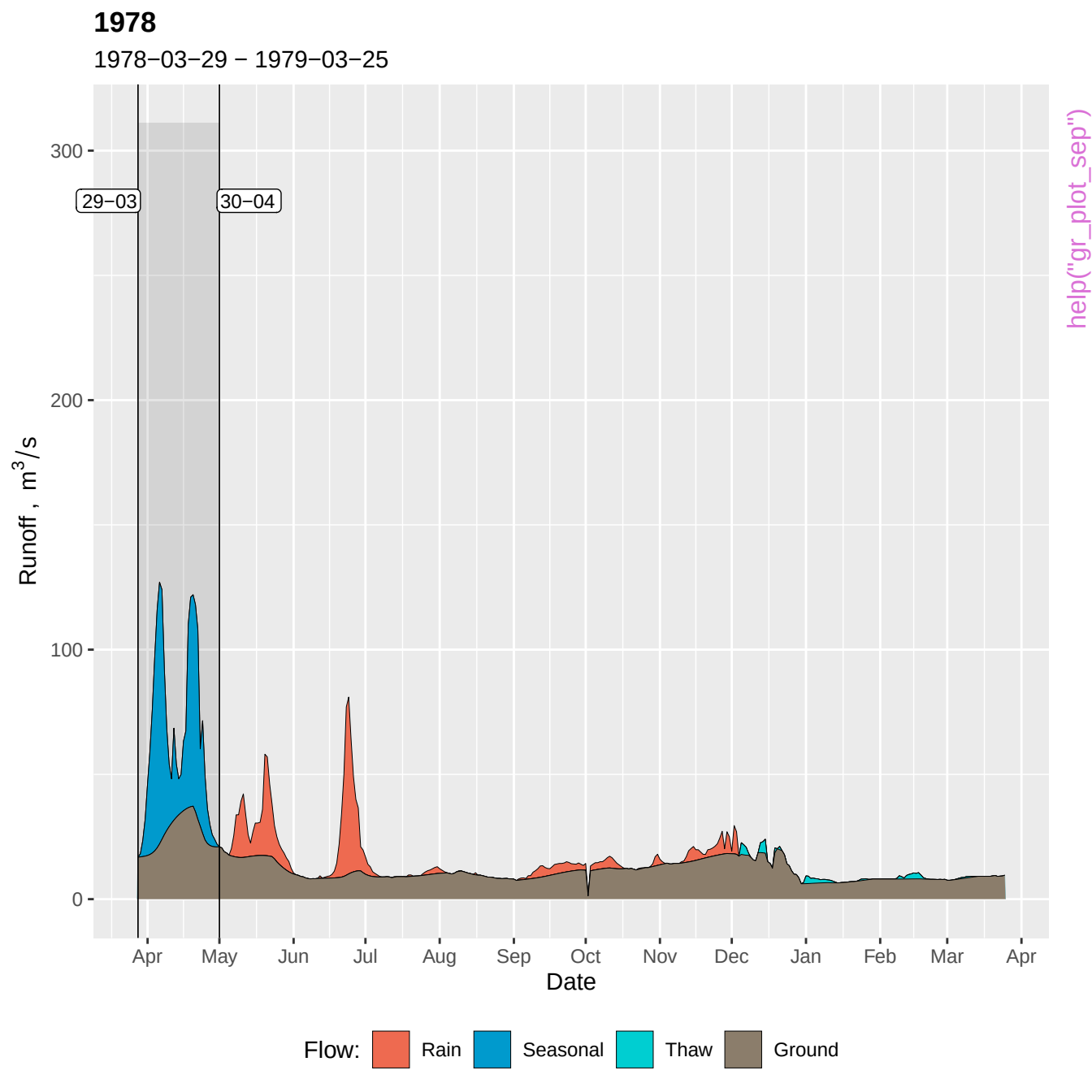
Spring flood runoff volume (with gr

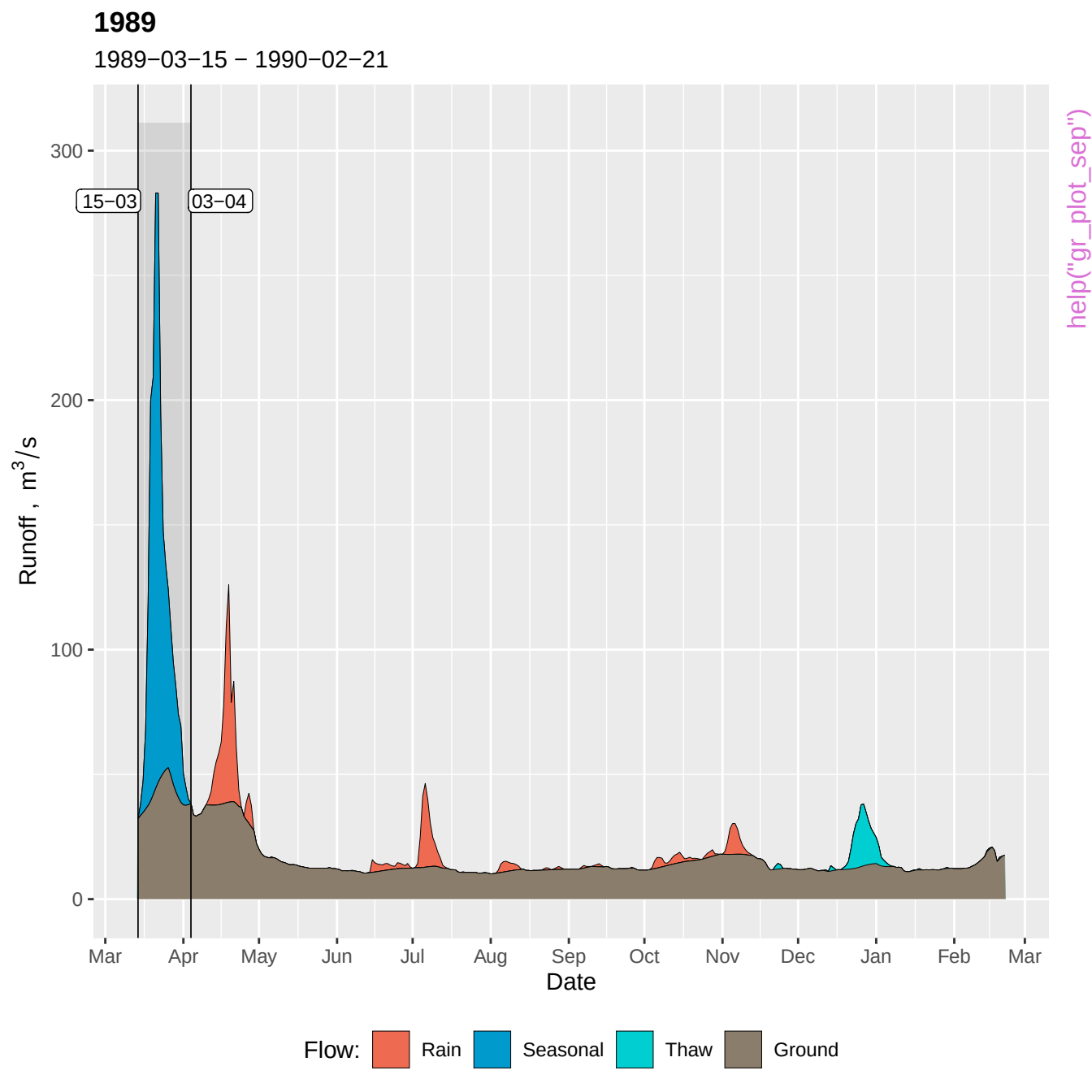
Student: t = 0.209, p = 0.84155, m1 = 0.0
Fisher: F = 1.124, p = 0.74904, cv1 = 0.5




Year
2012
2001
1989
1965
1960
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Date
help("gr_plot_ridge")

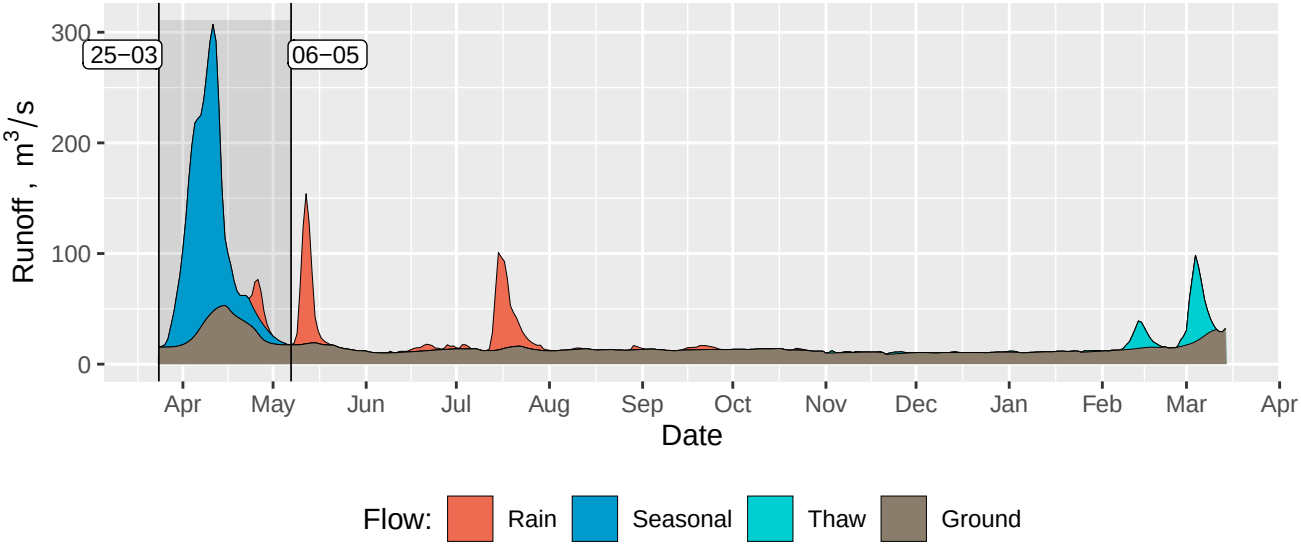

1978
1978−03−29 − 1979−03−25
29−03
30−04
250
200
150
100
50
0
Runoff , m3/s
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
Date
Flow:
Rain
Seasonal
Thaw
Ground
help("gr_plot_sep")


1978
1978−03−29 − 1979−03−25
29−03
30−04
300
200
100
0
Runoff , m3/s
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
Date
Flow:
Rain
Seasonal
Thaw
Ground
help("gr_plot_sep")


1989
1989−03−15 − 1990−02−21
15−03
03−04
300
200
100
0
Runoff , m3/s
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Date
Flow:
Rain
Seasonal
Thaw
Ground
help("gr_plot_sep")

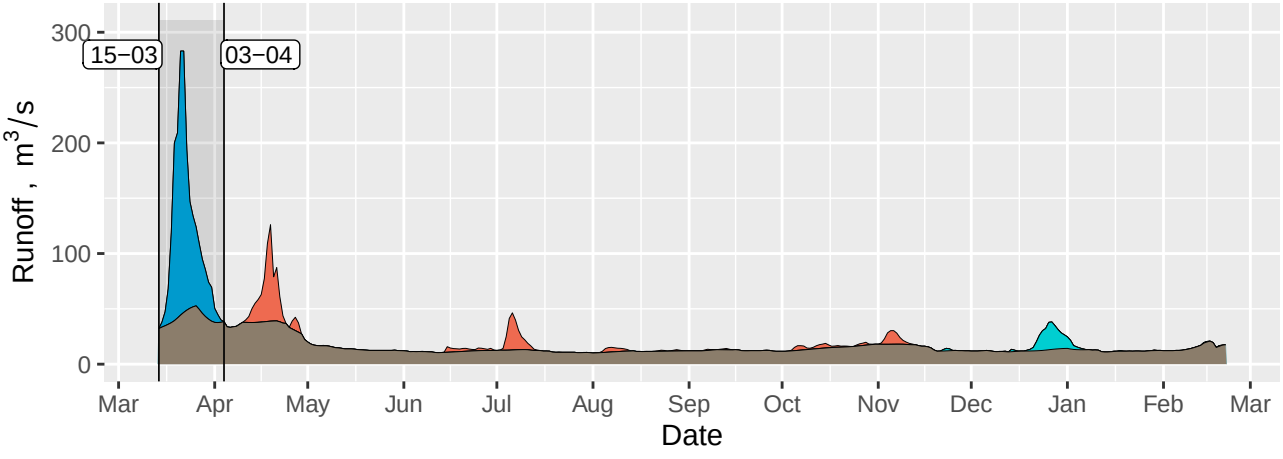
1988

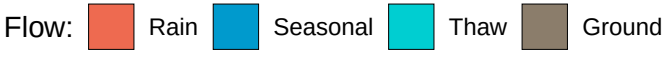
1988−03−25 − 1989−03−14

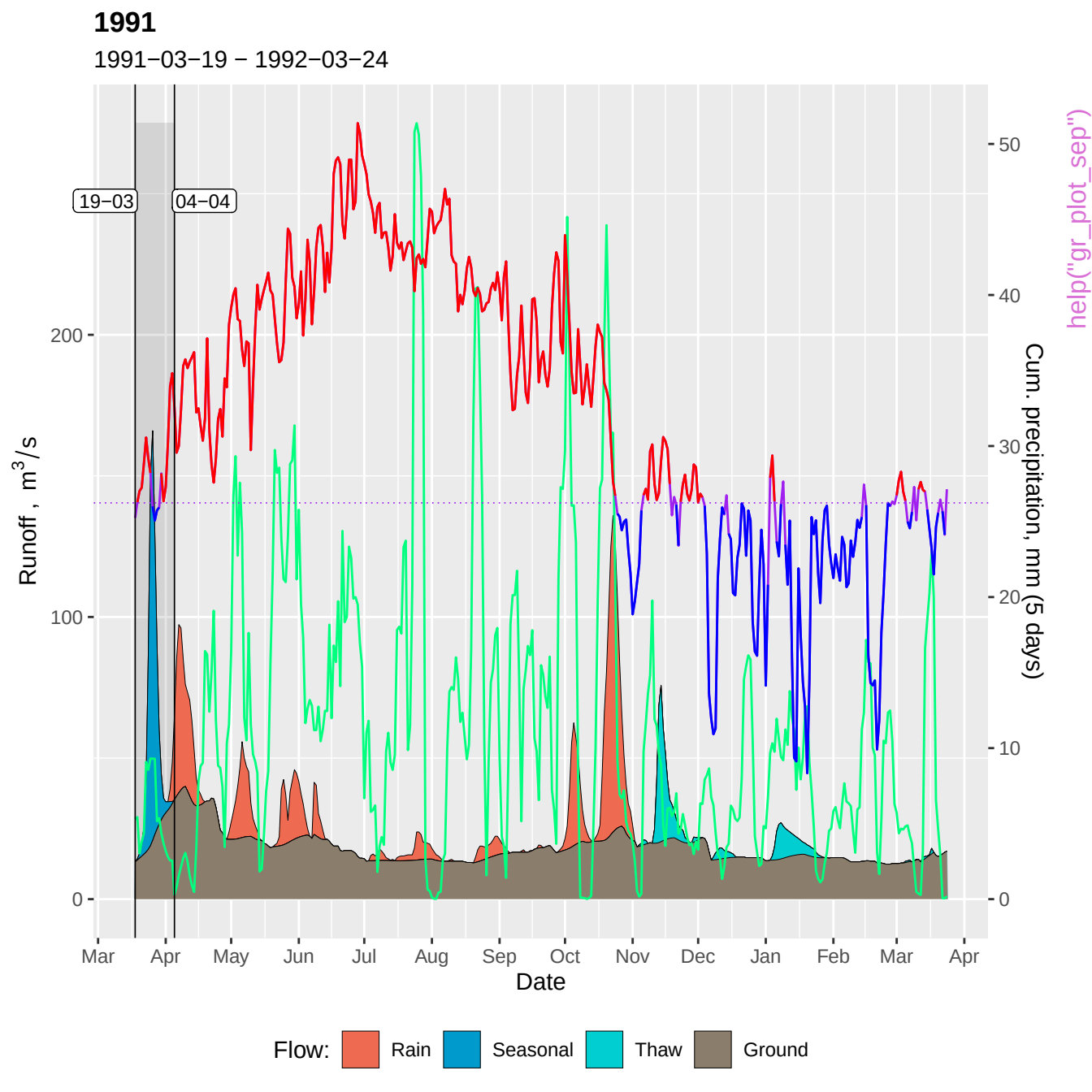


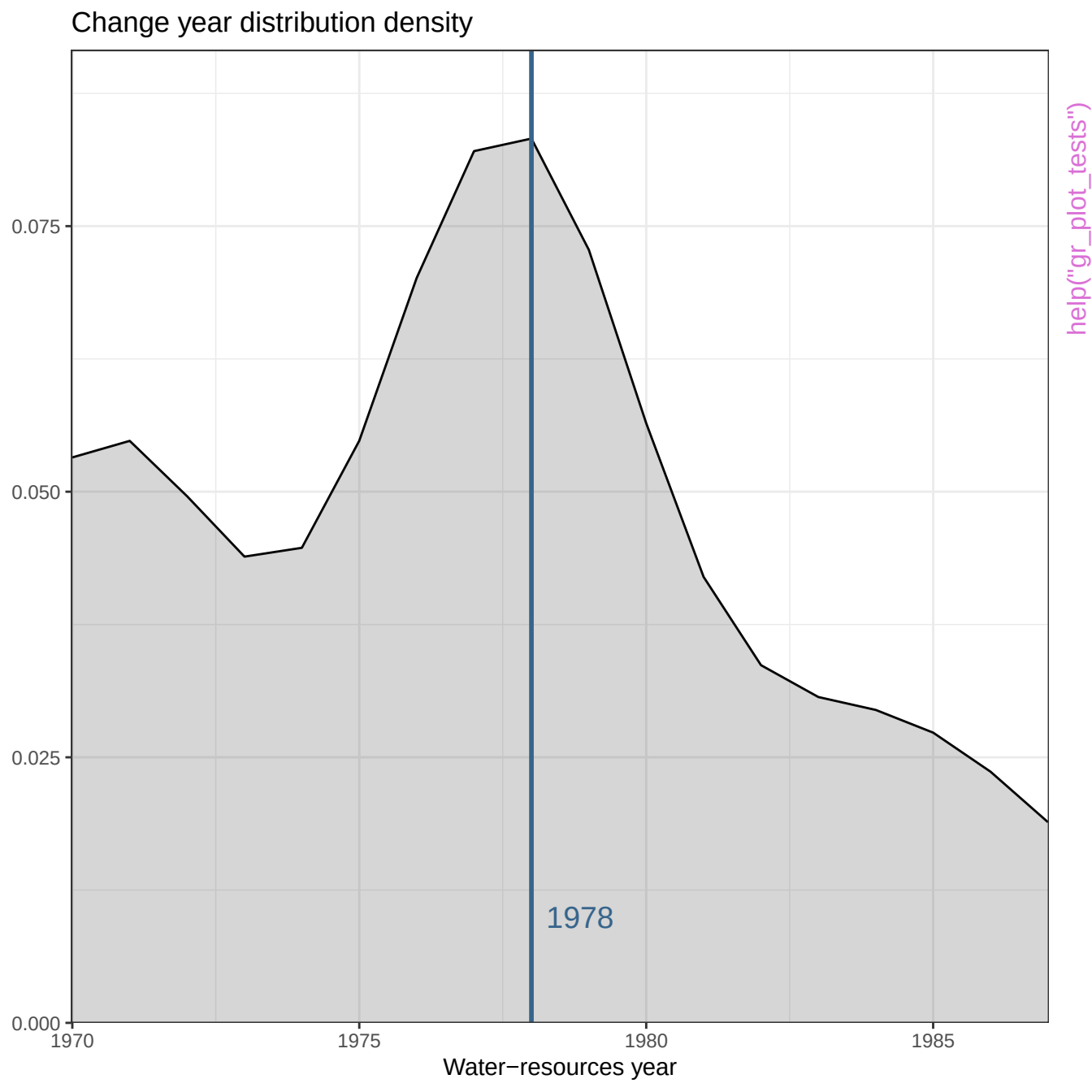
1989

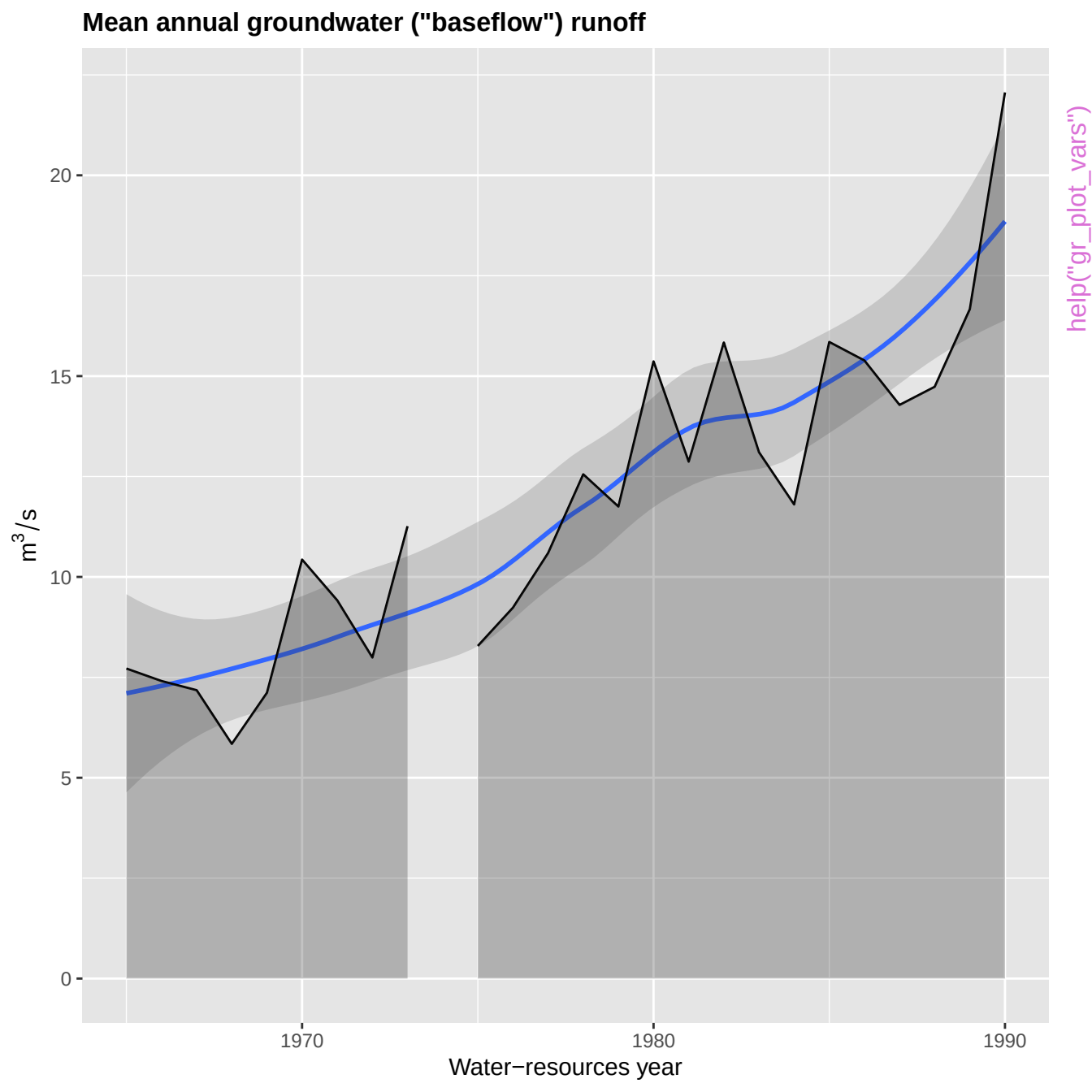
1989−03−15 − 1990−02−21

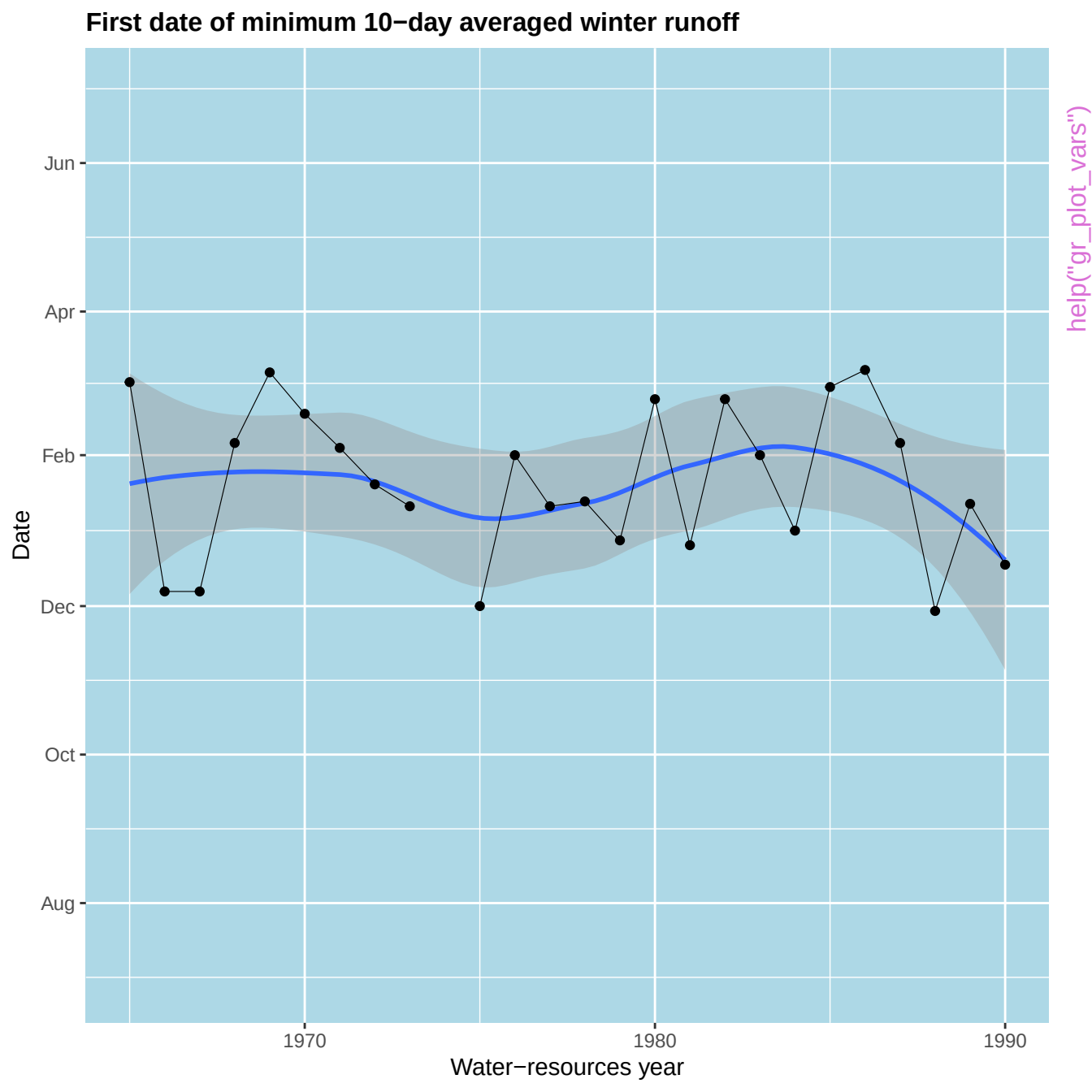





1991
1991−03−19 − 1992−03−24
19−03
04−04
Runoff , m3/s
Cum. precipitation, mm (5 days)
help("gr_plot_sep")
0
100
200
0
10
20
30
40
50
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
Date
Flow:
Rain
Seasonal
Thaw
Ground


Change year distribution density
0.075
0.050
0.025
0.000
1978
1970
1975
1980
1985
Water−resources year
help("gr_plot_tests")

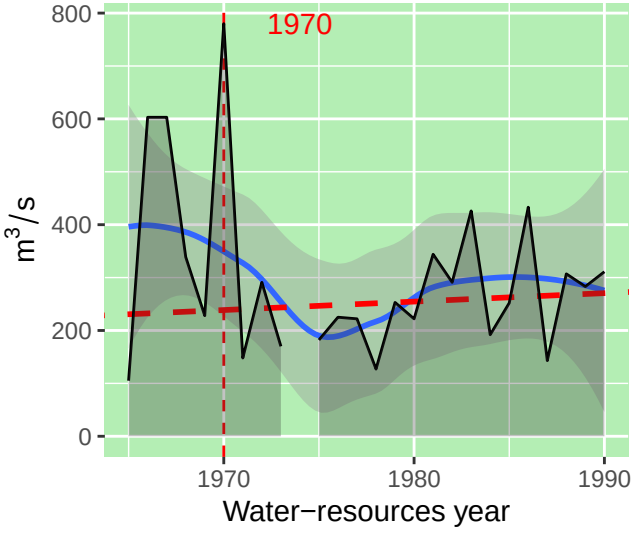

Mean annual groundwater ("baseflow") runoff
20
15
10
5
0
m3/s
1970
1980
1990
Water−resources year
help("gr_plot_vars")


First date of minimum 10−day averaged winter runoff
Jun
Apr
Feb
Dec
Oct
Aug
Date
1970
1980
1990
Water−resources year
help("gr_plot_vars")


Spring flood runoff volume (with groundwater and rain)
0.08
0.06
0.04
0.02
0.00
km3
1970
1980
1990
Water−resources year
help("gr_plot_vars")

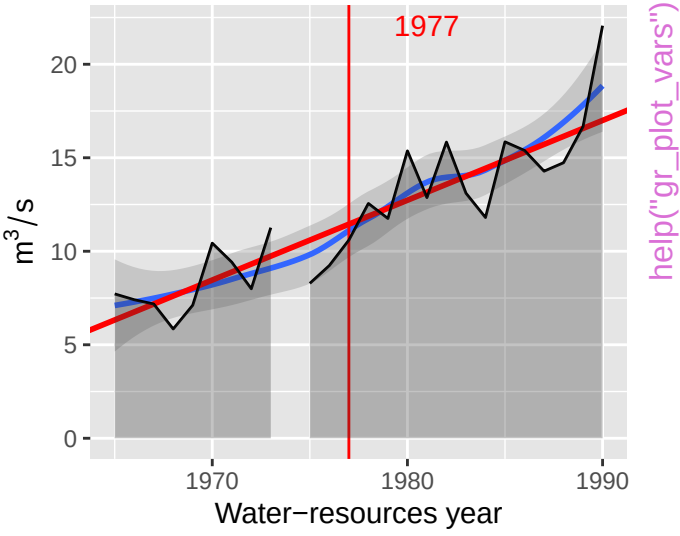
Maximum spring flood runoff

Mann−Kendall: z = 0.28, p = 0.7791
Theil−Sen: i = 1.59615, p = 0.41131. Petti



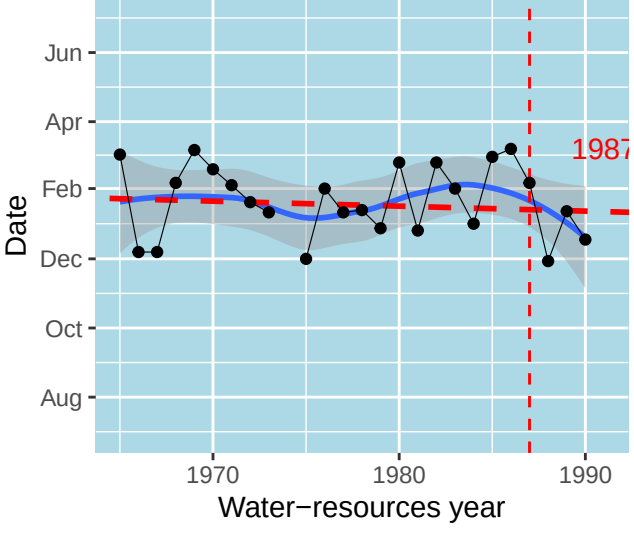
Mean annual groundwater ("baseflow")

Mann−Kendall: z = 5.208, p = 0
Theil−Sen: i = 0.42685, p = 0. Pettitt: U* = 156



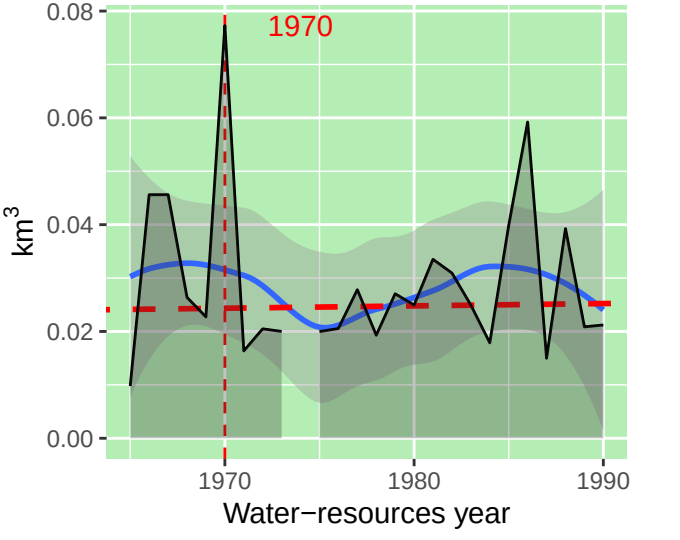
First date of minimum 10−day avera

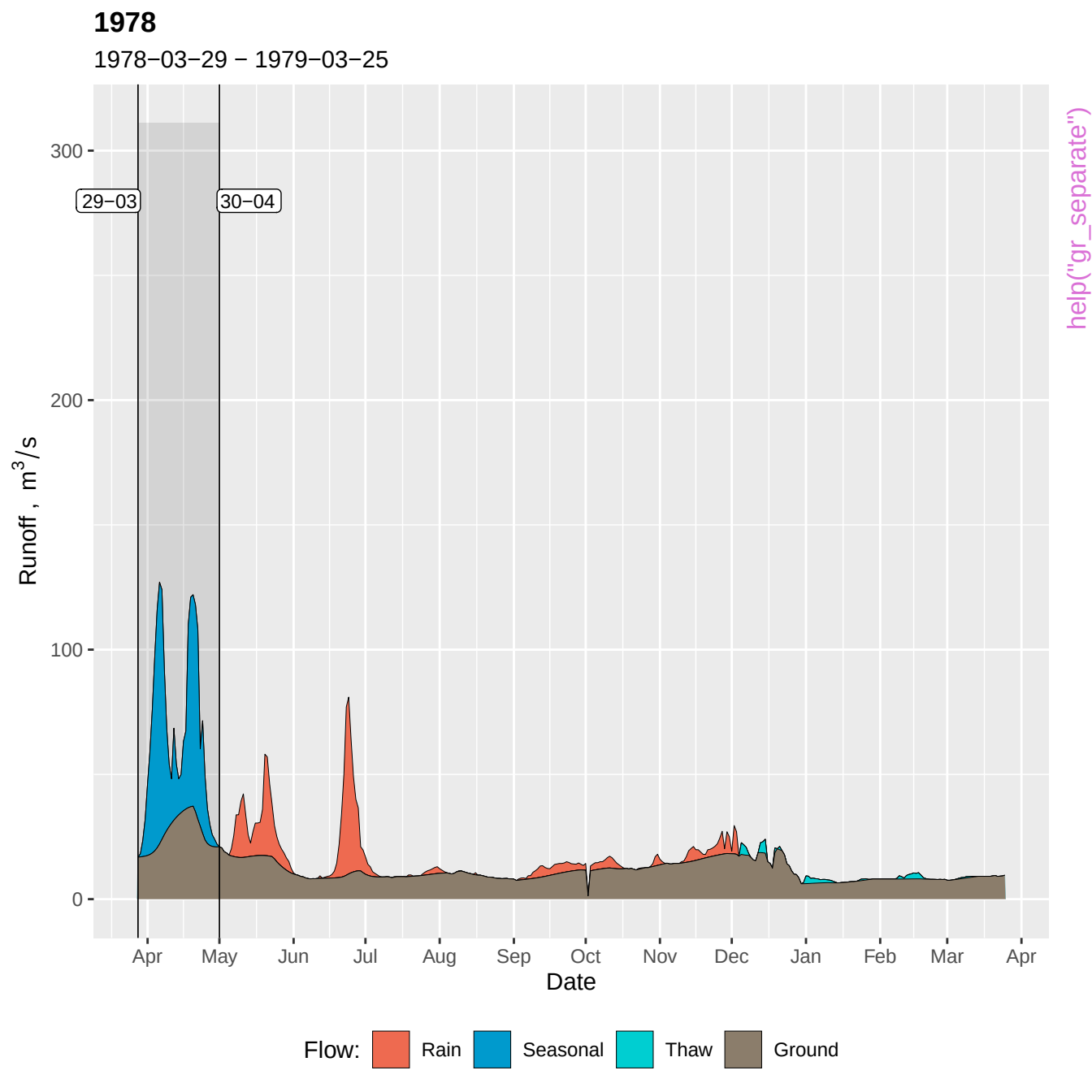
Mann−Kendall: z = −0.515, p = 0.60689
Theil−Sen: i = −0.43922, p = 0.23257. Pett

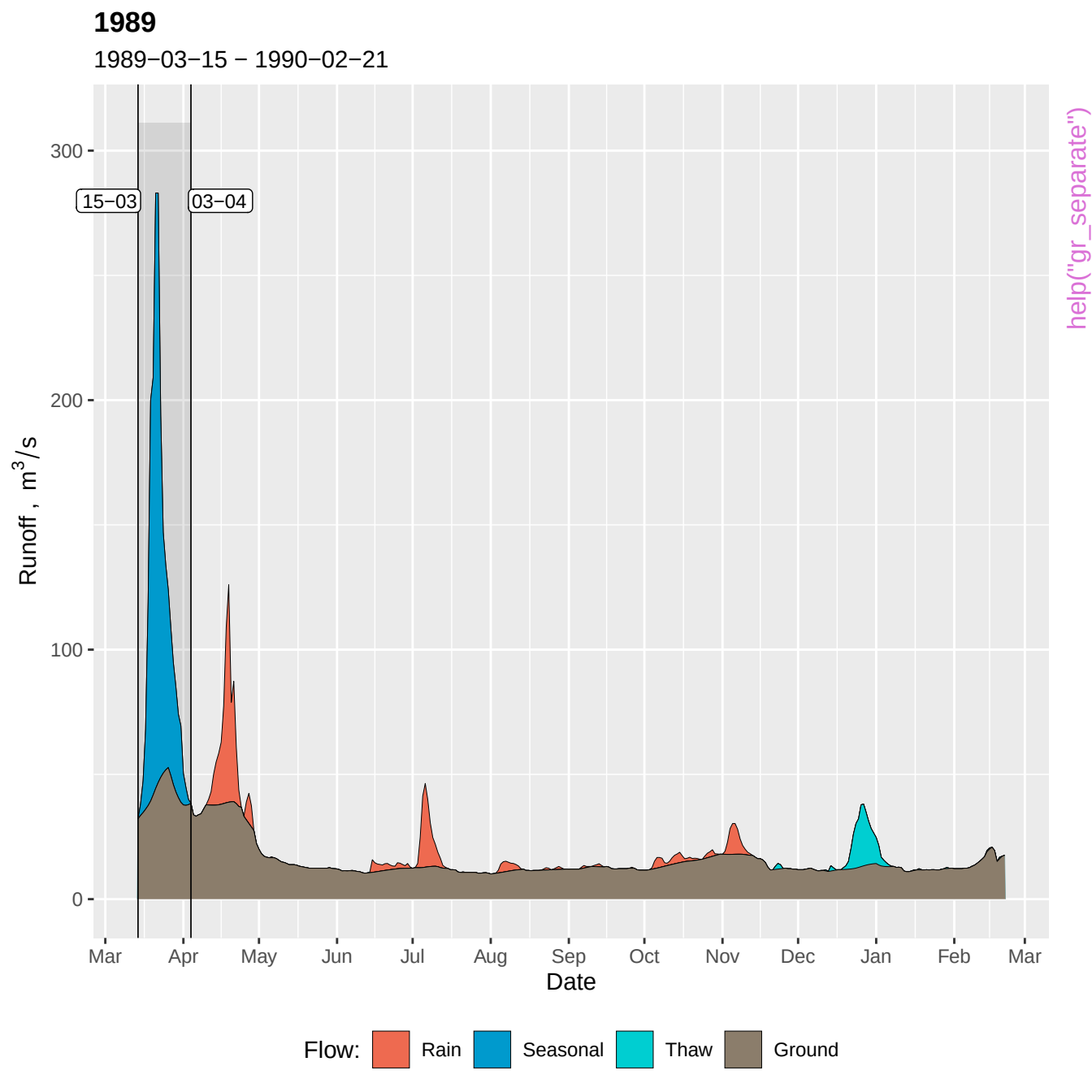


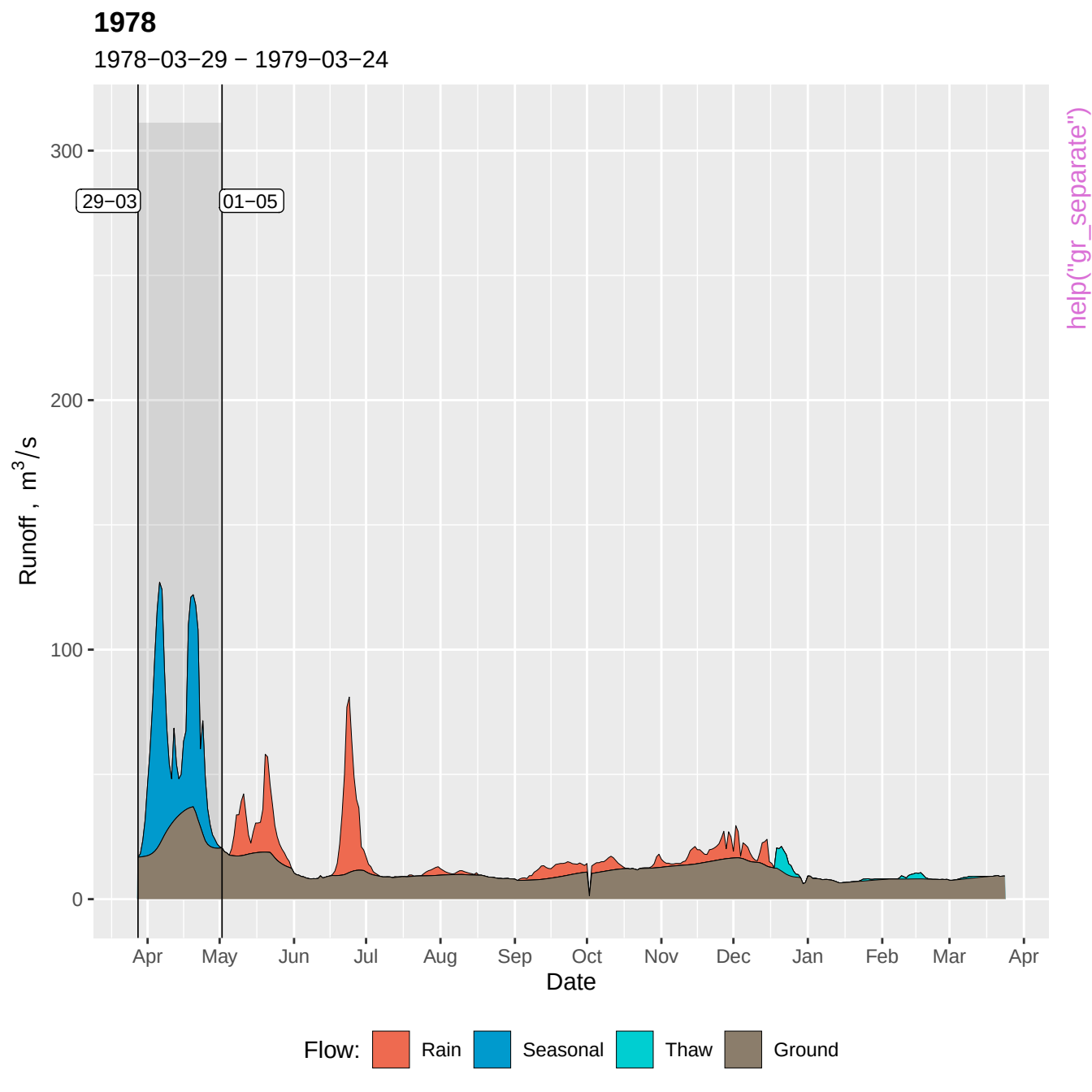
Spring flood runoff volume (with grou

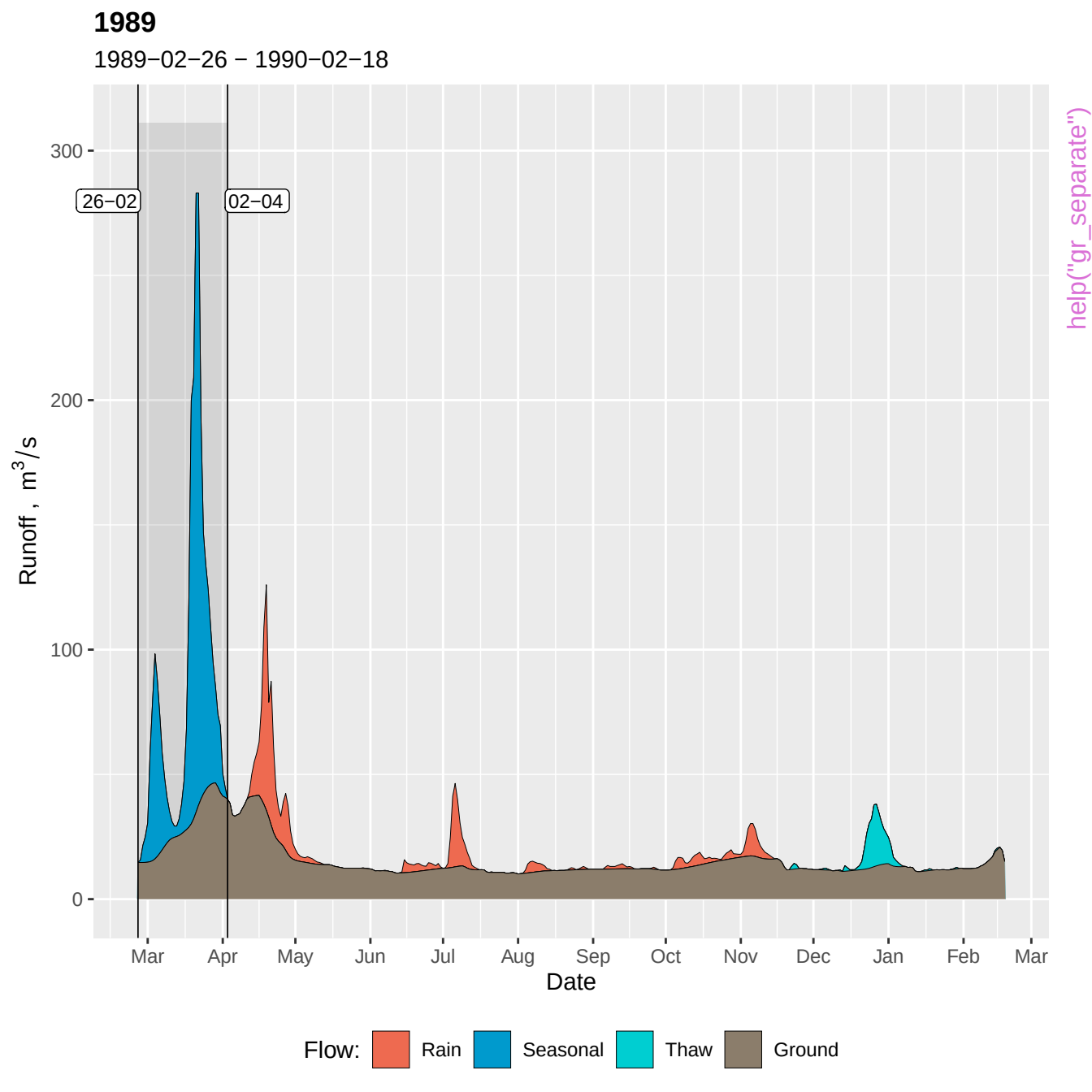
Mann−Kendall: z = 0.21, p = 0.83347
Theil−Sen: i = 4e−05, p = 0.72475. Pettitt: U

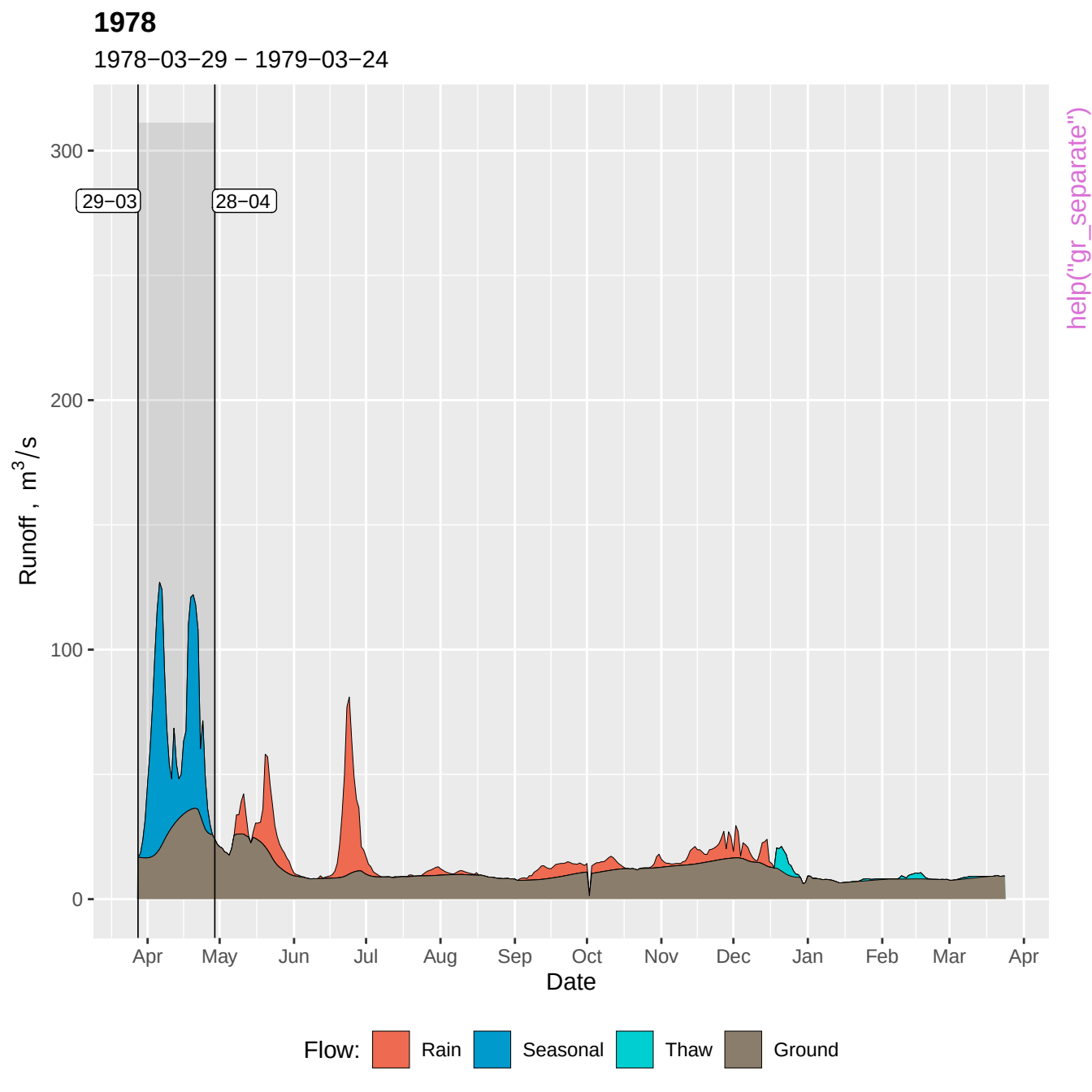


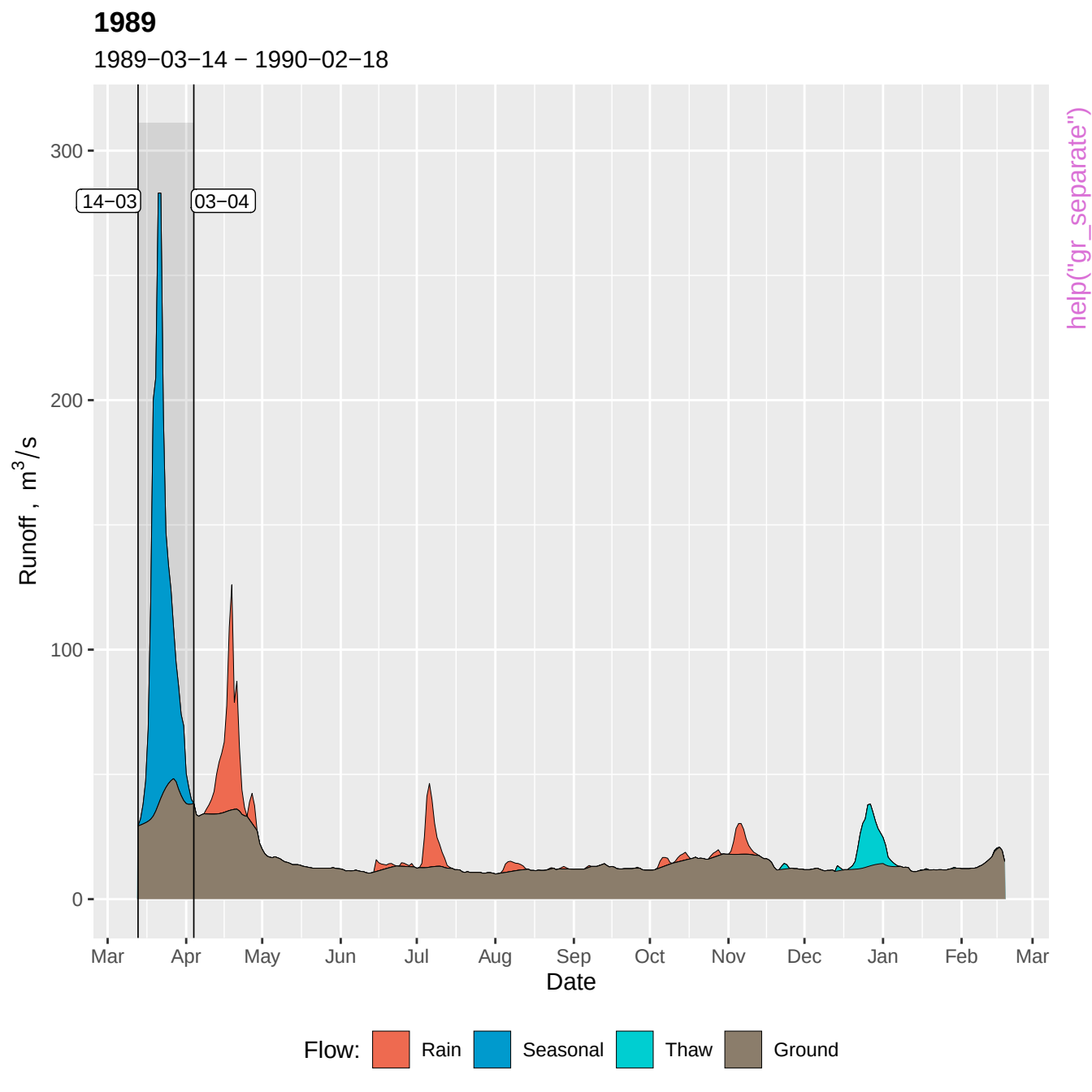

1978
1978−03−29 − 1979−03−25
29−03
30−04
300
200
100
0
Runoff , m3/s
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
Date
Flow:
Rain
Seasonal
Thaw
Ground
help("gr_separate")

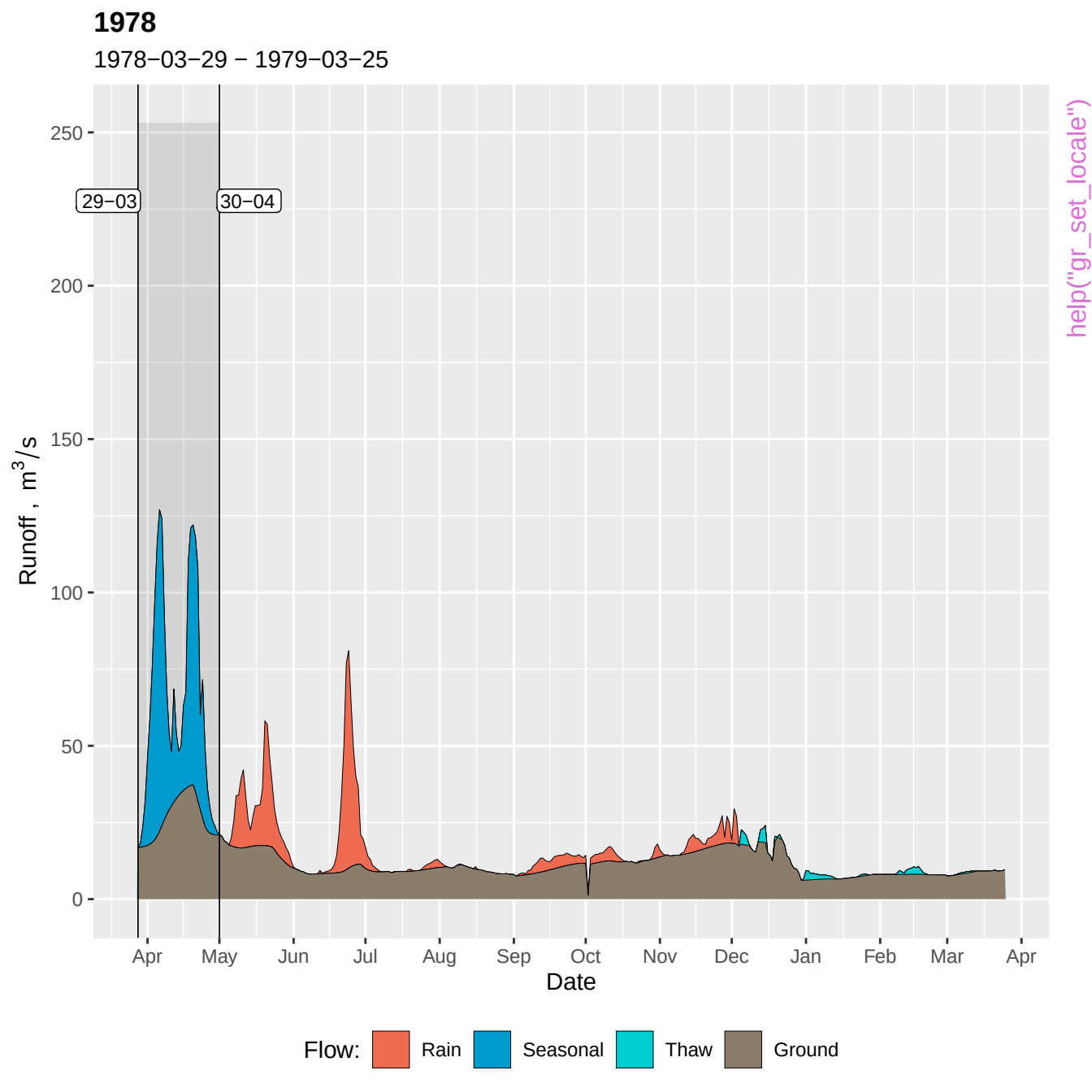

1989
1989−03−15 − 1990−02−21
15−03
03−04
300
200
100
0
Runoff , m3/s
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Date
Flow:
Rain
Seasonal
Thaw
Ground
help("gr_separate")

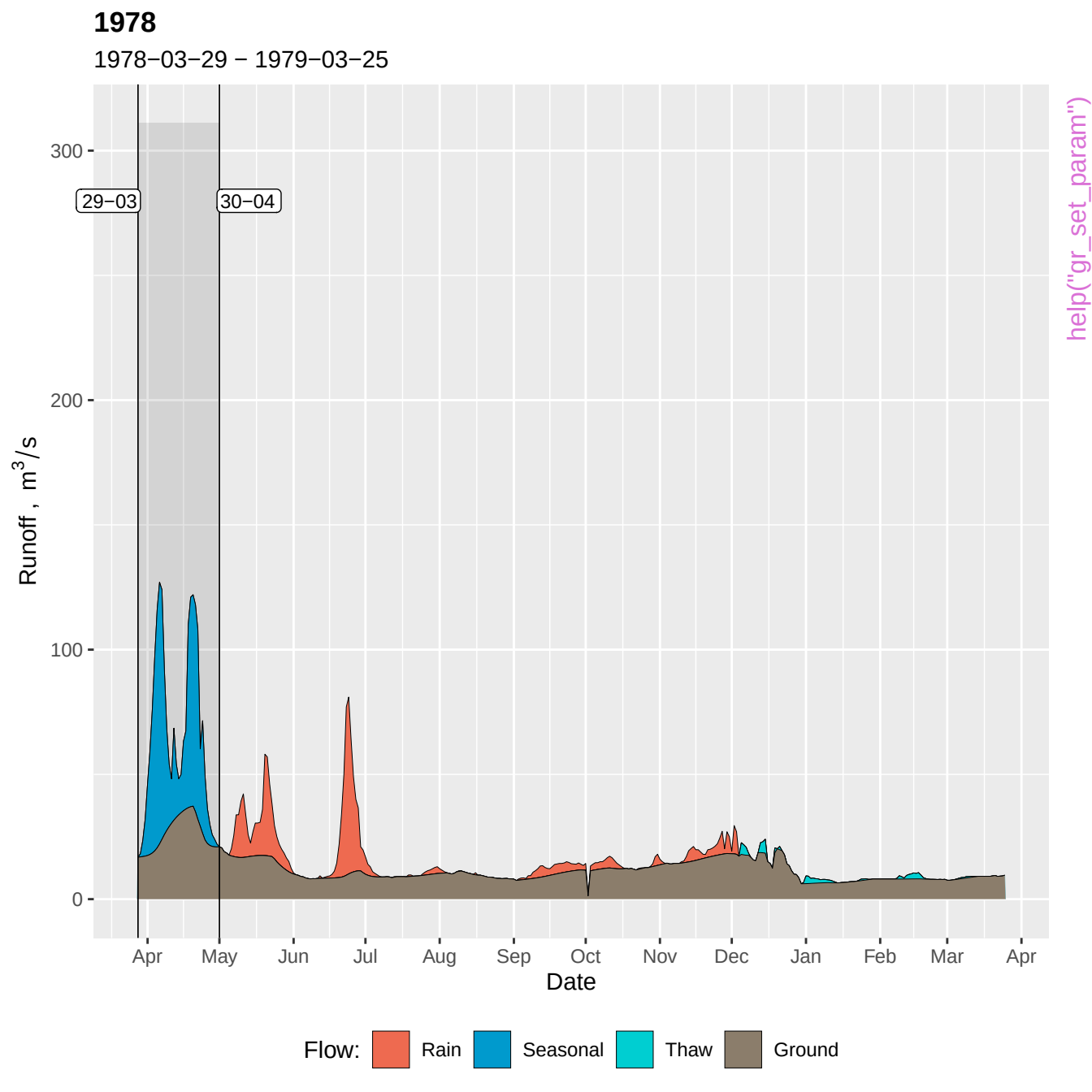

1978
1978−03−29 − 1979−03−24
29−03
01−05
300
200
100
0
Runoff , m3/s
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
Date
Flow:
Rain
Seasonal
Thaw
Ground
help("gr_separate")

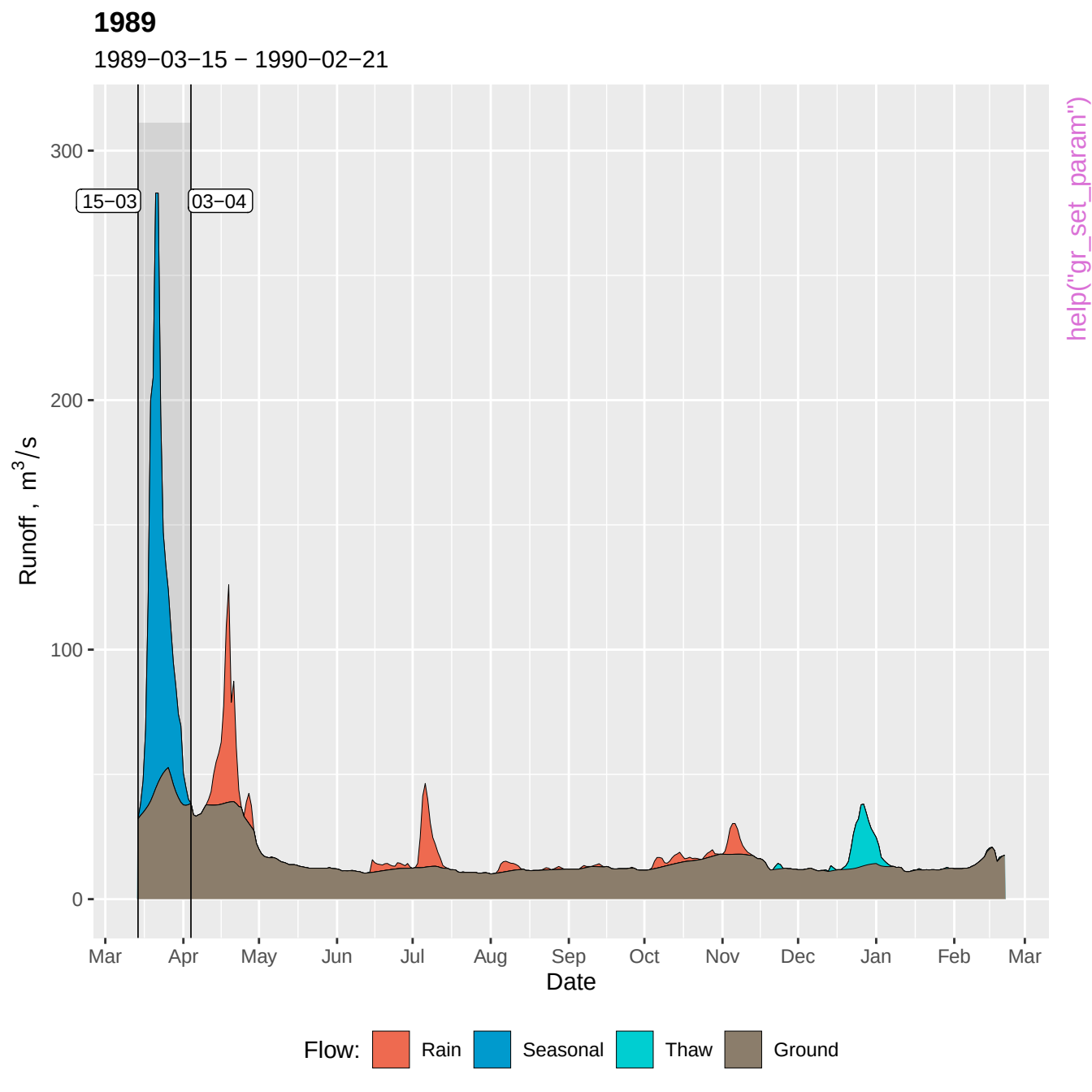

1989
1989−02−26 − 1990−02−18
26−02
02−04
300
200
100
0
Runoff , m3/s
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Date
help("gr_separate")
Flow:
Rain
Seasonal
Thaw
Ground

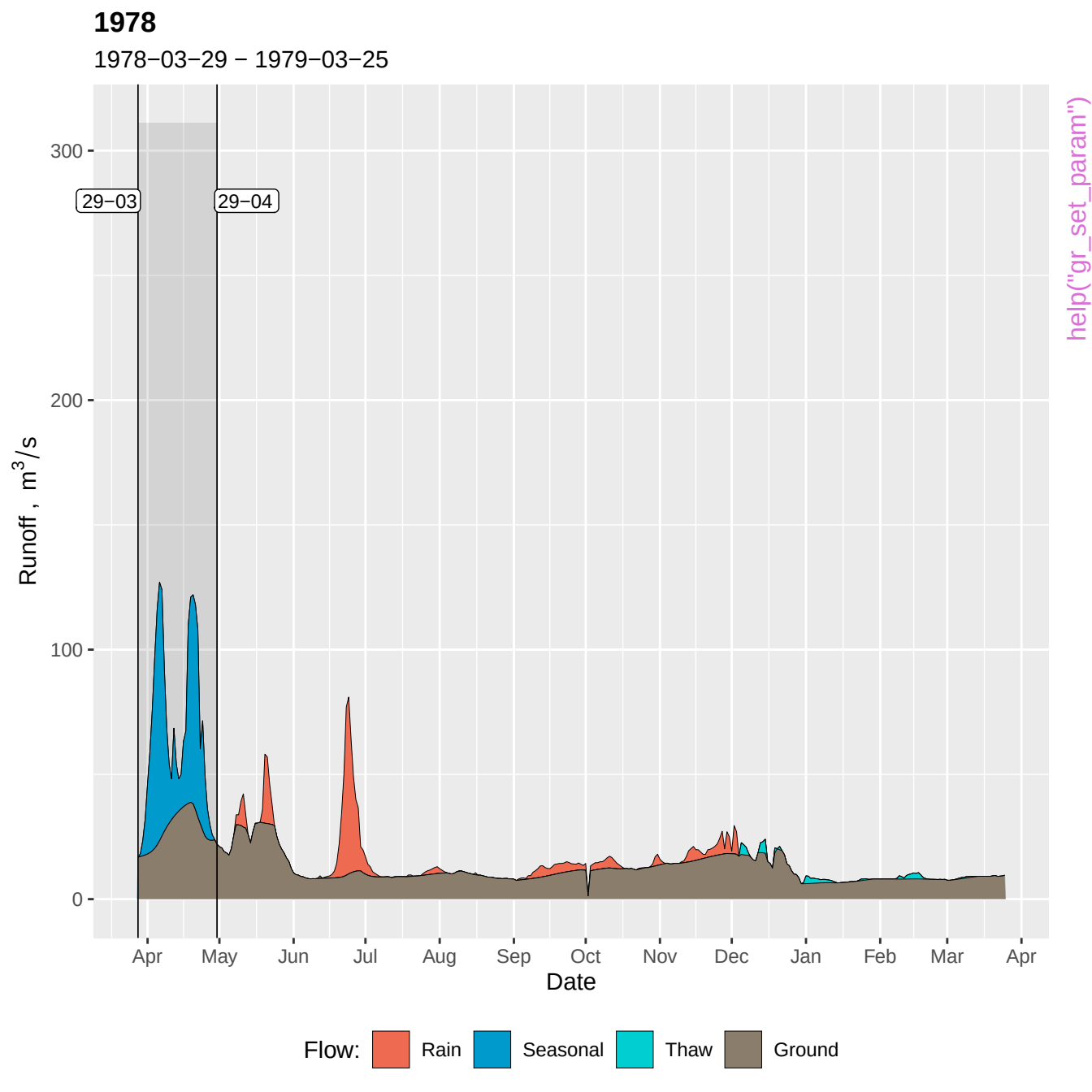

1978
1978−03−29 − 1979−03−24
29−03
28−04
300
200
100
0
Runoff , m3/s
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
Date
Flow:
Rain
Seasonal
Thaw
Ground
help("gr_separate")

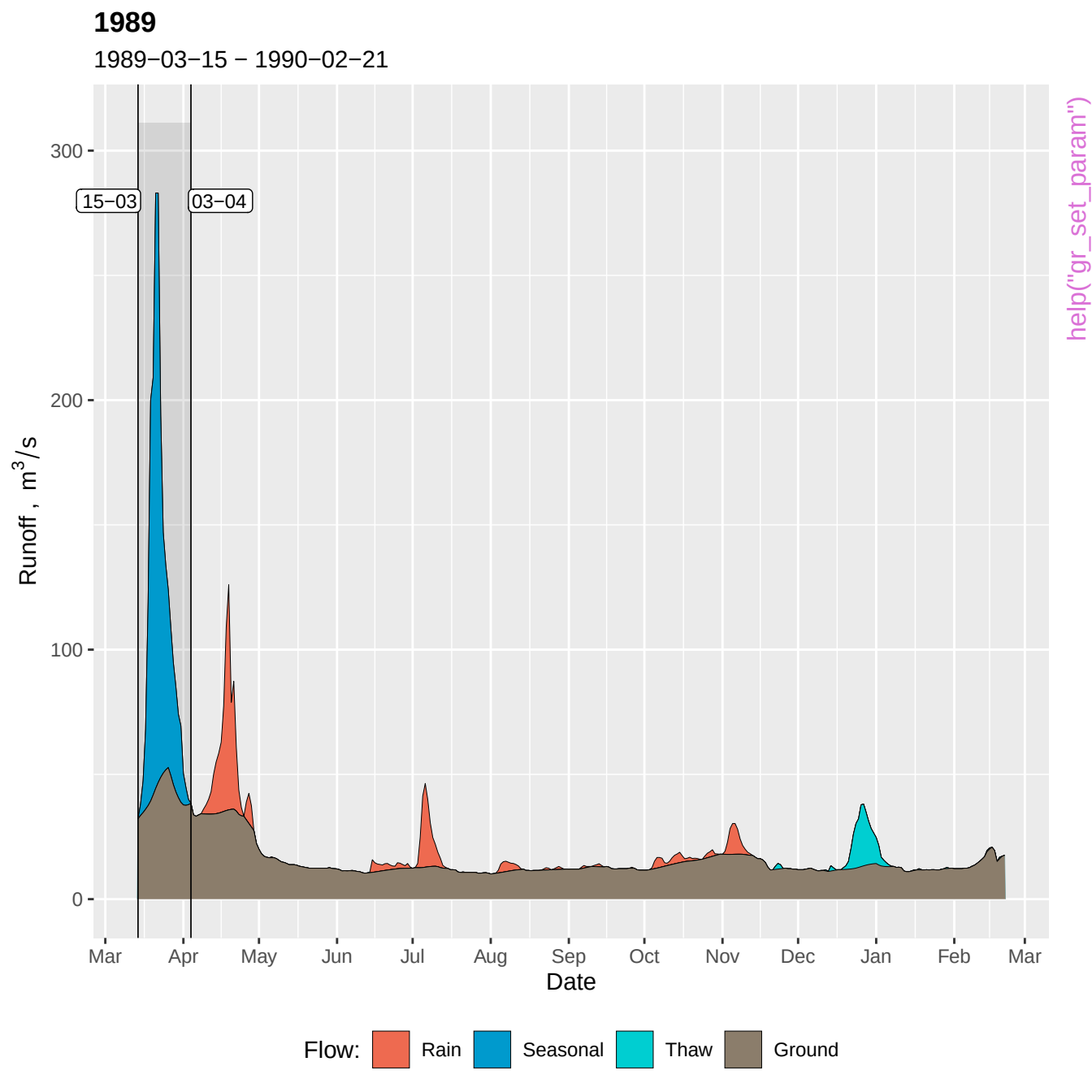

1989
1989−03−14 − 1990−02−18
14−03
03−04
300
200
100
0
Runoff , m3/s
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Date
help("gr_separate")
Flow:
Rain
Seasonal
Thaw
Ground


1978
1978−03−29 − 1979−03−25
29−03
30−04
250
200
150
100
50
0
Runoff , m3/s
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
Date
Flow:
Rain
Seasonal
Thaw
Ground
help("gr_set_locale")


1978
1978−03−29 − 1979−03−25
29−03
30−04
300
200
100
0
Runoff , m3/s
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
Date
Flow:
Rain
Seasonal
Thaw
Ground
help("gr_set_param")

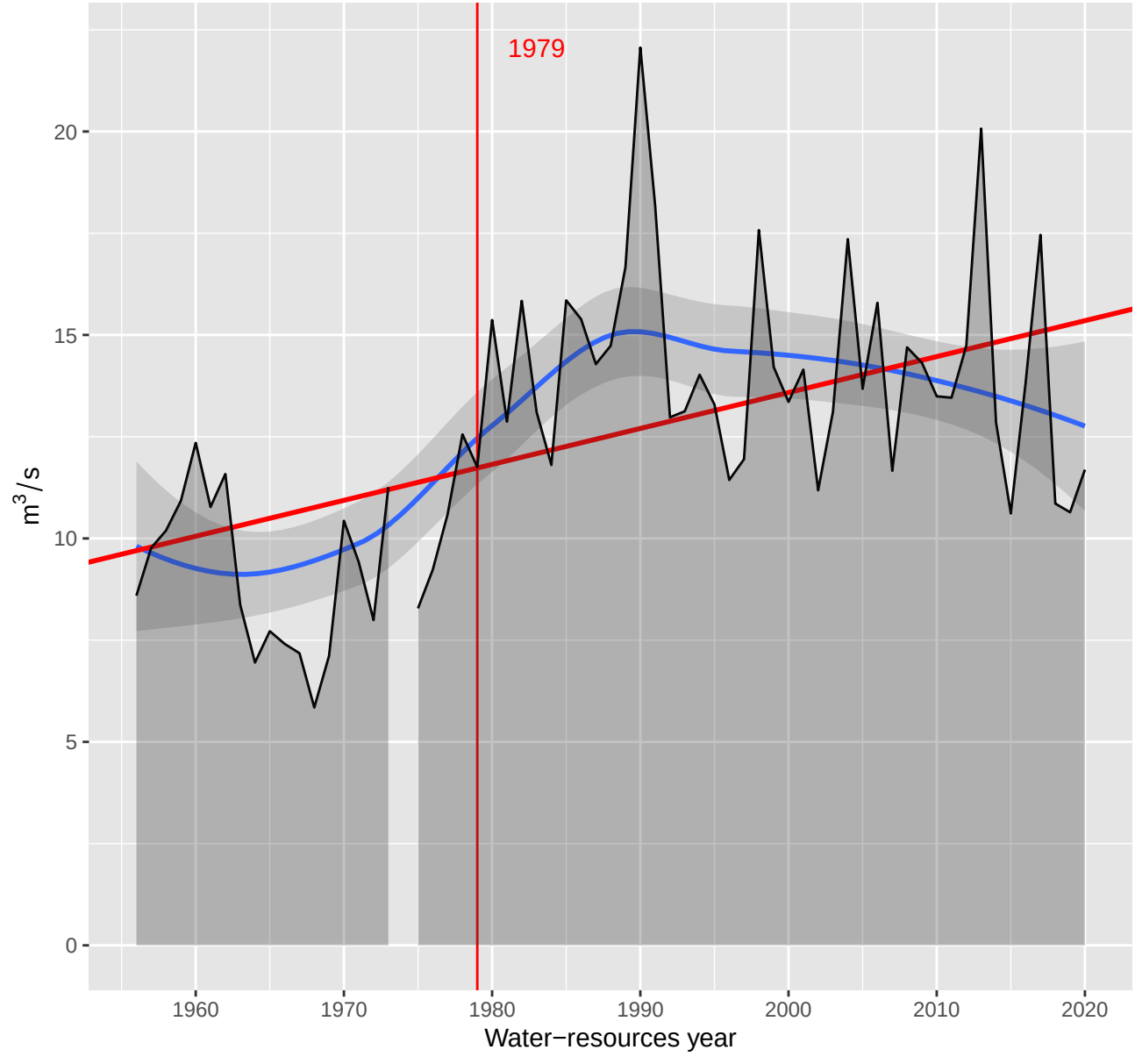

1989
1989−03−15 − 1990−02−21
15−03
03−04
300
200
100
0
Runoff , m3/s
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Date
Flow:
Rain
Seasonal
Thaw
Ground
help("gr_set_param")


1978
1978−03−29 − 1979−03−25
29−03
29−04
300
200
100
0
Runoff , m3/s
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
Date
Flow:
Rain
Seasonal
Thaw
Ground
help("gr_set_param")


1989
1989−03−15 − 1990−02−21
15−03
03−04
300
200
100
0
Runoff , m3/s
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Date
Flow:
Rain
Seasonal
Thaw
Ground
help("gr_set_param")

Mean annual groundwater ("baseflow") runoff

Mann−Kendall: z = 4.339, p = 1e−05
Theil−Sen: i = 0.0883, p = 0. Pettitt: U* = 865, p = 0



help("gr_summarize")