

KGE for calibrations

Parameters

Outlet results

Ensembles

Catchment results

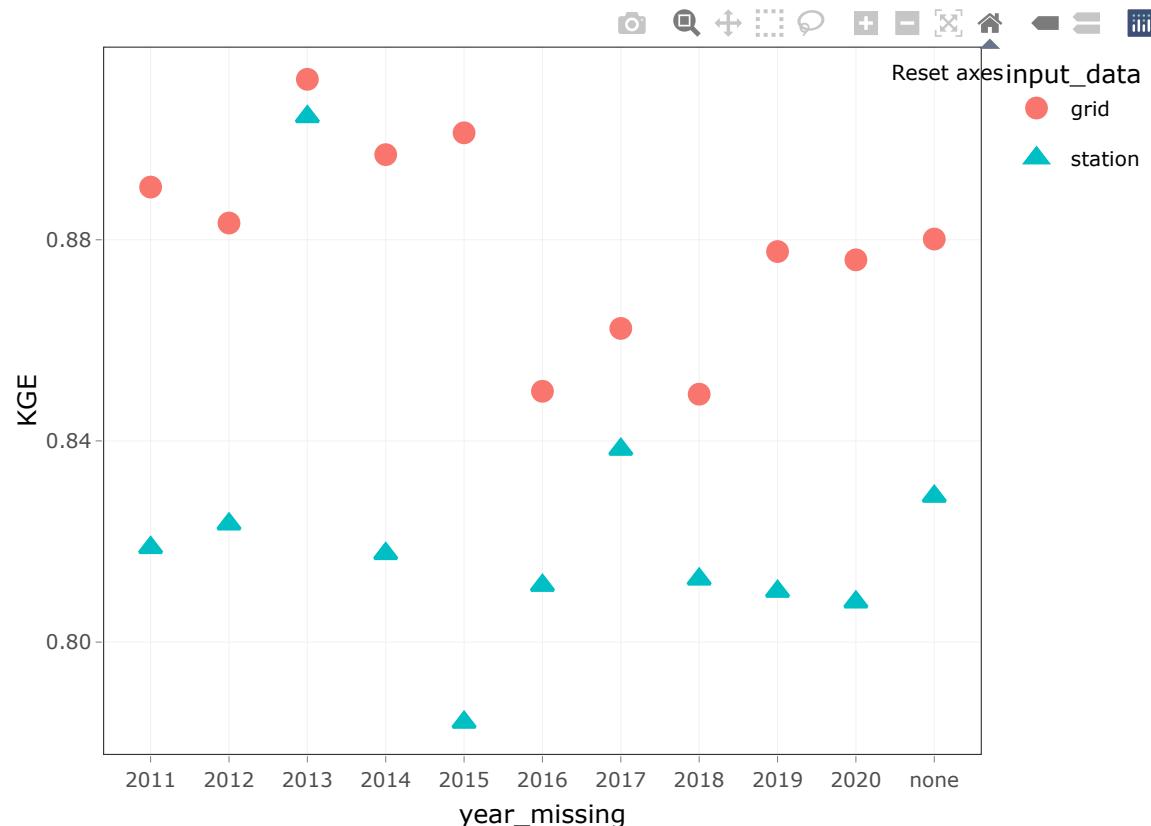
HRU results

Fourmile Calibrations

Megan Sears

2023-02-07

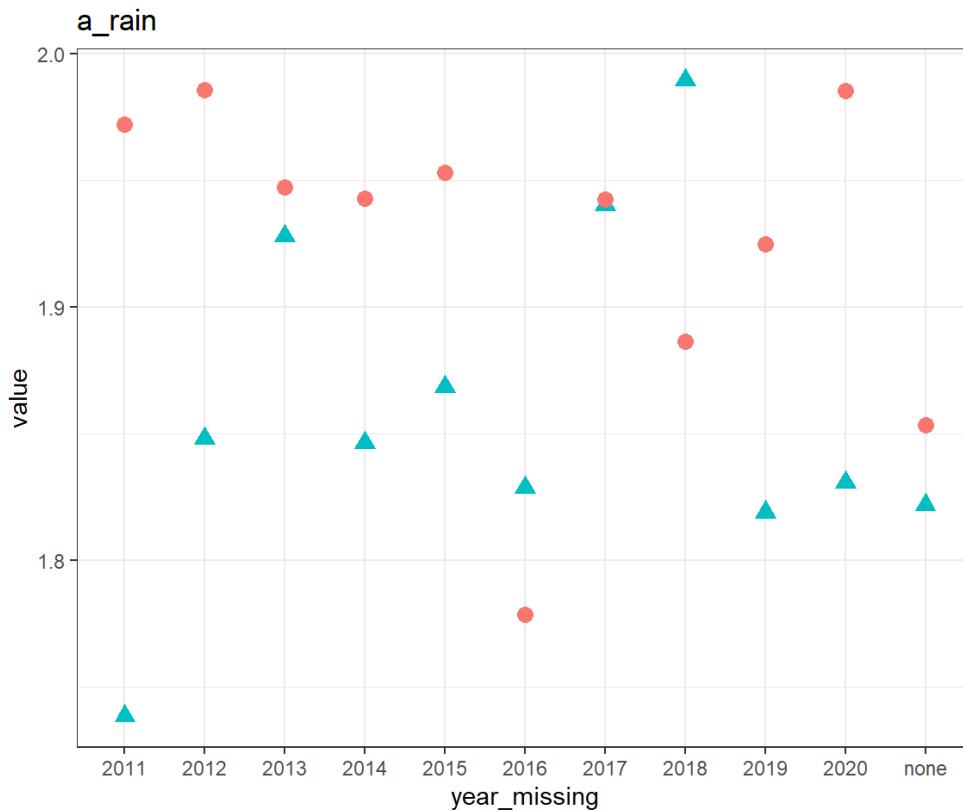
KGE for calibrations



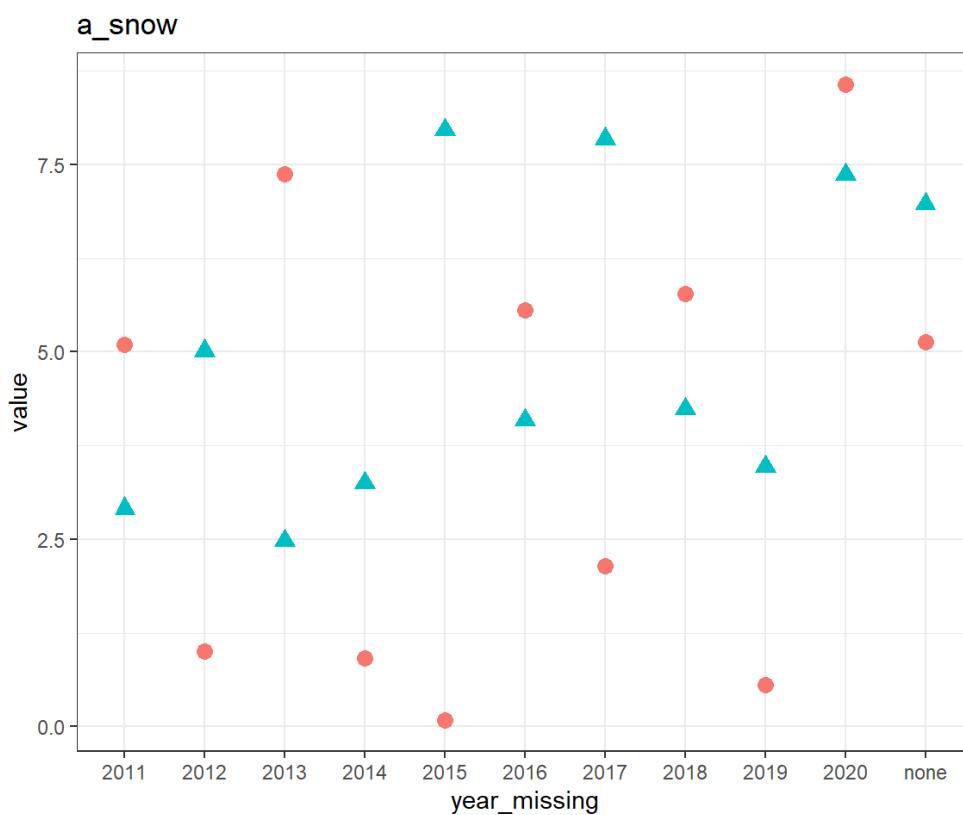
Parameters

Scatter plots

```
## [[1]]
```

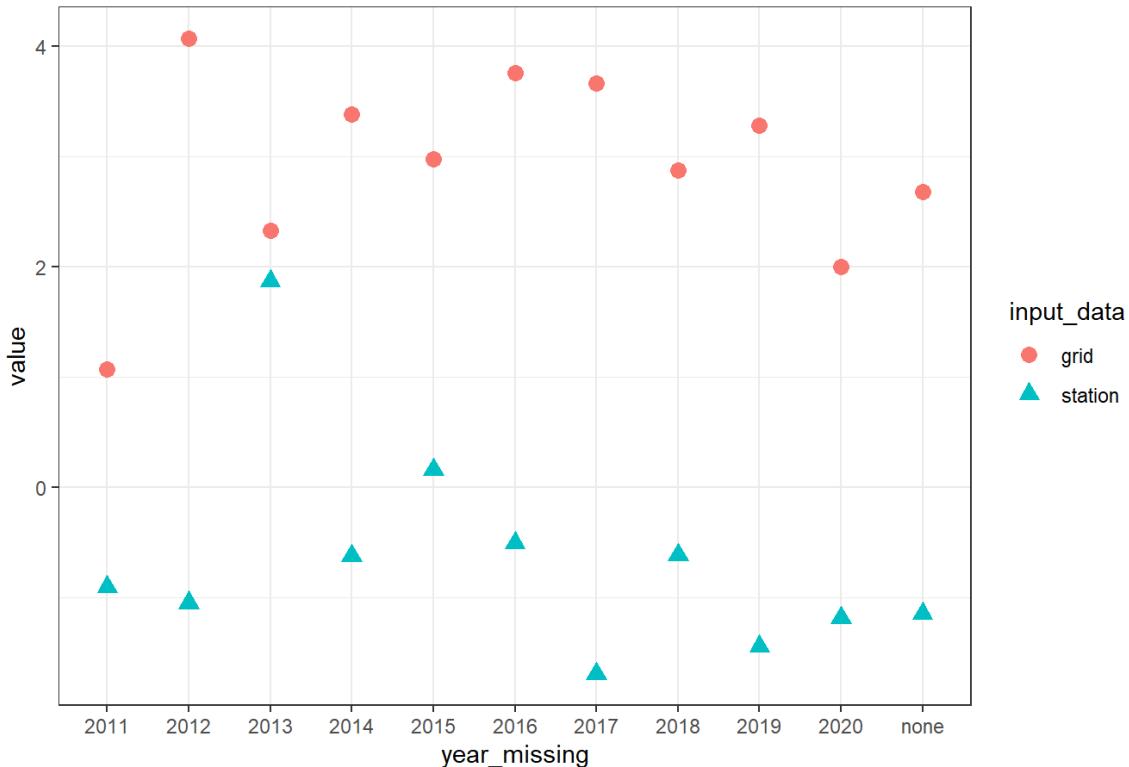


```
##  
## [[2]]
```



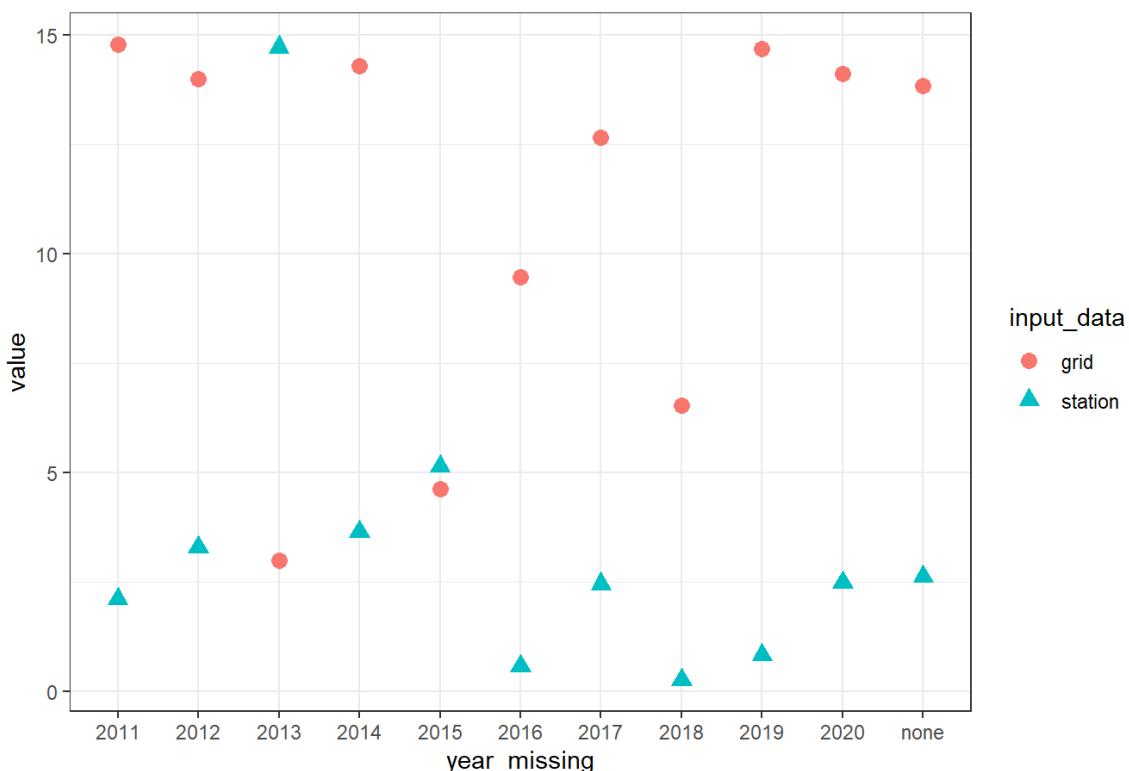
```
##  
## [[3]]
```

baseTemp

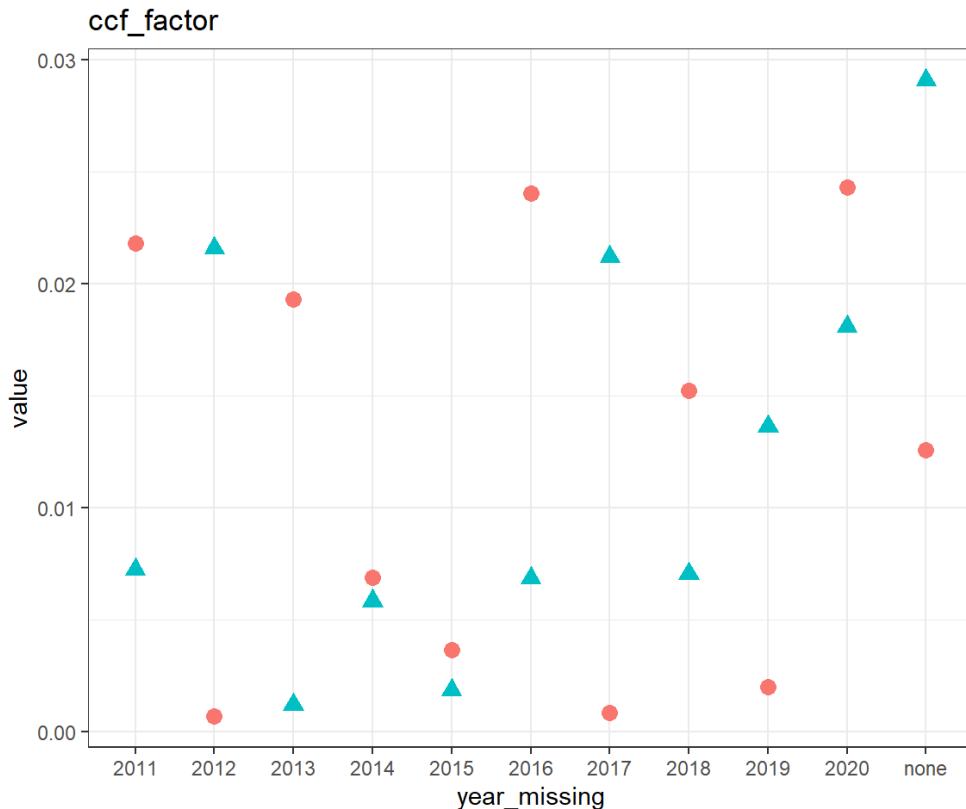


```
##  
## [[4]]
```

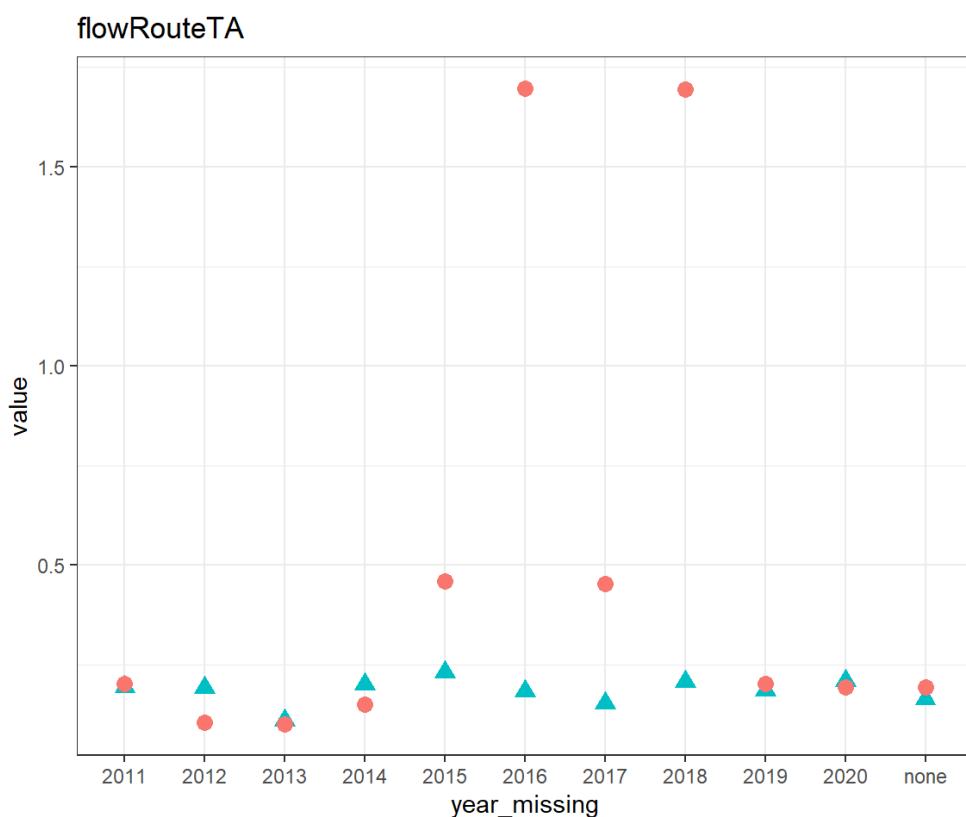
BetaW



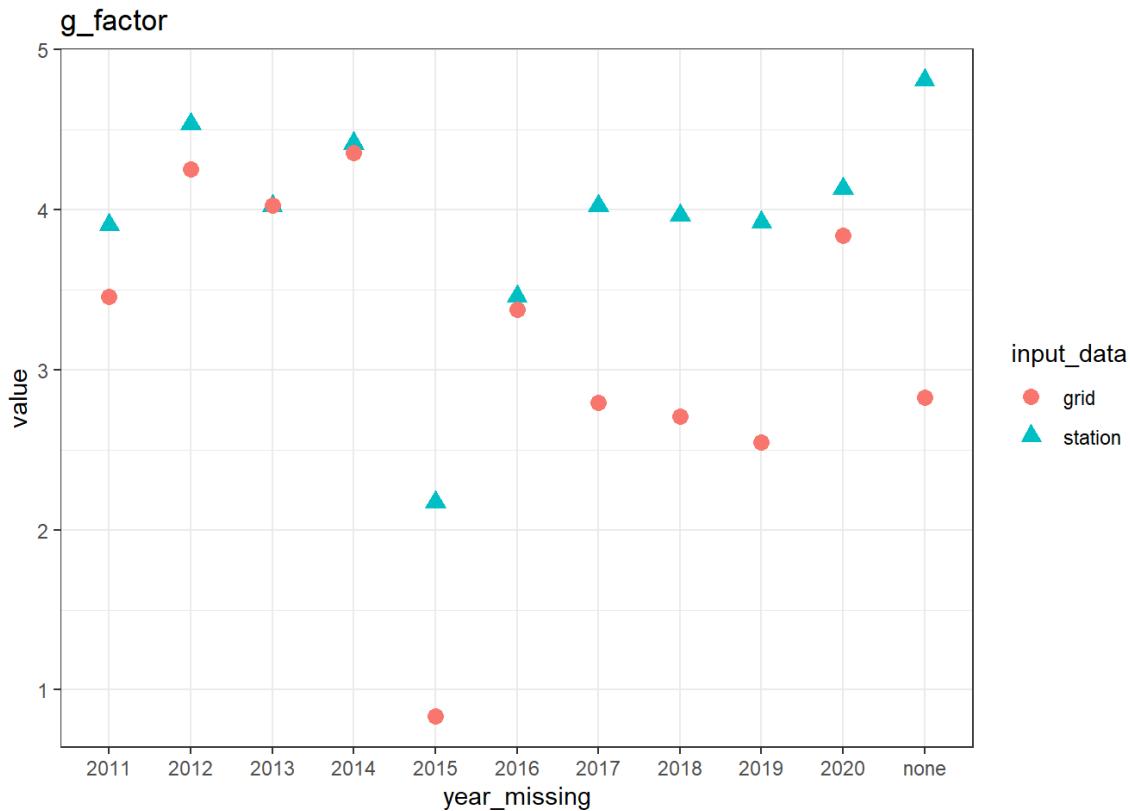
```
##  
## [[5]]
```



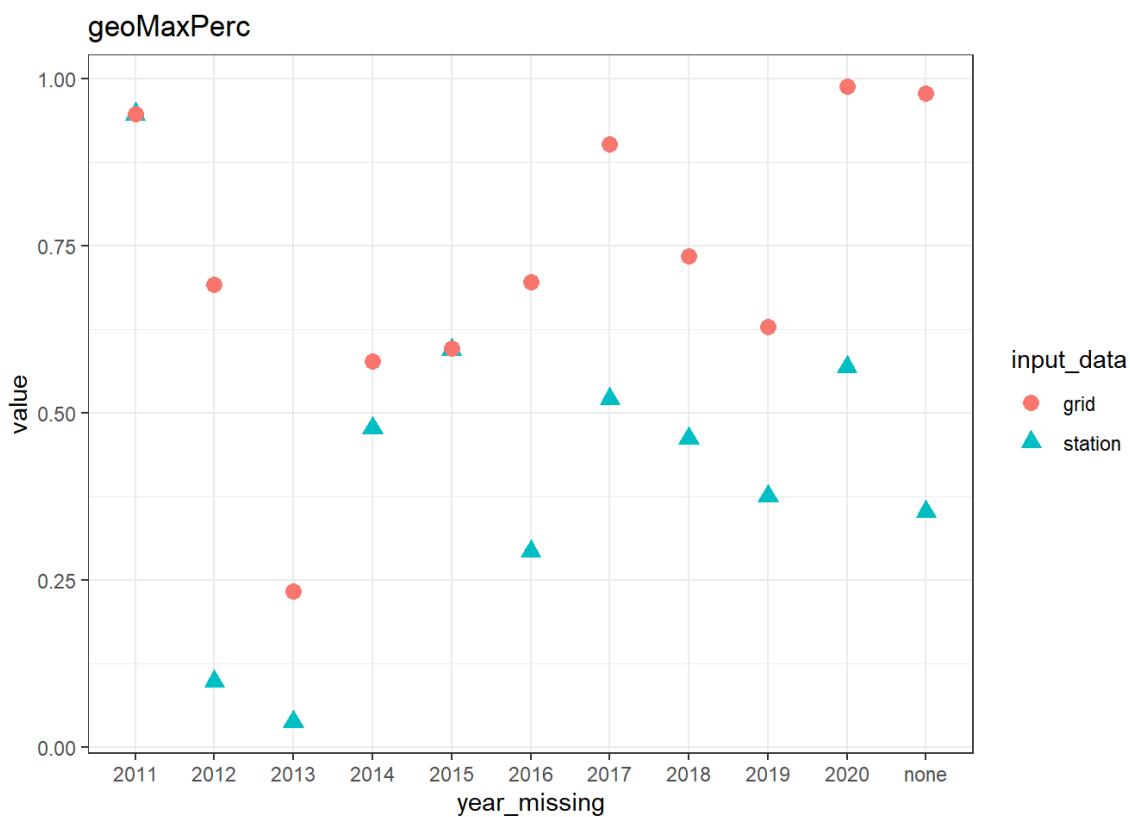
```
##  
## [[6]]
```



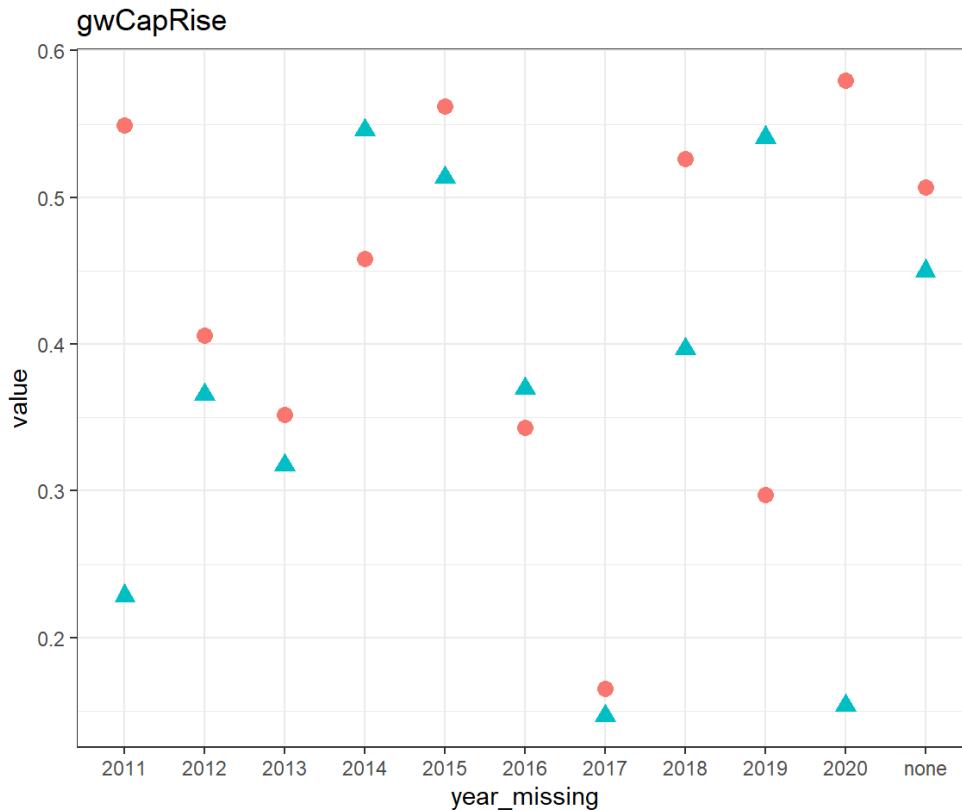
```
##  
## [[7]]
```



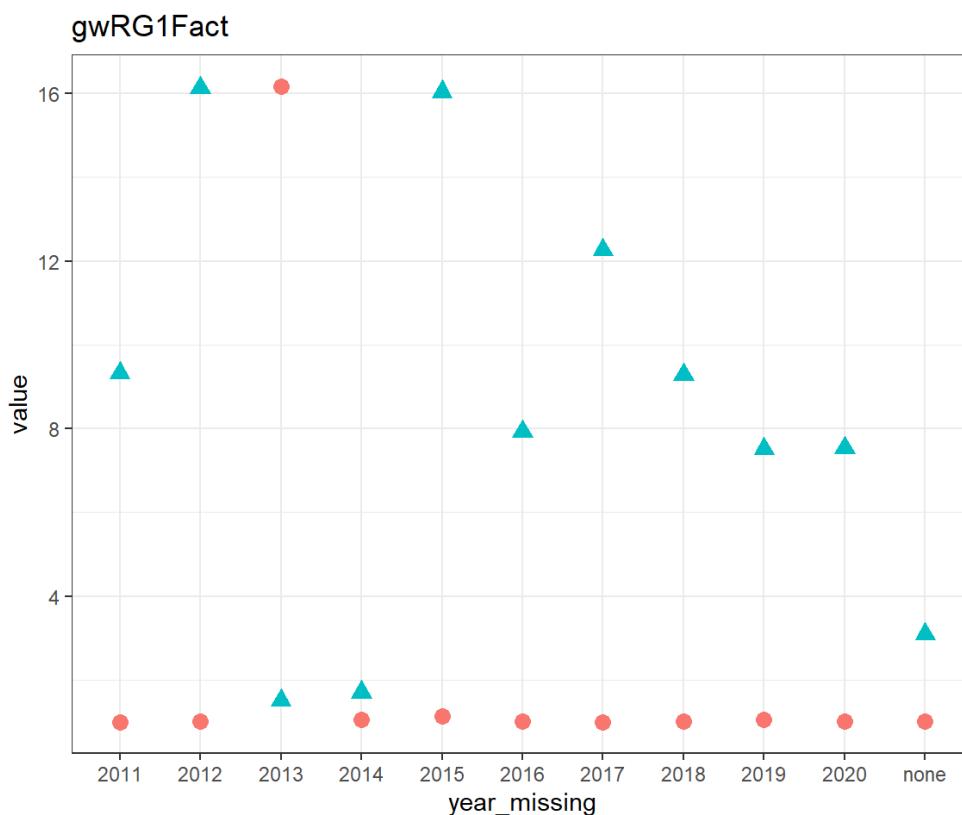
```
##  
## [[8]]
```



```
##  
## [[9]]
```

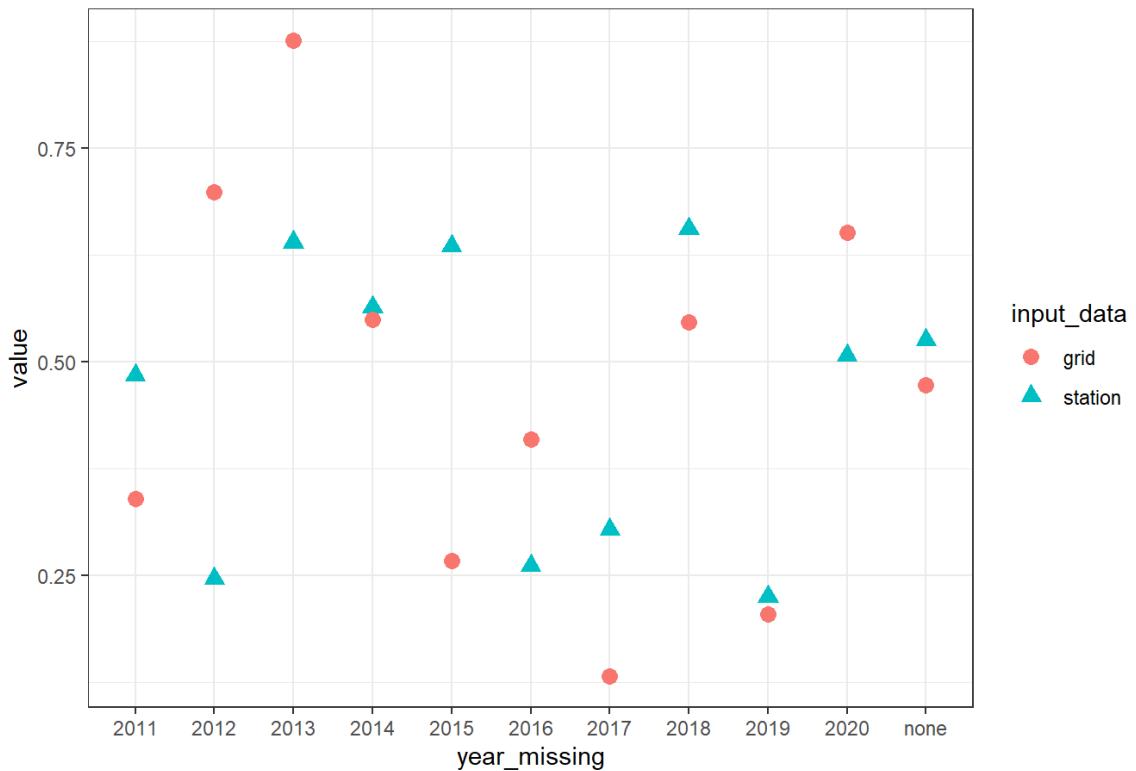


```
##  
## [[10]]
```



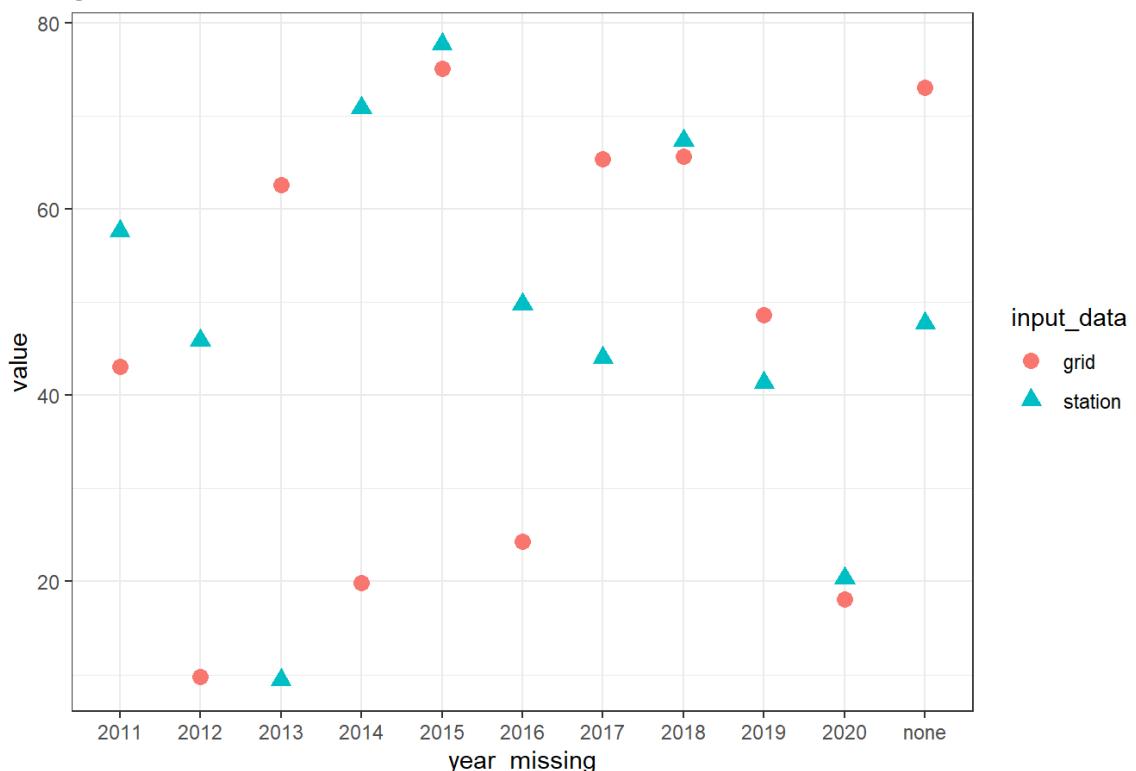
```
##  
## [[11]]
```

gwRG1RG2dist

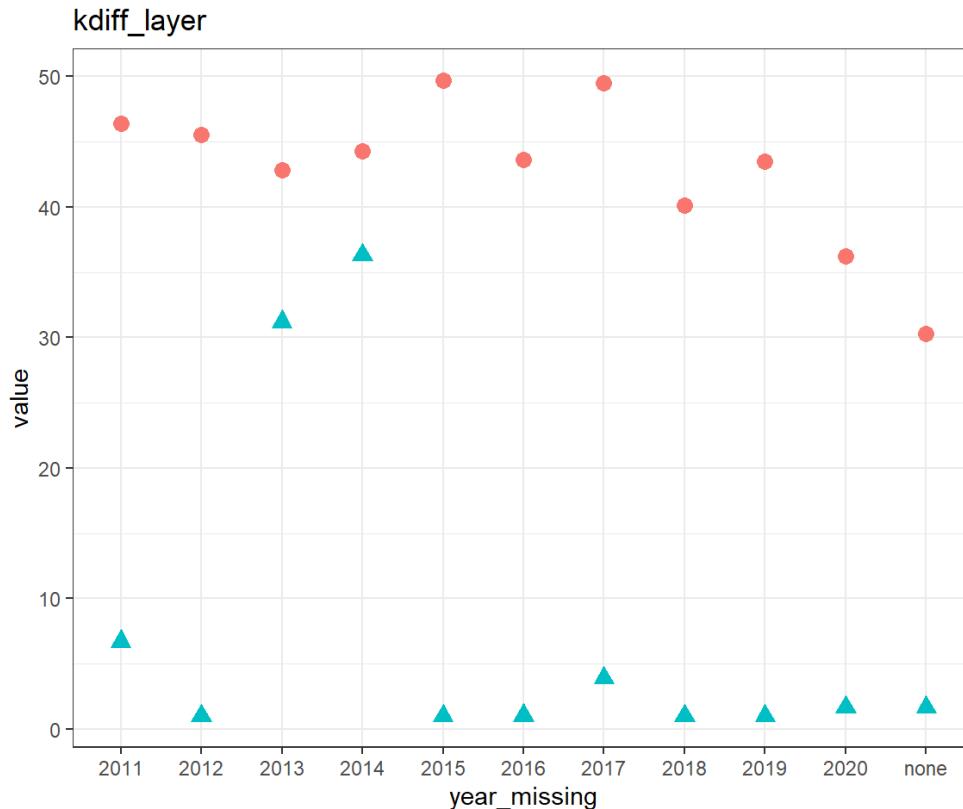


```
##  
## [[12]]
```

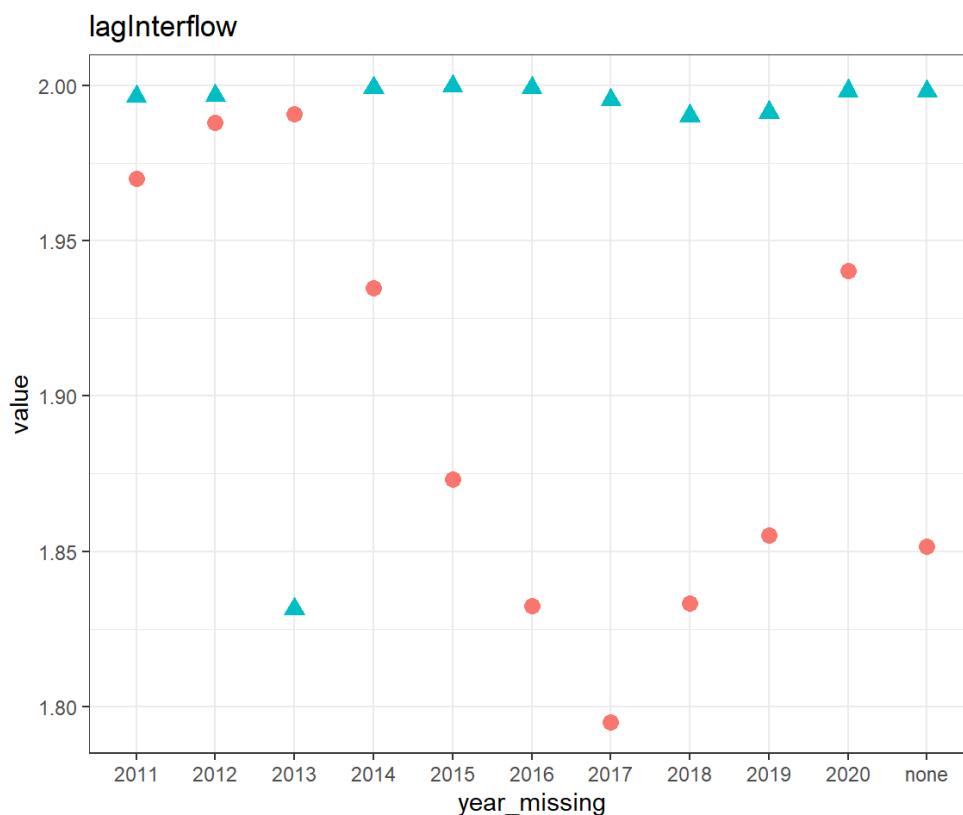
gwRG2Fact



```
##  
## [[13]]
```

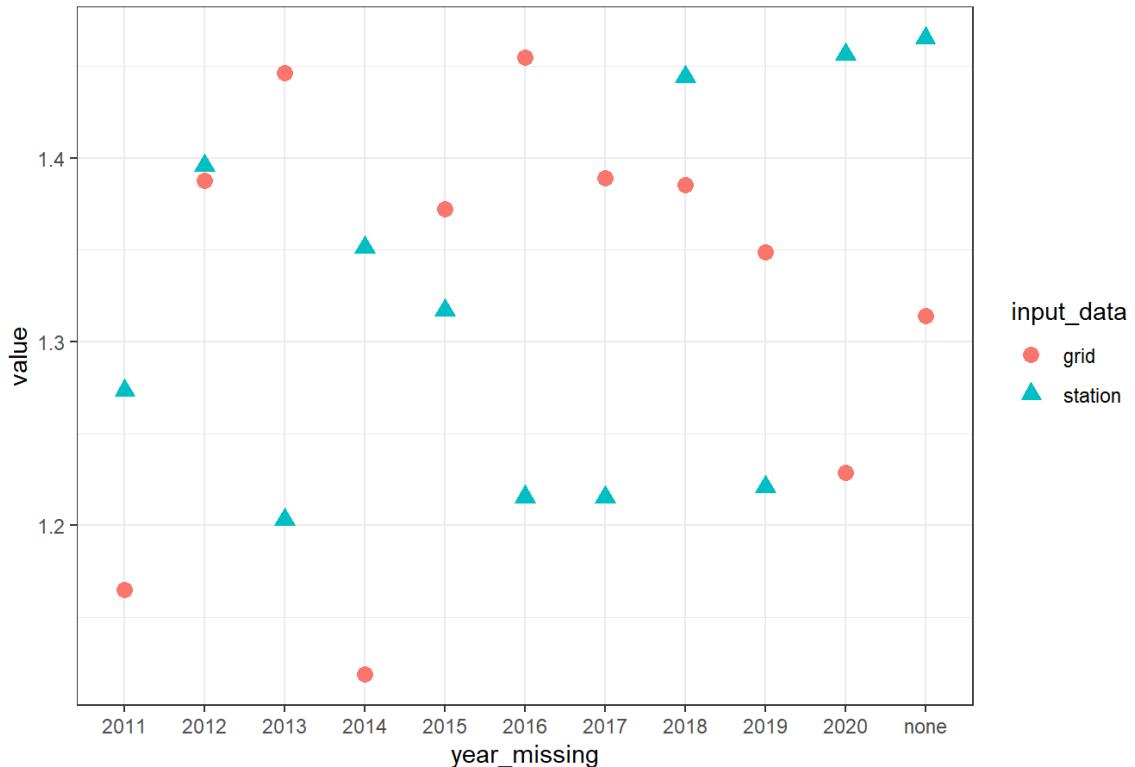


```
##  
## [[14]]
```



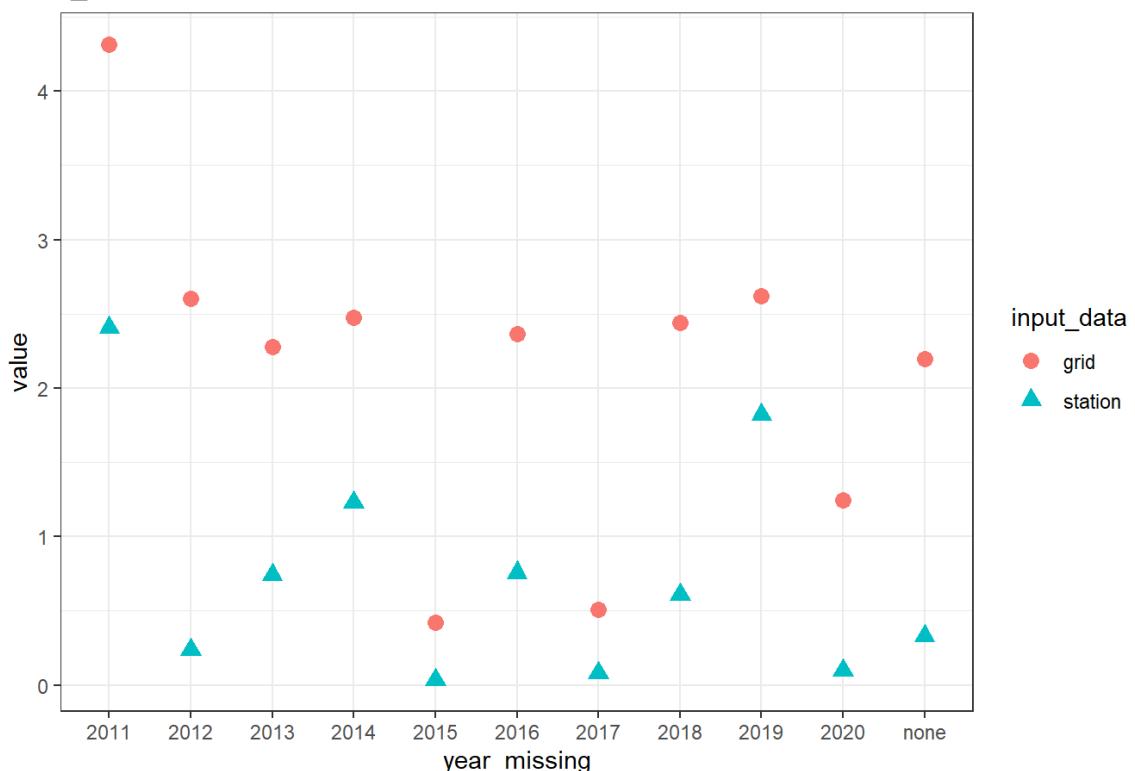
```
##  
## [[15]]
```

lagSurfaceRunoff

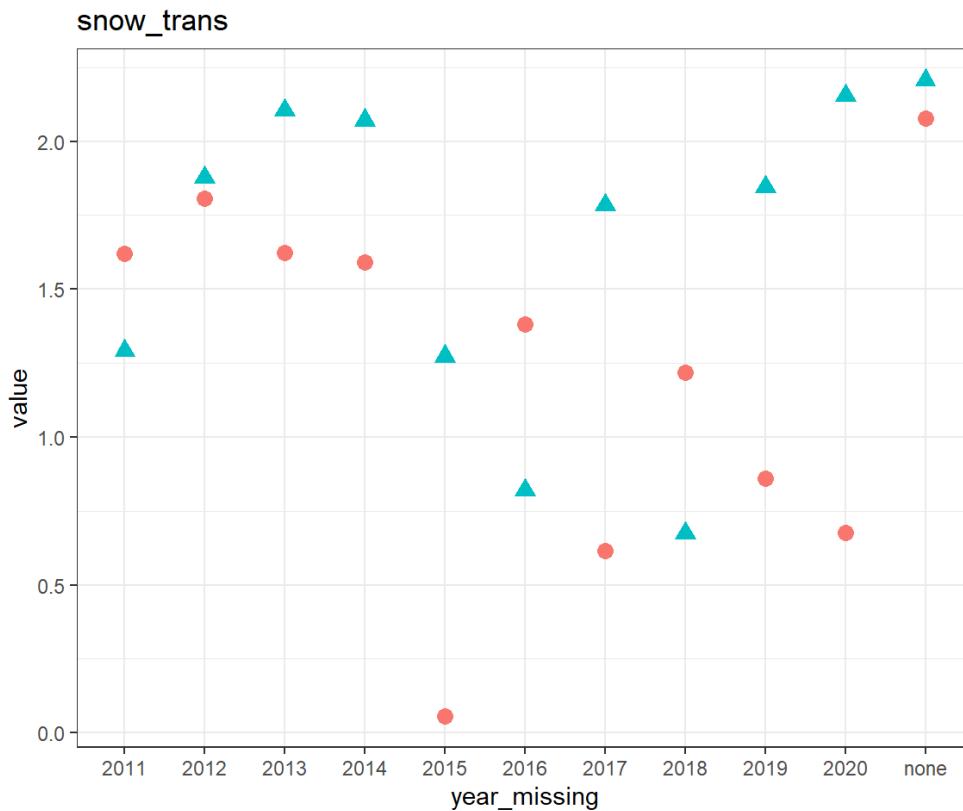


```
##  
## [[16]]
```

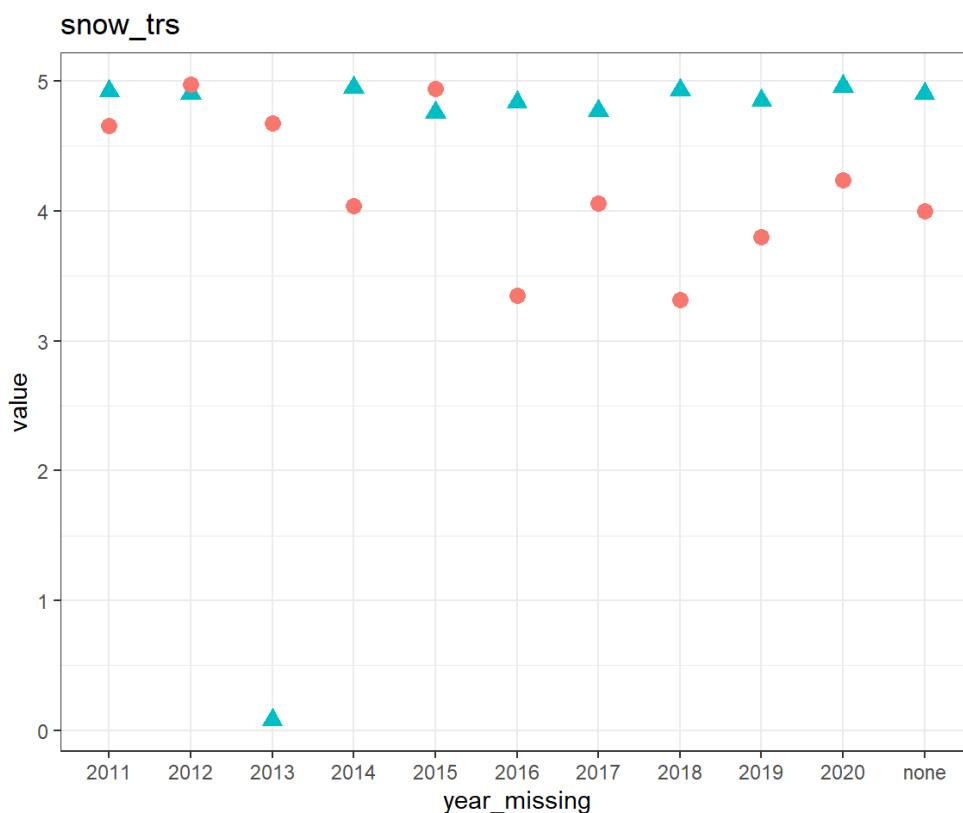
r_factor



```
##  
## [[17]]
```



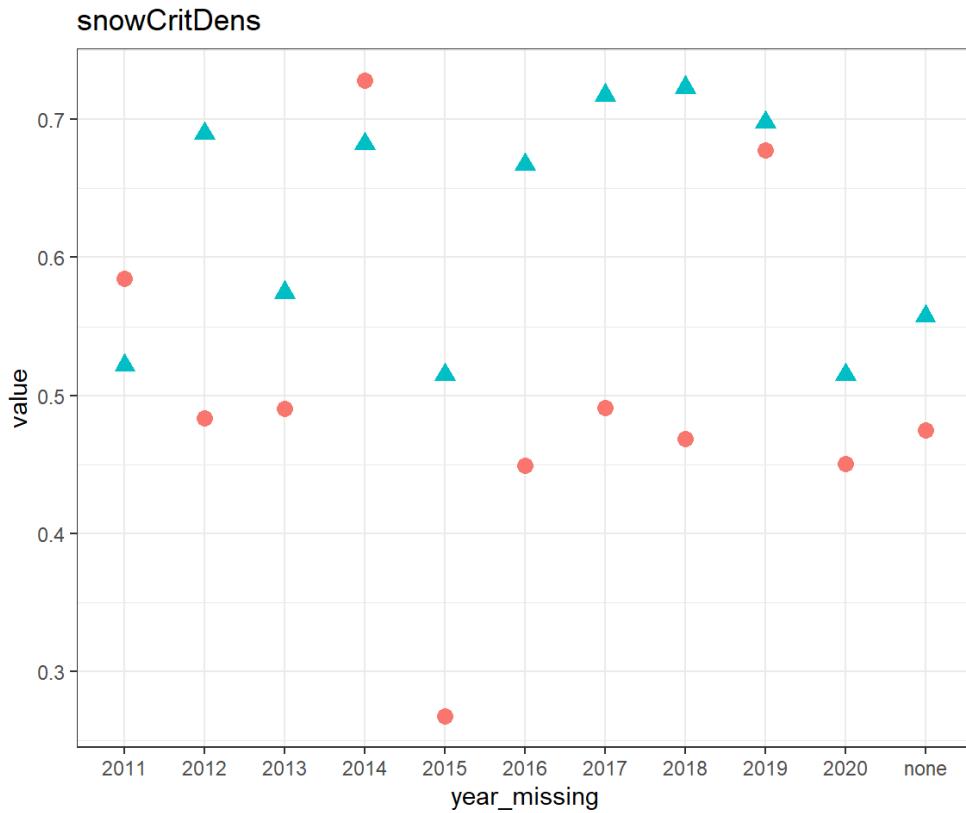
```
##  
## [[18]]
```



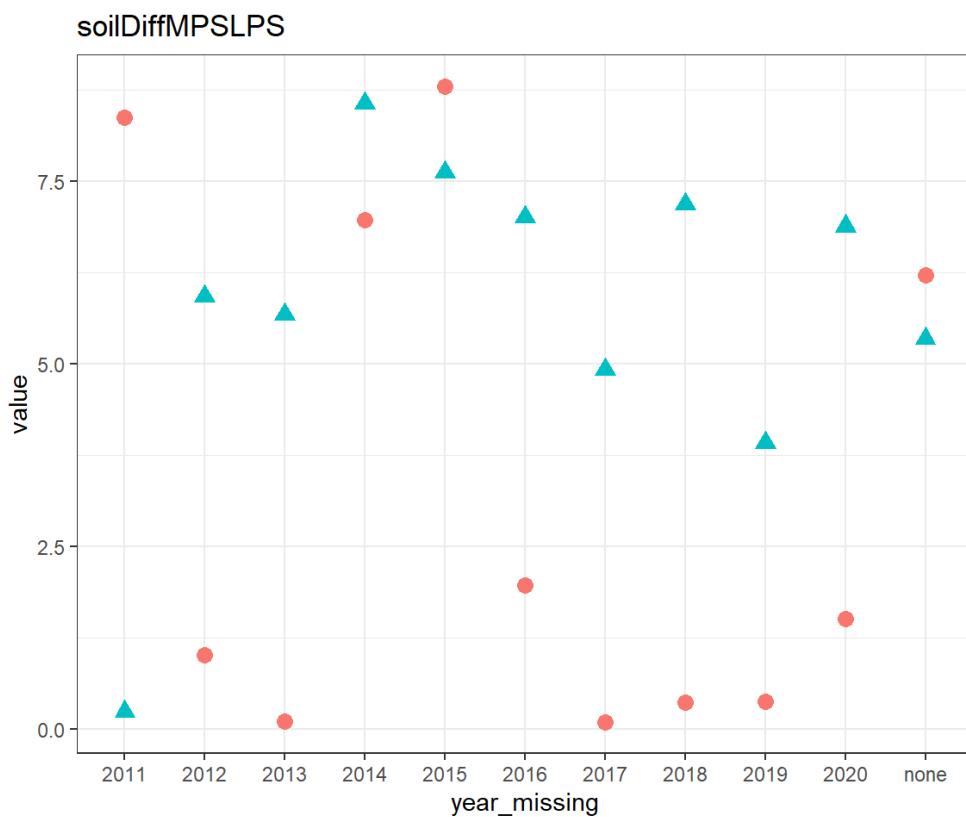
```
input_data  
  ● grid  
  ▲ station
```

```
input_data  
  ● grid  
  ▲ station
```

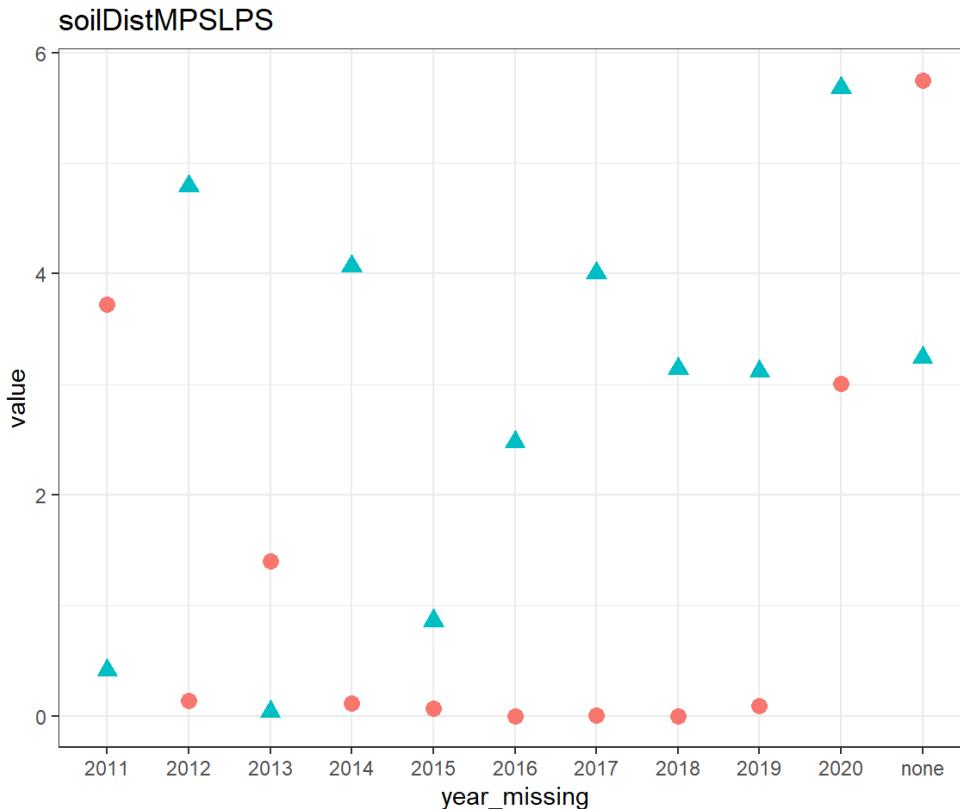
```
##  
## [[19]]
```



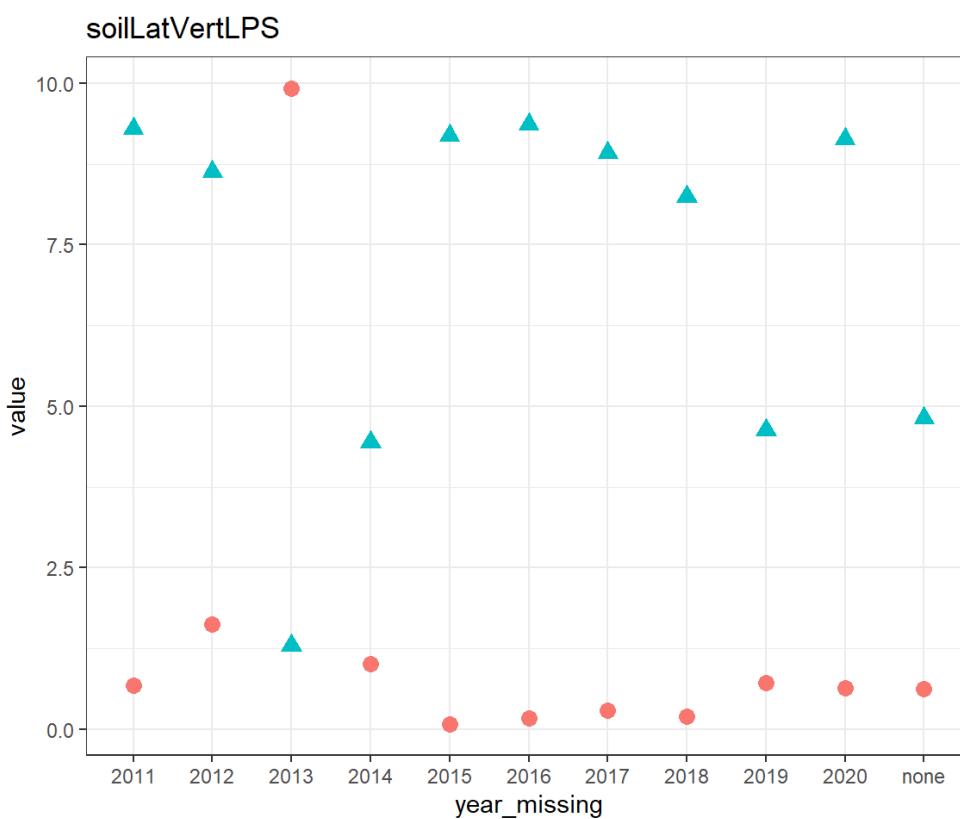
```
##  
## [[20]]
```



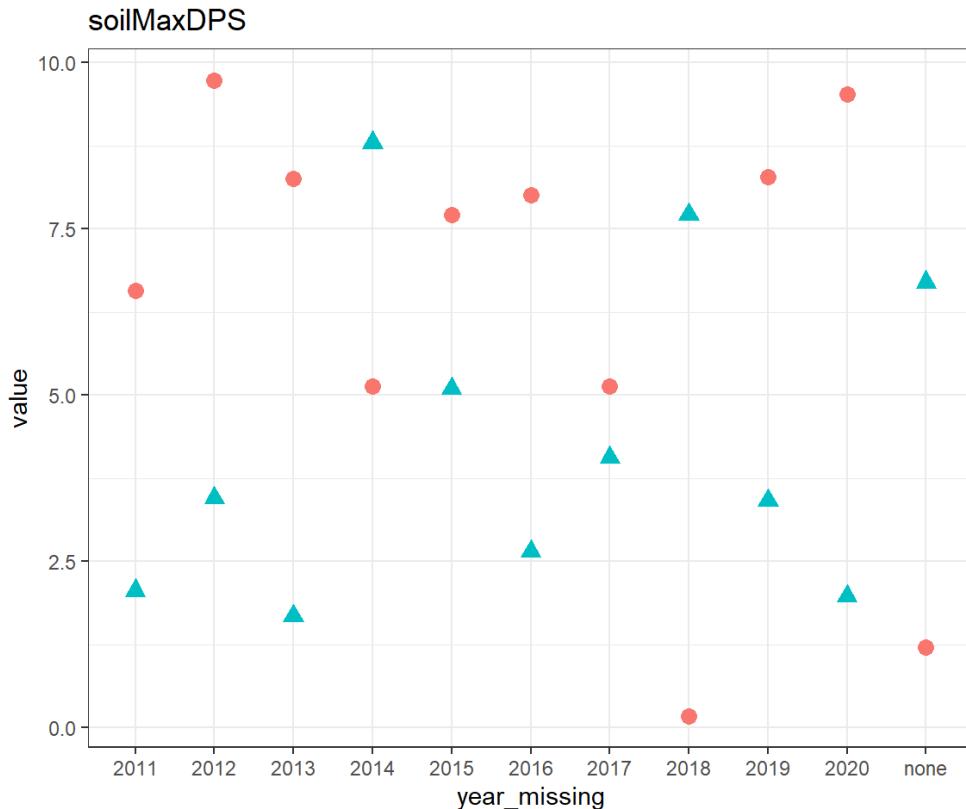
```
##  
## [[21]]
```



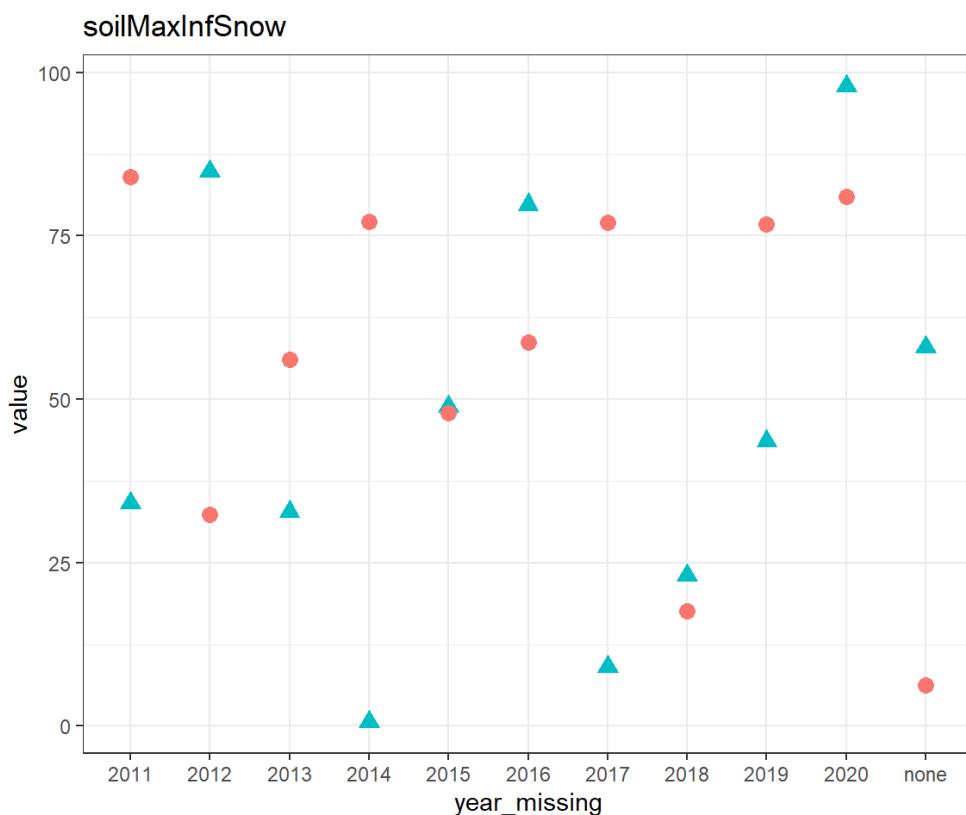
```
##  
## [[22]]
```



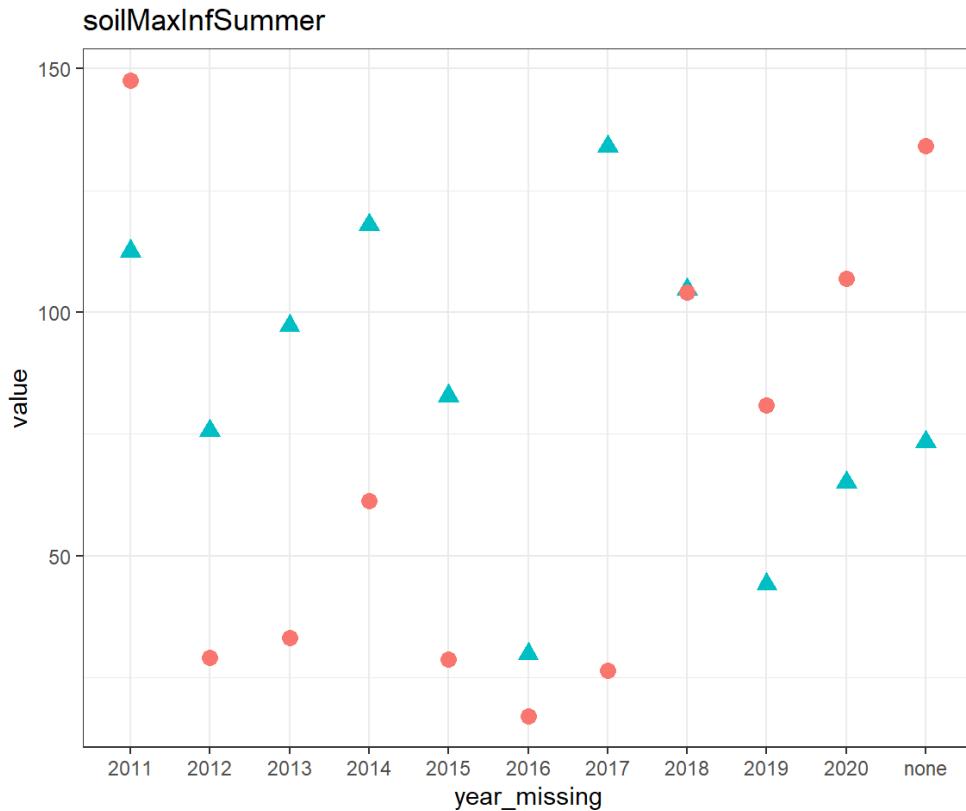
```
##  
## [[23]]
```



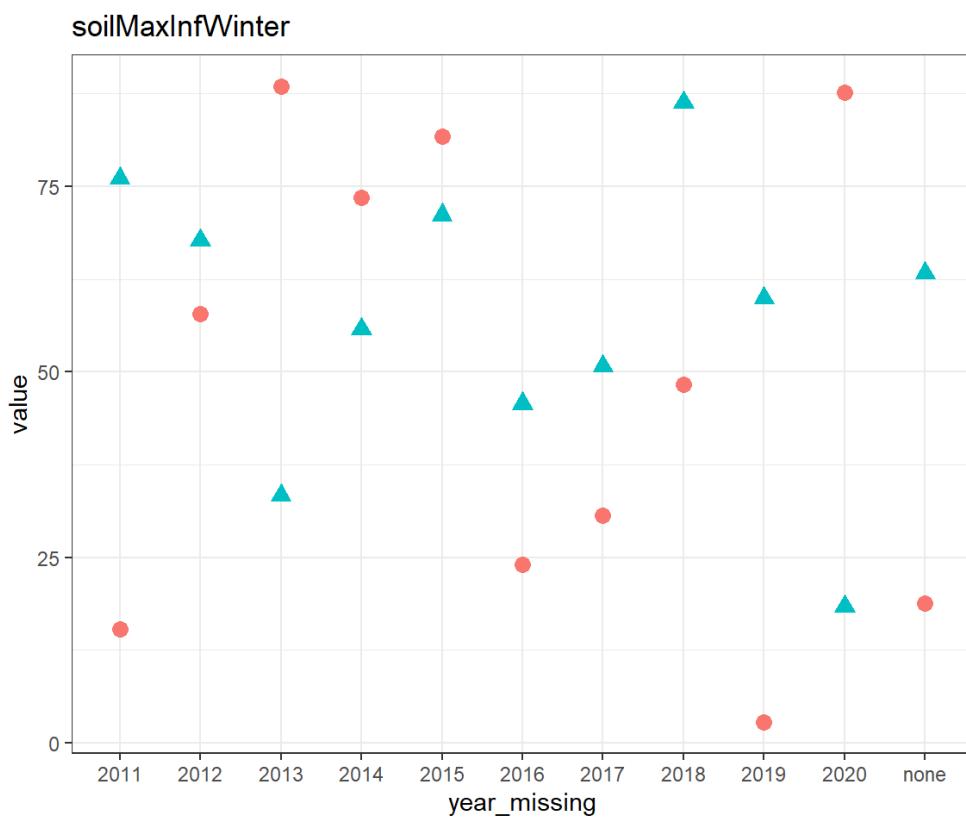
```
##  
## [[24]]
```



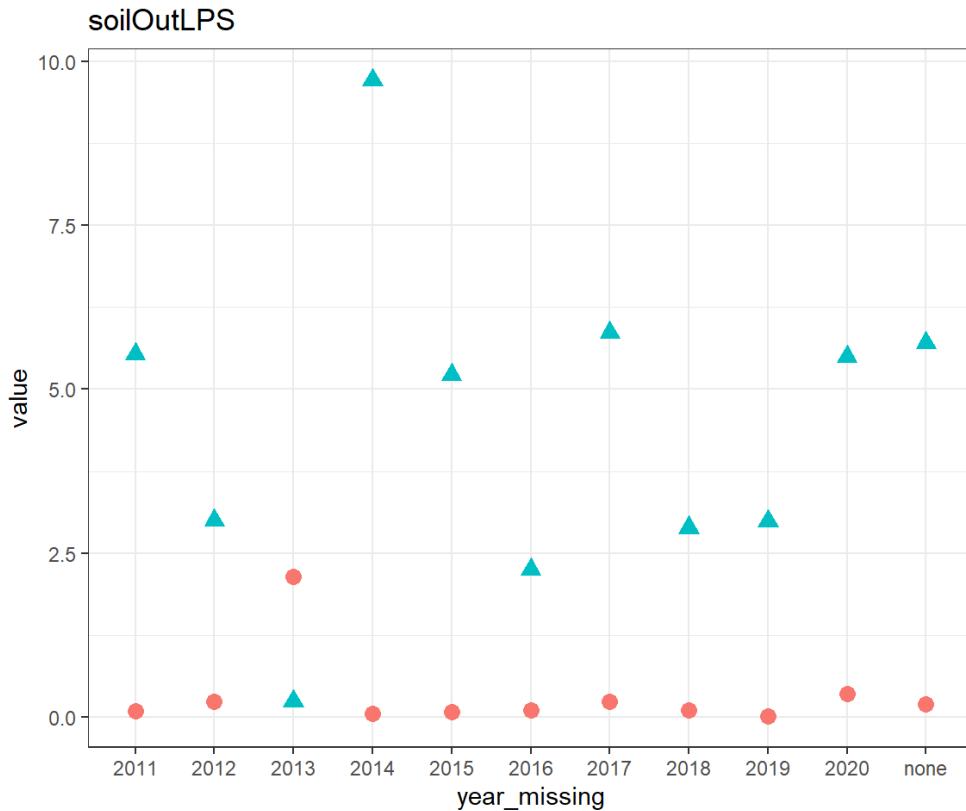
```
##  
## [[25]]
```



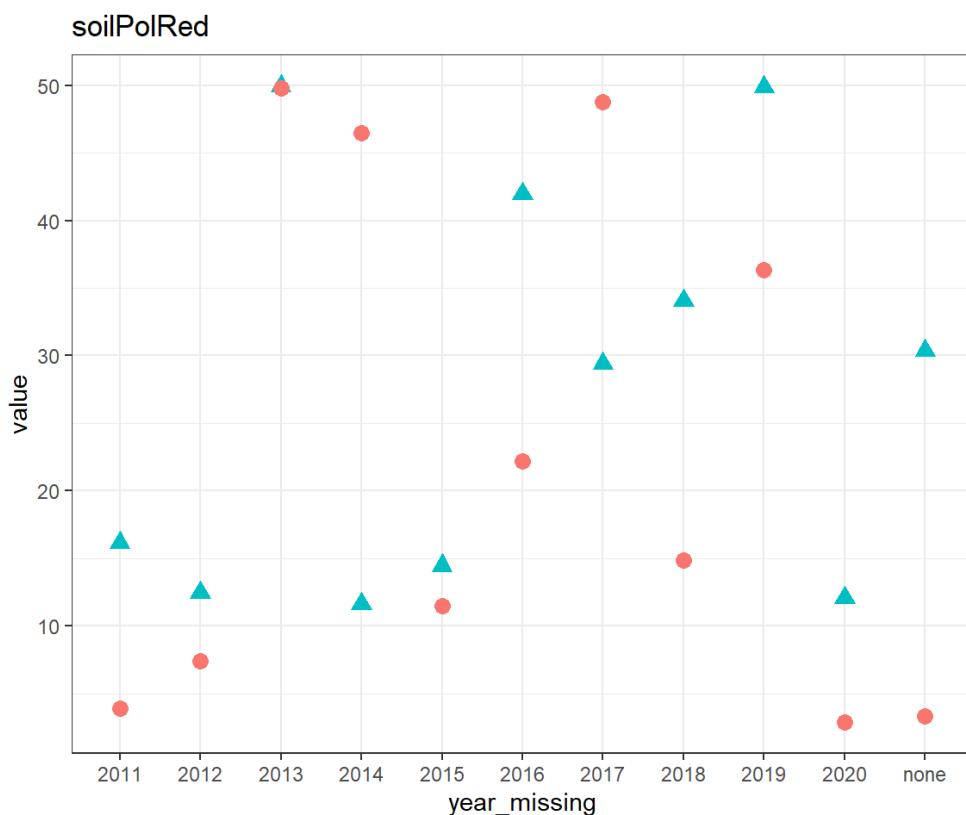
```
##  
## [26]
```



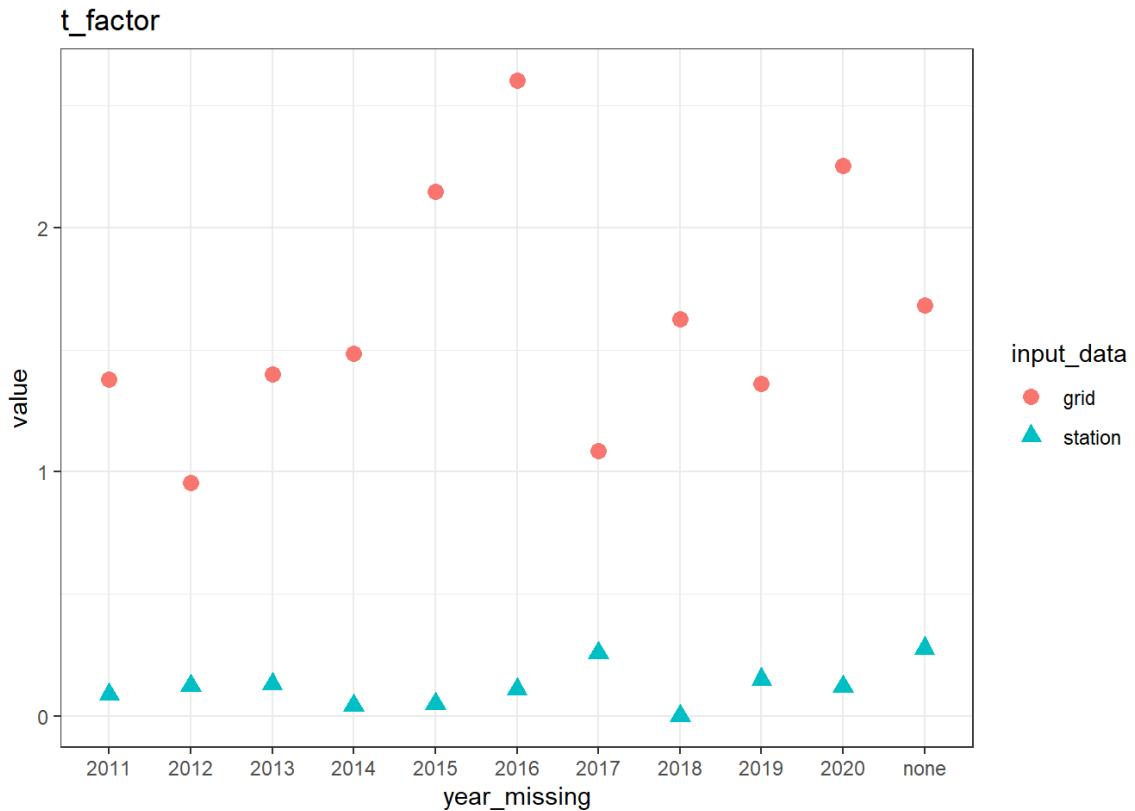
```
##  
## [27]
```



```
##  
## [[28]]
```



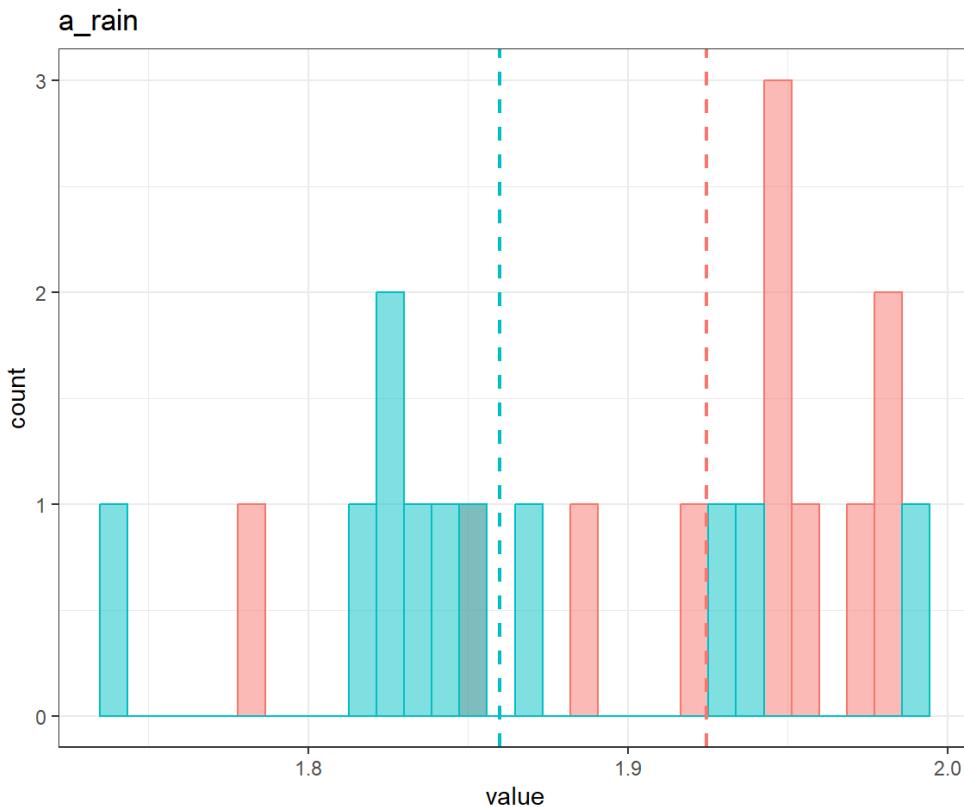
```
##  
## [[29]]
```



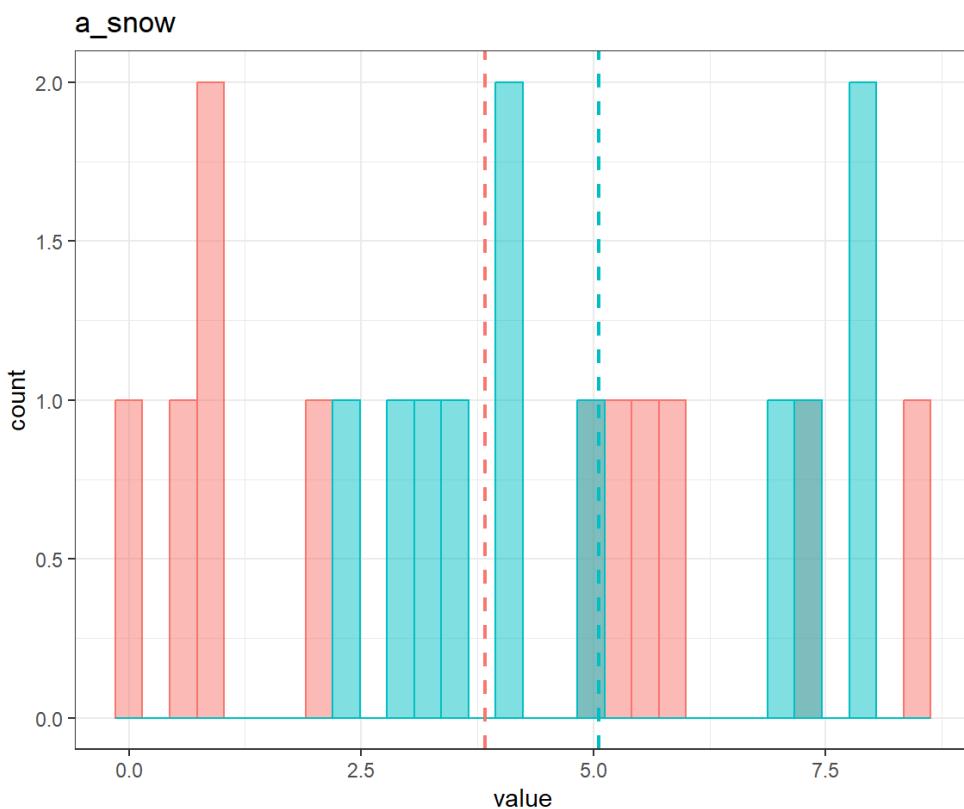
Histograms

```
## Warning: Using `size` aesthetic for lines was deprecated in ggplot2 3.4.0.  
## Please use `linewidth` instead.
```

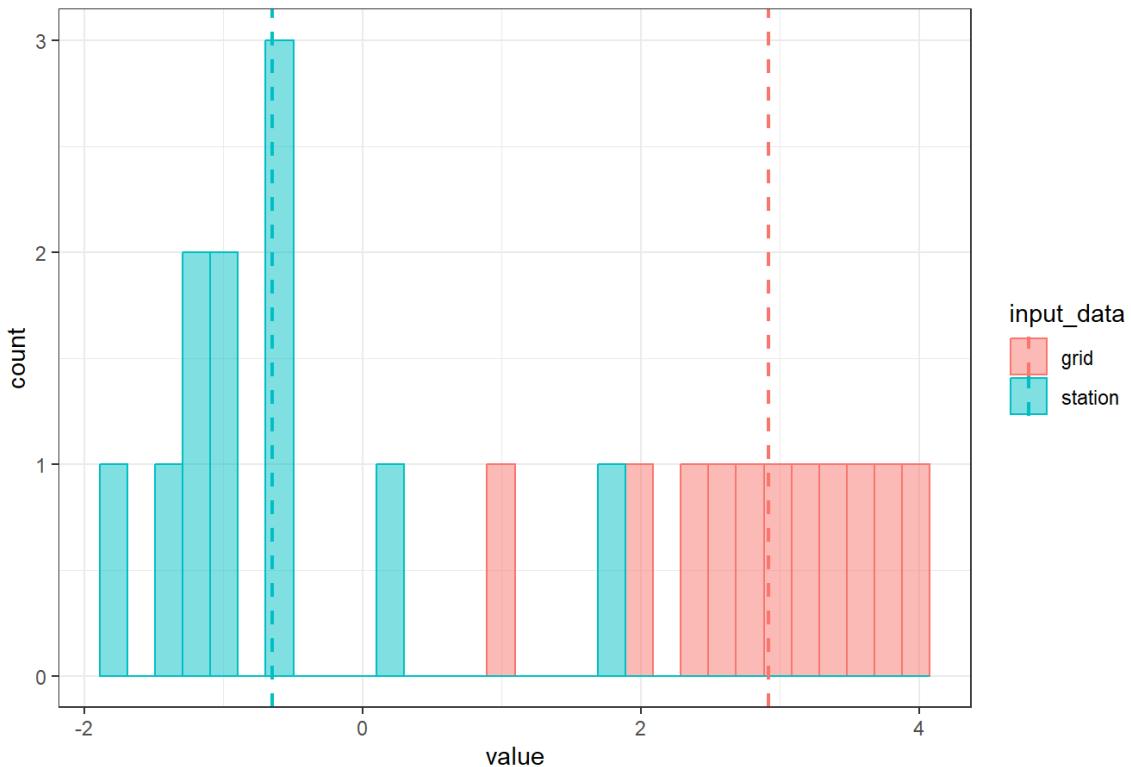
```
## [[1]]
```



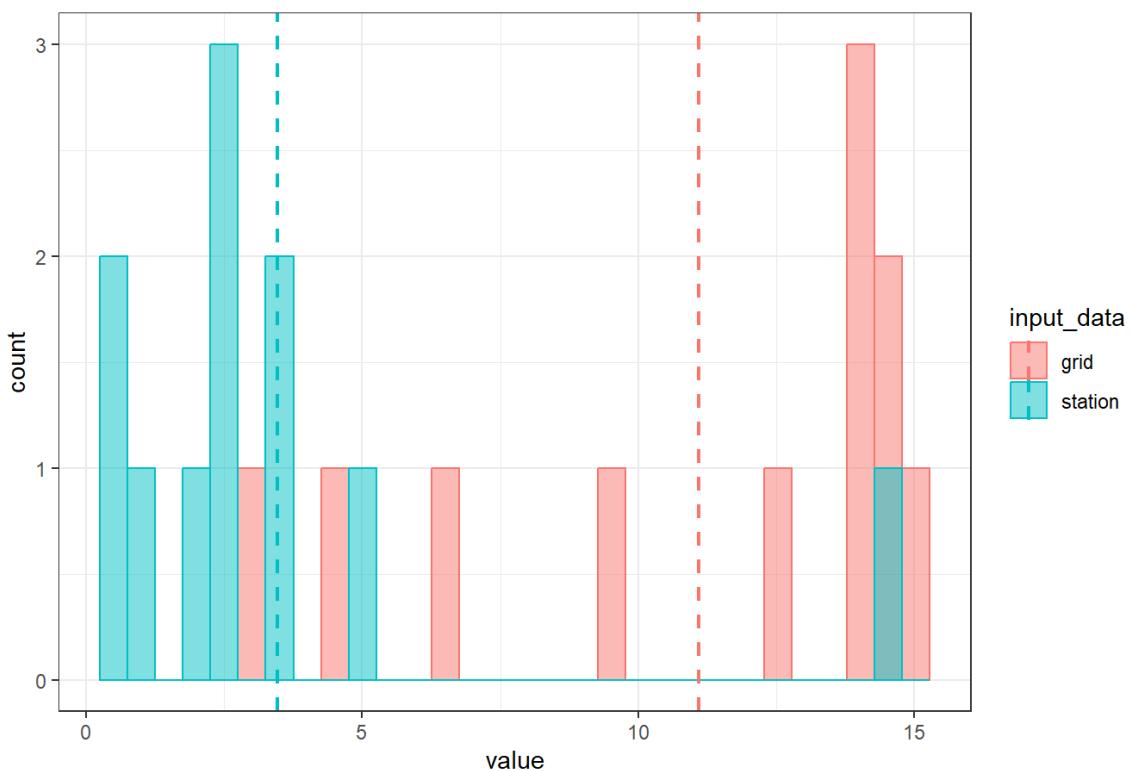
```
##  
## [[2]]
```



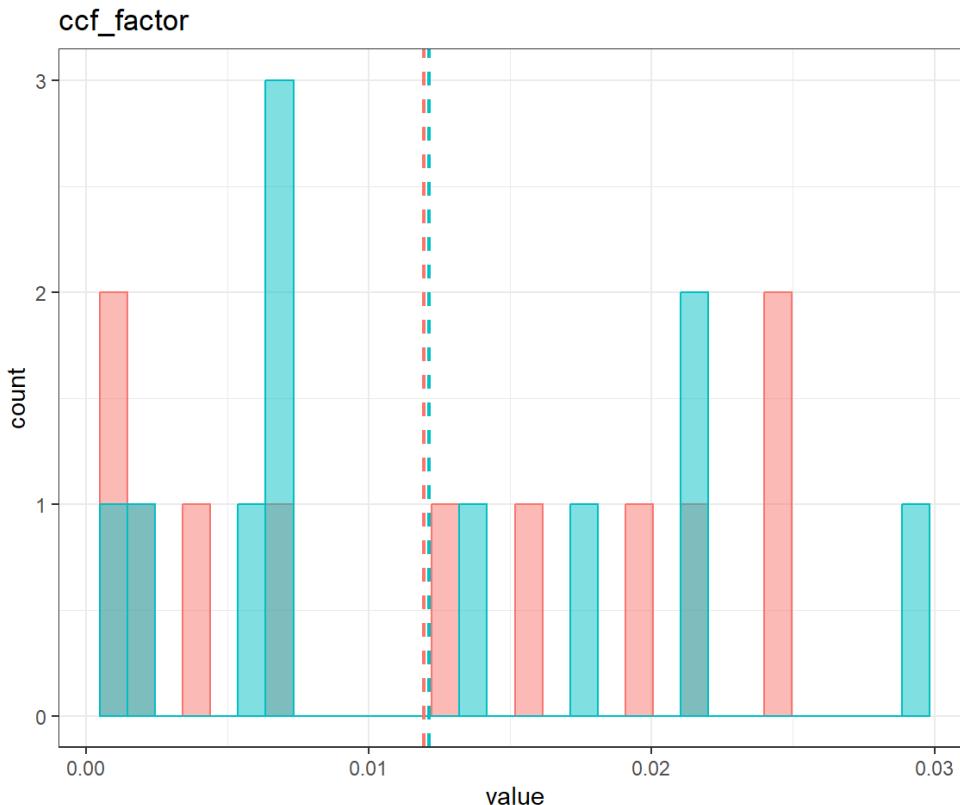
```
##  
## [[3]]
```

baseTemp

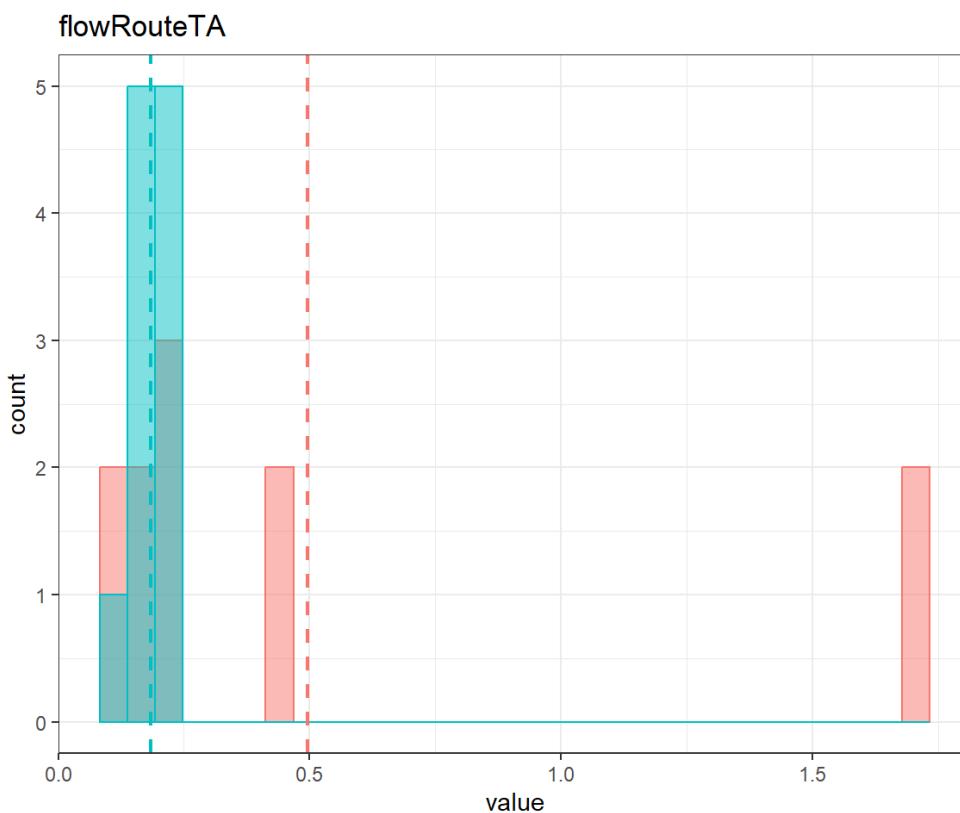
```
##  
## [[4]]
```

BetaW

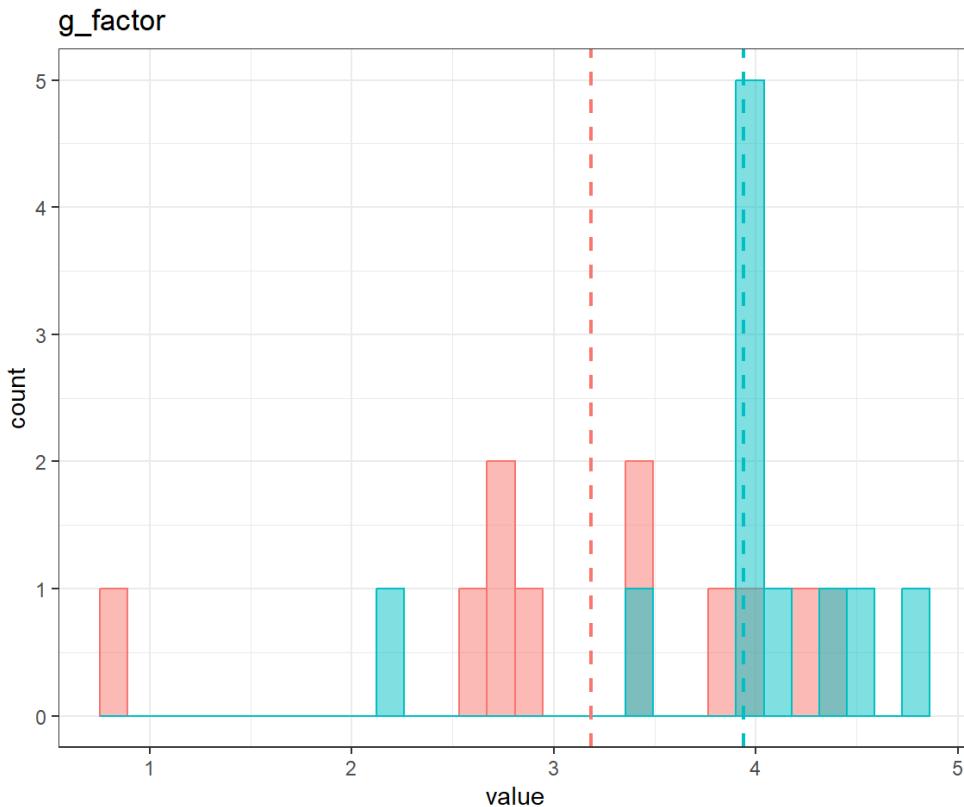
```
##  
## [[5]]
```



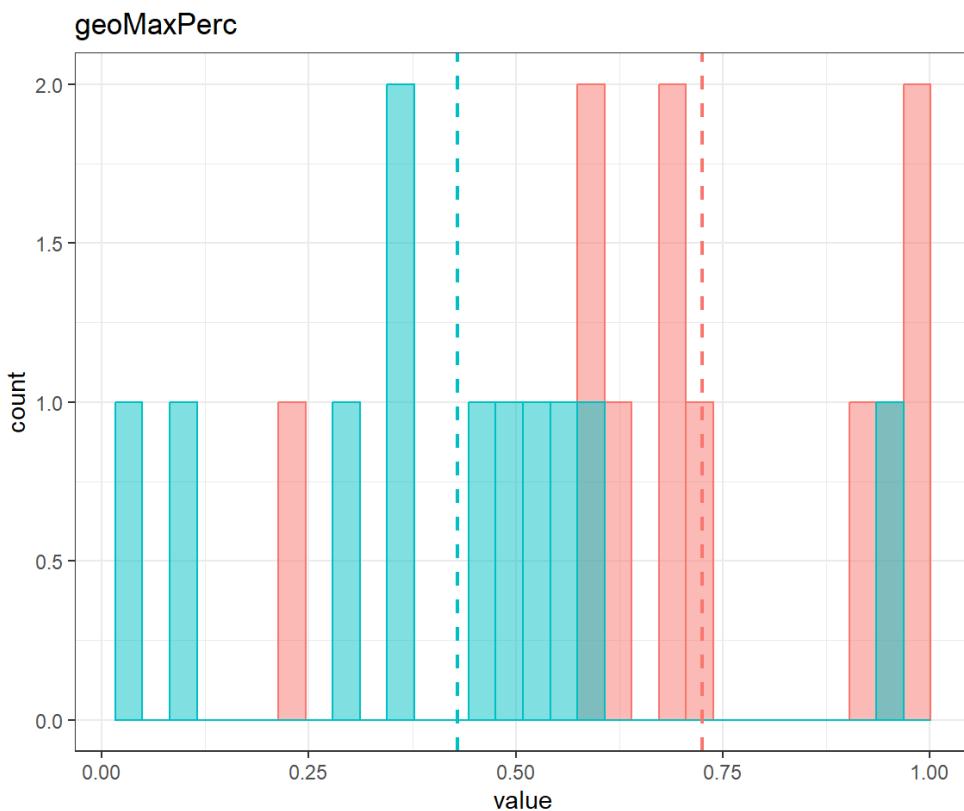
```
##  
## [[6]]
```



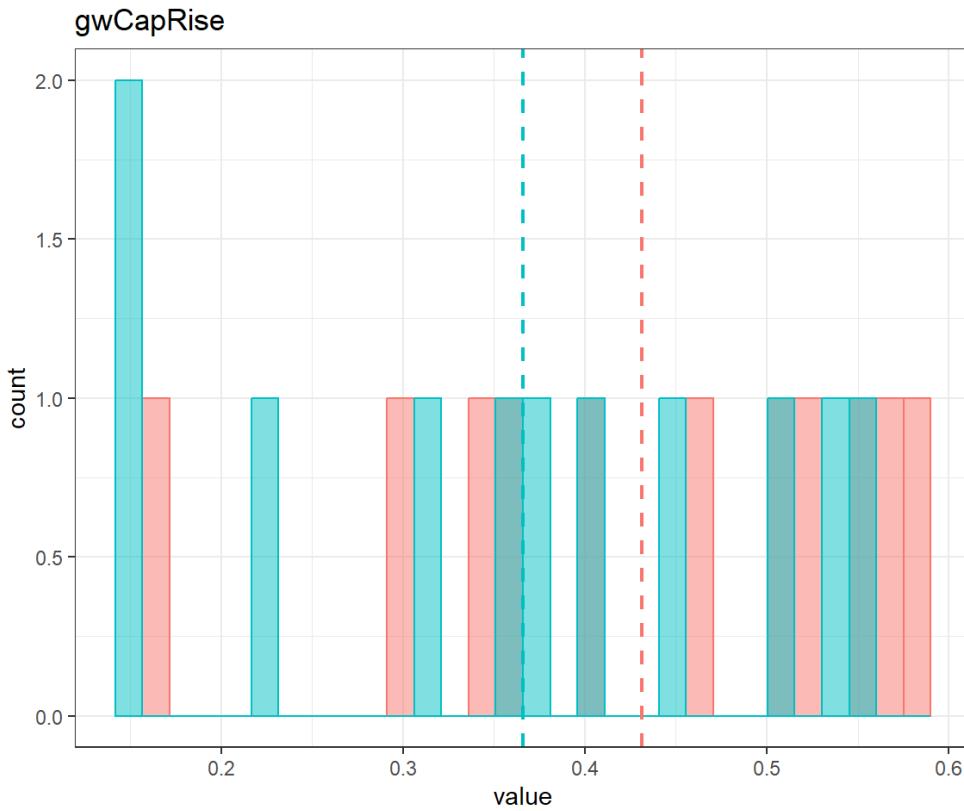
```
##  
## [[7]]
```



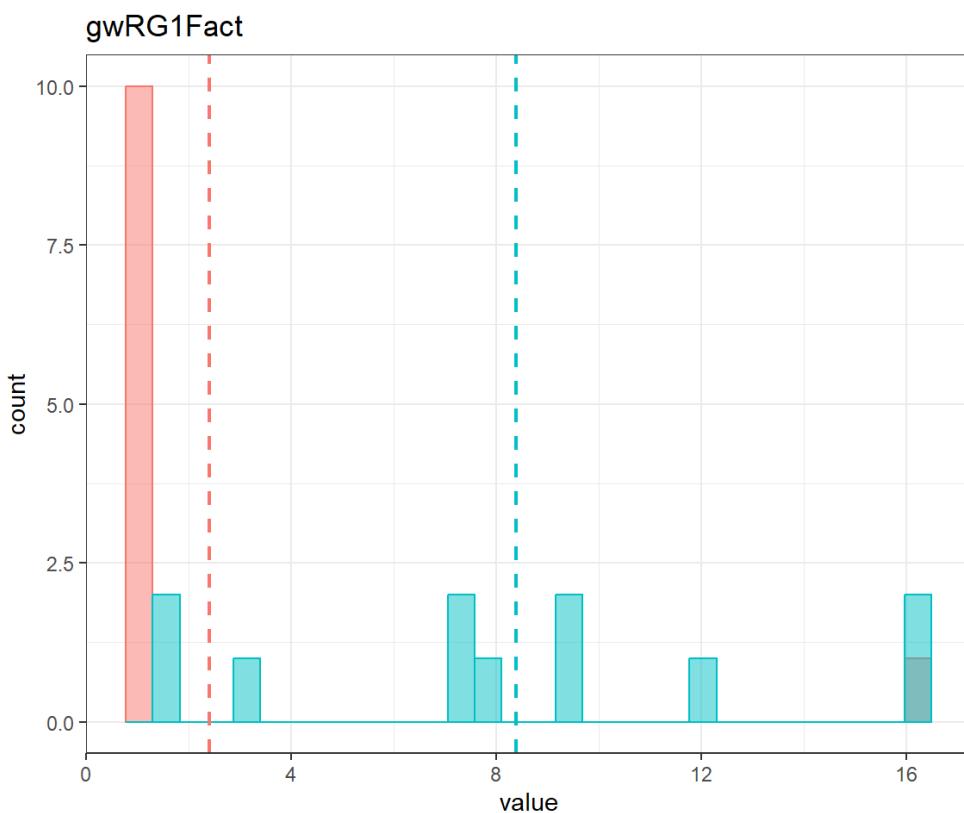
```
##  
## [[8]]
```



```
##  
## [[9]]
```

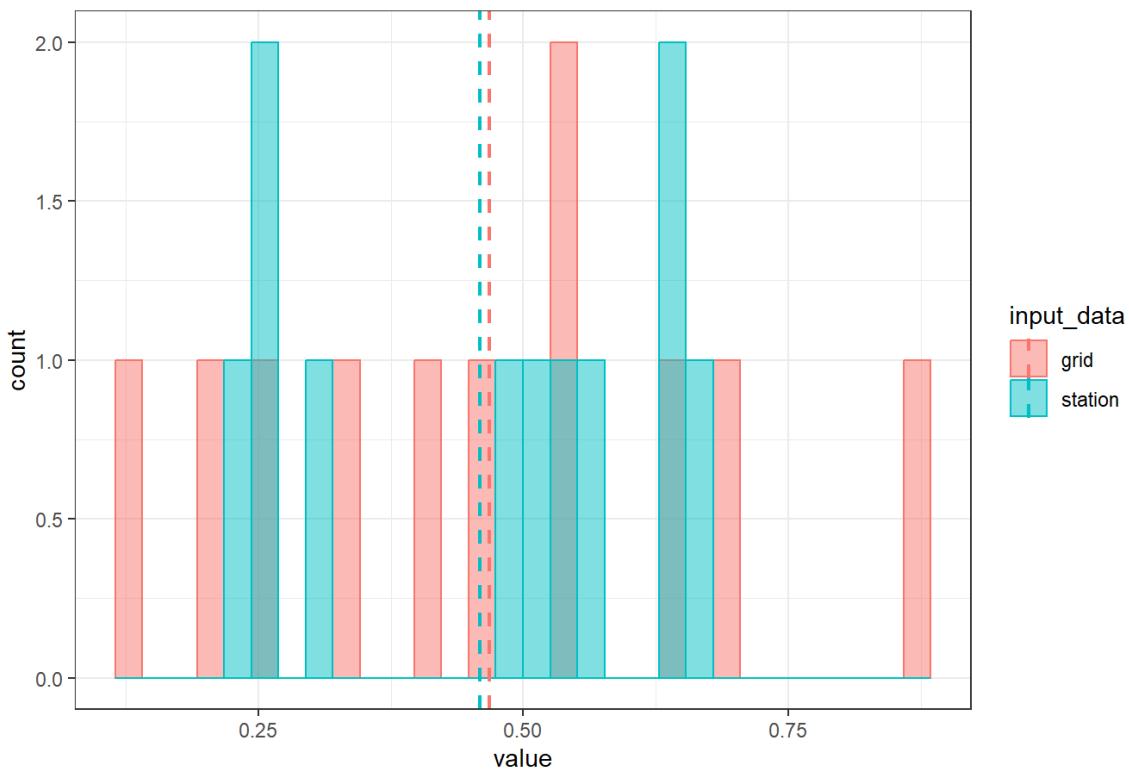


```
##  
## [[10]]
```



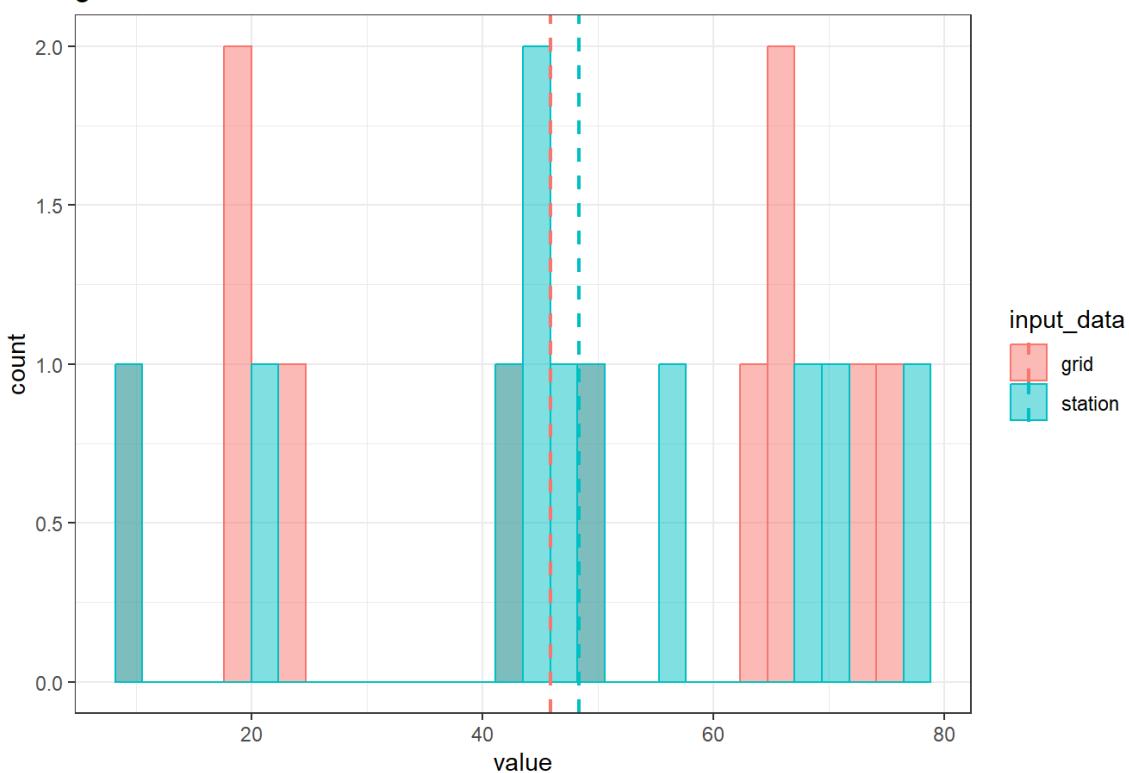
```
##  
## [[11]]
```

gwRG1RG2dist



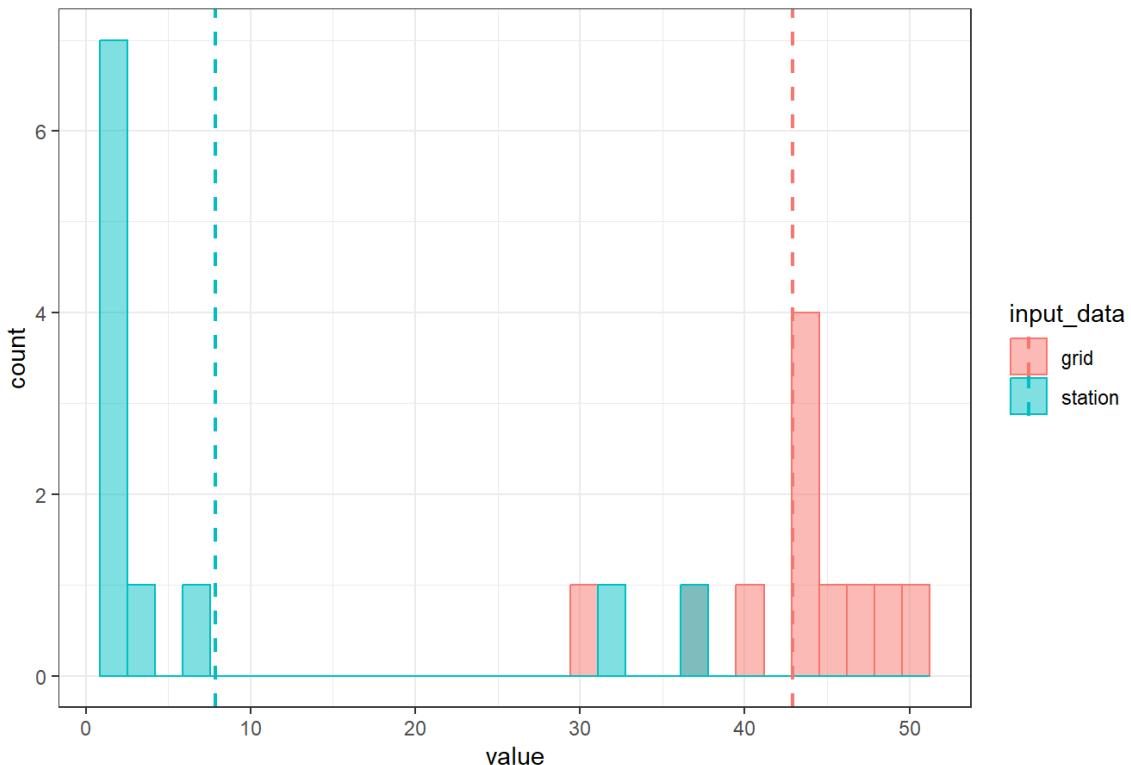
```
##  
## [[12]]
```

gwRG2Fact



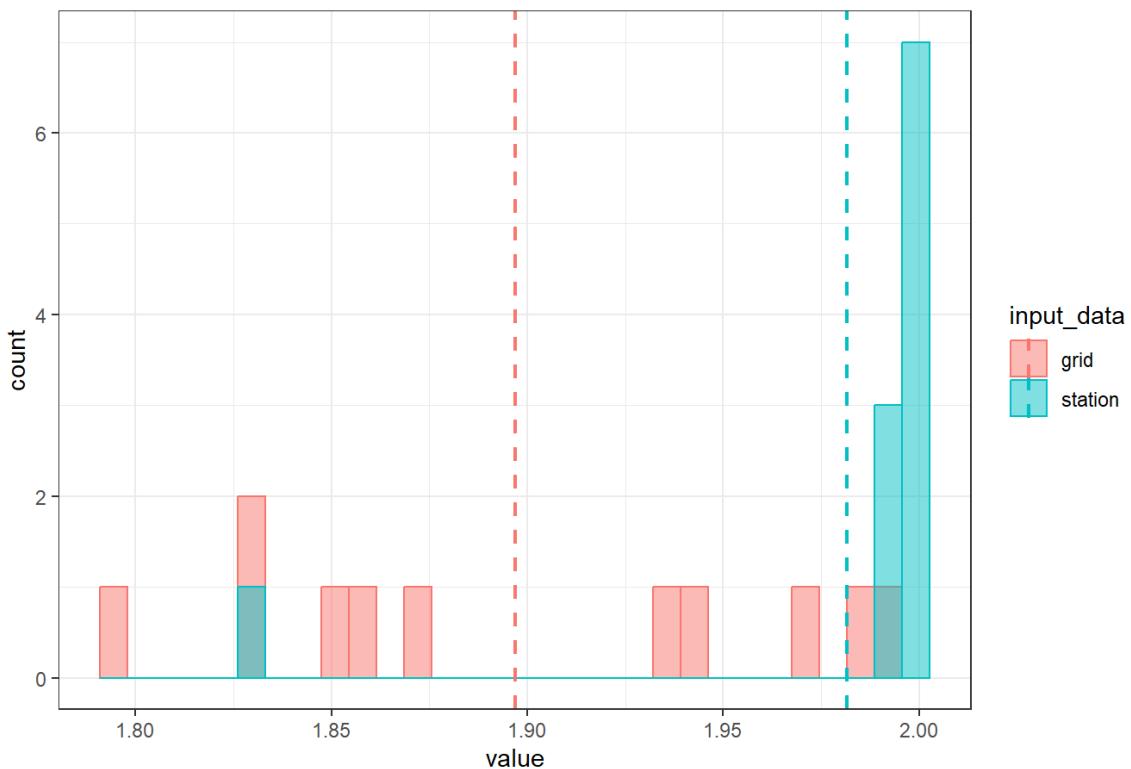
```
##  
## [[13]]
```

kdiff_layer



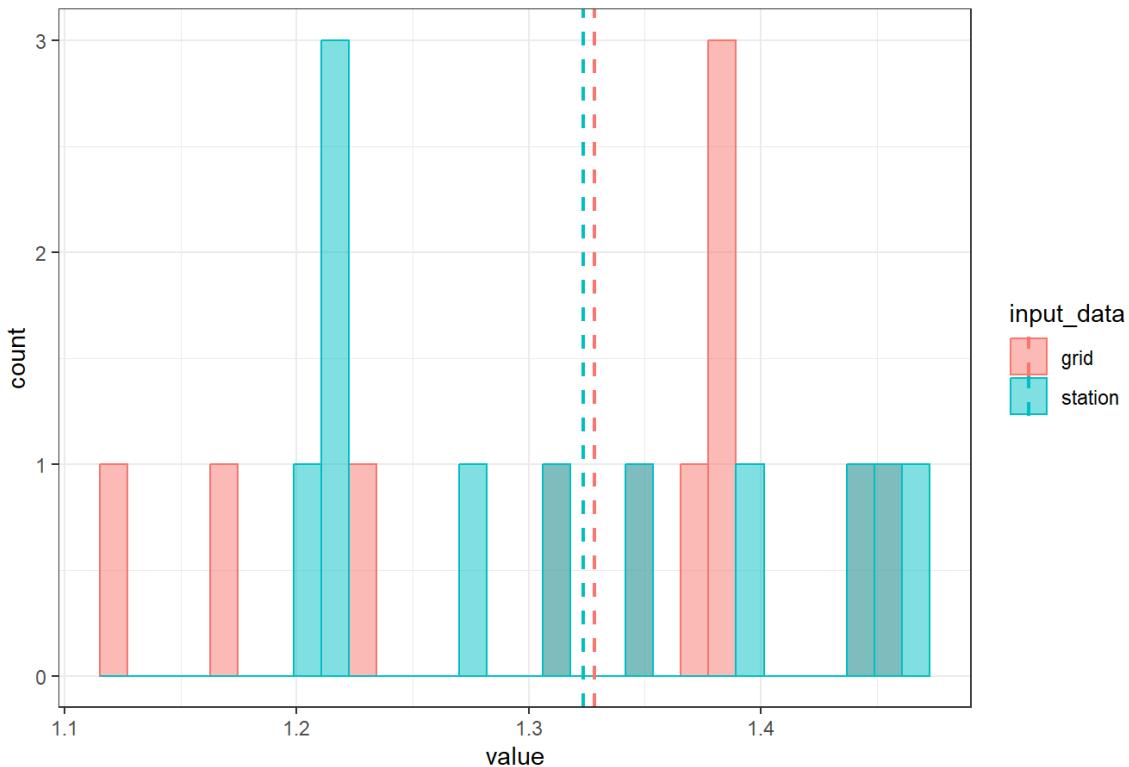
```
##  
## [[14]]
```

lagInterflow



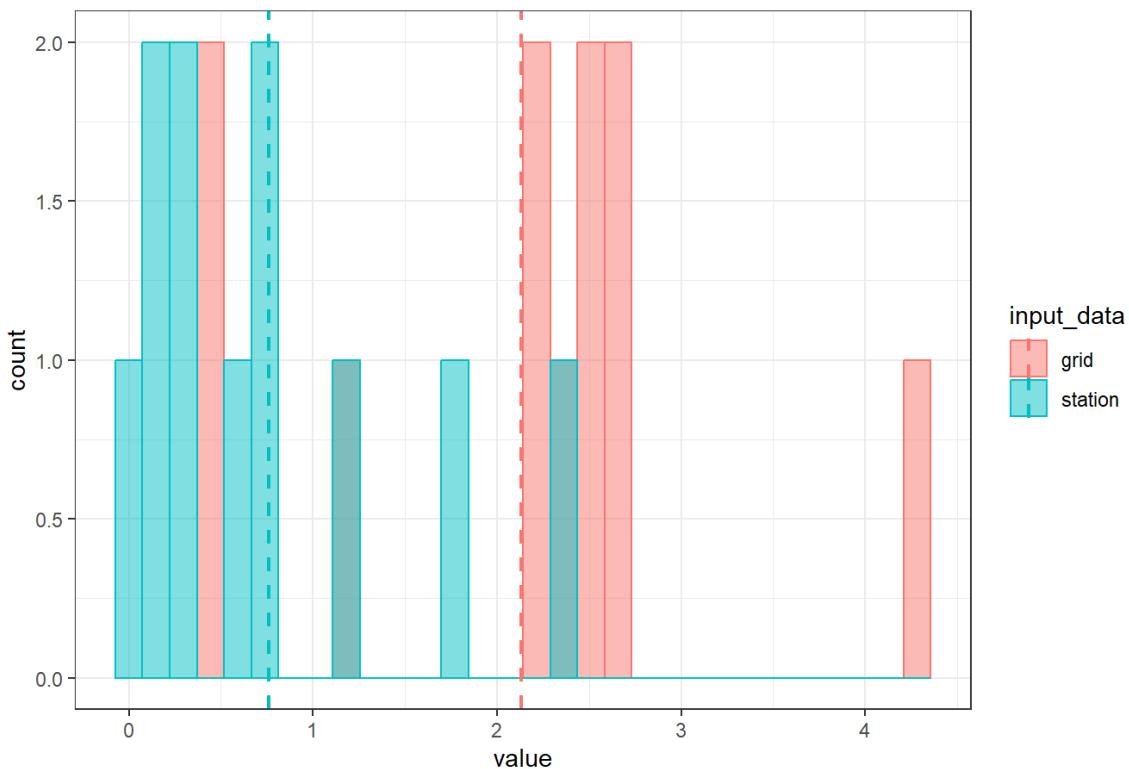
```
##  
## [[15]]
```

lagSurfaceRunoff

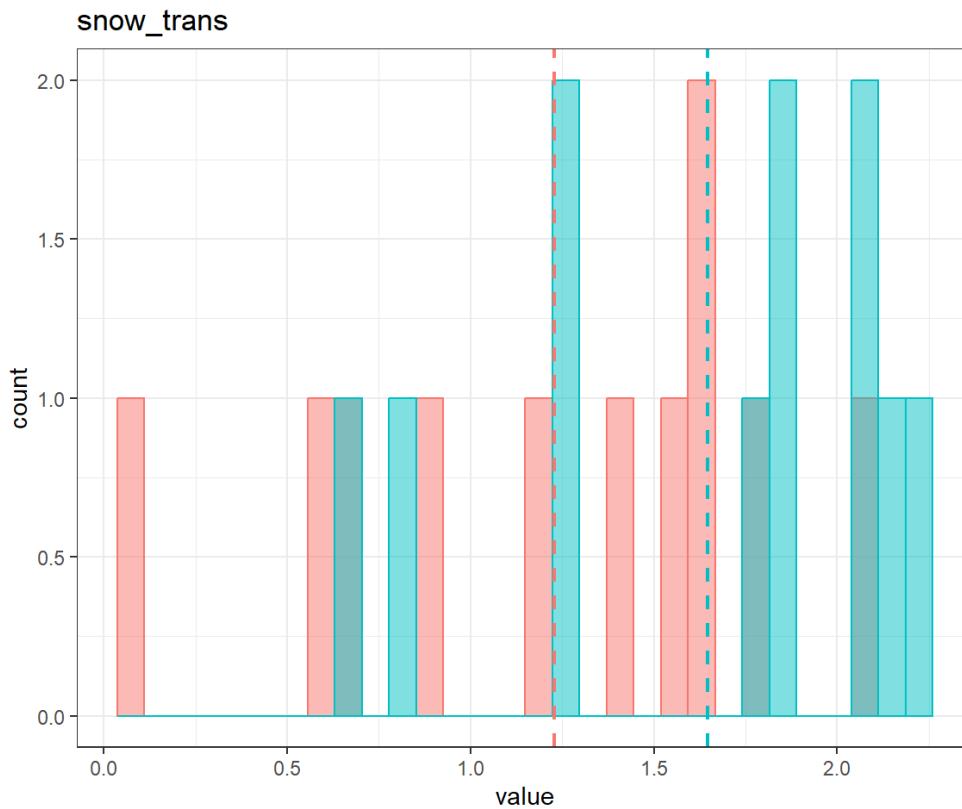


```
##  
## [[16]]
```

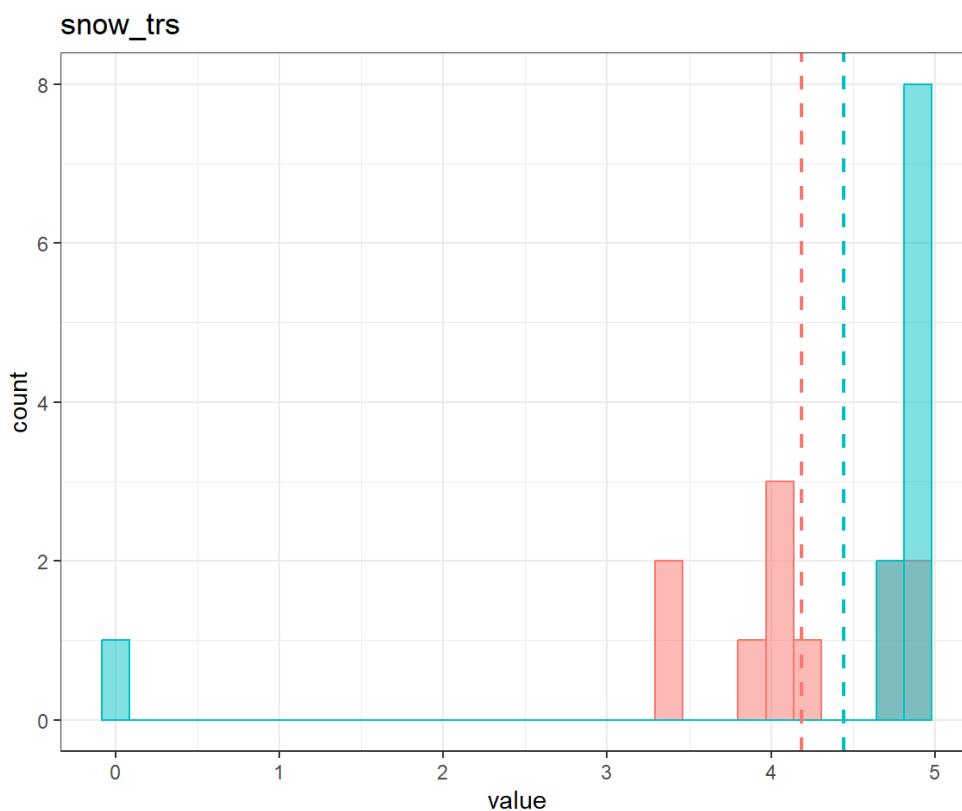
r_factor



```
##  
## [[17]]
```

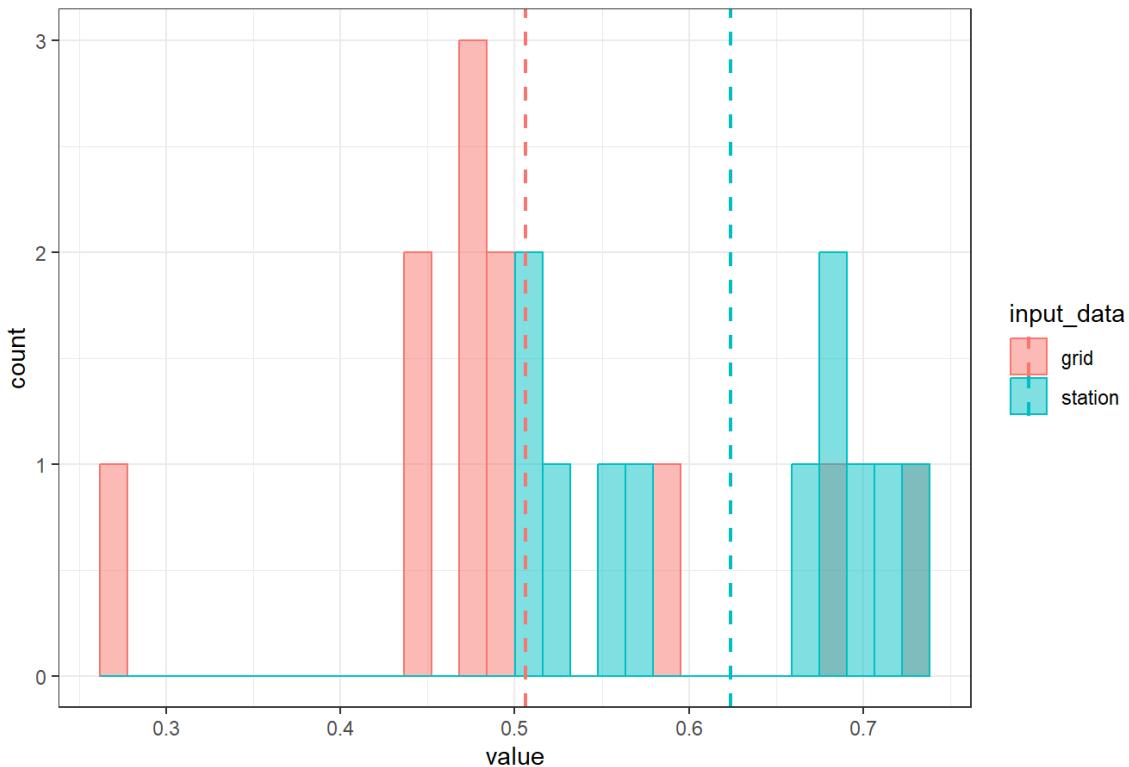


```
##  
## [[18]]
```



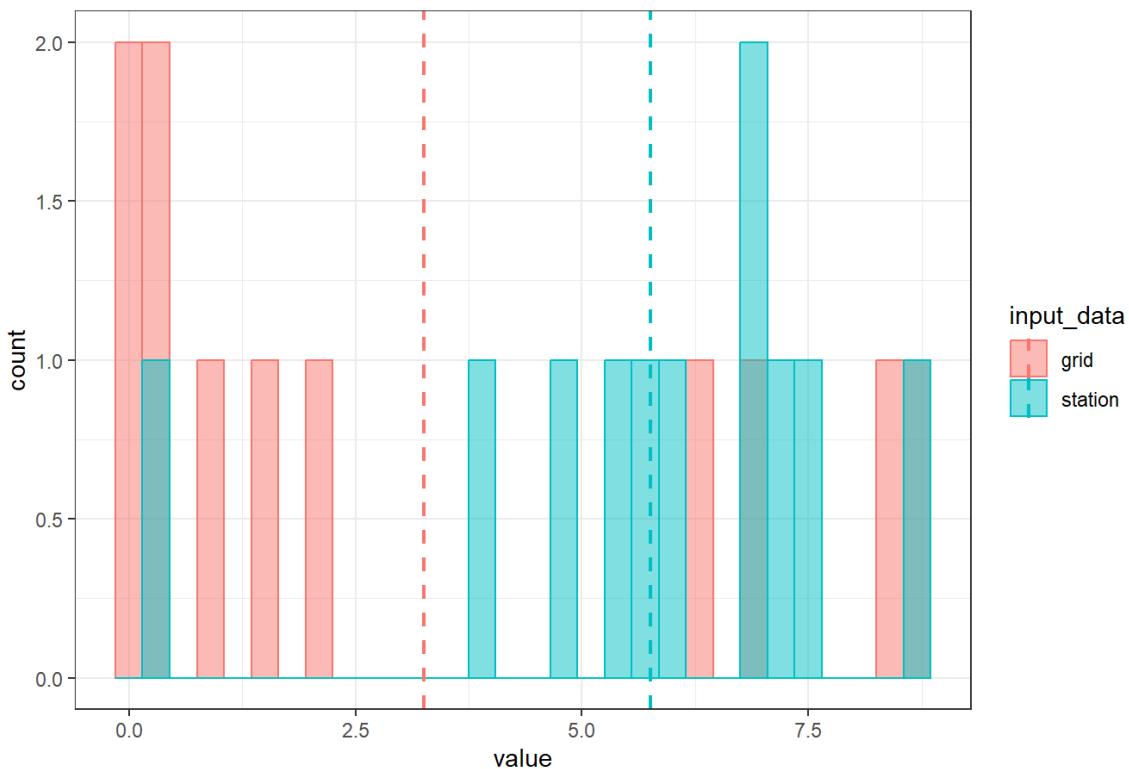
```
##  
## [[19]]
```

snowCritDens

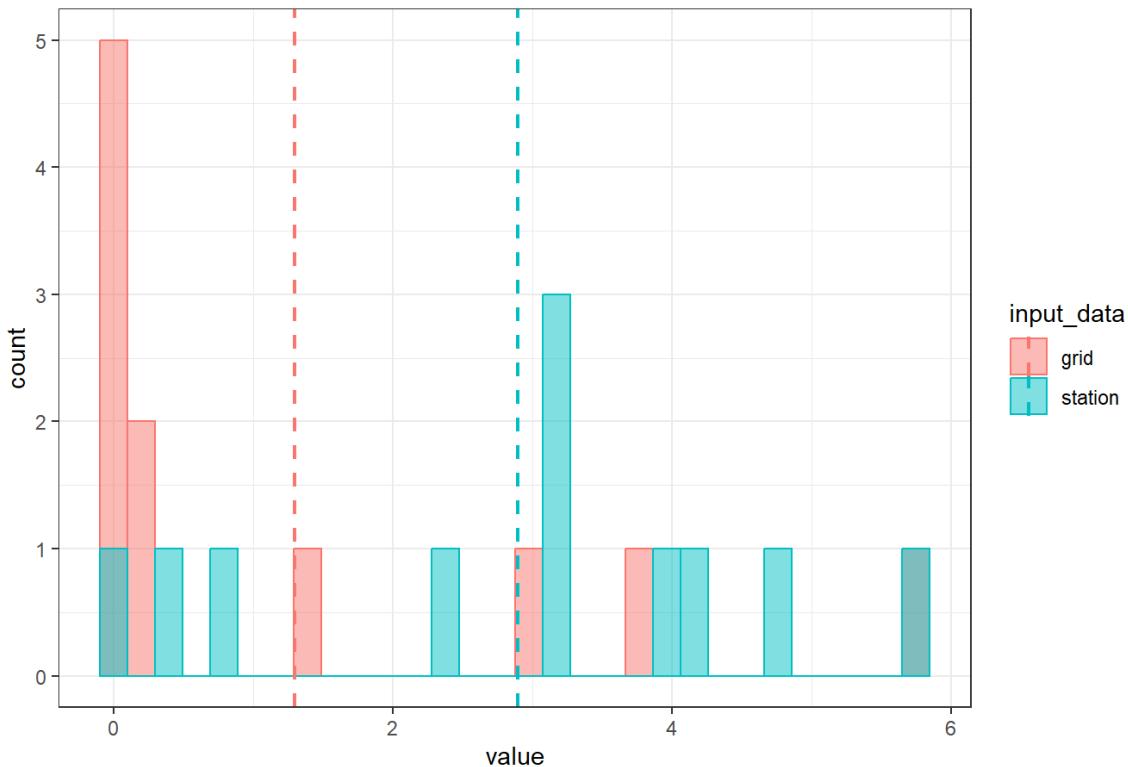


```
##  
## [[20]]
```

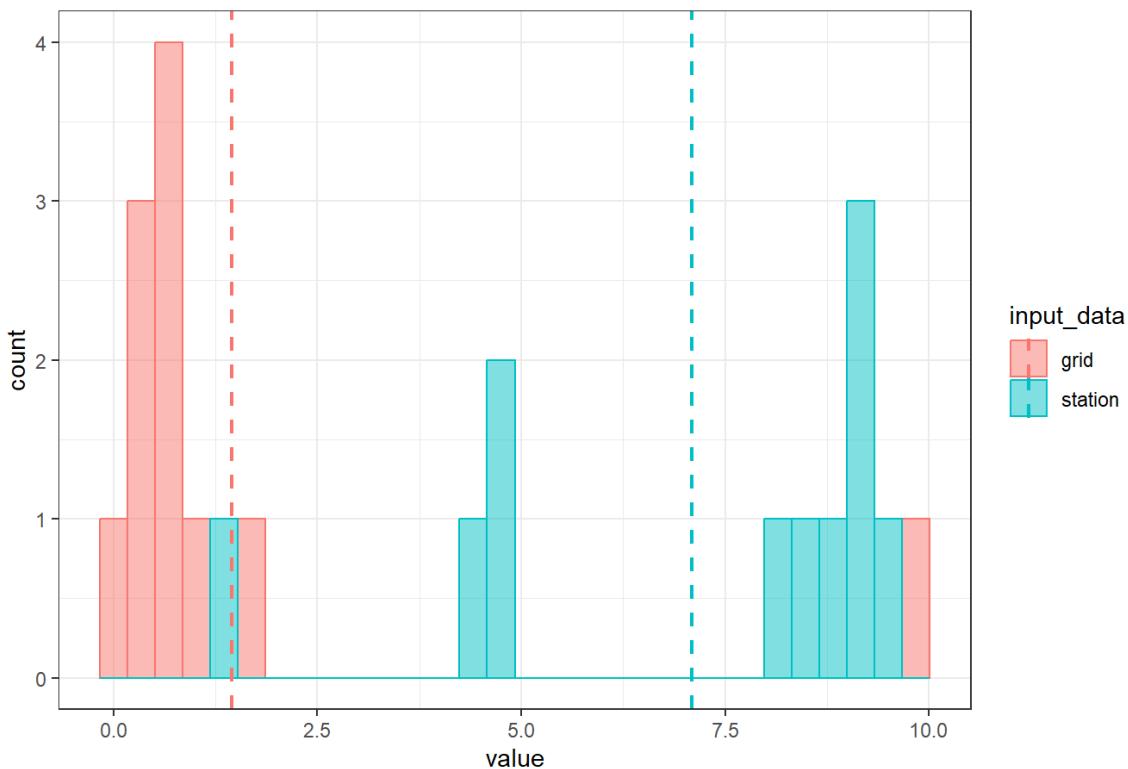
soilDiffMPSLPS



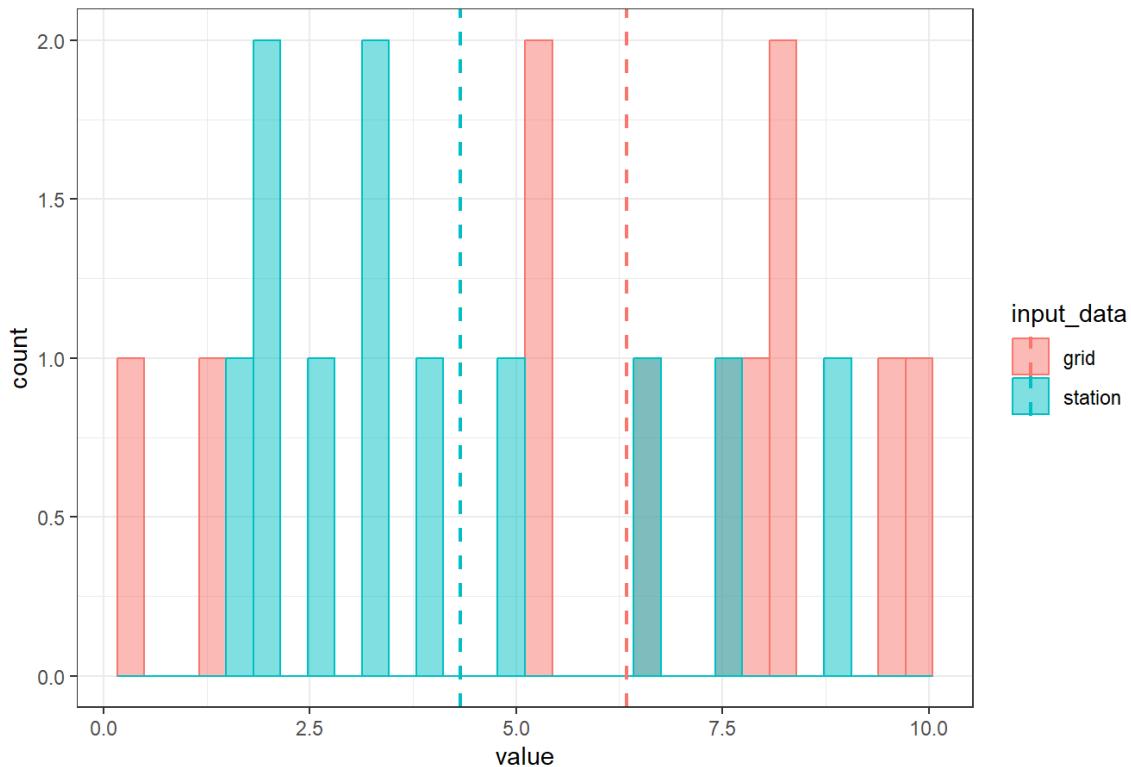
```
##  
## [[21]]
```

soilDistMPSLPS

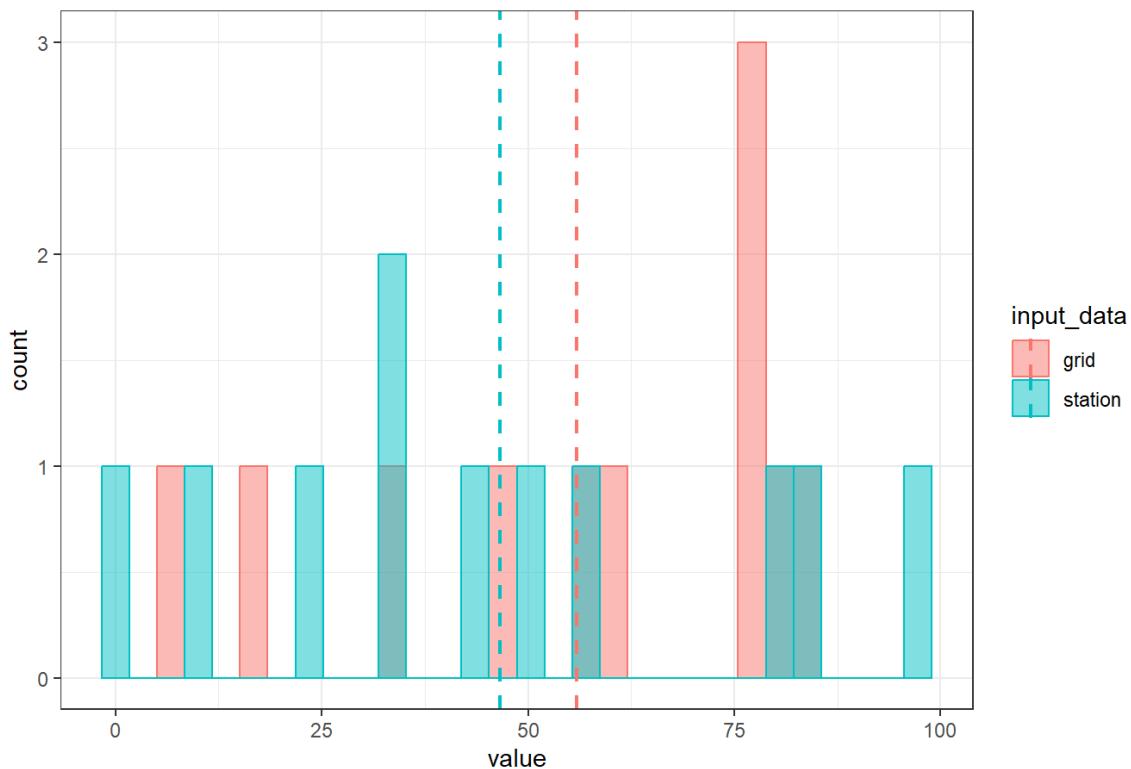
```
##  
## [[22]]
```

soilLatVertLPS

```
##  
## [[23]]
```

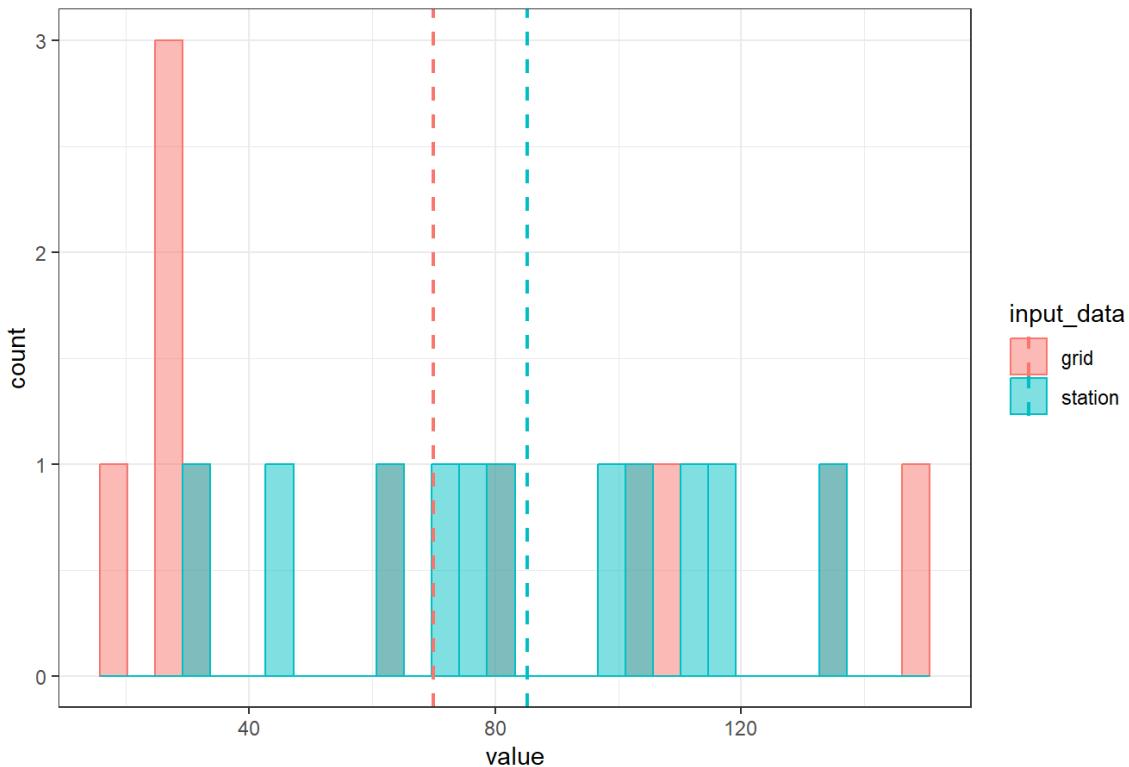
soilMaxDPS

```
##  
## [[24]]
```

soilMaxInfSnow

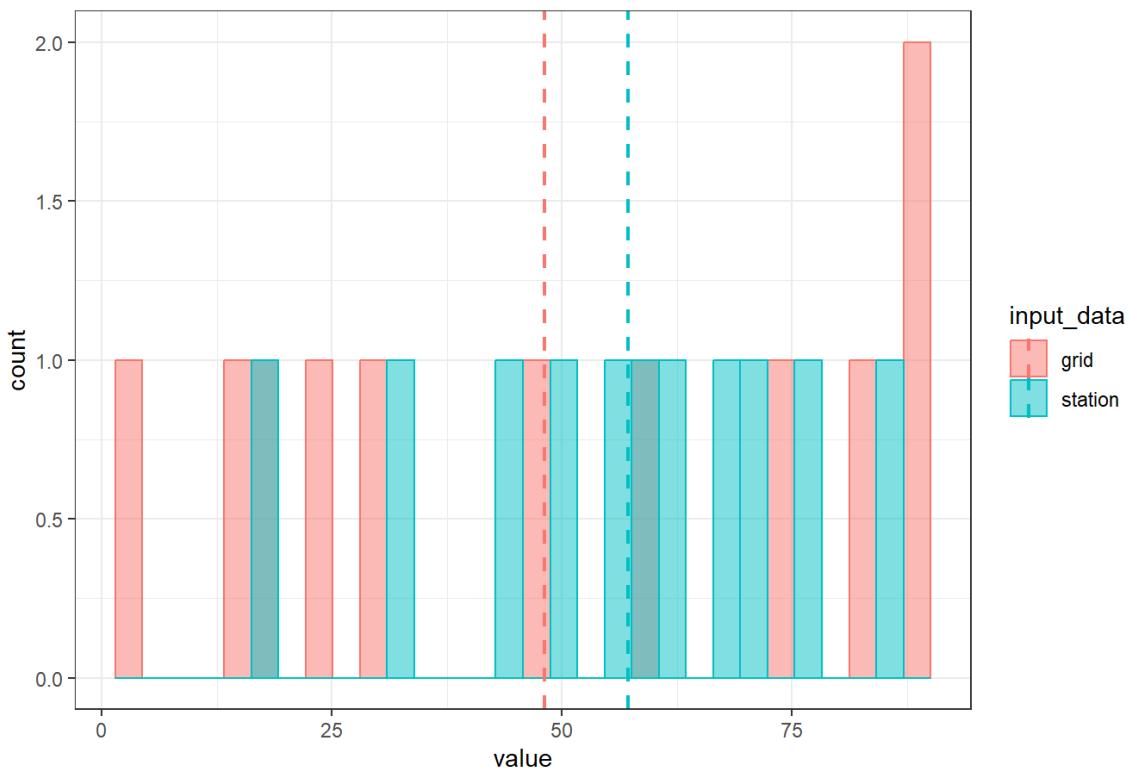
```
##  
## [[25]]
```

soilMaxInfSummer

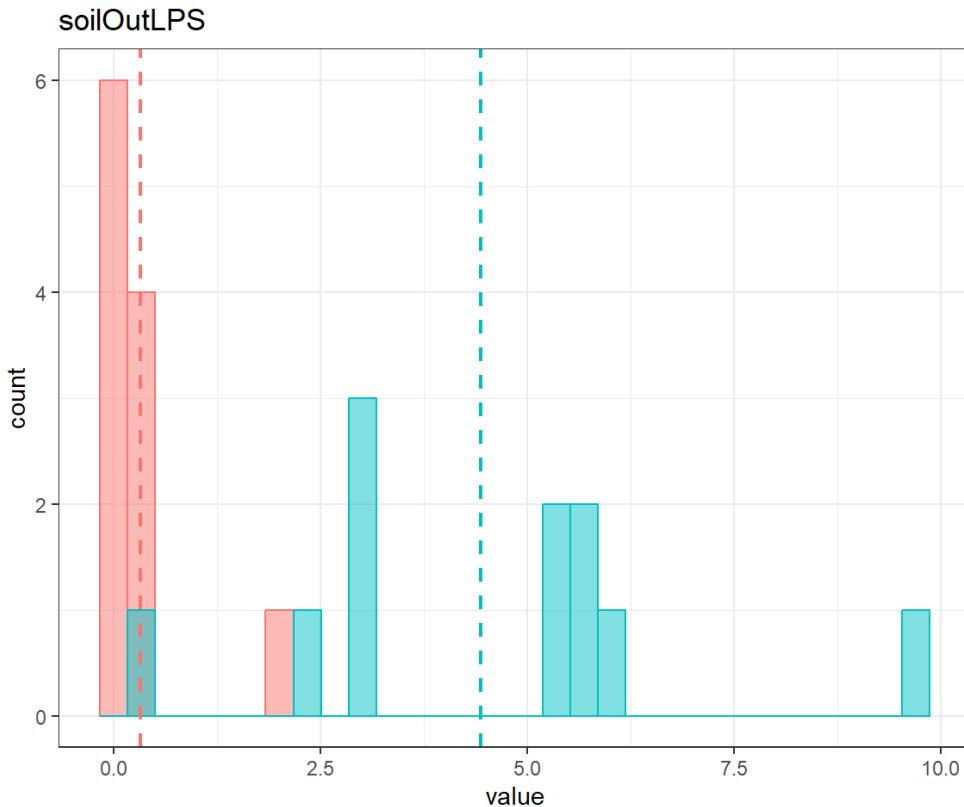


```
##  
## [[26]]
```

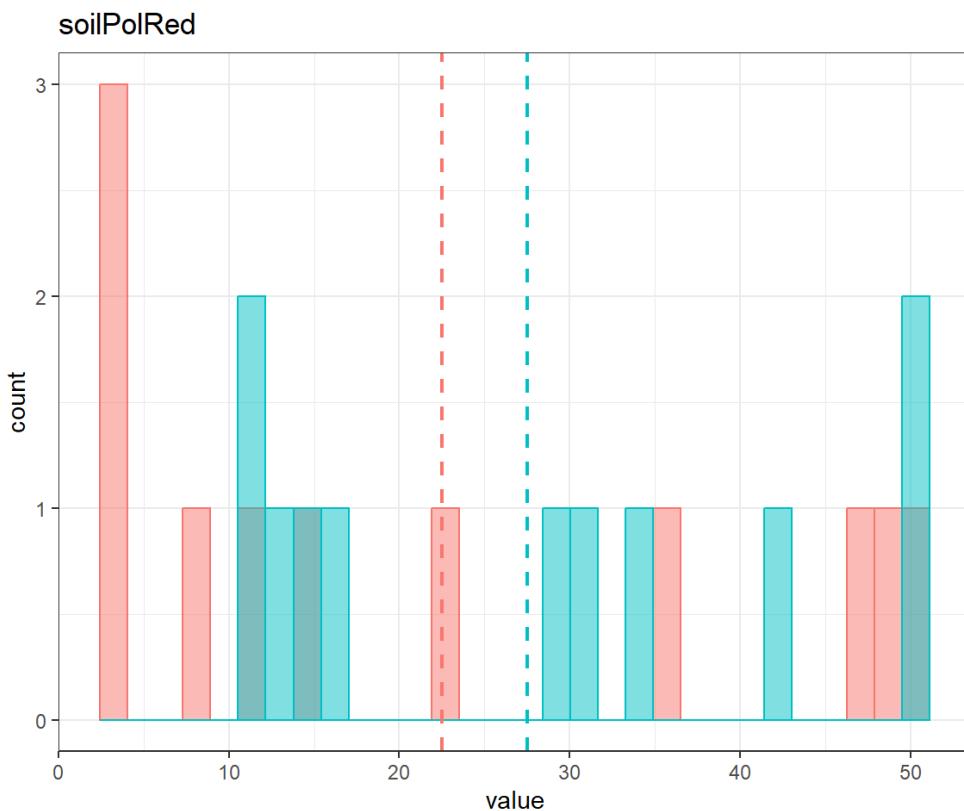
soilMaxInfWinter



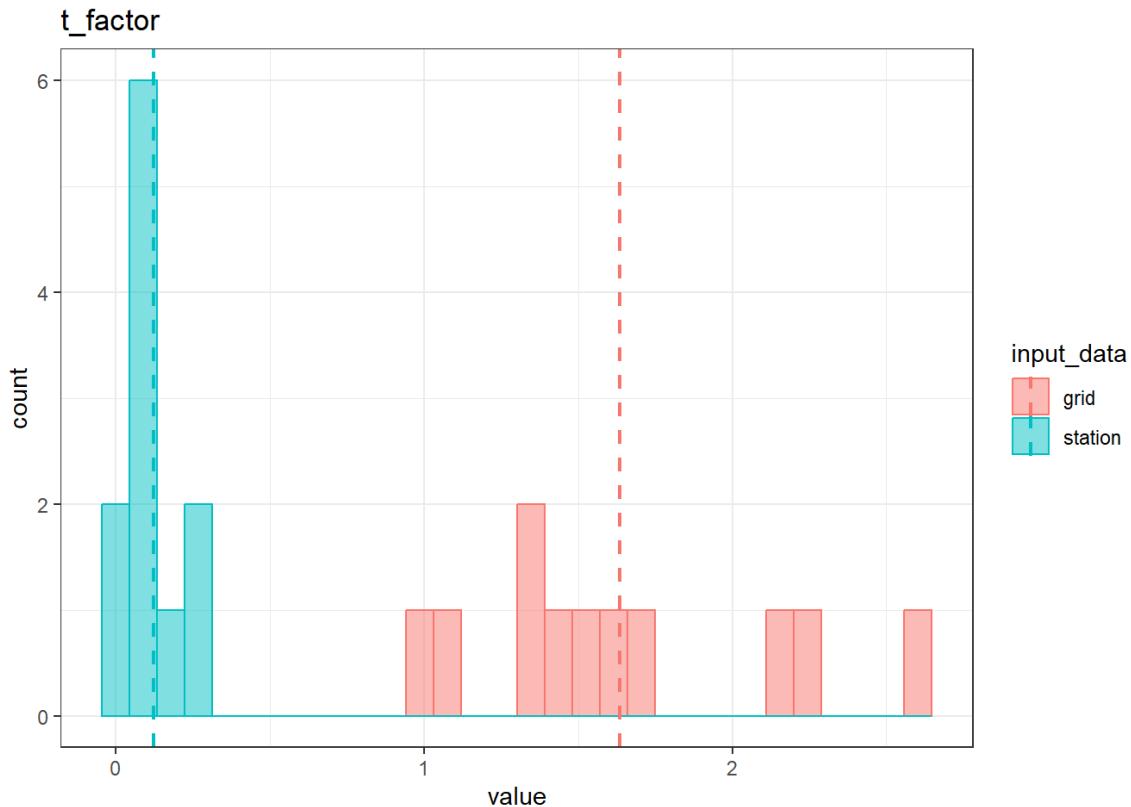
```
##  
## [[27]]
```



```
##  
## [28]
```

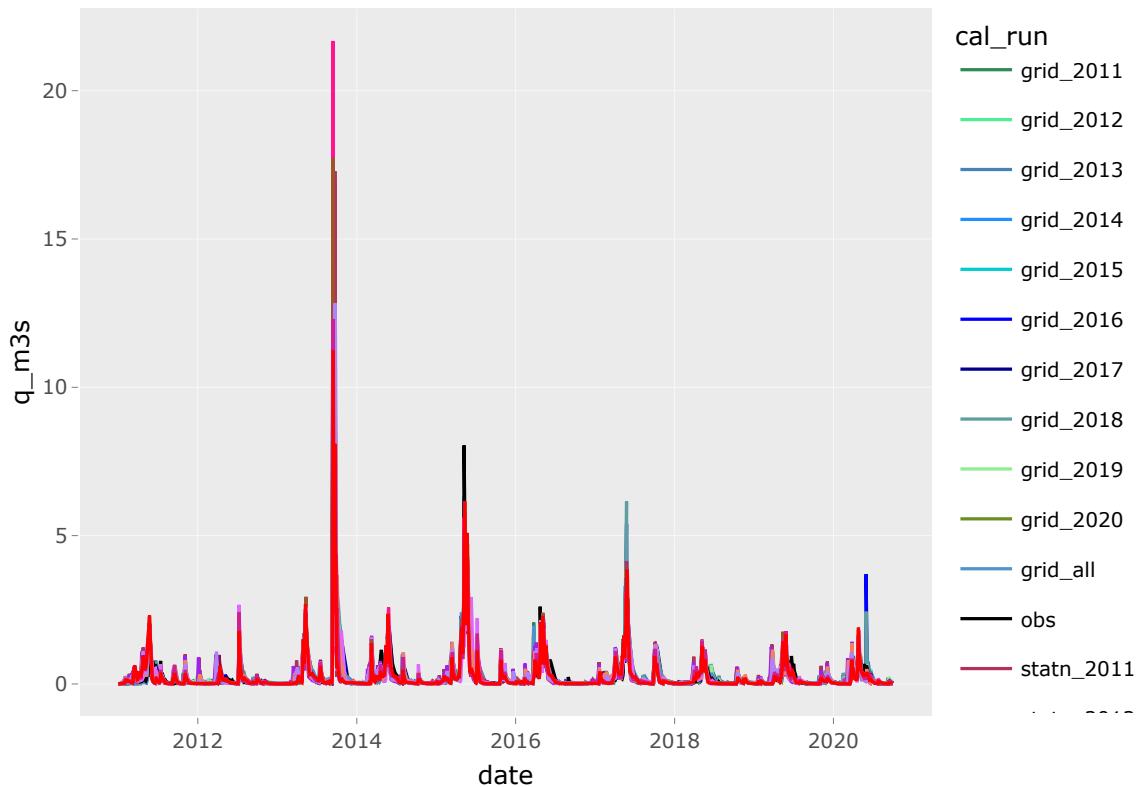


```
##  
## [29]
```



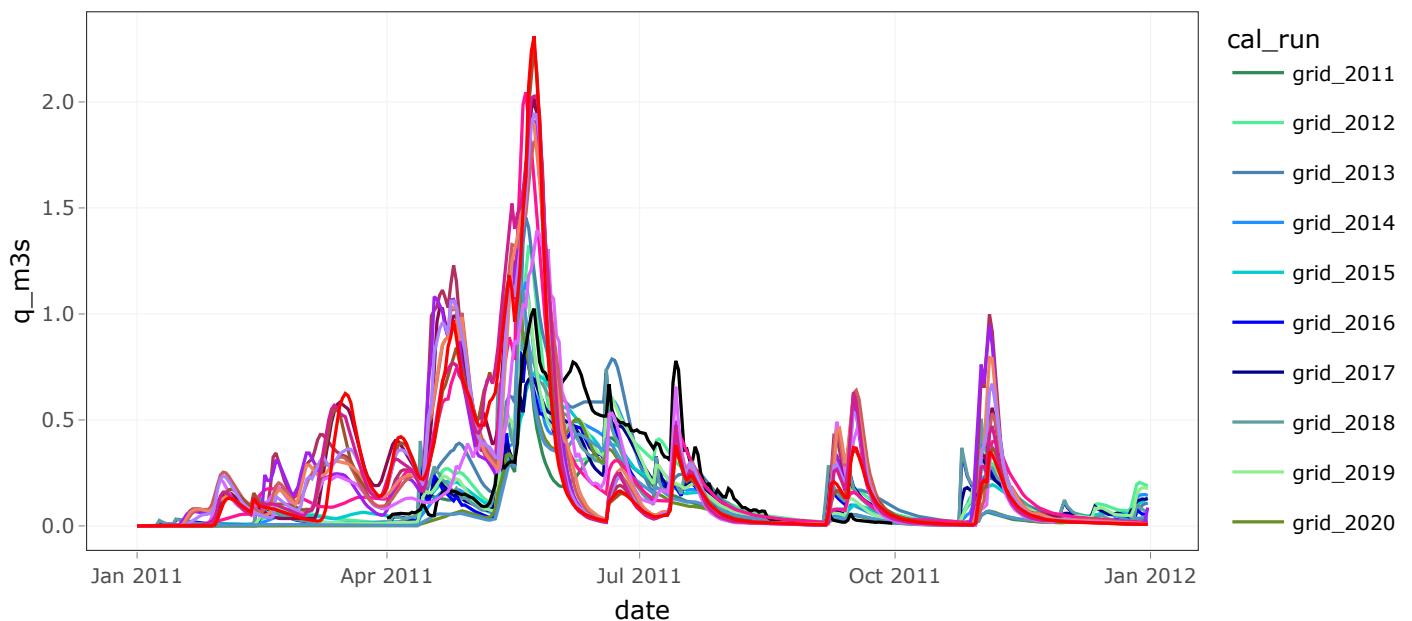
Outlet results

Hydrograph

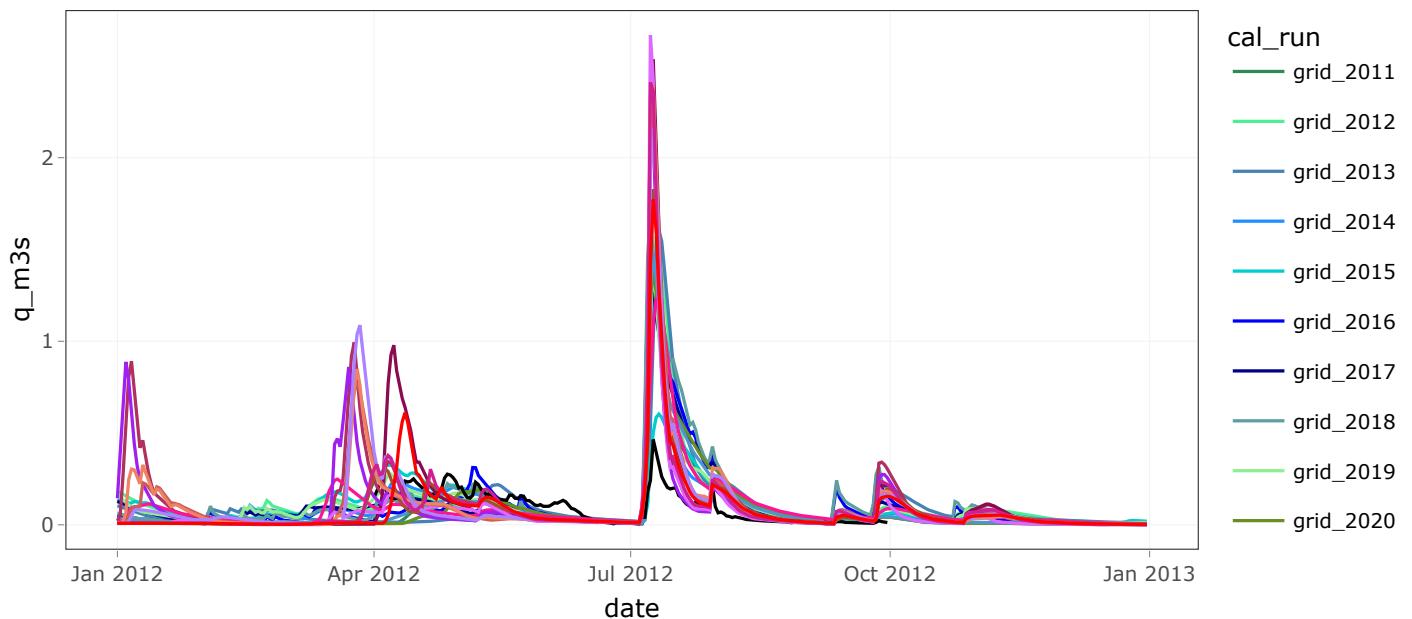


Annual hydrographs

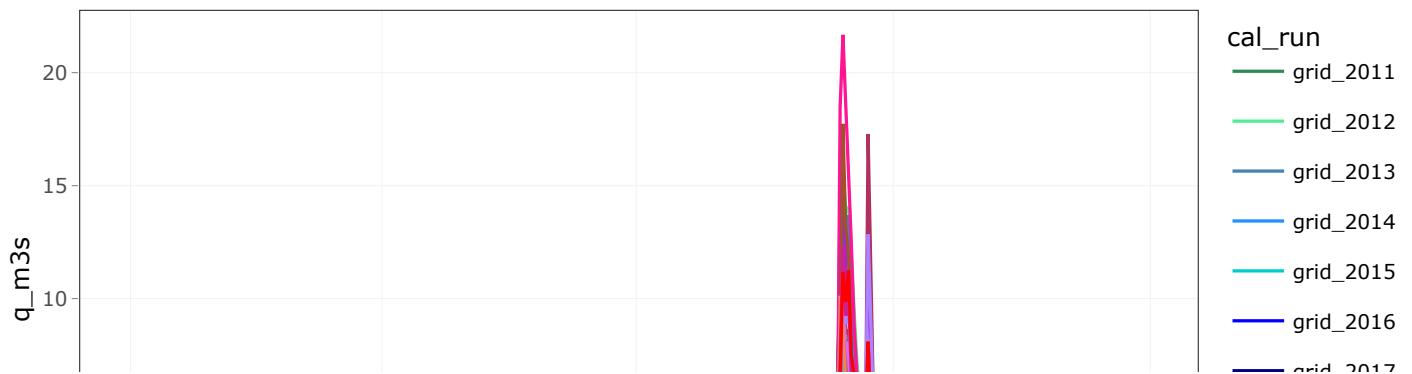
2011



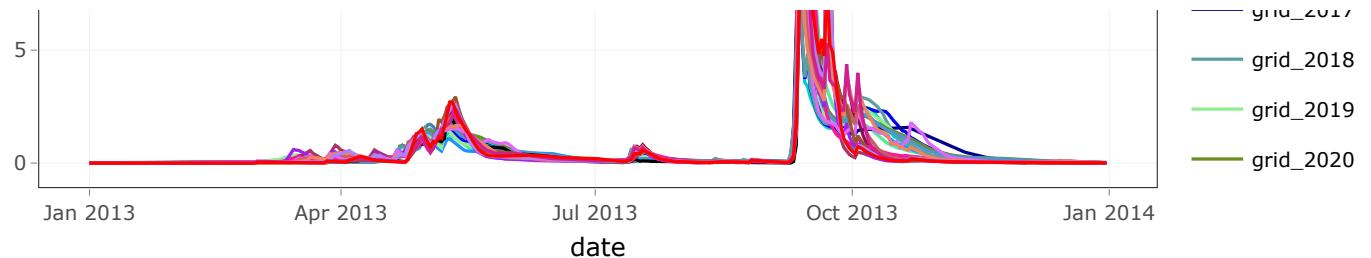
2012



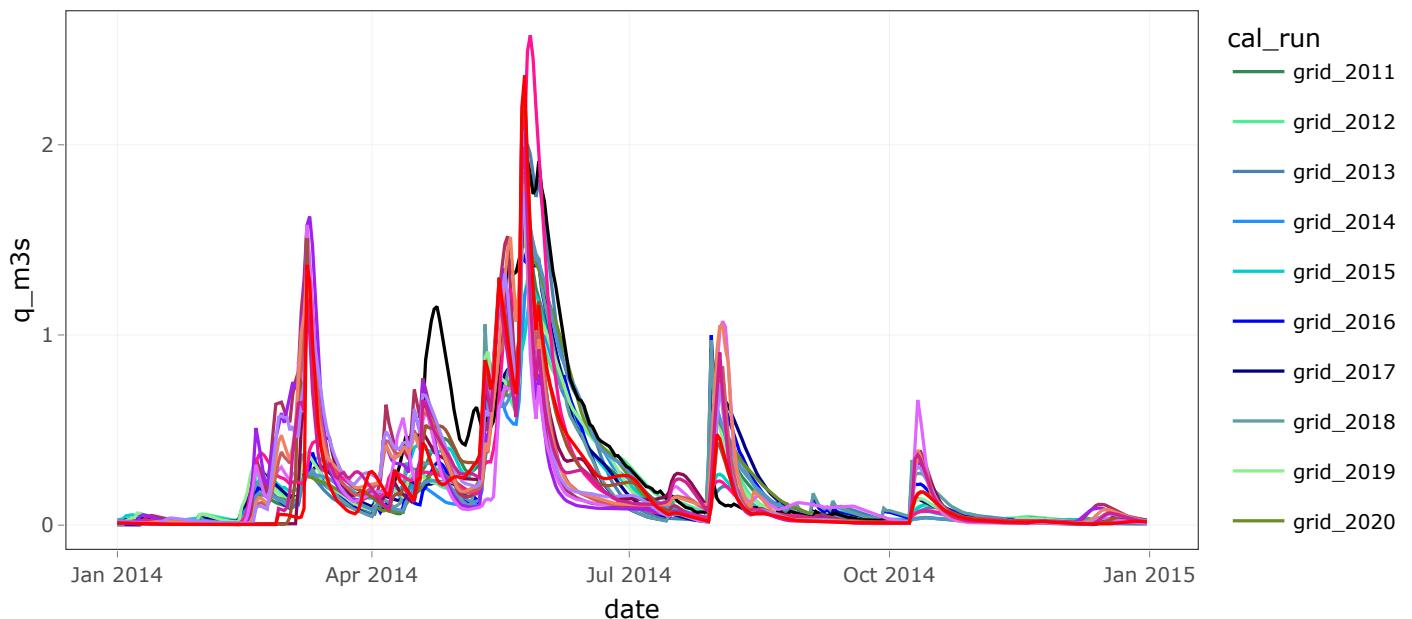
2013



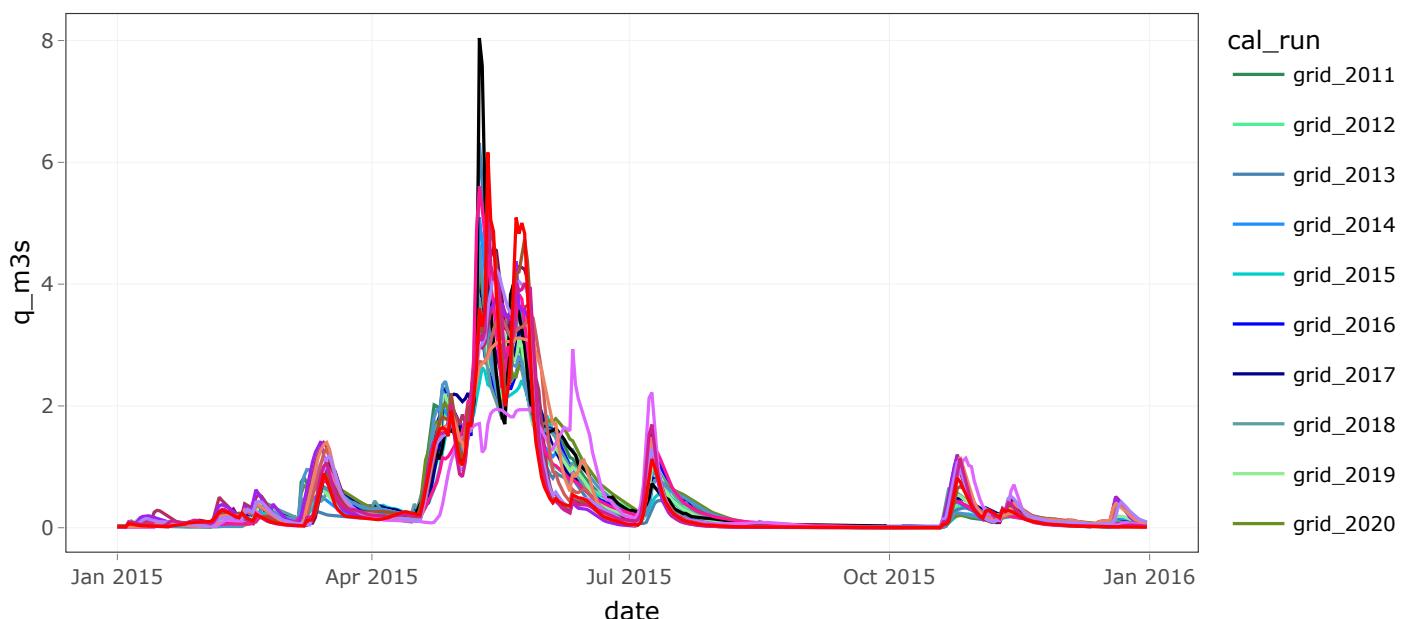
Fourmile Calibrations



2014



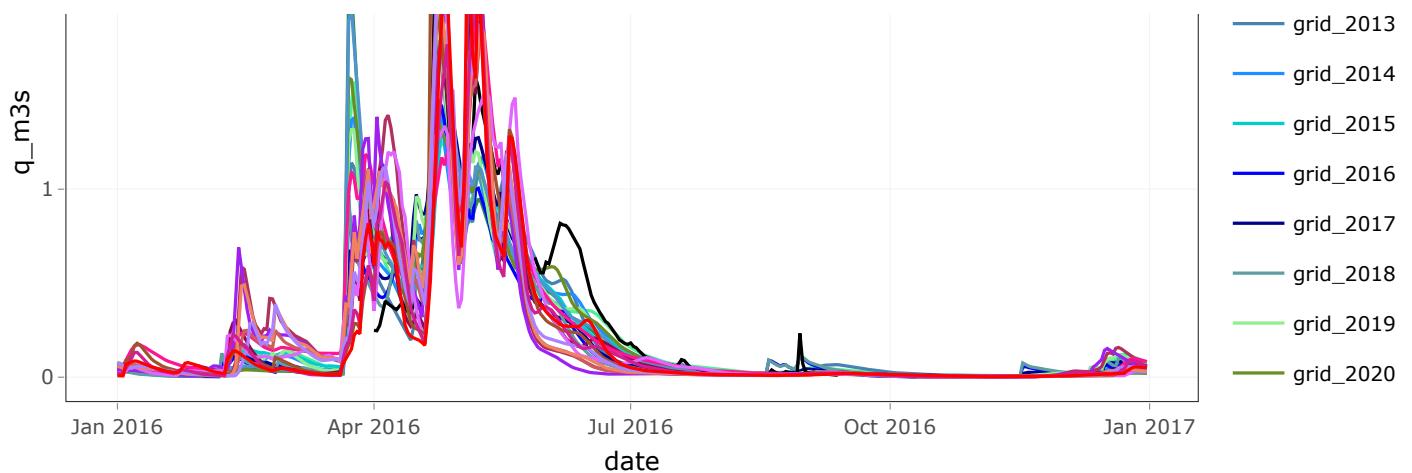
2015



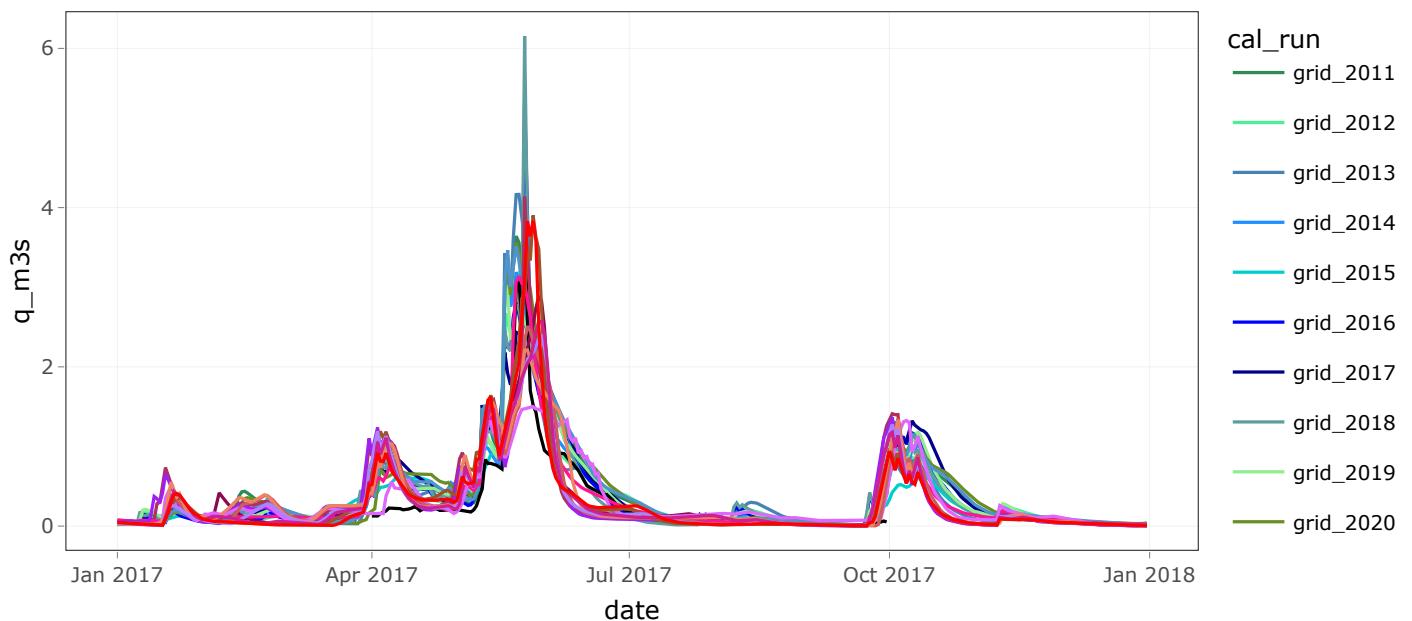
2016



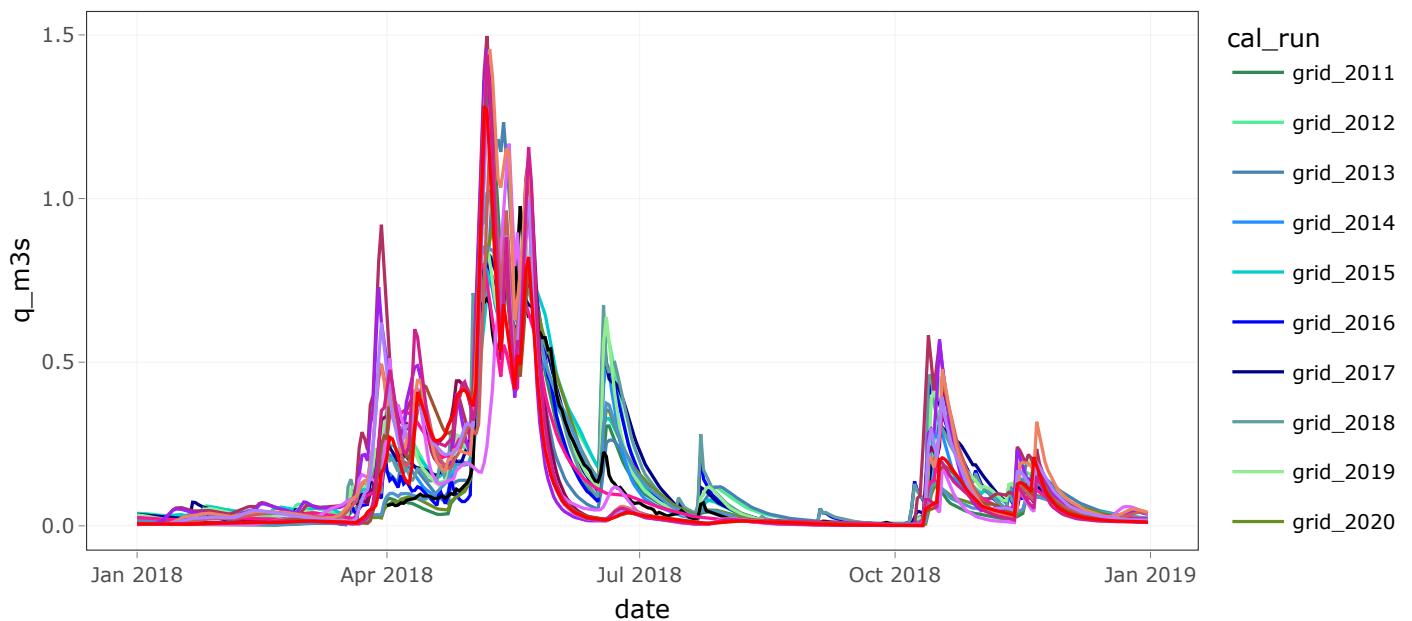
Fourmile Calibrations



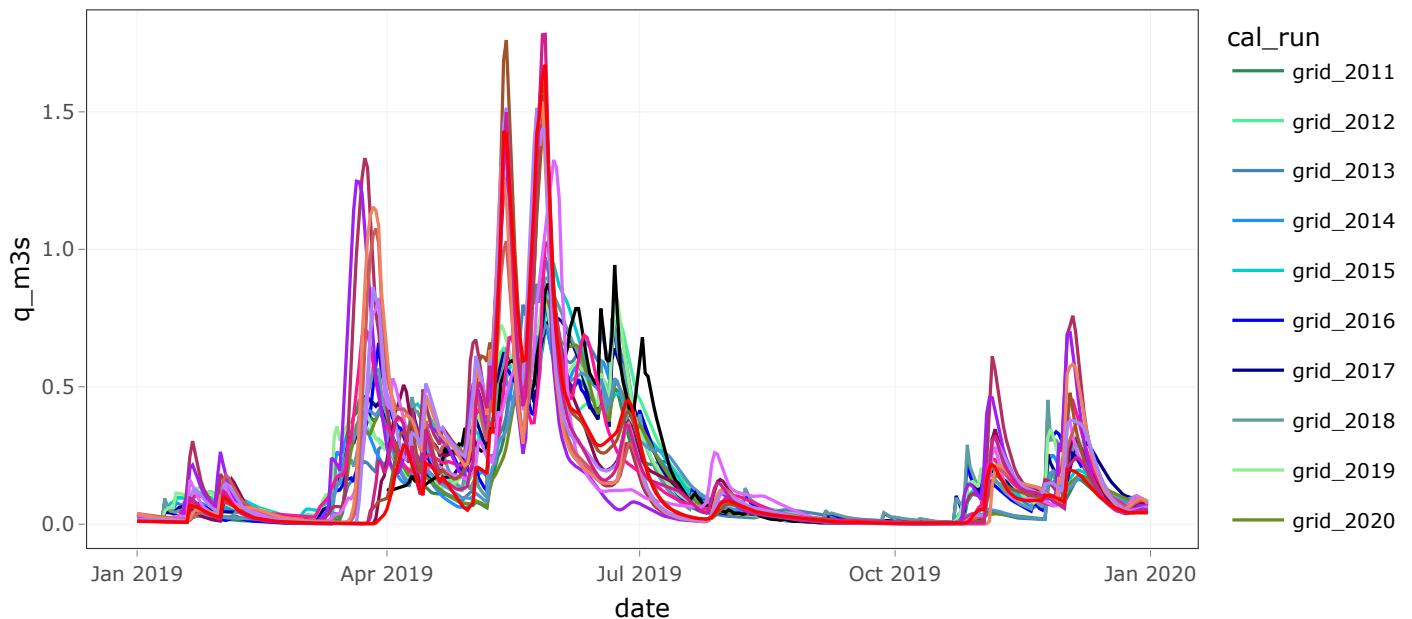
2017



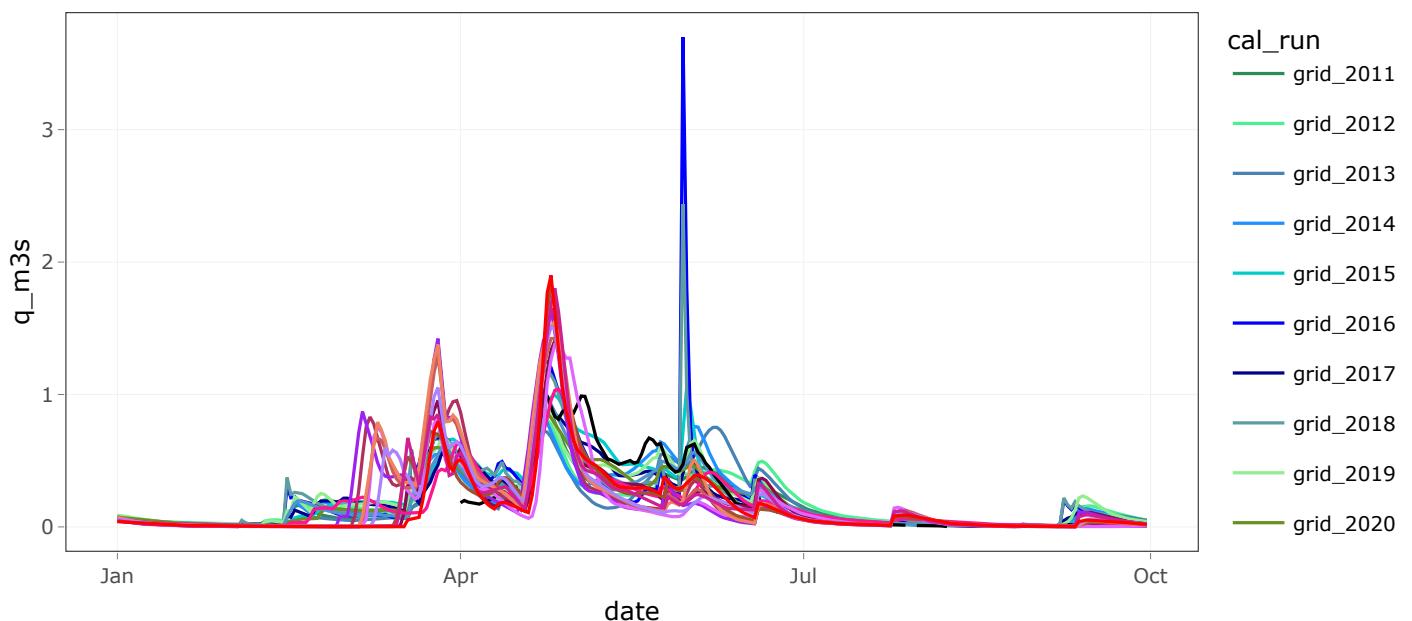
2018



2019



2020



```
## [[1]]
##
## [[2]]
##
## [[3]]
##
## [[4]]
##
## [[5]]
##
## [[6]]
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## [[7]]
##
## [[8]]
##
## [[9]]
##
## [[10]]
```

KGE

Overall KGE

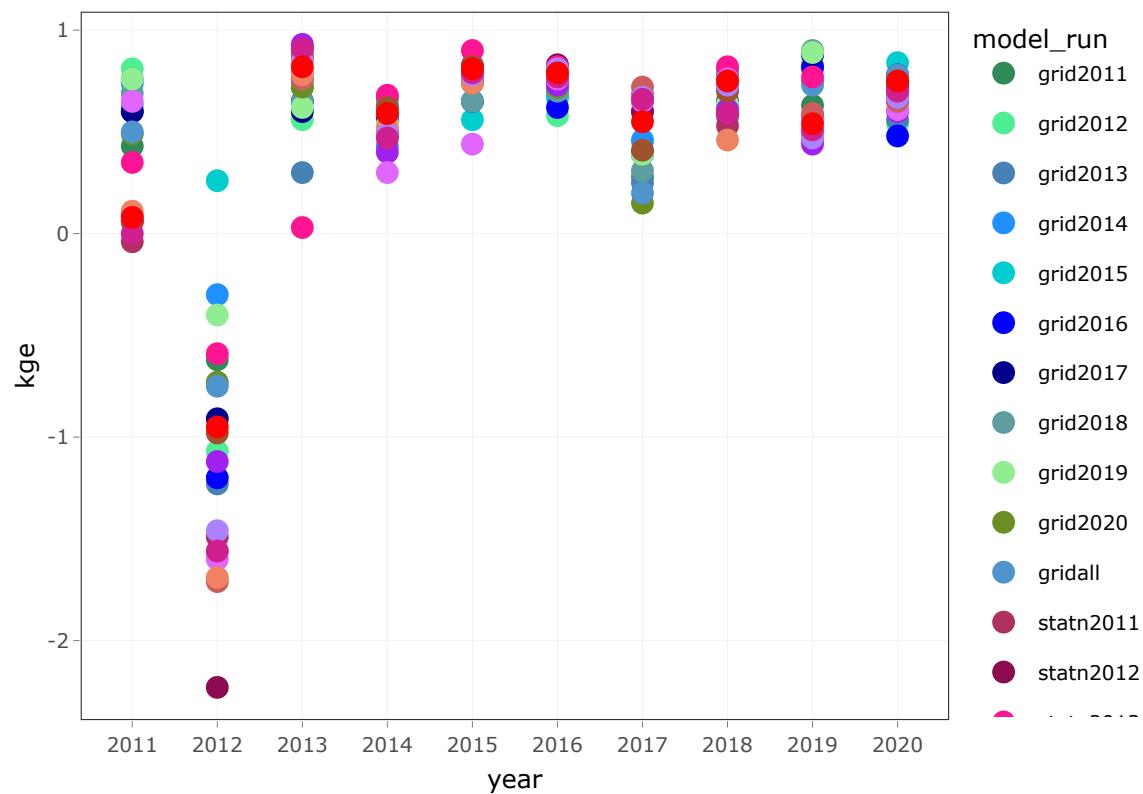
name	value
statn2015	0.66
grid2015	0.78
statn2013	0.78
statn2014	0.79
statn2011	0.80
statn2019	0.80
statn2012	0.81
statn2016	0.81
statn2018	0.81
statn2020	0.81
statn2017	0.82
statnall	0.83
grid2013	0.84
grid2016	0.84
grid2018	0.85

	name	value
	grid2014	0.86
	grid2017	0.87
	grid2011	0.88
	grid2012	0.88
	grid2019	0.88
	grid2020	0.88
	gridall	0.88

KGE by year

model_run	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
grid2011	0.43	-0.62	0.72	0.61	0.76	0.73	0.28	0.73	0.63	0.68
grid2012	0.81	-1.07	0.56	0.47	0.77	0.58	0.45	0.63	0.83	0.54
grid2013	0.76	-1.23	0.30	0.67	0.83	0.70	0.25	0.73	0.89	0.56
grid2014	0.74	-0.30	0.65	0.43	0.75	0.67	0.46	0.81	0.81	0.70
grid2015	0.63	0.26	0.75	0.48	0.56	0.68	0.68	0.71	0.88	0.84
grid2016	0.60	-1.20	0.65	0.56	0.65	0.62	0.39	0.78	0.82	0.48
grid2017	0.60	-0.91	0.60	0.59	0.79	0.81	0.40	0.65	0.88	0.78
grid2018	0.69	-1.56	0.65	0.59	0.65	0.70	0.31	0.57	0.90	0.73
grid2019	0.76	-0.40	0.62	0.54	0.74	0.78	0.39	0.64	0.89	0.75
grid2020	0.49	-0.73	0.72	0.66	0.74	0.72	0.15	0.79	0.75	0.72
gridall	0.50	-0.75	0.77	0.63	0.76	0.76	0.20	0.79	0.73	0.78
statn2011	-0.04	-1.49	0.86	0.50	0.78	0.76	0.60	0.53	0.46	0.65
statn2012	0.06	-2.23	0.91	0.49	0.82	0.83	0.60	0.59	0.58	0.72
statn2013	0.35	-0.59	0.03	0.68	0.90	0.82	0.68	0.82	0.77	0.68
statn2014	0.06	-1.12	0.93	0.40	0.77	0.73	0.65	0.61	0.44	0.60
statn2015	0.65	-1.60	0.80	0.30	0.44	0.76	0.65	0.76	0.56	0.61
statn2016	0.09	-1.71	0.76	0.48	0.75	0.77	0.72	0.75	0.59	0.65
statn2017	0.06	-0.98	0.88	0.62	0.82	0.80	0.41	0.70	0.48	0.75
statn2018	0.11	-1.69	0.78	0.52	0.74	0.80	0.67	0.46	0.49	0.70

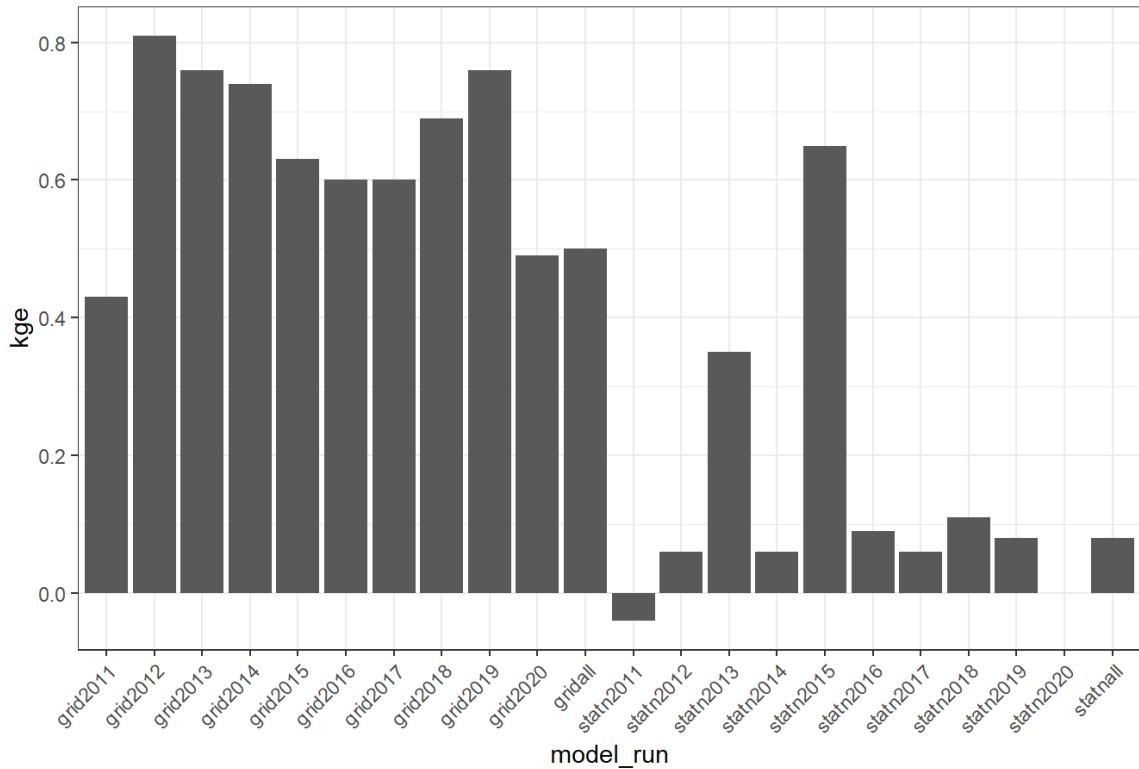
model_run	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
statn2019	0.08	-1.46	0.85	0.49	0.78	0.81	0.67	0.73	0.47	0.67
statn2020	0.00	-1.56	0.91	0.47	0.79	0.77	0.66	0.59	0.51	0.70
statnall	0.08	-0.95	0.82	0.59	0.81	0.79	0.55	0.75	0.54	0.75



Annual KGE plots

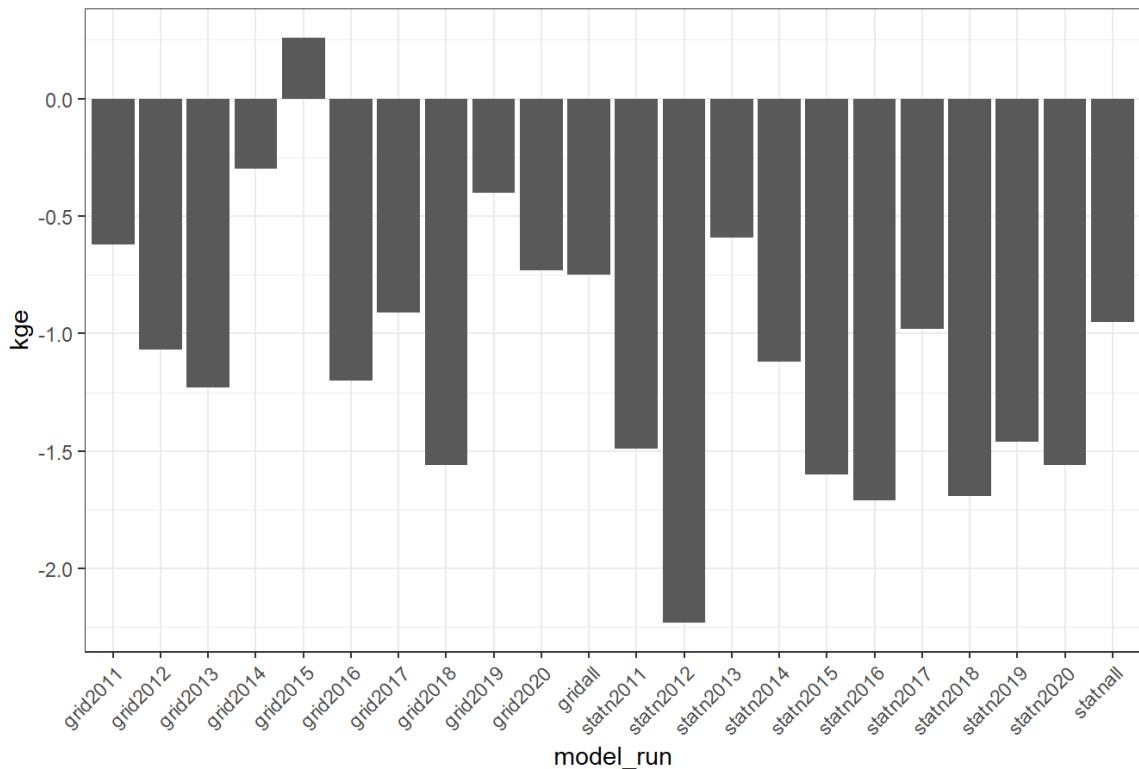
```
## [[1]]
```

2011



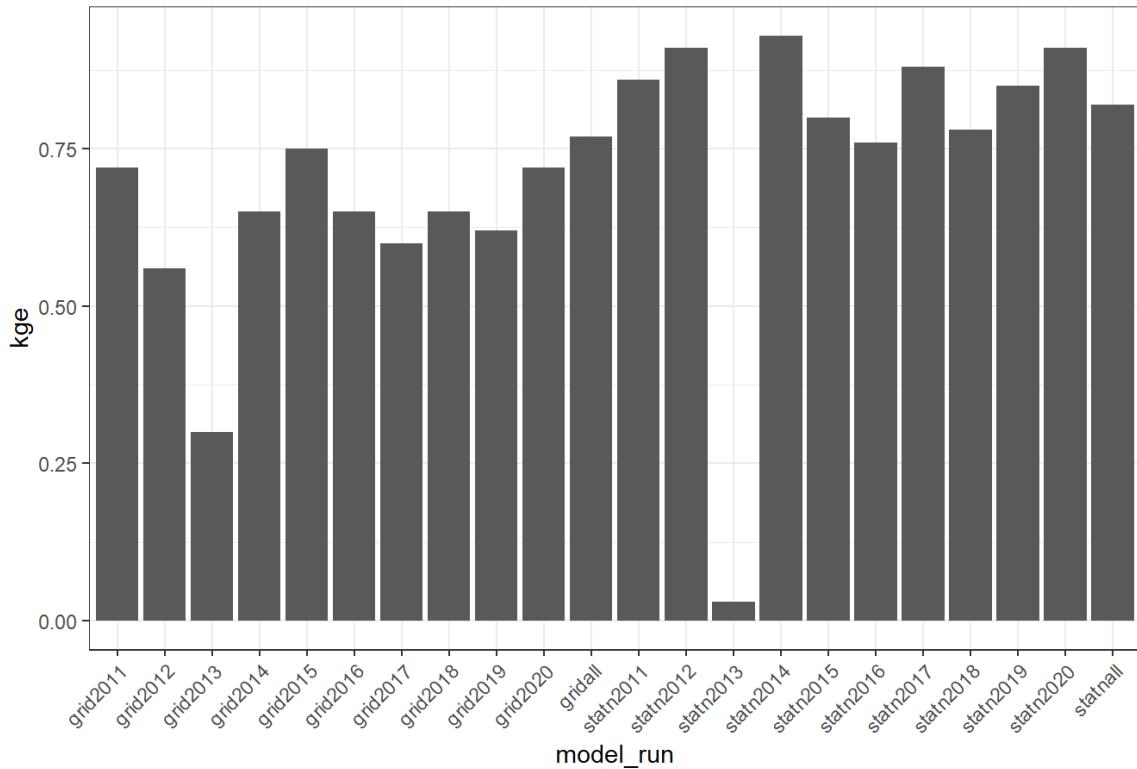
```
##  
## [[2]]
```

2012



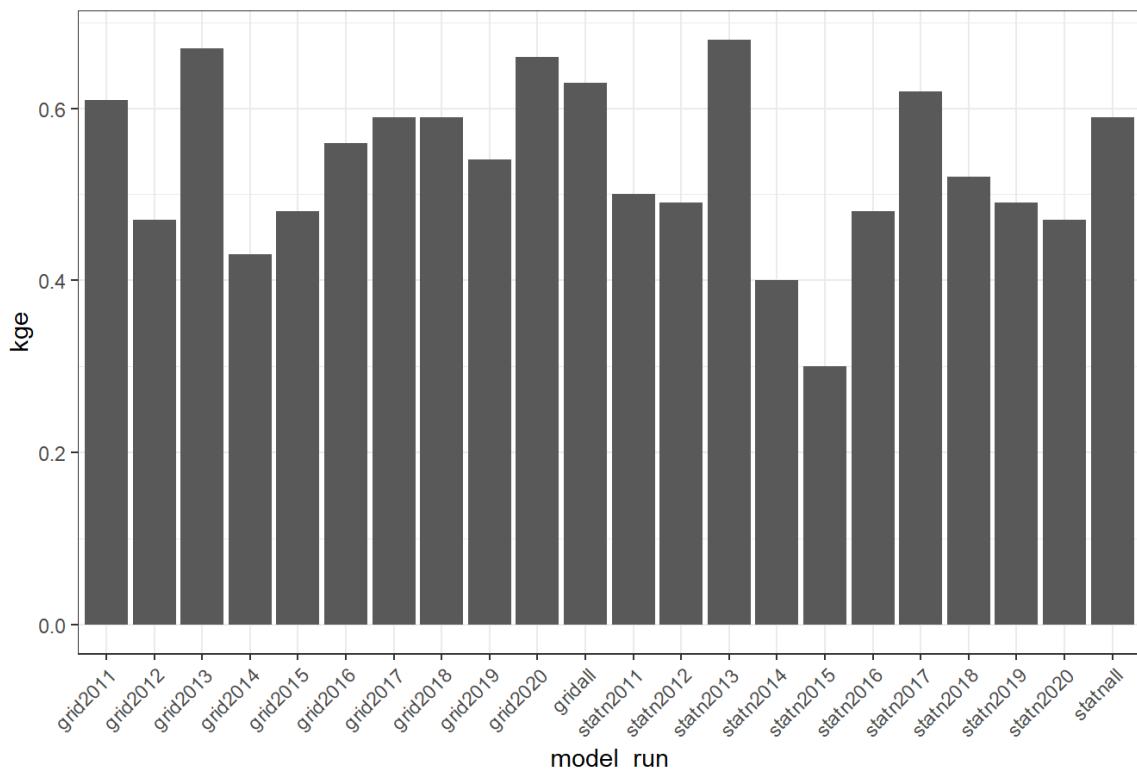
```
##  
## [[3]]
```

2013



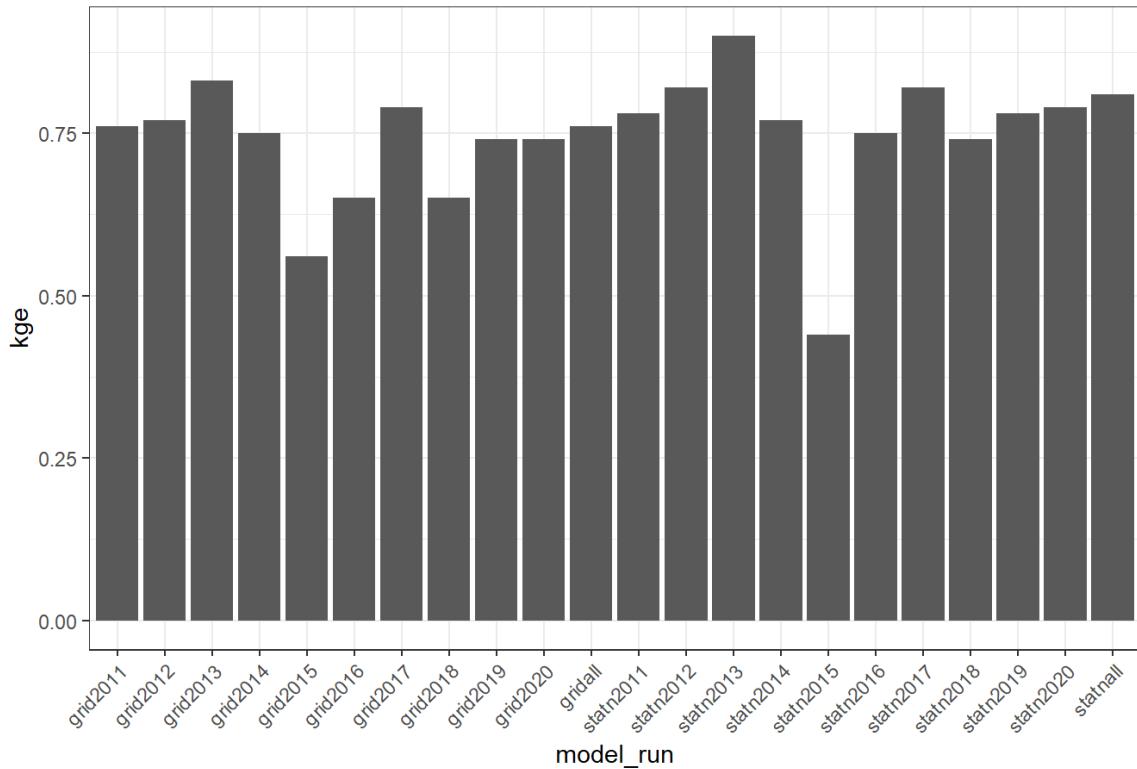
```
##  
## [[4]]
```

2014



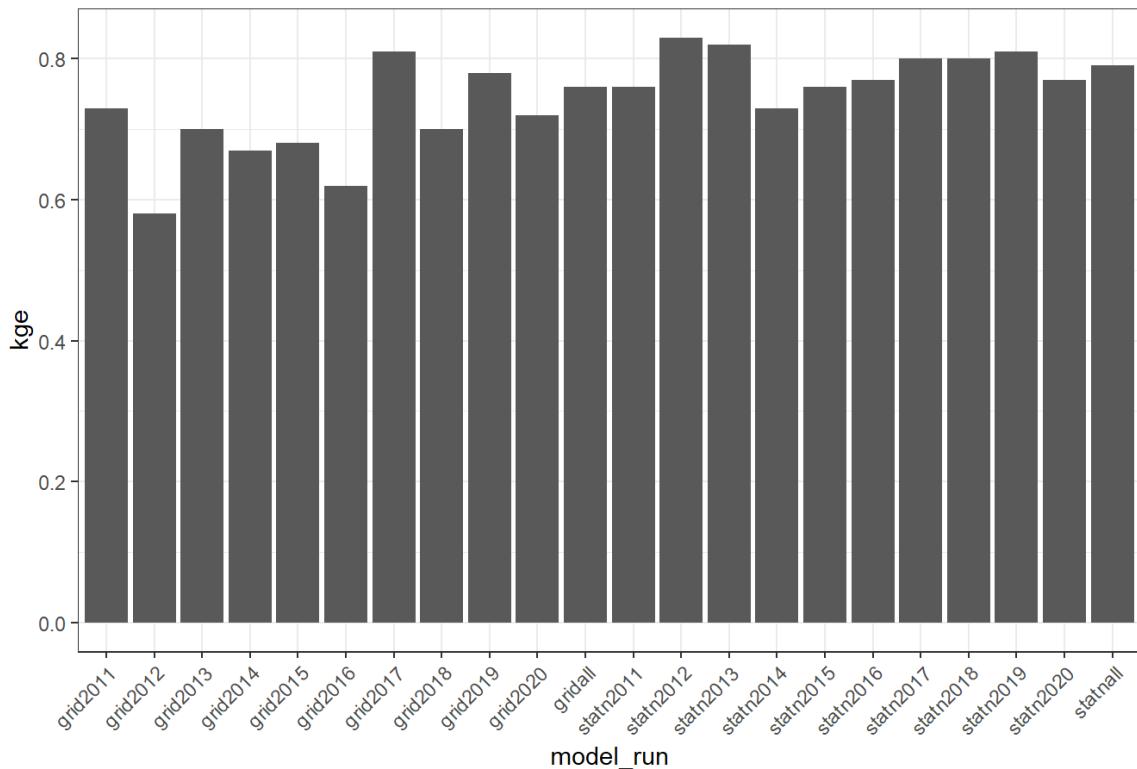
```
##  
## [[5]]
```

2015



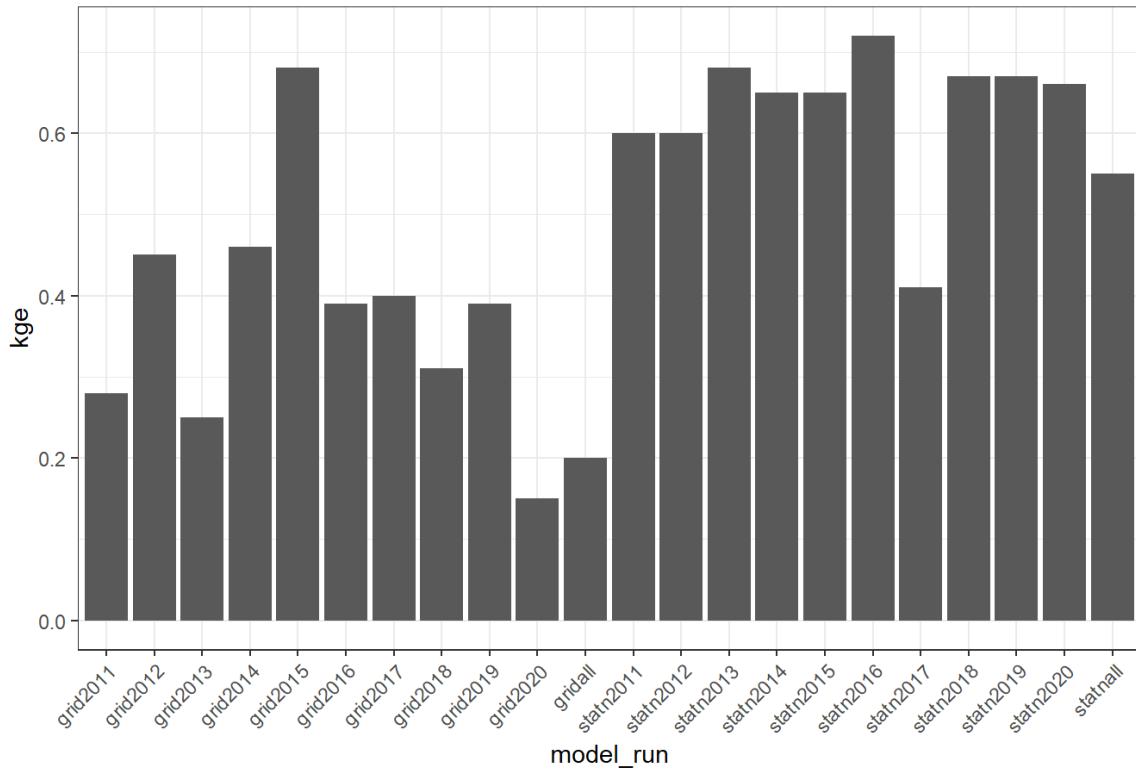
```
##  
## [[6]]
```

2016



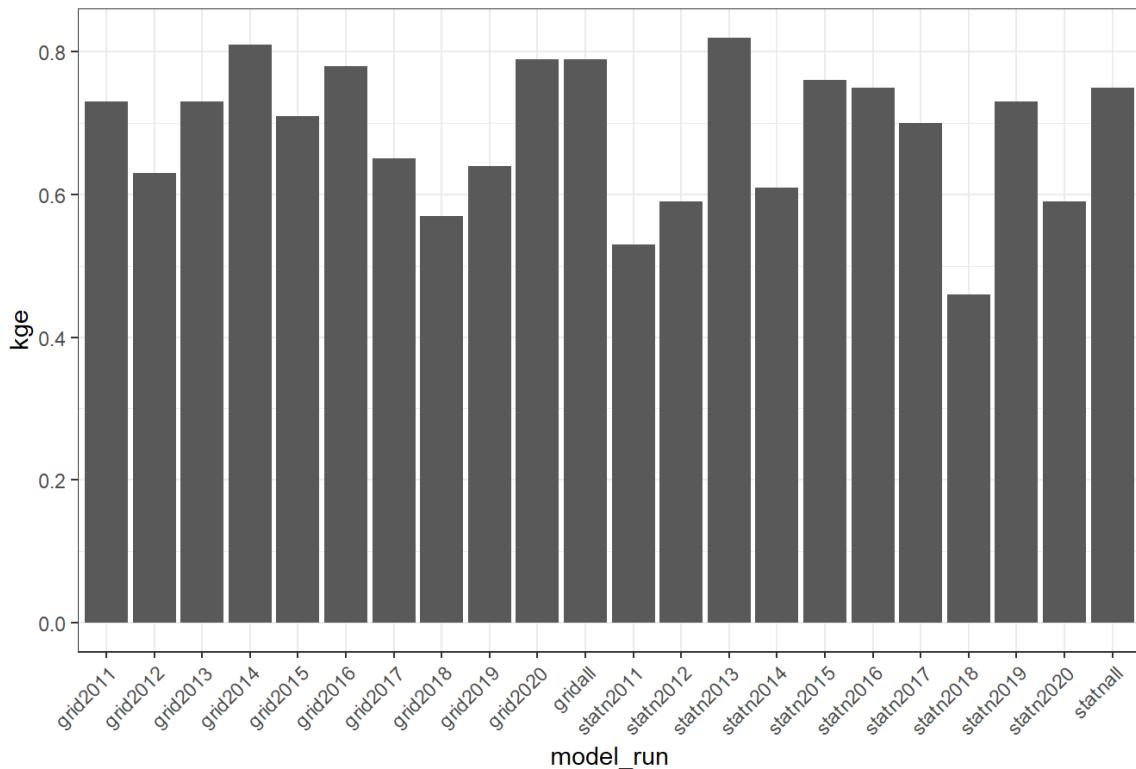
```
##  
## [[7]]
```

2017



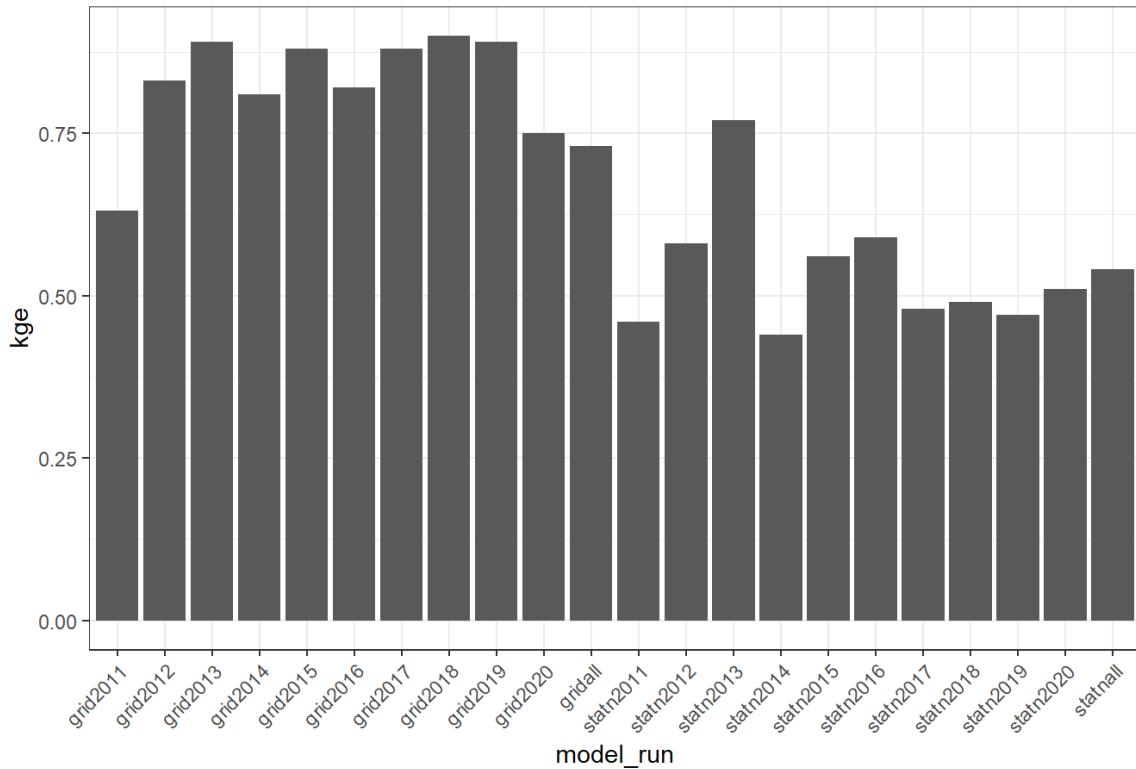
```
##  
## [[8]]
```

2018



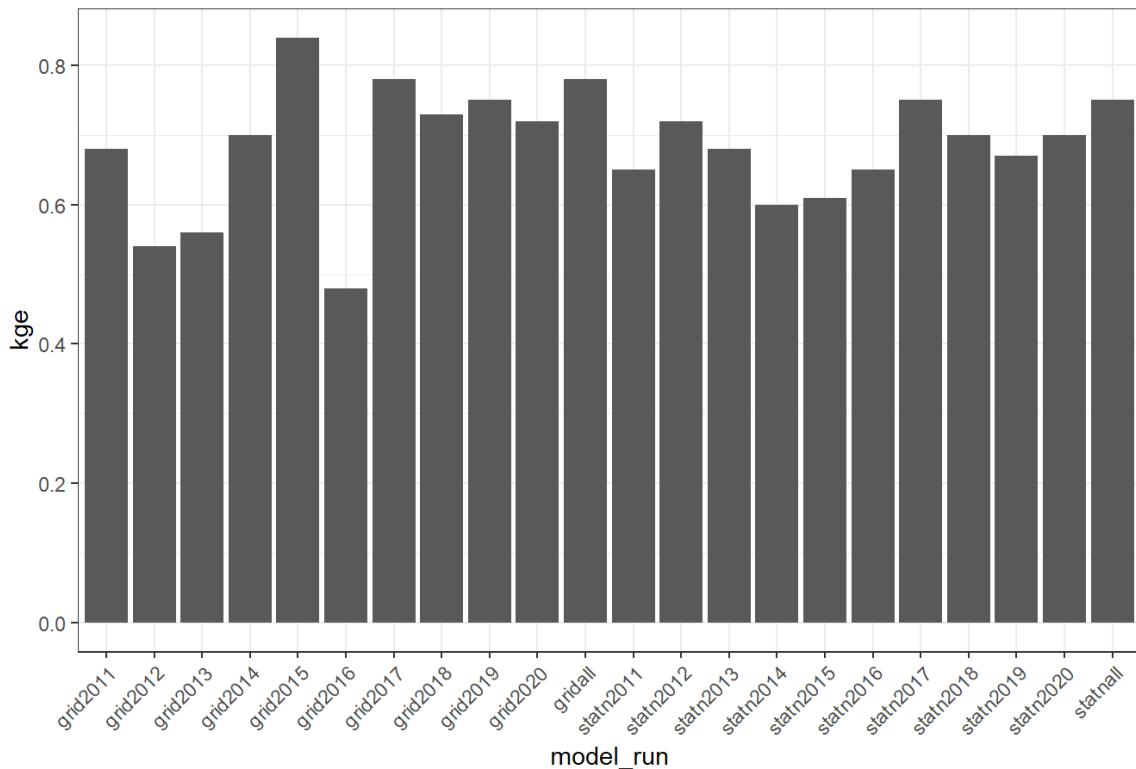
```
##  
## [[9]]
```

2019



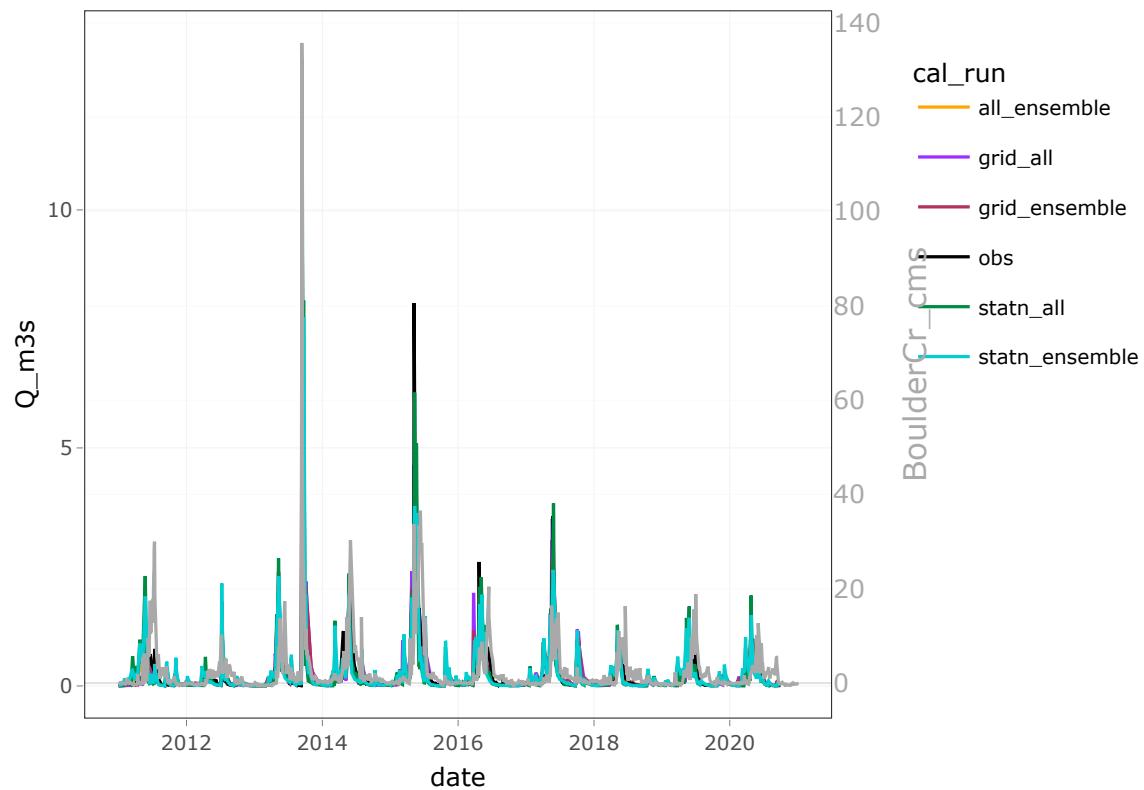
```
##  
## [[10]]
```

2020



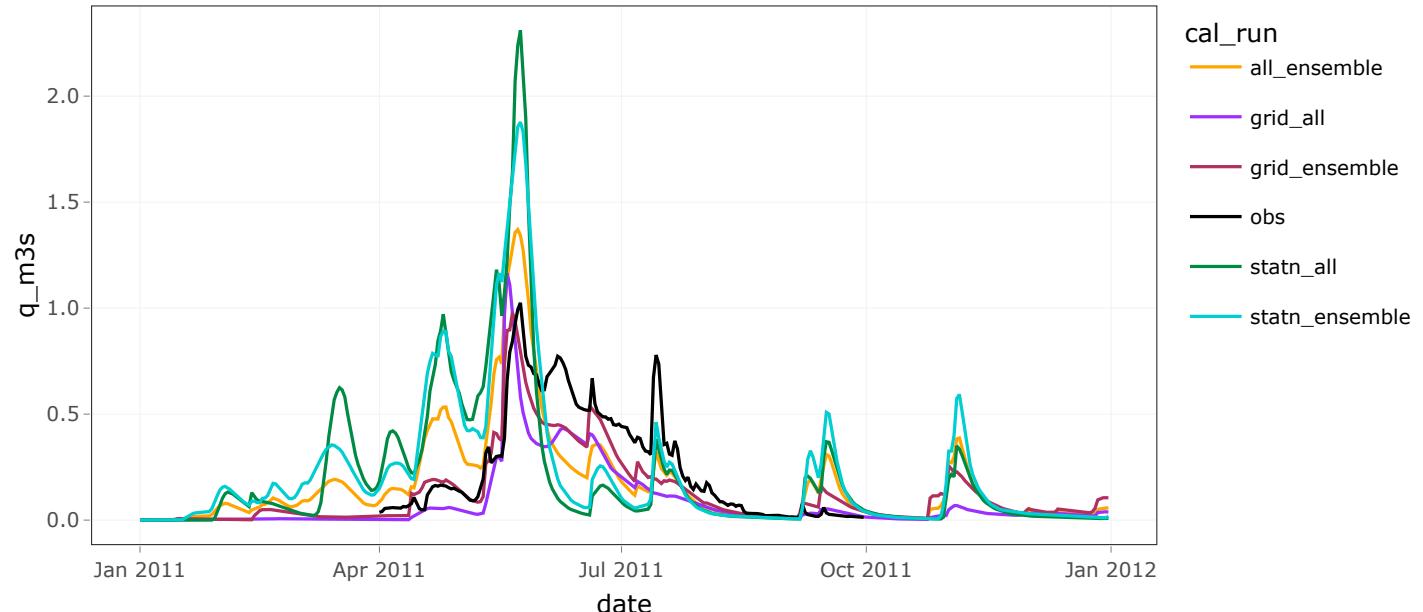
Ensembles

Hydrograph



Annual hydrographs

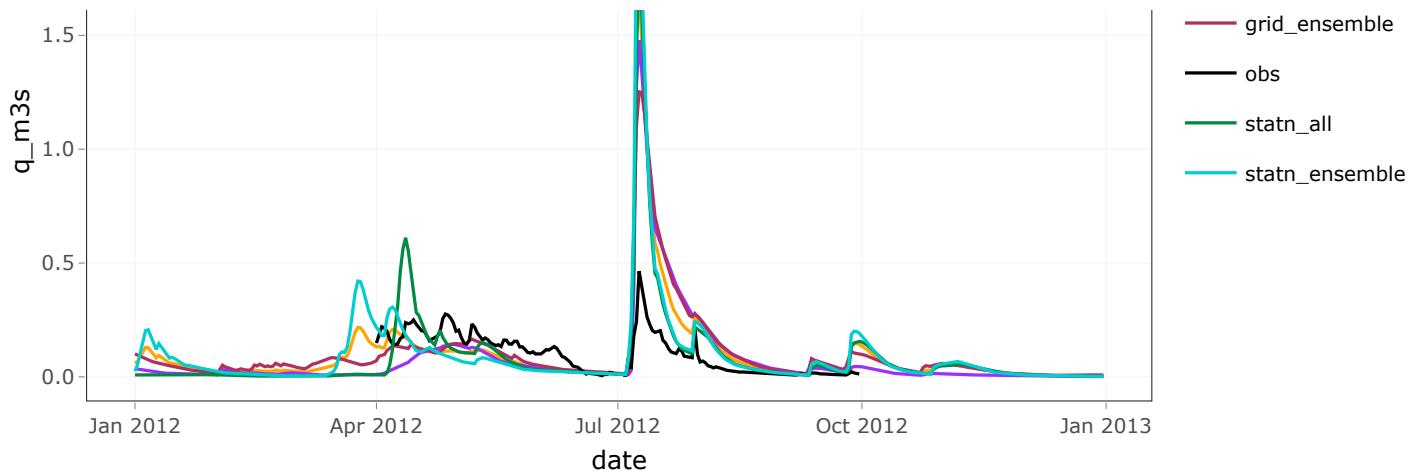
2011



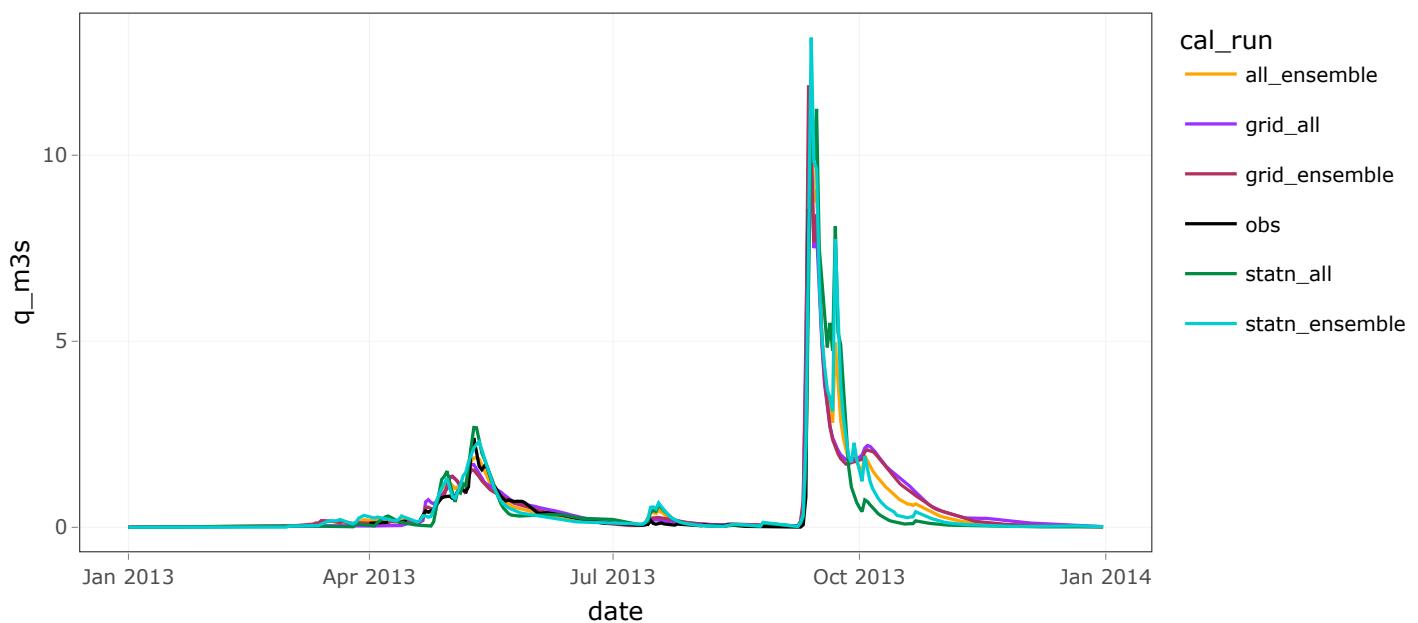
2012



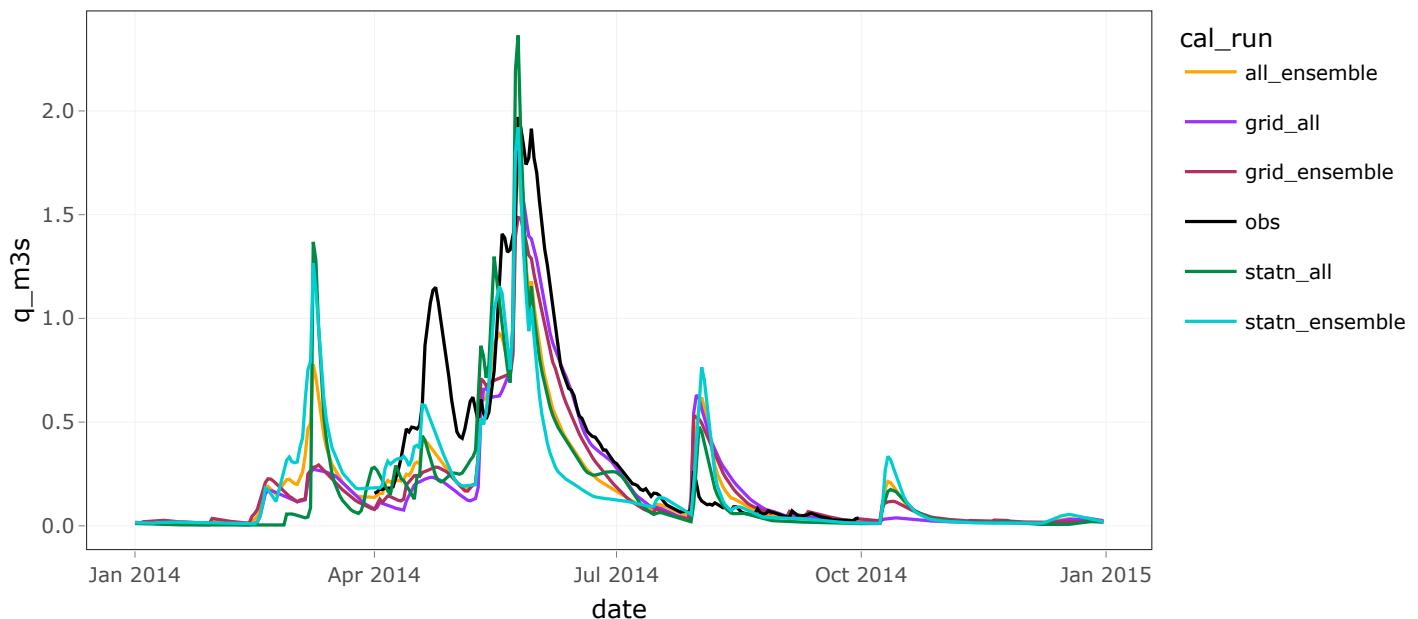
Fourmile Calibrations



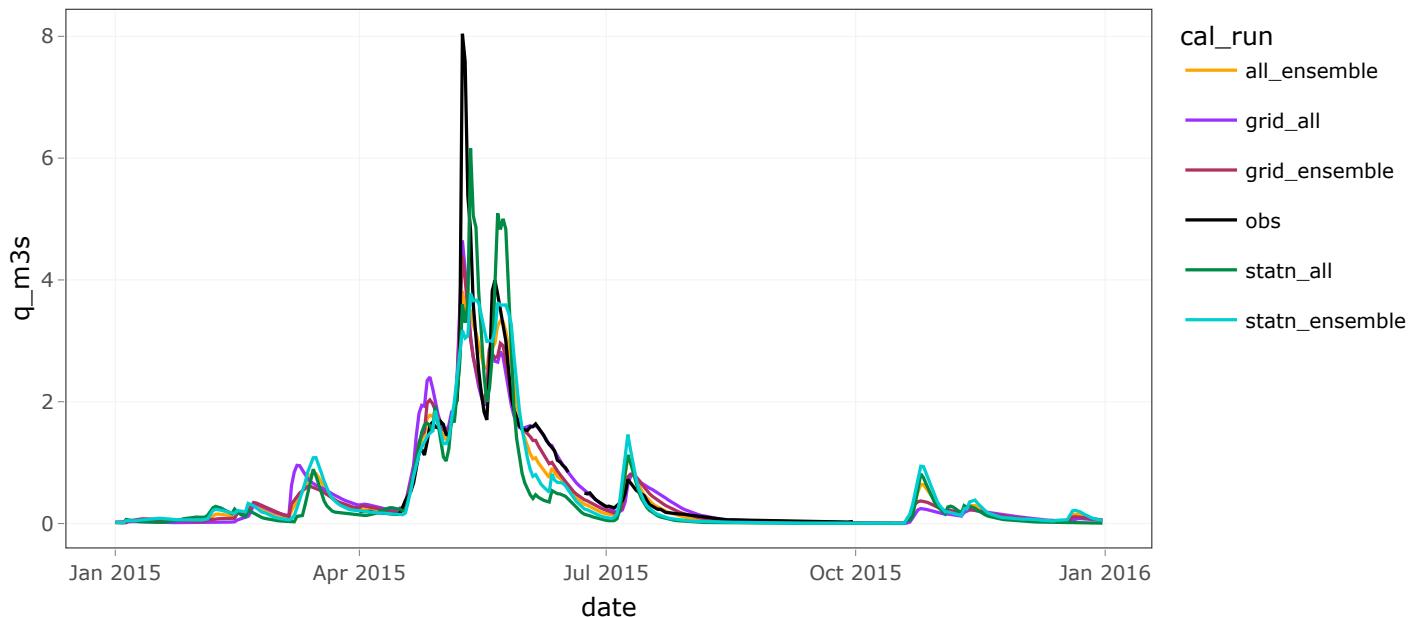
2013



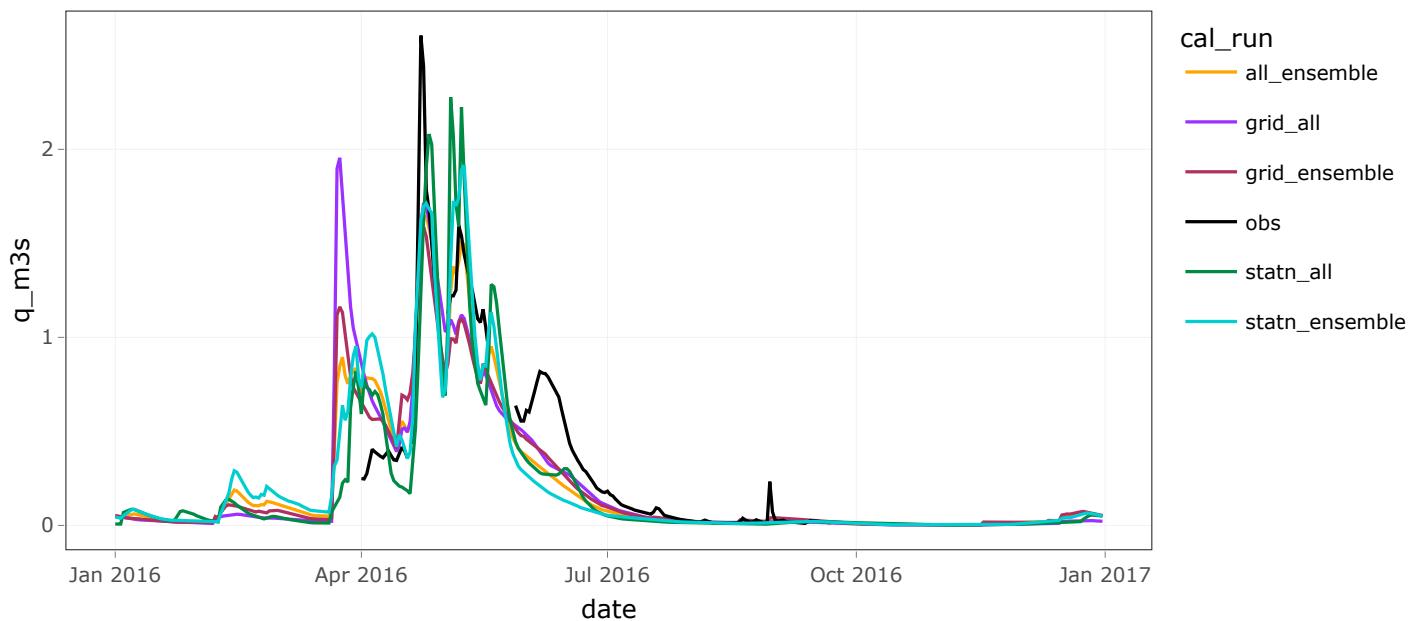
2014



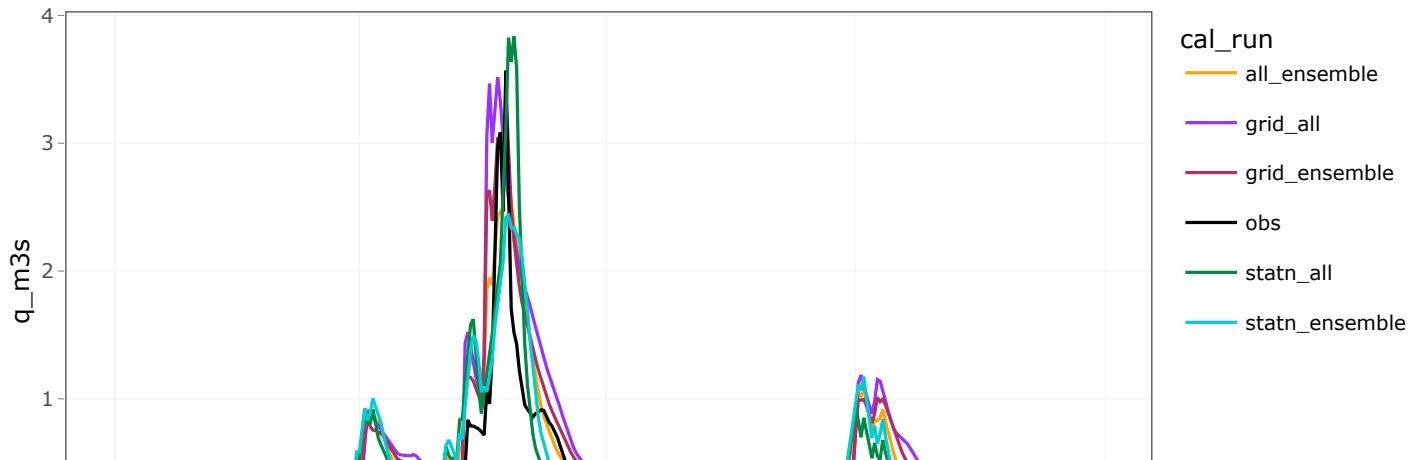
2015



2016



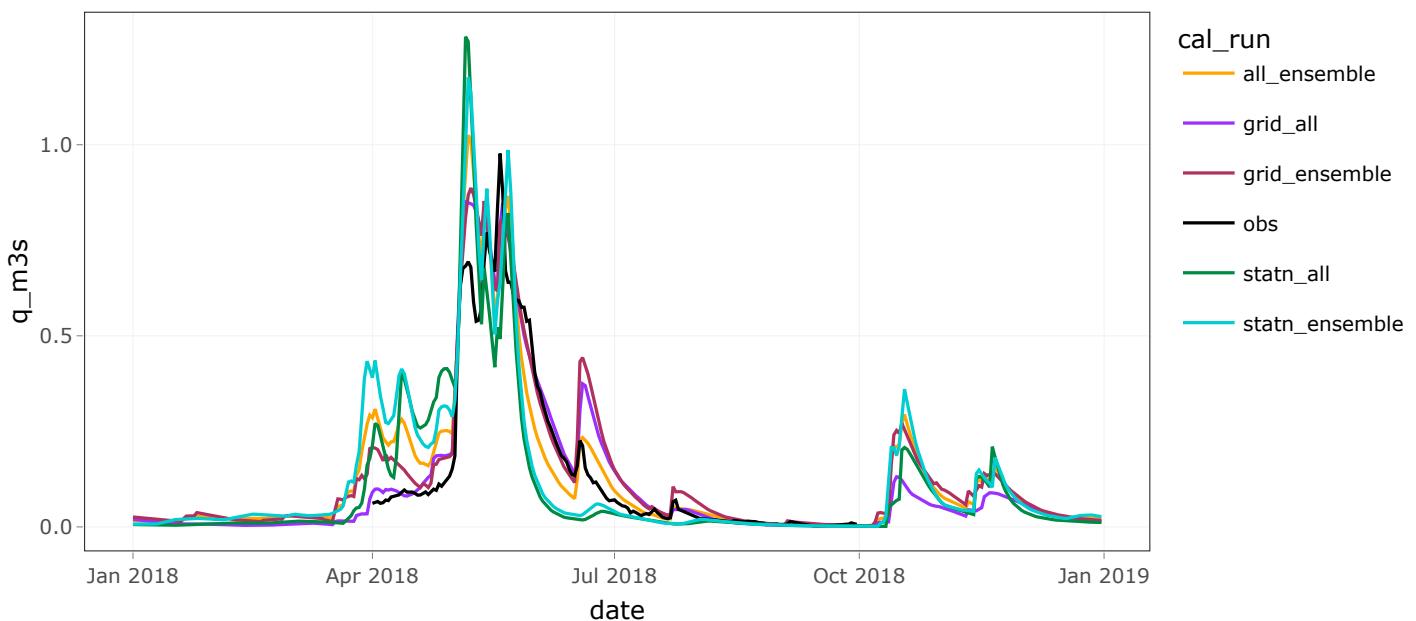
2017



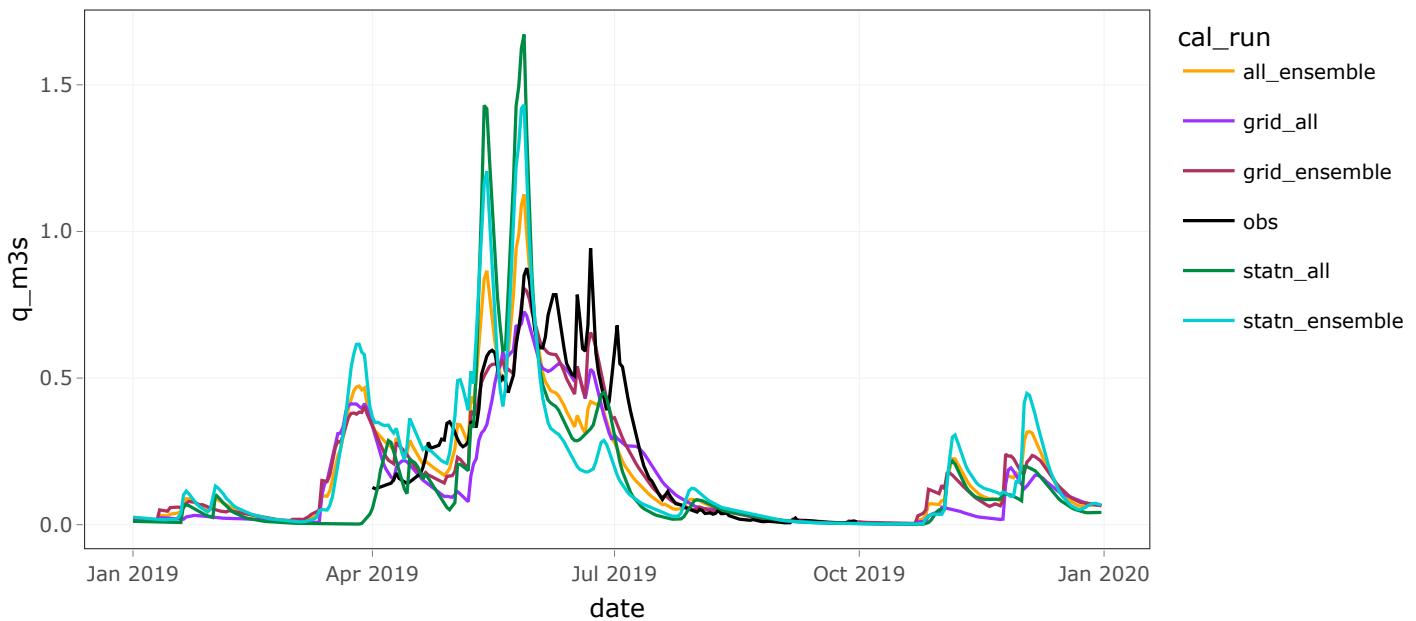
Fourmile Calibrations



2018



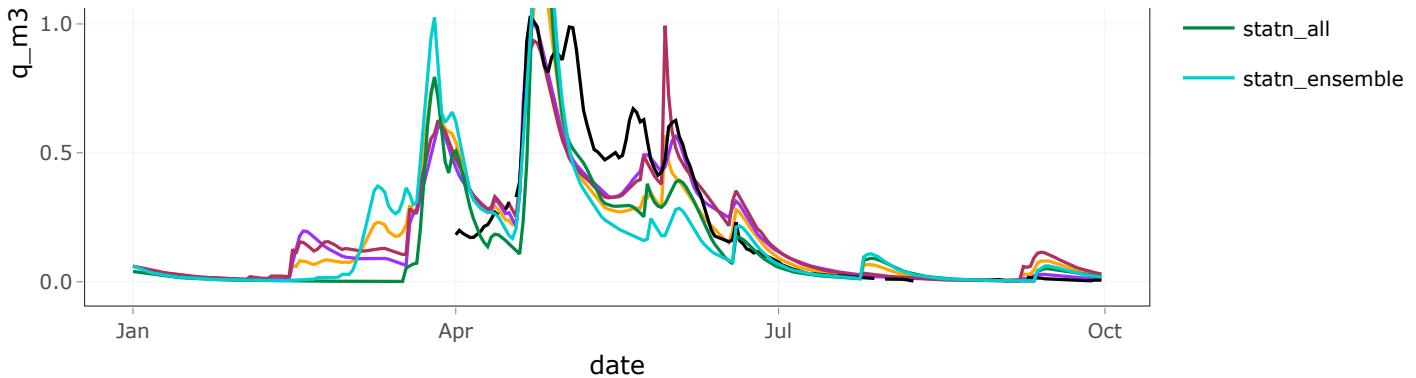
2019



2020



Fourmile Calibrations



```
## [[1]]
##
## [[2]]
##
## [[3]]
##
## [[4]]
##
## [[5]]
##
## [[6]]
##
## [[7]]
##
## [[8]]
##
## [[9]]
##
## [[10]]
```

KGE

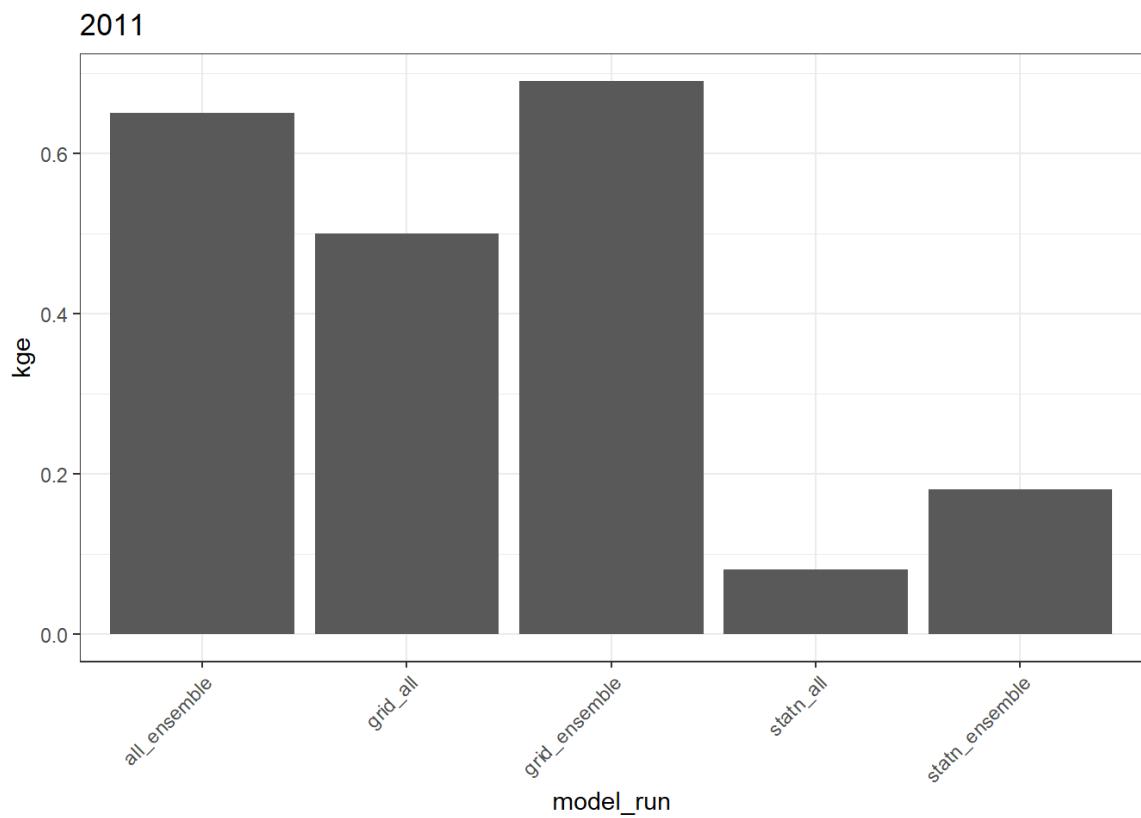
KGE for ensembles (entire period)

	grid_ensemble	statn_ensemble	all_ensemble	grid_all	statn_all
	0.88	0.84	0.87	0.88	0.83

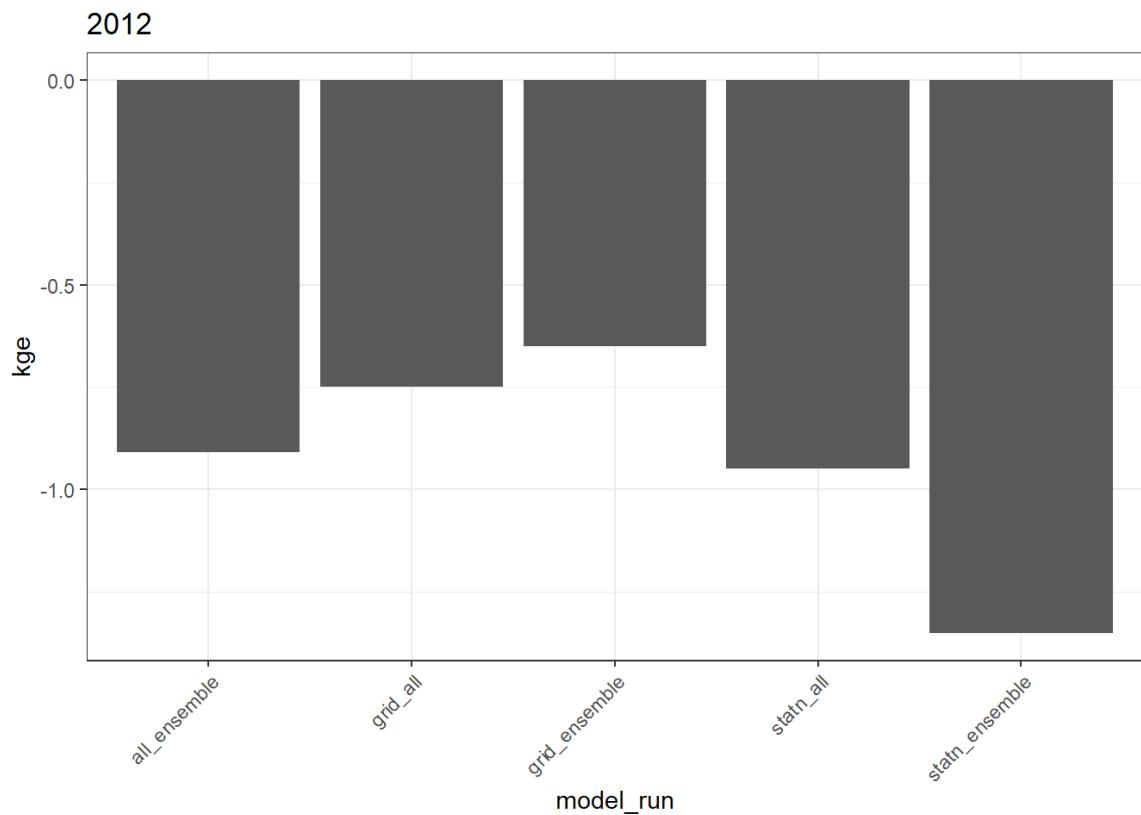
Annual KGEs for ensembles

model_run	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
grid_ensemble	0.69	-0.65	0.65	0.56	0.72	0.70	0.40	0.73	0.84	0.75
statn_ensemble	0.18	-1.35	0.85	0.50	0.77	0.82	0.68	0.73	0.62	0.71
all_ensemble	0.65	-0.91	0.79	0.53	0.76	0.79	0.56	0.79	0.82	0.77
grid_all	0.50	-0.75	0.77	0.63	0.76	0.76	0.20	0.79	0.73	0.78
statn_all	0.08	-0.95	0.82	0.59	0.81	0.79	0.55	0.75	0.54	0.75

```
## [[1]]
```

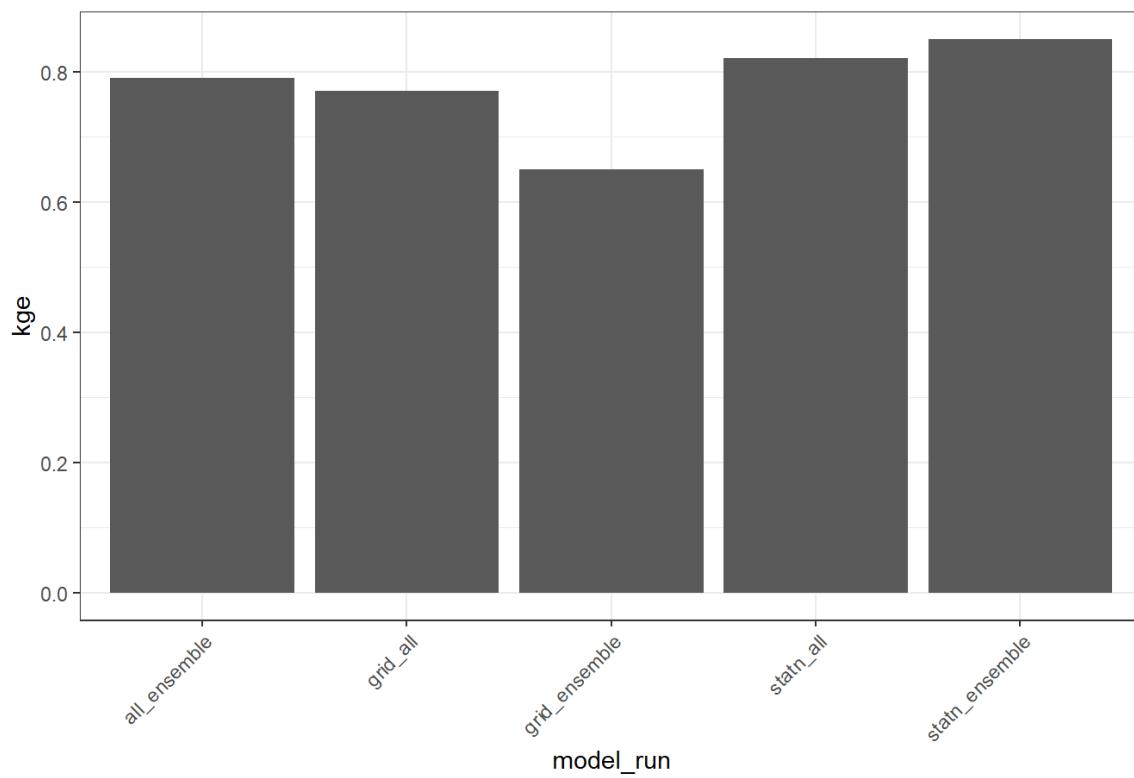


```
##  
## [[2]]
```



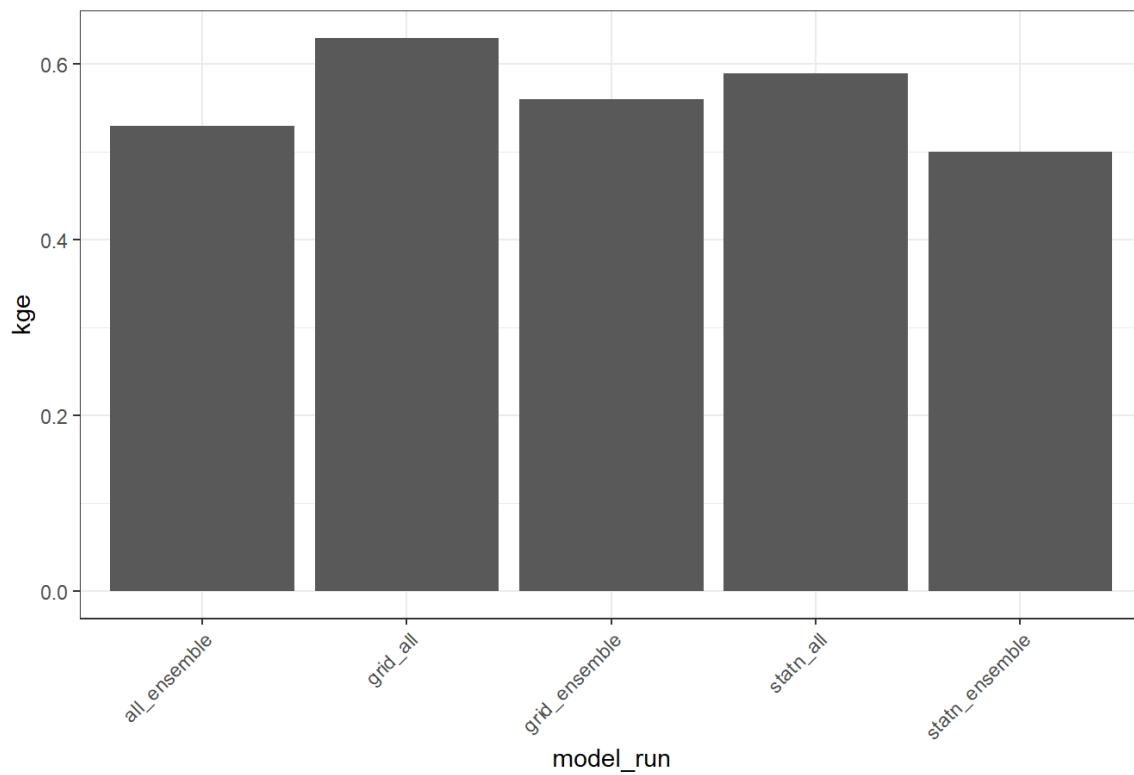
```
##  
## [[3]]
```

2013



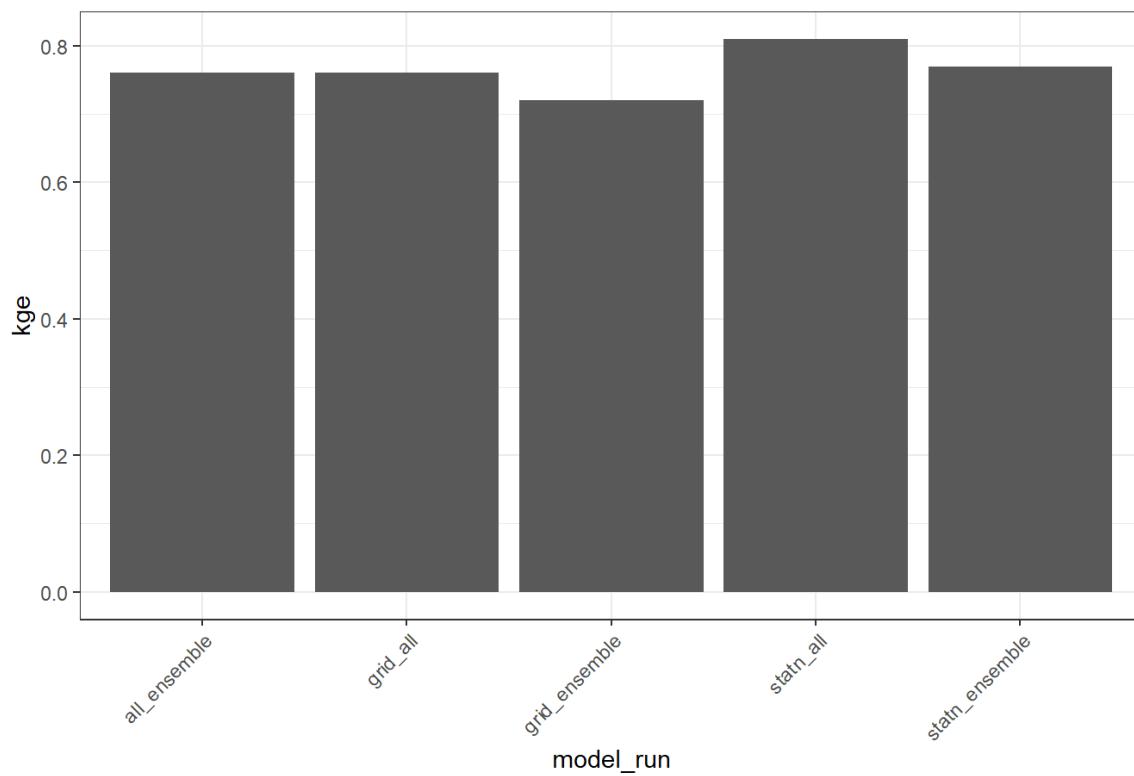
```
##  
## [[4]]
```

2014



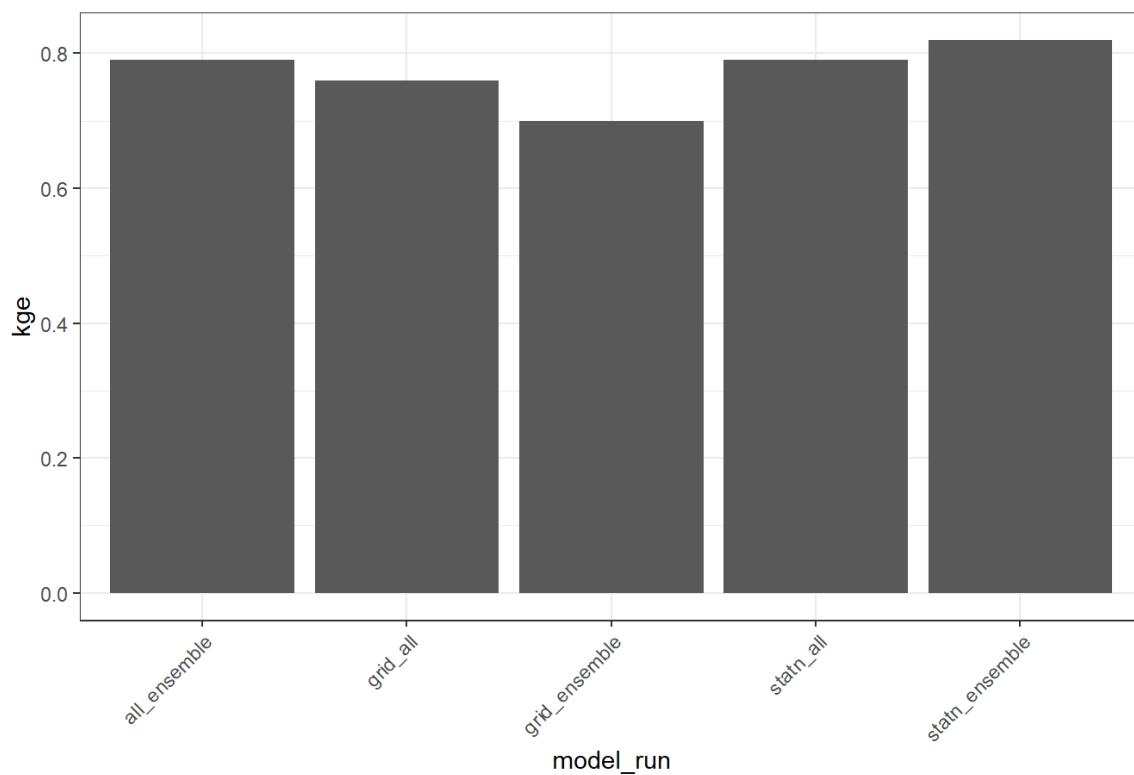
```
##  
## [[5]]
```

2015



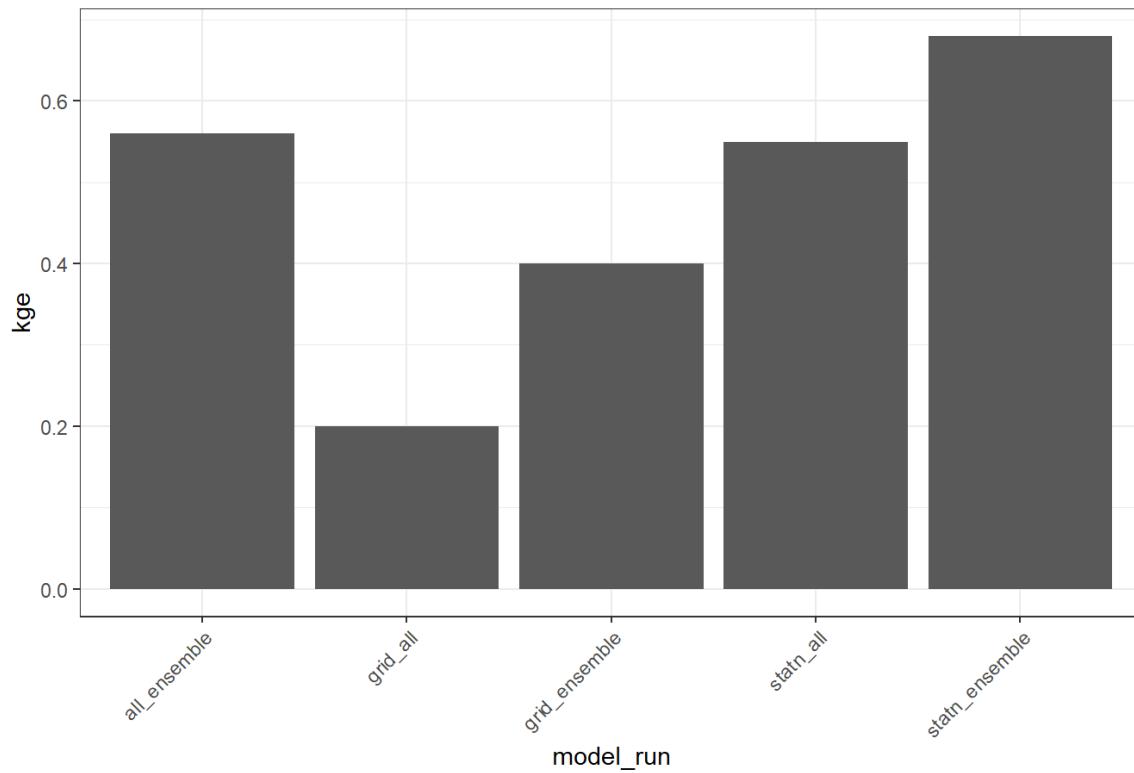
```
##  
## [[6]]
```

2016



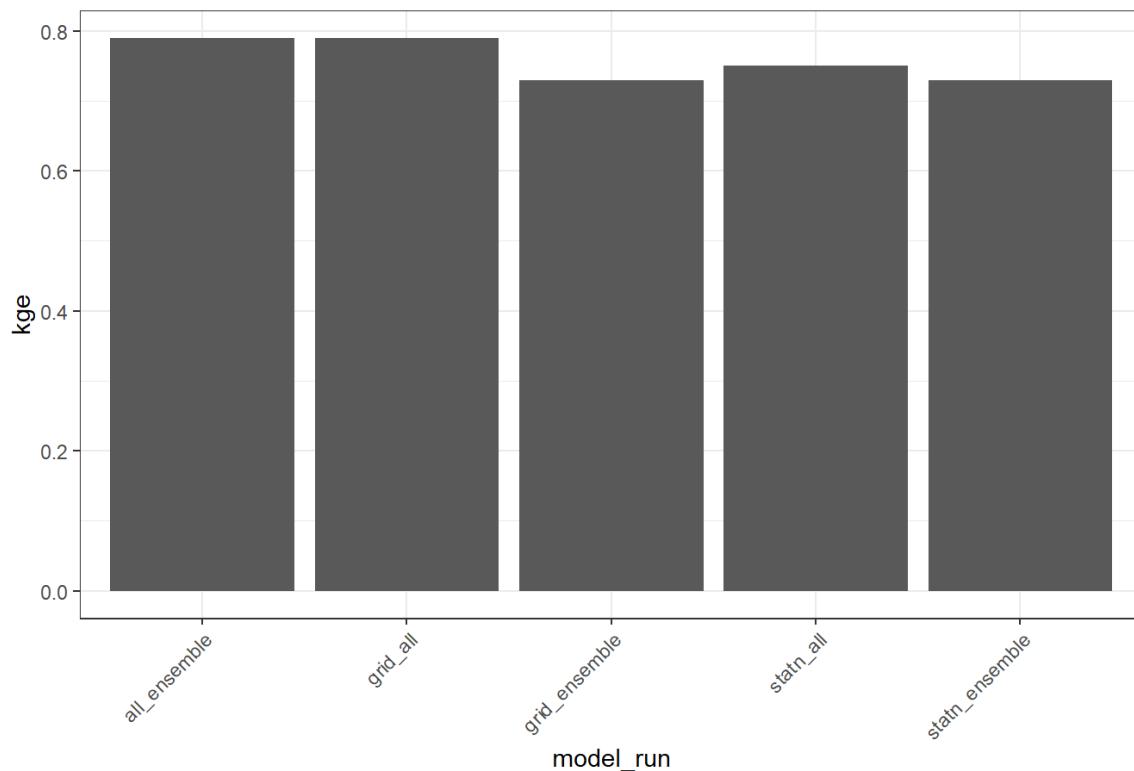
```
##  
## [[7]]
```

2017



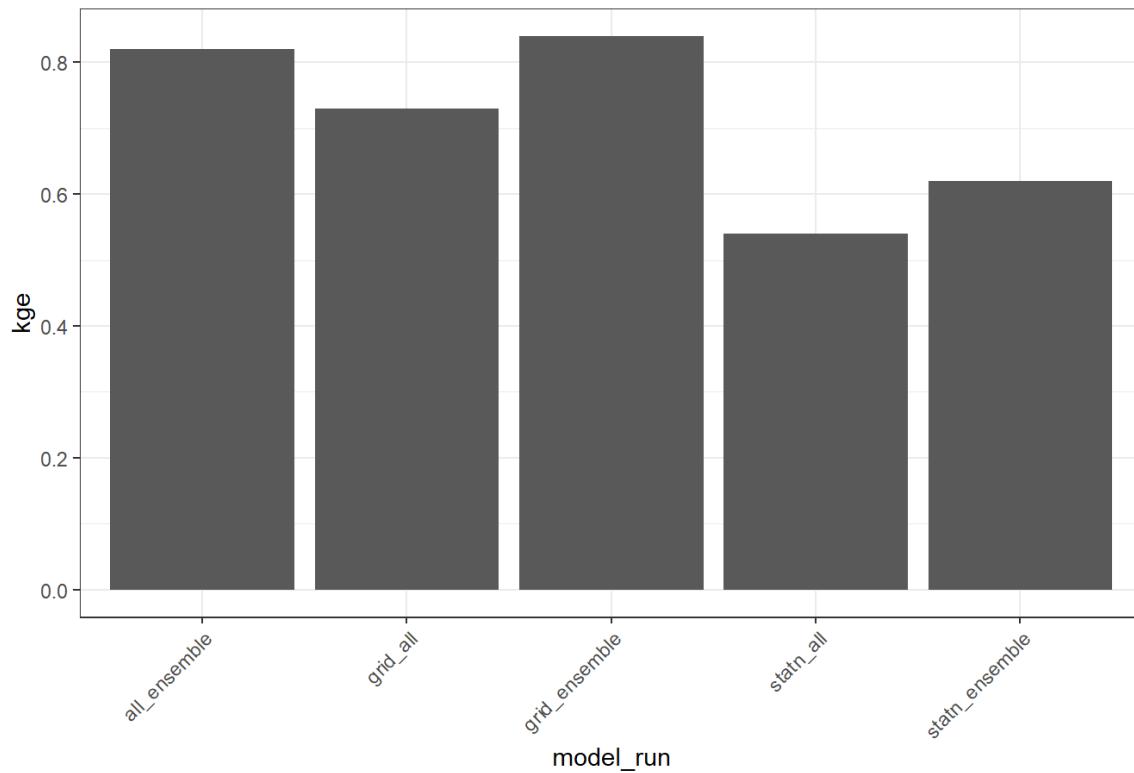
```
##  
## [[8]]
```

2018



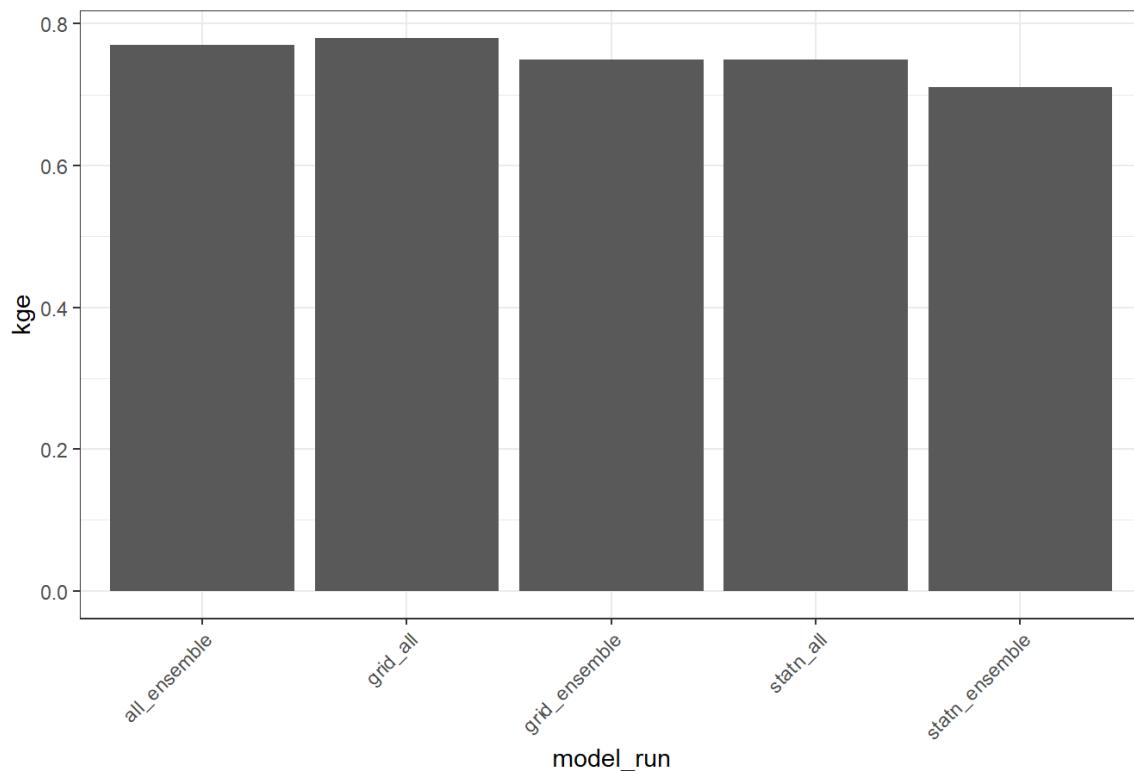
```
##  
## [[9]]
```

2019



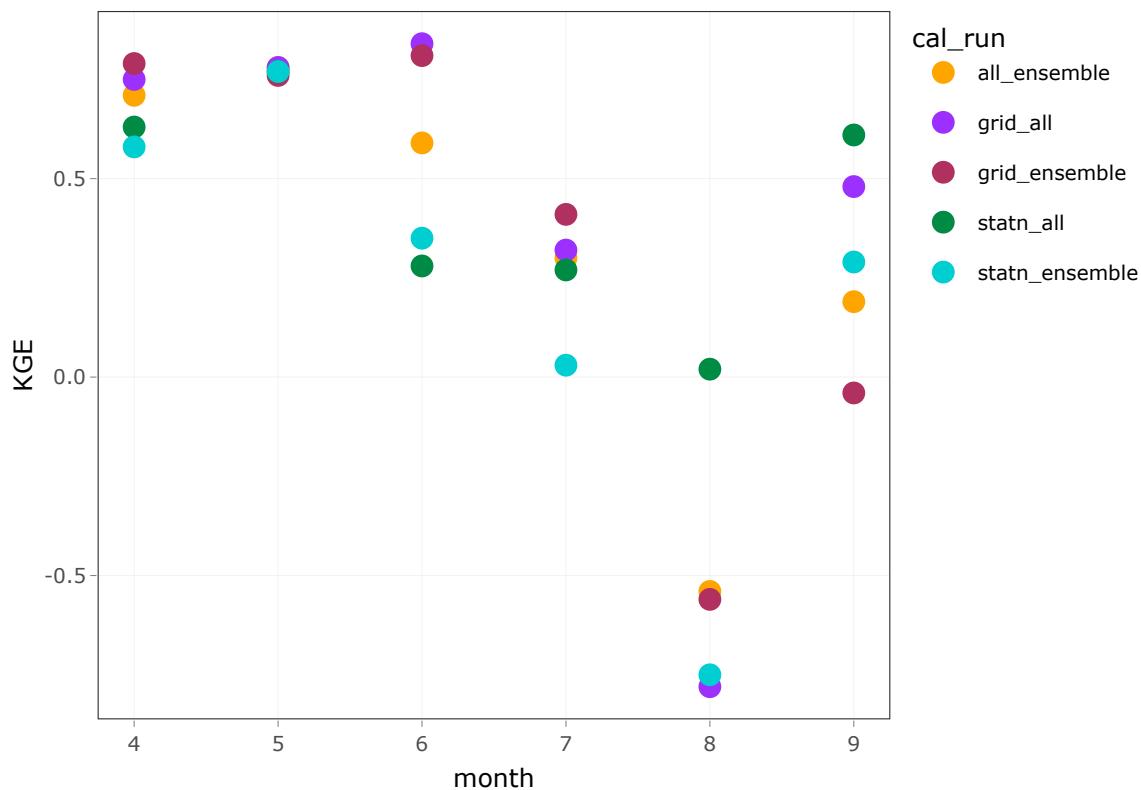
```
##  
## [[10]]
```

2020



Monthly KGEs for ensembles

month	grid_ensemble	statn_ensemble	all_ensemble	grid_all	statn_all
4		0.79	0.58	0.71	0.75
5		0.76	0.77	0.78	0.78
6		0.81	0.35	0.59	0.84
7		0.41	0.03	0.30	0.32
8		-0.56	-0.75	-0.54	-0.78
9		-0.04	0.29	0.19	0.48



RMSE

Ensemble RMSE for entire period

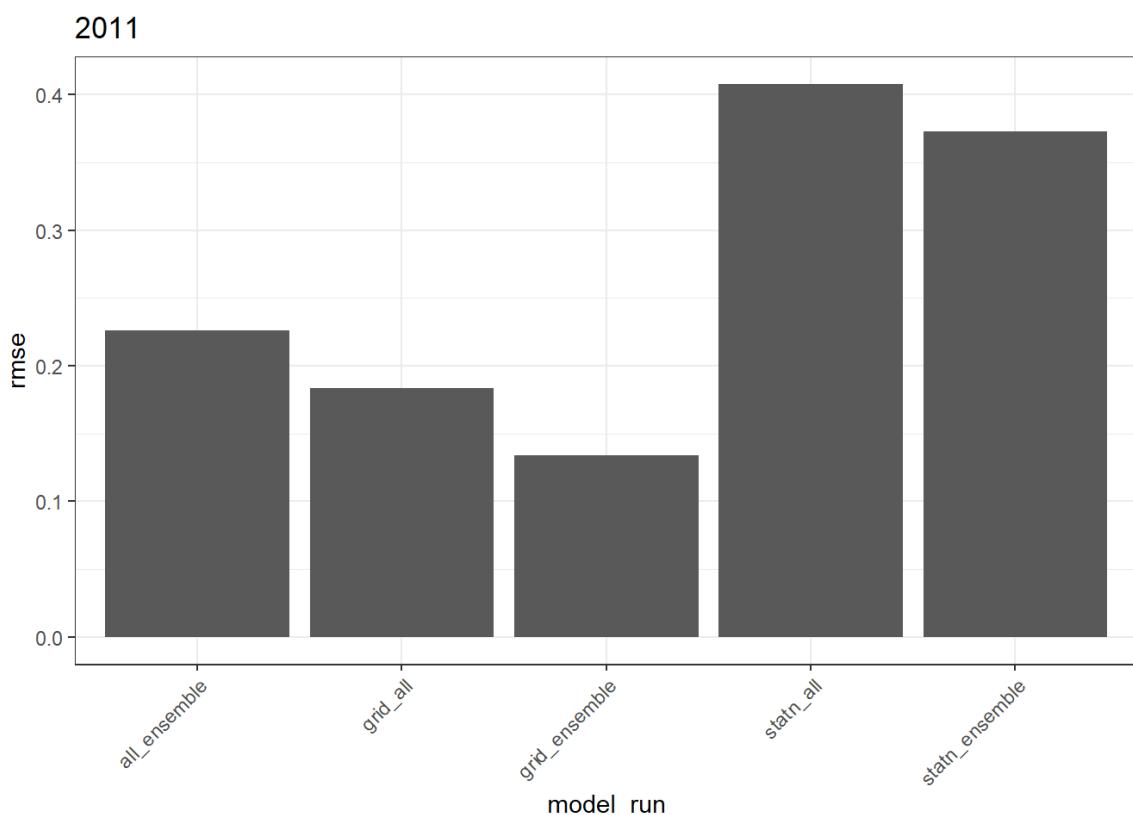
	grid_ensemble	statn_ensemble	all_ensemble	grid_all	statn_all
	0.2657	0.3293	0.2689	0.2779	0.3526

Annual RMSE for ensembles

model_run	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
grid_ensemble	0.1340	0.1919	0.4140	0.2734	0.4849	0.2067	0.3173	0.0855	0.0873	0.1404

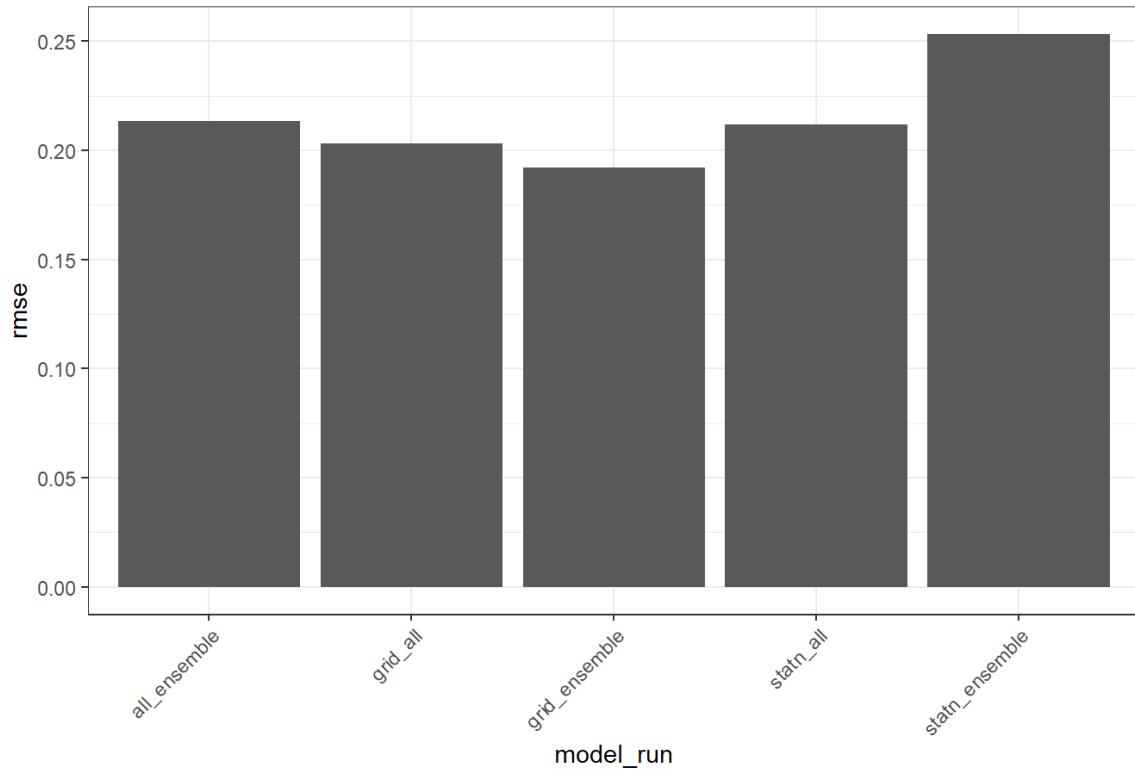
model_run	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
statn_ensemble	0.3728	0.2533	0.2176	0.3231	0.6394	0.2628	0.3467	0.1526	0.2330	0.2024
all_ensemble	0.2258	0.2133	0.2687	0.2828	0.5305	0.2140	0.2978	0.1037	0.1456	0.1511
grid_all	0.1838	0.2031	0.3559	0.2783	0.4891	0.2021	0.4230	0.0714	0.1146	0.1220
statn_all	0.4080	0.2117	0.3177	0.2992	0.6811	0.2669	0.4156	0.1620	0.2423	0.1950

```
## [[1]]
```



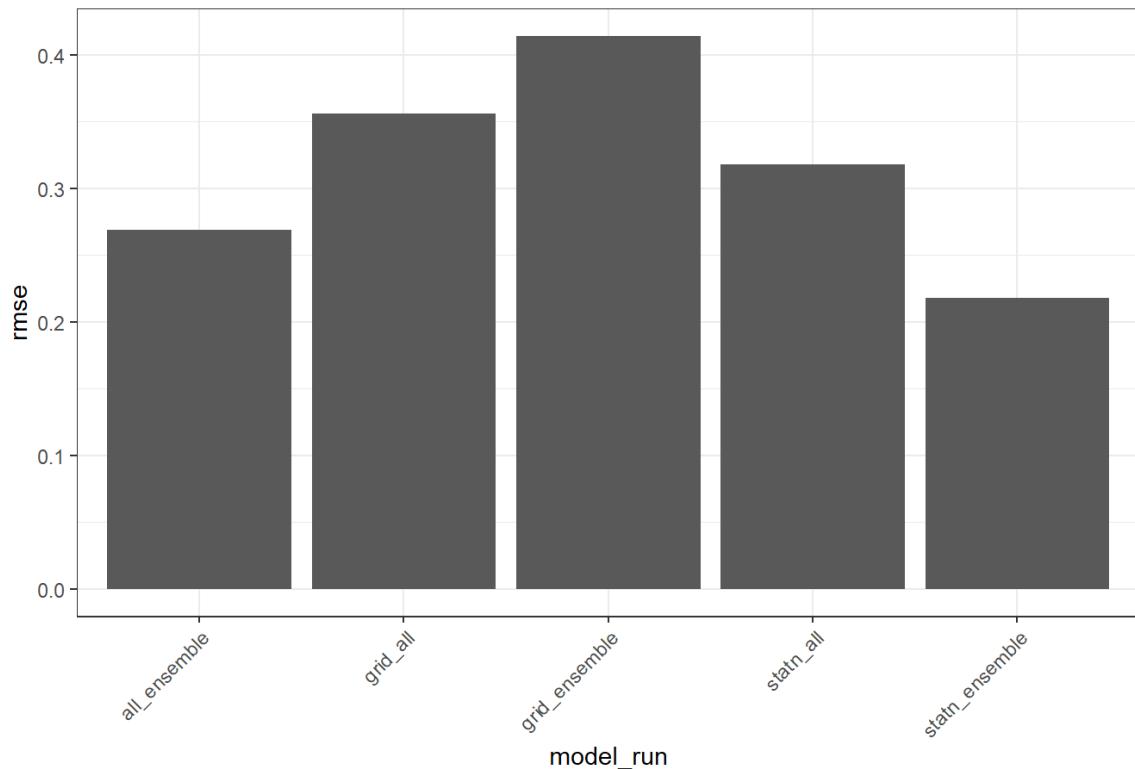
```
##  
## [[2]]
```

2012



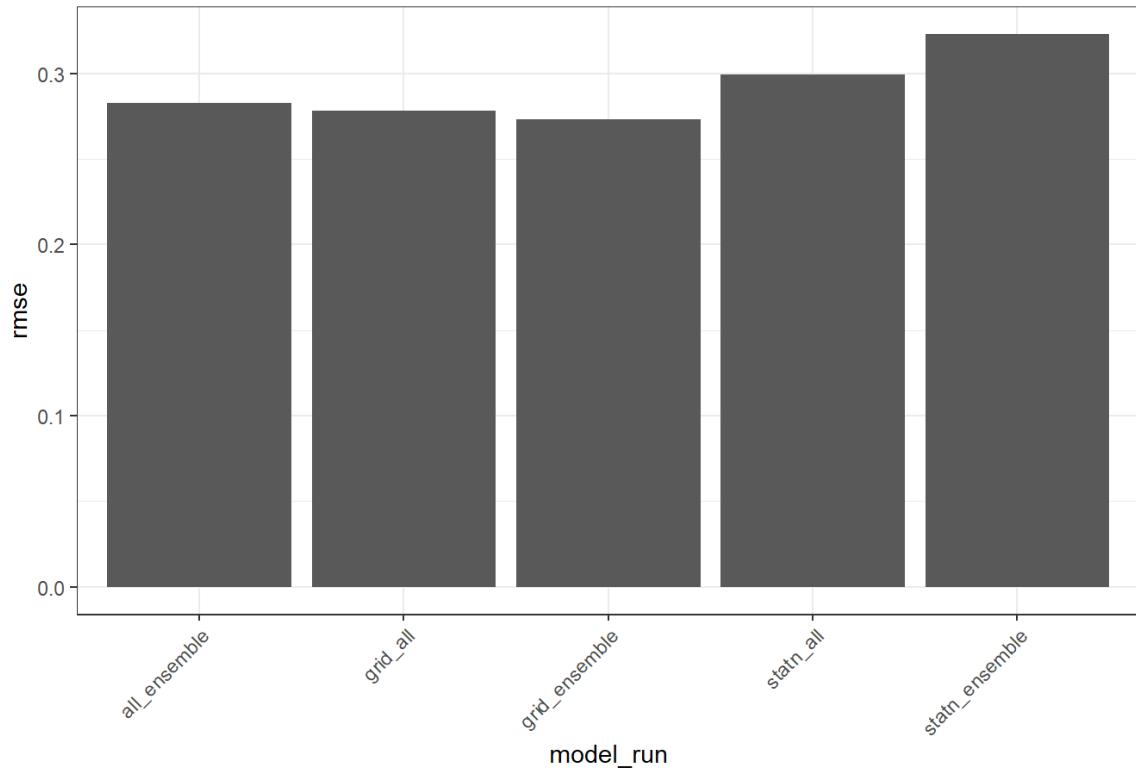
```
##  
## [[3]]
```

2013



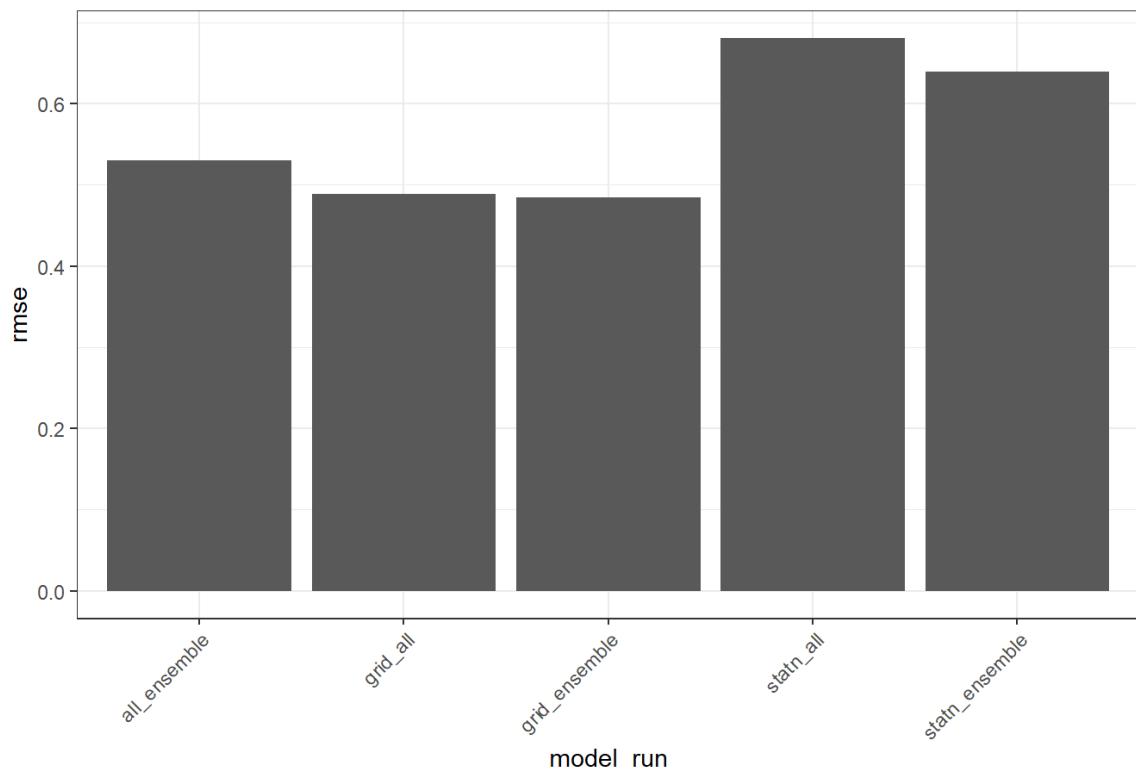
```
##  
## [[4]]
```

2014



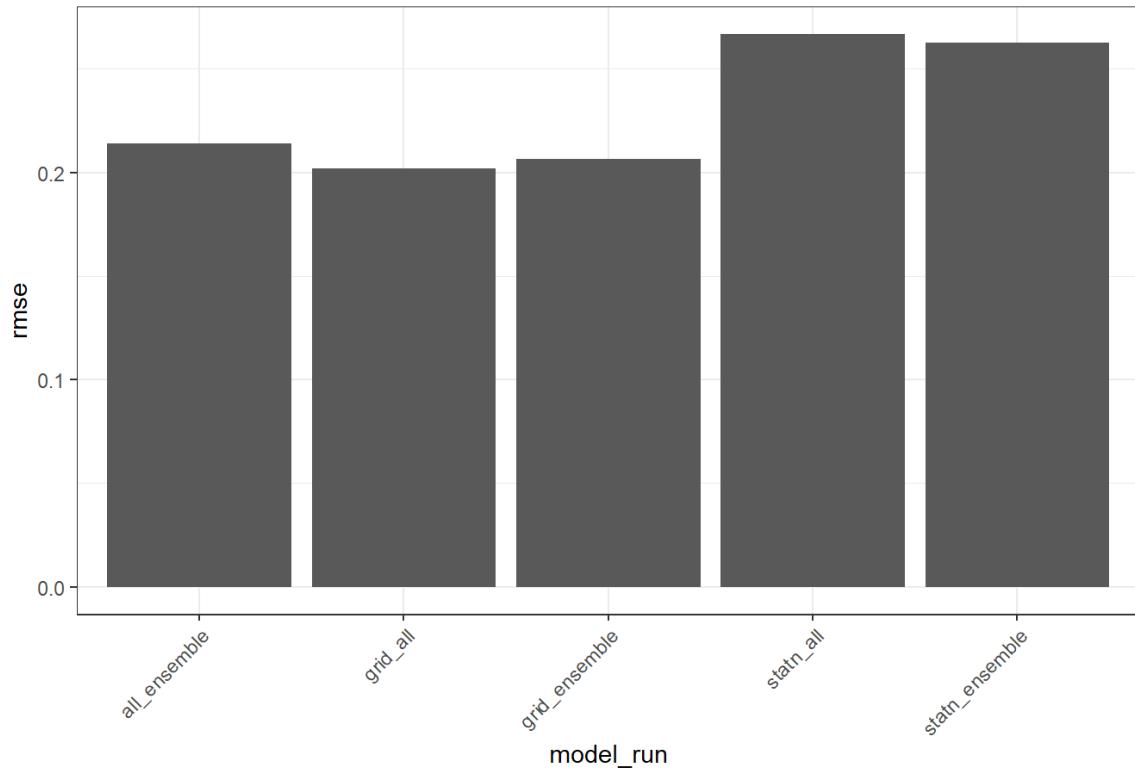
```
##  
## [[5]]
```

2015



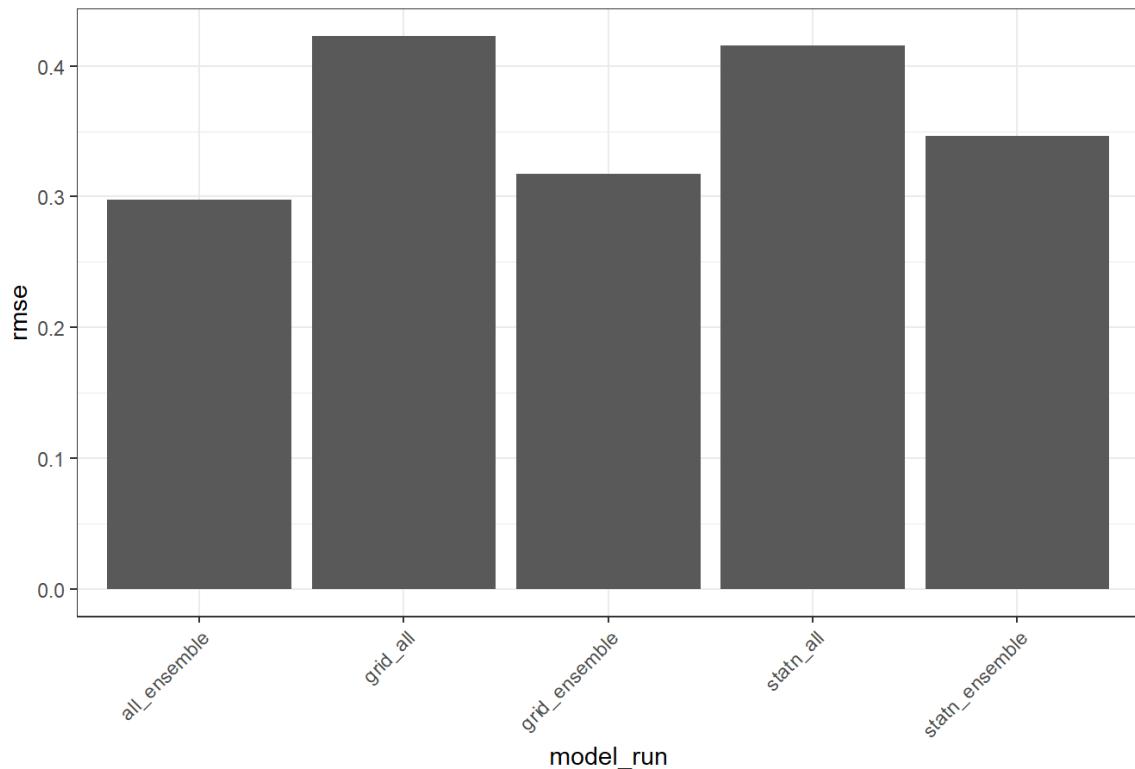
```
##  
## [[6]]
```

2016



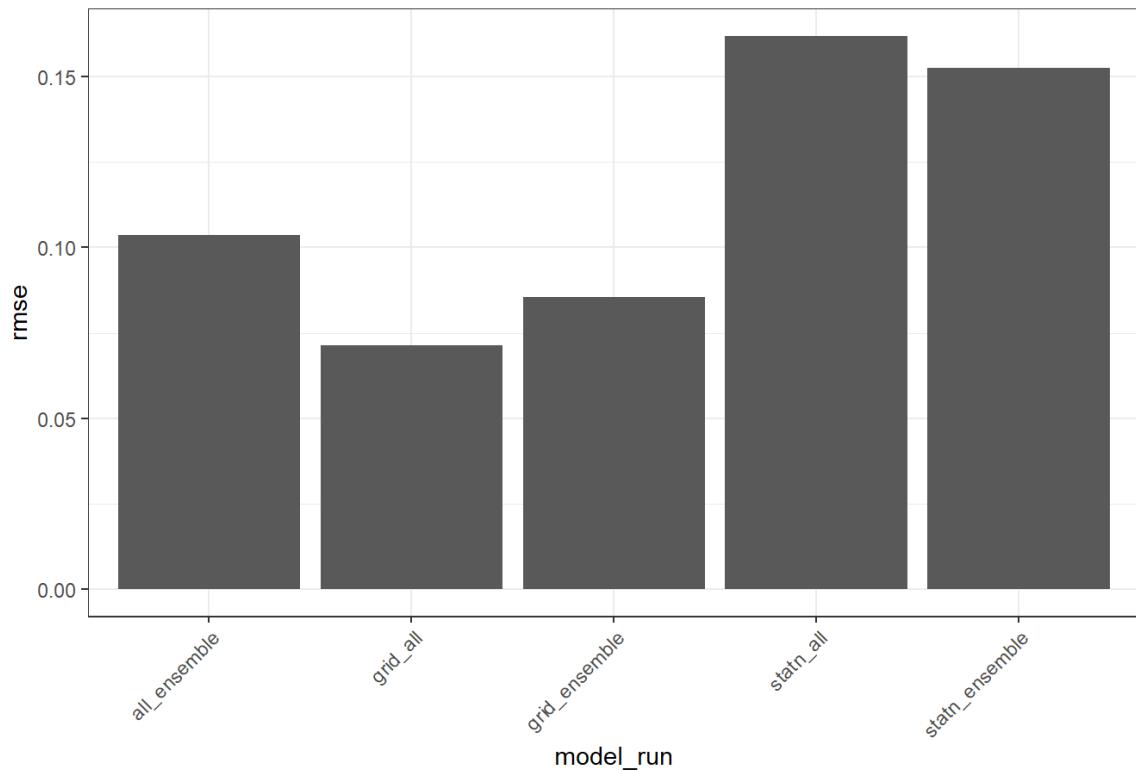
```
##  
## [[7]]
```

2017



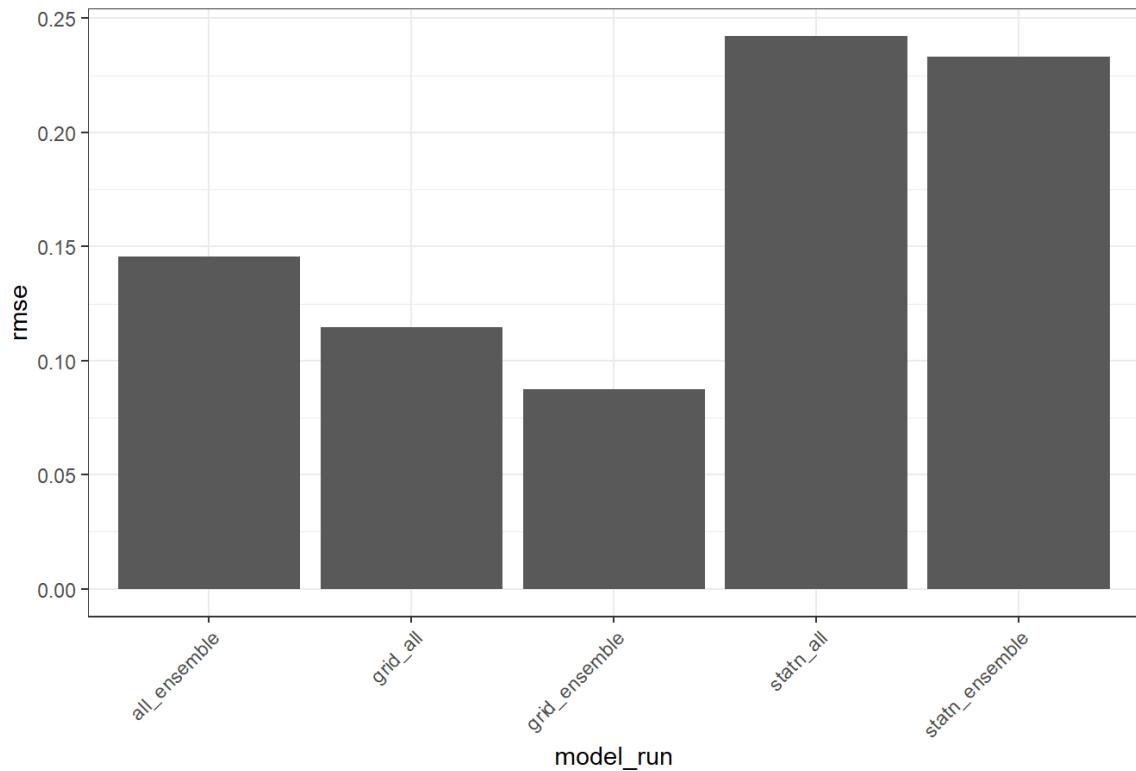
```
##  
## [[8]]
```

2018

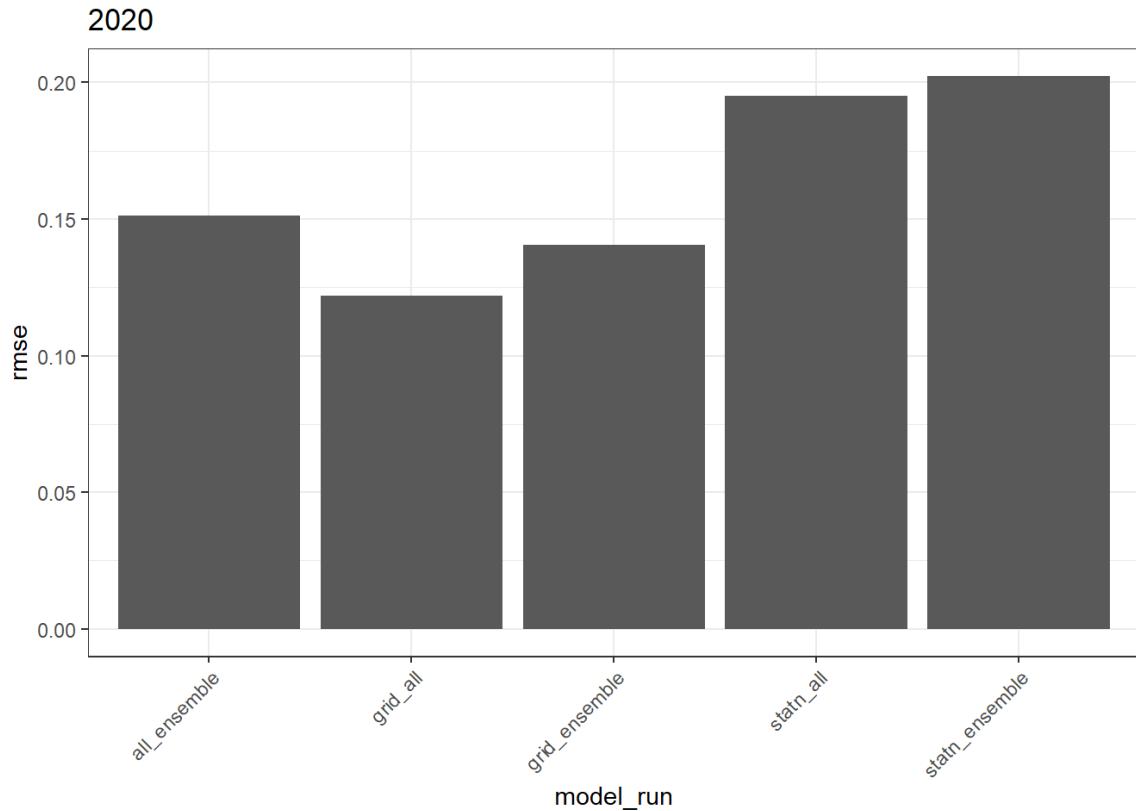


```
##  
## [[9]]
```

2019

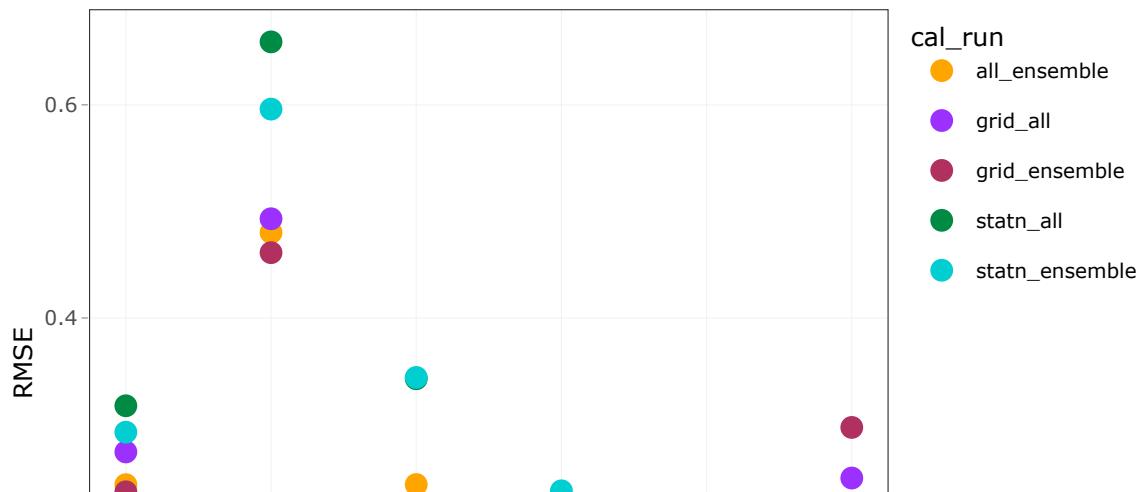


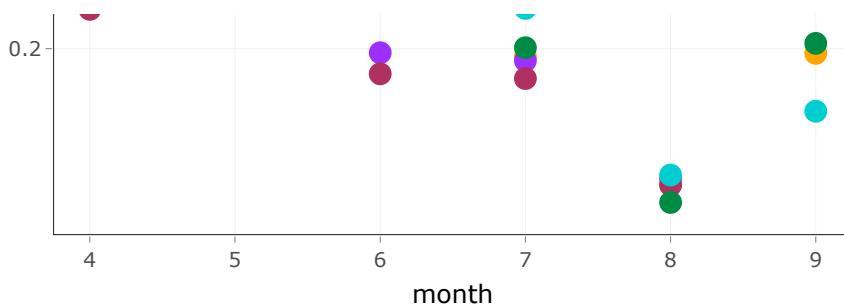
```
##  
## [[10]]
```



Monthly RMSEs for ensembles

month	grid_ensemble	statn_ensemble	all_ensemble	grid_all	statn_all
4	0.2369	0.2928	0.2436	0.2743	0.3176
5	0.4613	0.5960	0.4802	0.4931	0.6591
6	0.1764	0.3442	0.2437	0.1962	0.3430
7	0.1720	0.2378	0.1928	0.1888	0.2009
8	0.0720	0.0814	0.0725	0.0779	0.0557
9	0.2973	0.1413	0.1956	0.2498	0.2050





NSE

Ensemble NSE for entire period

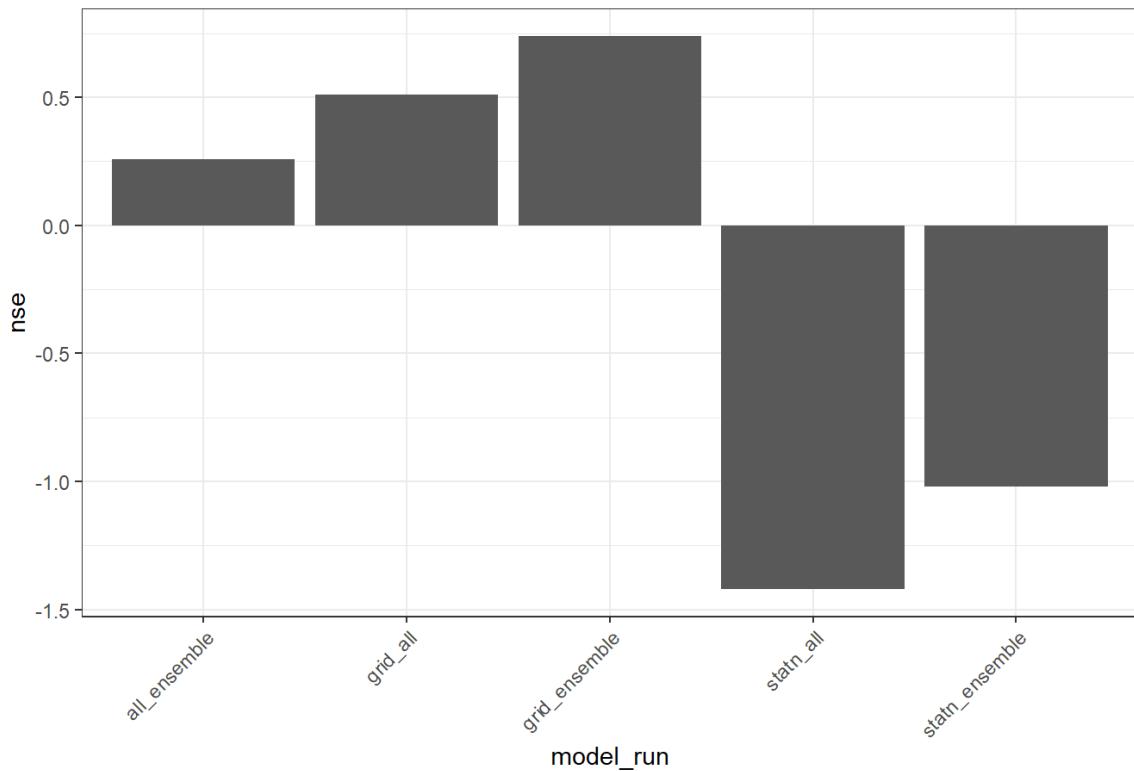
	grid_ensemble	statn_ensemble	all_ensemble	grid_all	statn_all
	0.8	0.7	0.8	0.79	0.66

Annual NSE for ensembles

model_run	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
grid_ensemble	0.7390	-3.6990	0.7234	0.6803	0.8510	0.8284	0.6876	0.8587	0.8846	0.7792
statn_ensemble	-1.0203	-7.1883	0.9236	0.5534	0.7409	0.7226	0.6271	0.5503	0.1774	0.5406
all_ensemble	0.2591	-4.8040	0.8834	0.6579	0.8216	0.8160	0.7248	0.7923	0.6789	0.7441
grid_all	0.5090	-4.2639	0.7956	0.6686	0.8484	0.8360	0.4447	0.9016	0.8011	0.8331
statn_all	-1.4196	-4.7168	0.8371	0.6169	0.7061	0.7137	0.4641	0.4935	0.1102	0.5738

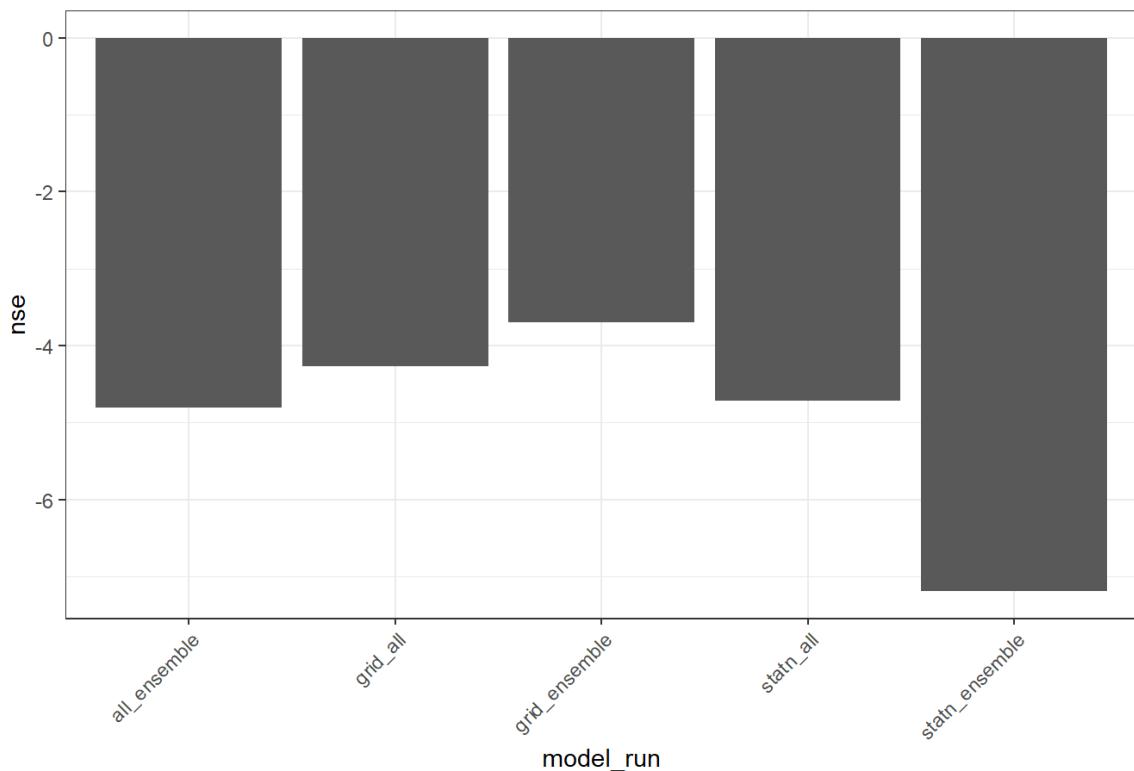
```
## [[1]]
```

2011



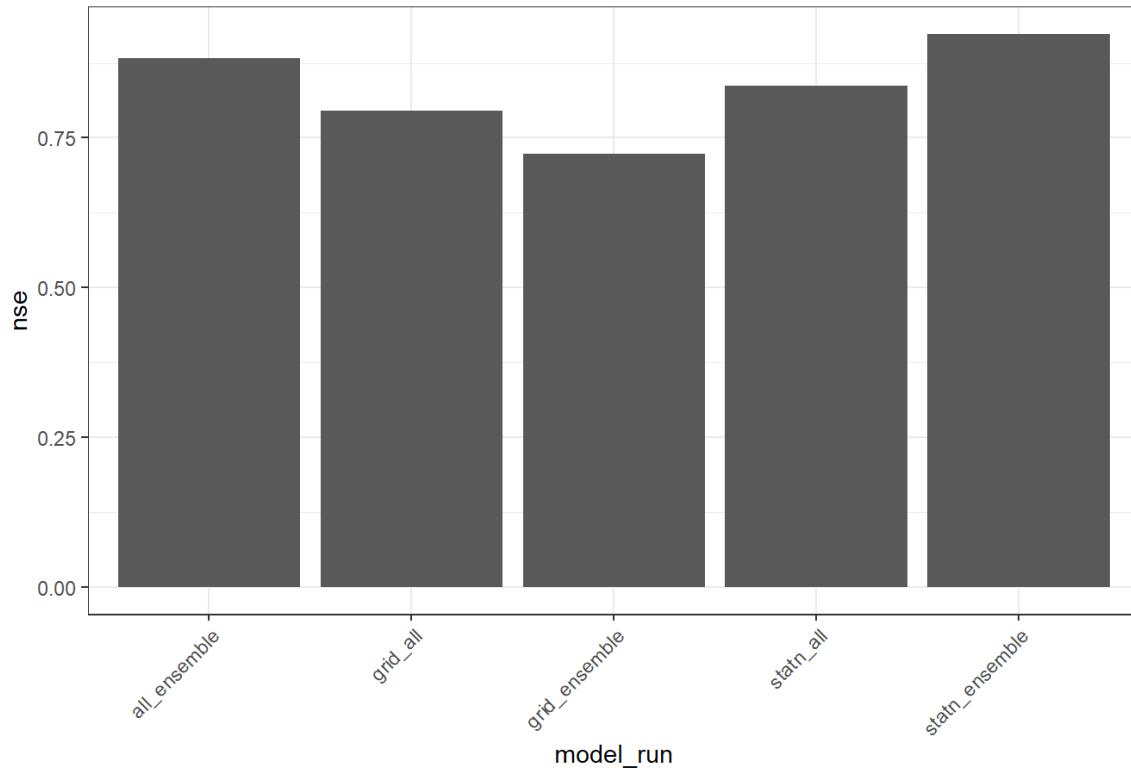
```
##  
## [[2]]
```

2012



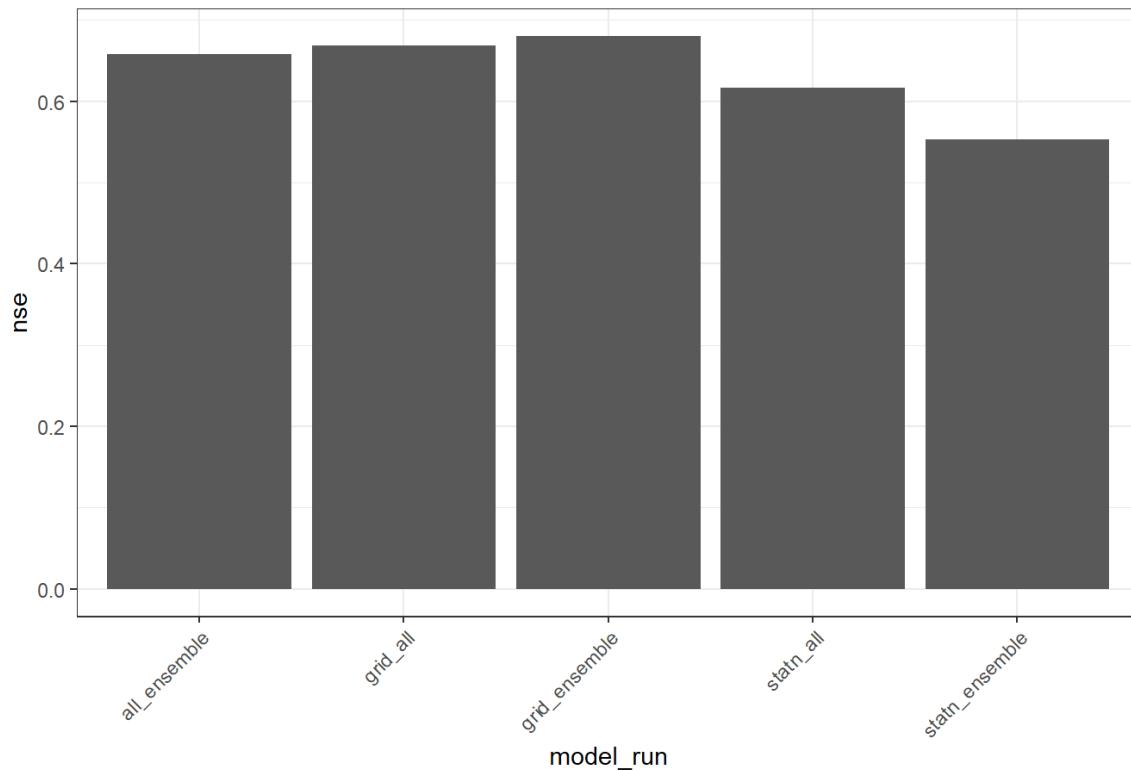
```
##  
## [[3]]
```

2013



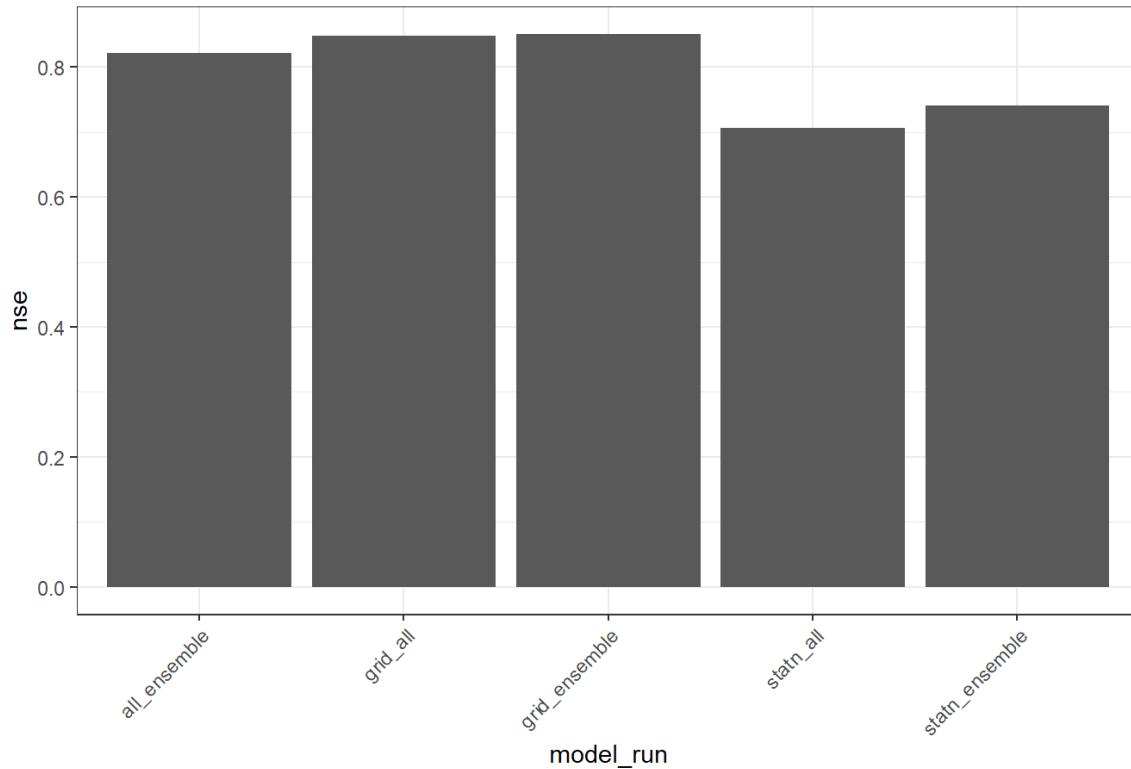
```
##  
## [[4]]
```

2014



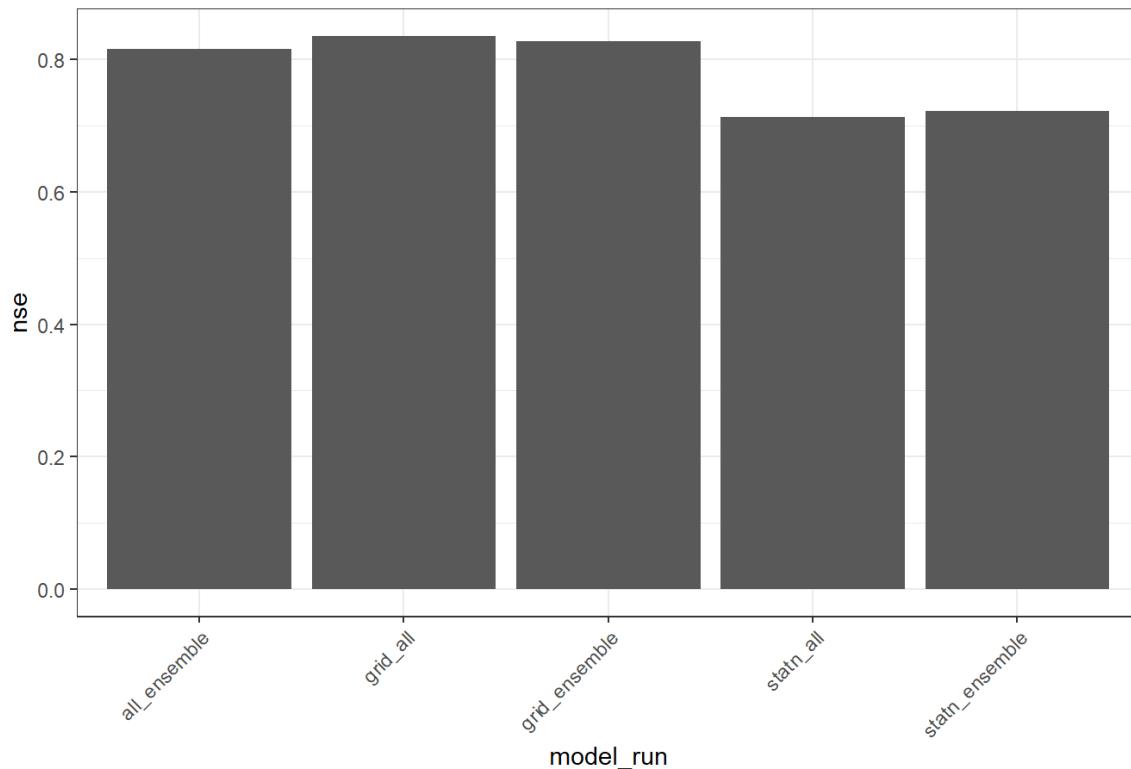
```
##  
## [[5]]
```

2015



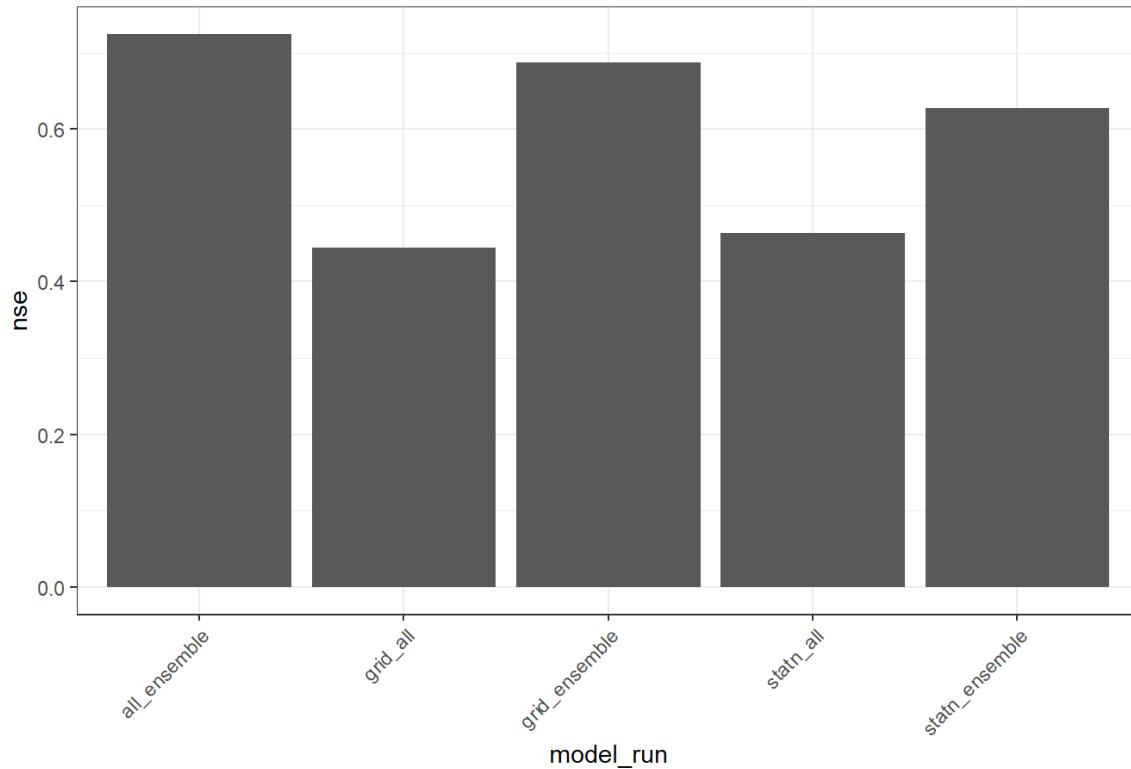
```
##  
## [[6]]
```

2016



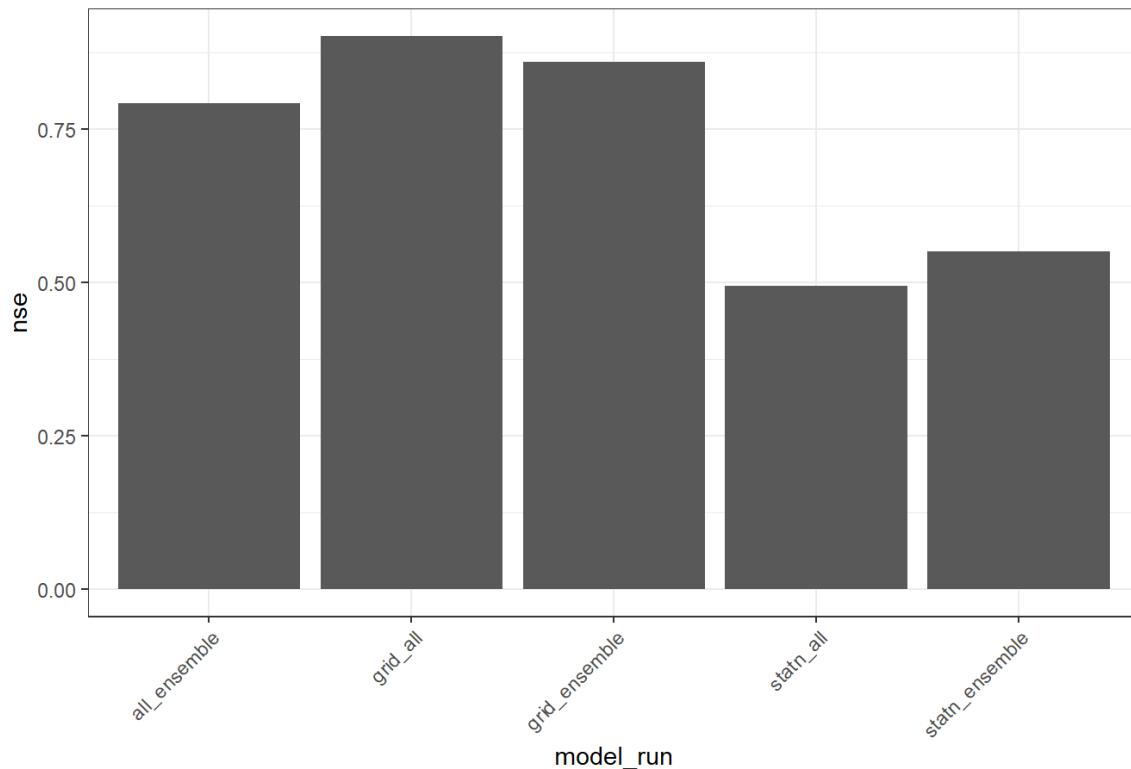
```
##  
## [[7]]
```

2017



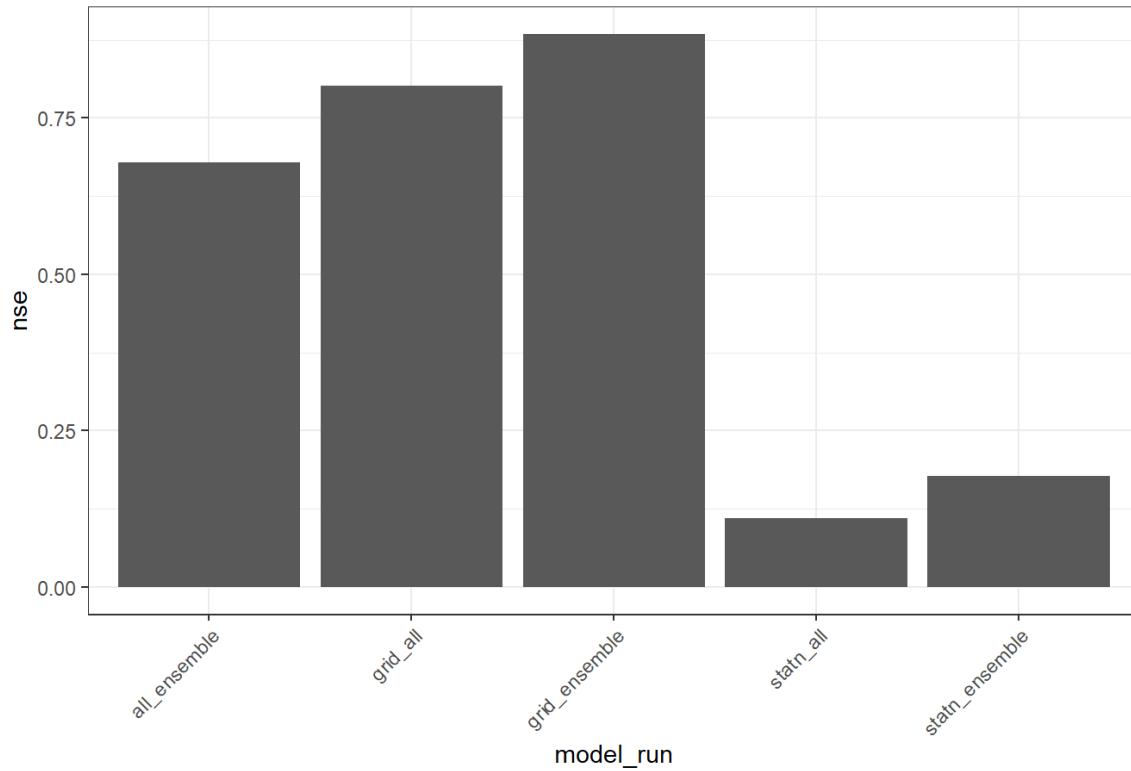
```
##  
## [[8]]
```

2018



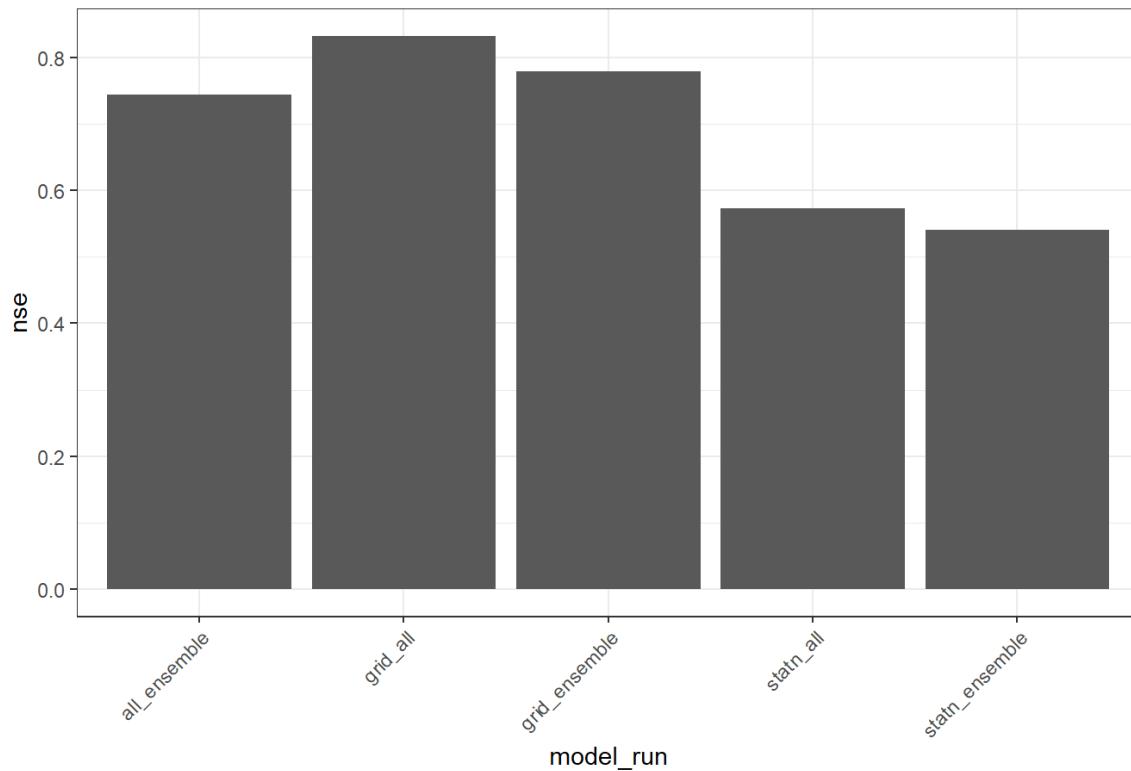
```
##  
## [[9]]
```

2019



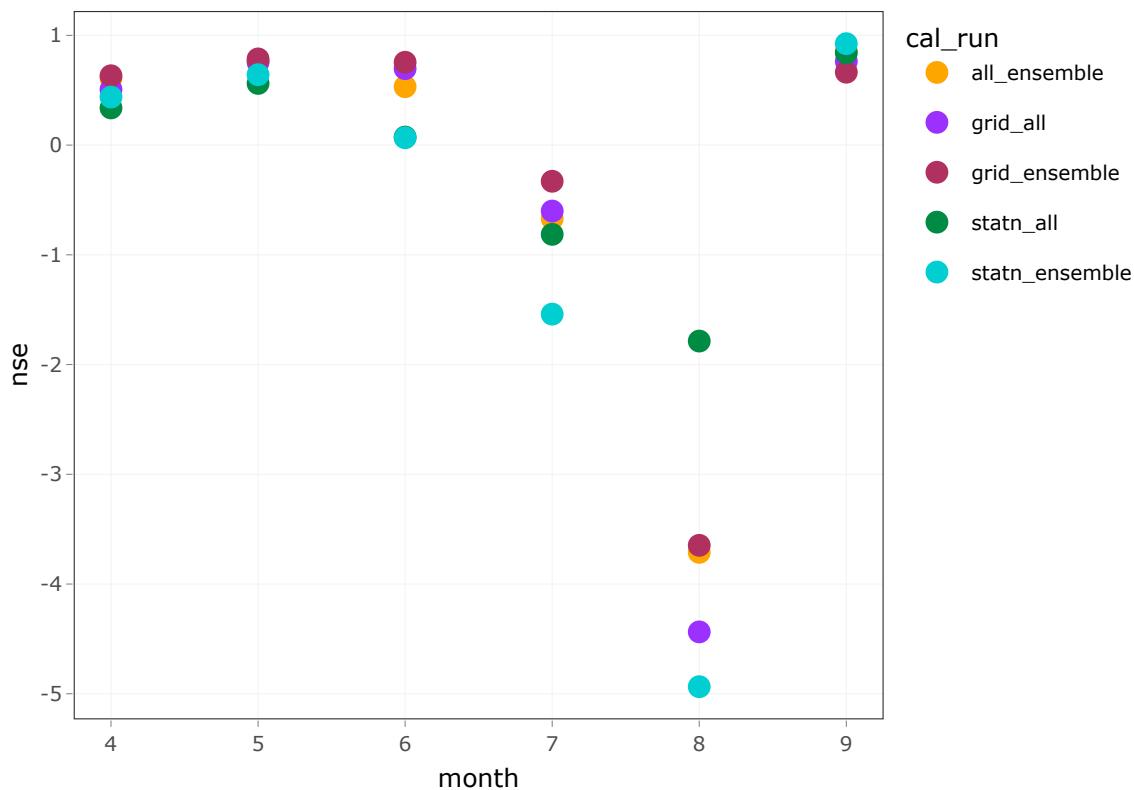
```
##  
## [[10]]
```

2020



Monthly NSE for ensembles

month	grid_ensemble	statn_ensemble	all_ensemble	grid_all	statn_all
4	0.6319	0.4378	0.6108	0.5066	0.3388
5	0.7853	0.6417	0.7674	0.7547	0.5618
6	0.7549	0.0670	0.5323	0.6966	0.0734
7	-0.3295	-1.5403	-0.6707	-0.6008	-0.8134
8	-3.6472	-4.9355	-3.7112	-4.4360	-1.7858
9	0.6643	0.9241	0.8547	0.7629	0.8403



Percent bias

Positive values indicate model overestimation and negative values model underestimation.

Ensemble pbias for entire period

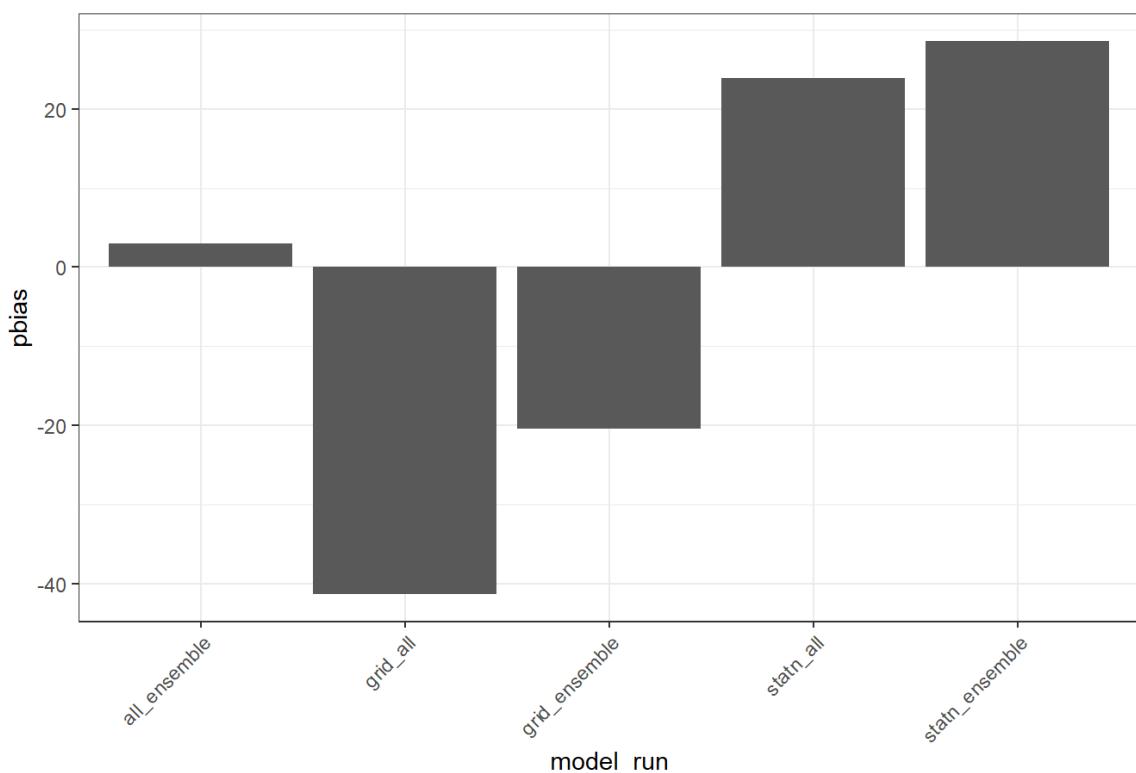
grid_ensemble	statn_ensemble	all_ensemble	grid_all	statn_all
-0.8	-2.2	-1.5	0	-3.1

Annual pbias for ensembles

model_run	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
grid_ensemble	-20.4	51.9	14.9	-29.2	-10.5	-19.0	55.0	25.2	-8.4	-2.8
statn_ensemble	28.6	40.0	11.9	-34.6	-11.5	-12.2	27.1	10.1	-4.3	-18.9
all_ensemble	3.0	45.4	13.1	-31.6	-10.8	-15.6	42.0	16.9	-6.8	-10.8
grid_all	-41.3	37.0	14.8	-25.4	-3.4	-16.1	70.4	18.5	-16.9	-6.2
statn_all	23.9	43.1	4.8	-31.1	-12.9	-15.6	32.7	0.2	-4.6	-14.5

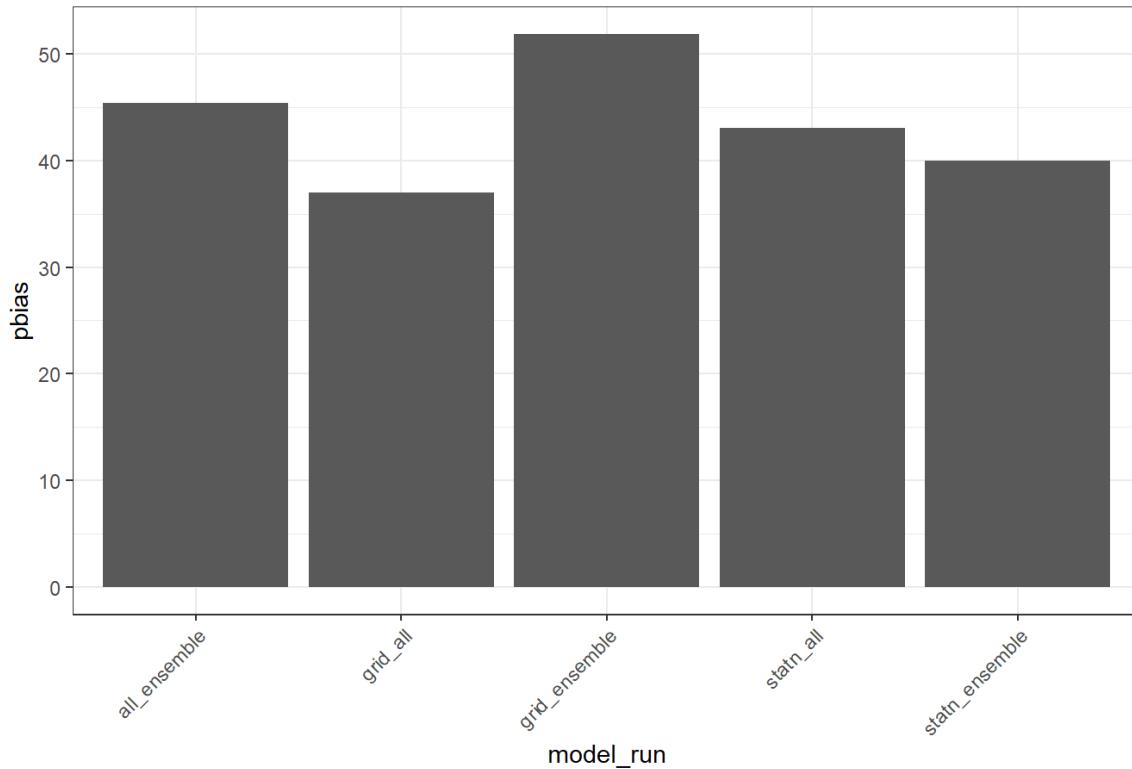
```
## [[1]]
```

2011



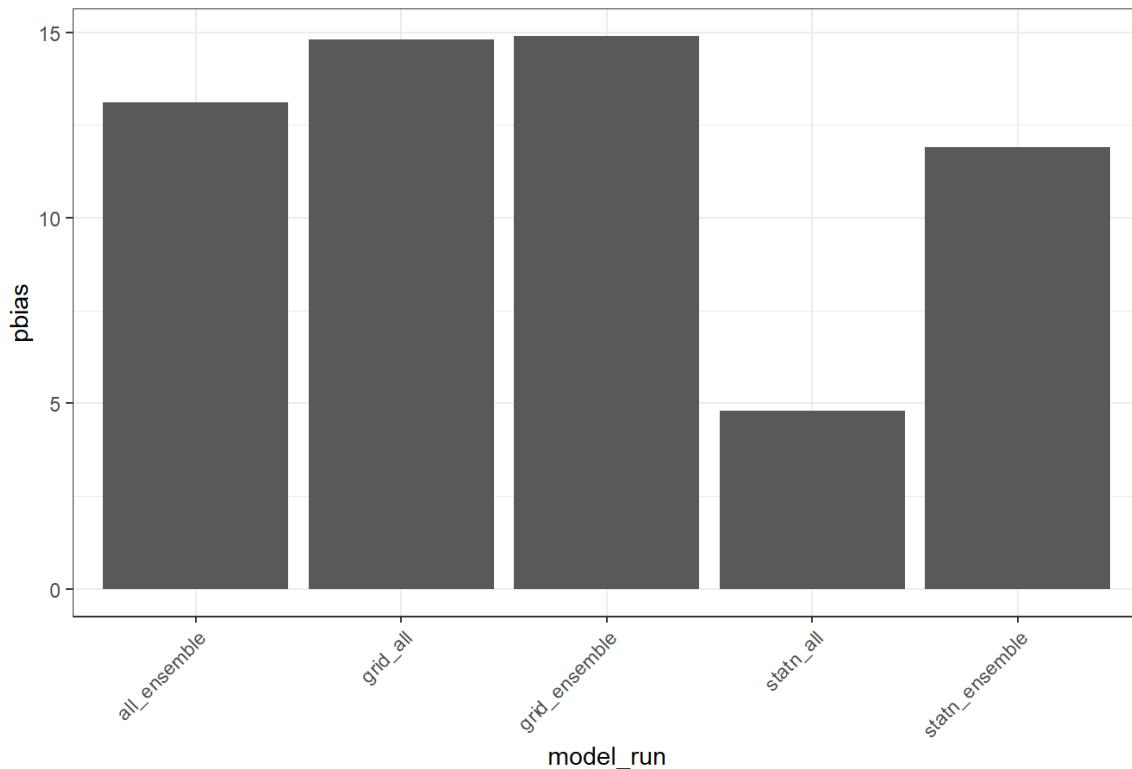
```
##  
## [[2]]
```

2012

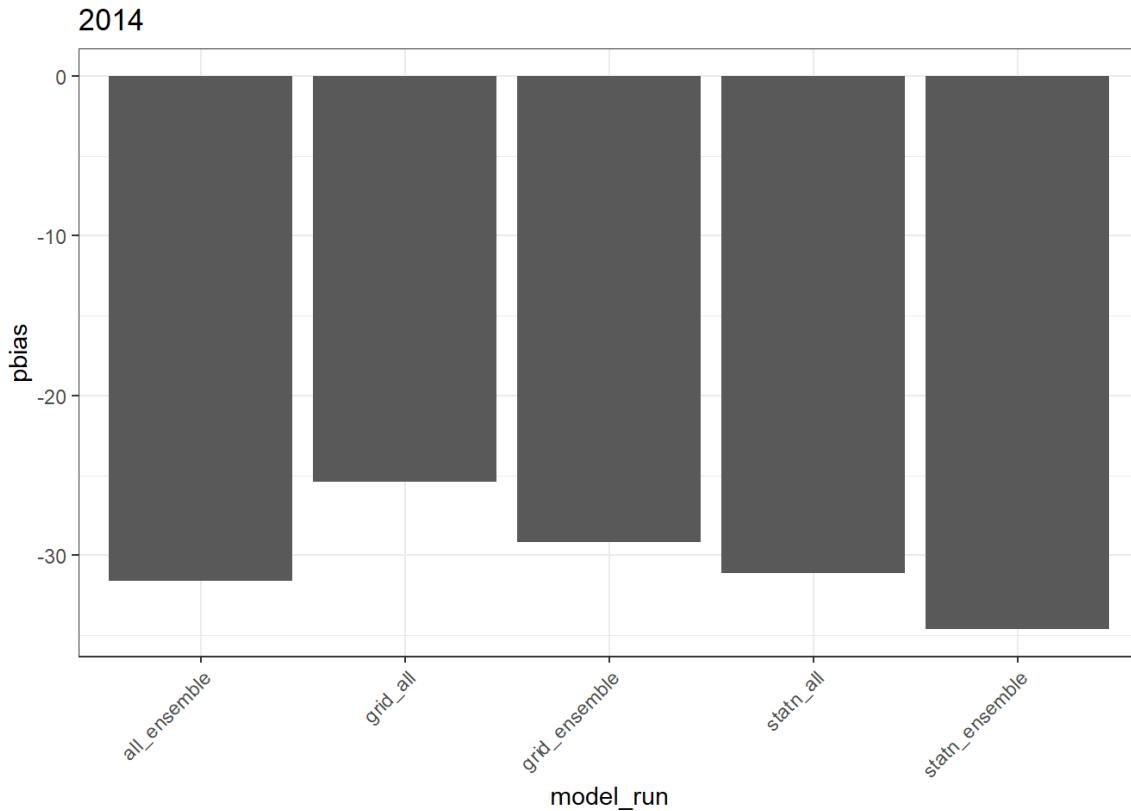


```
##  
## [[3]]
```

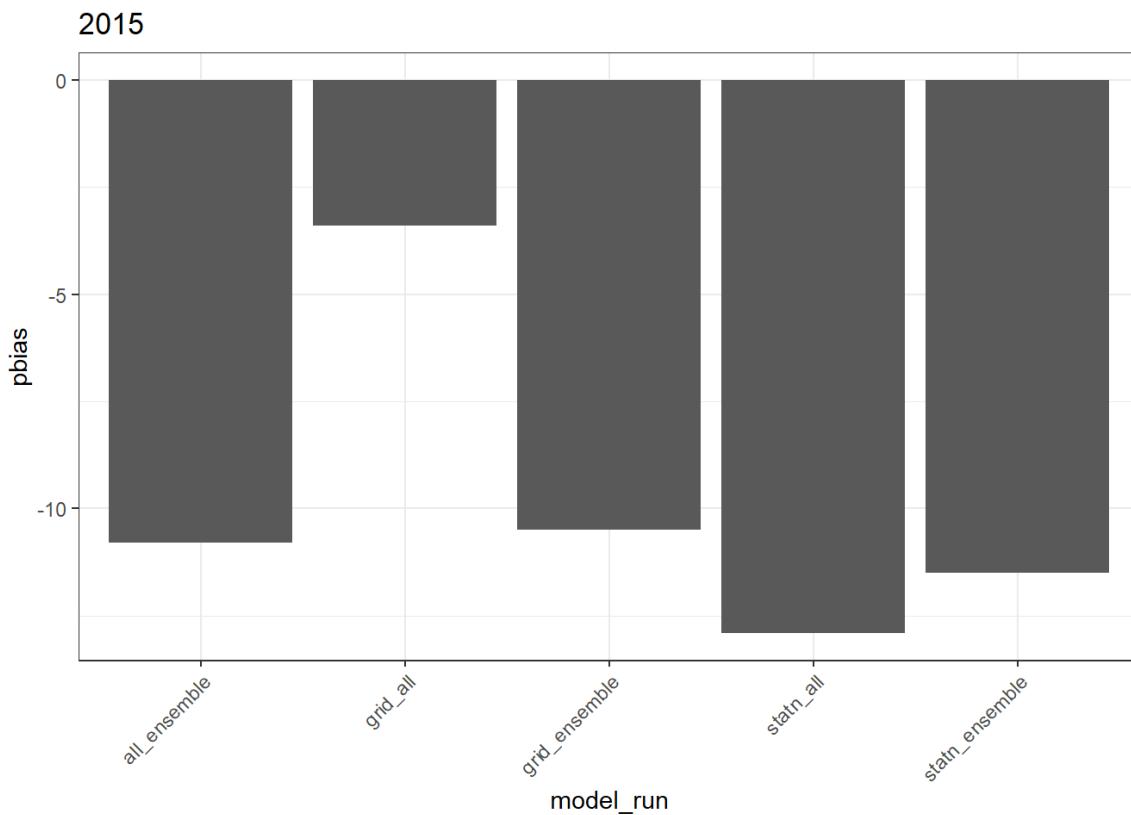
2013



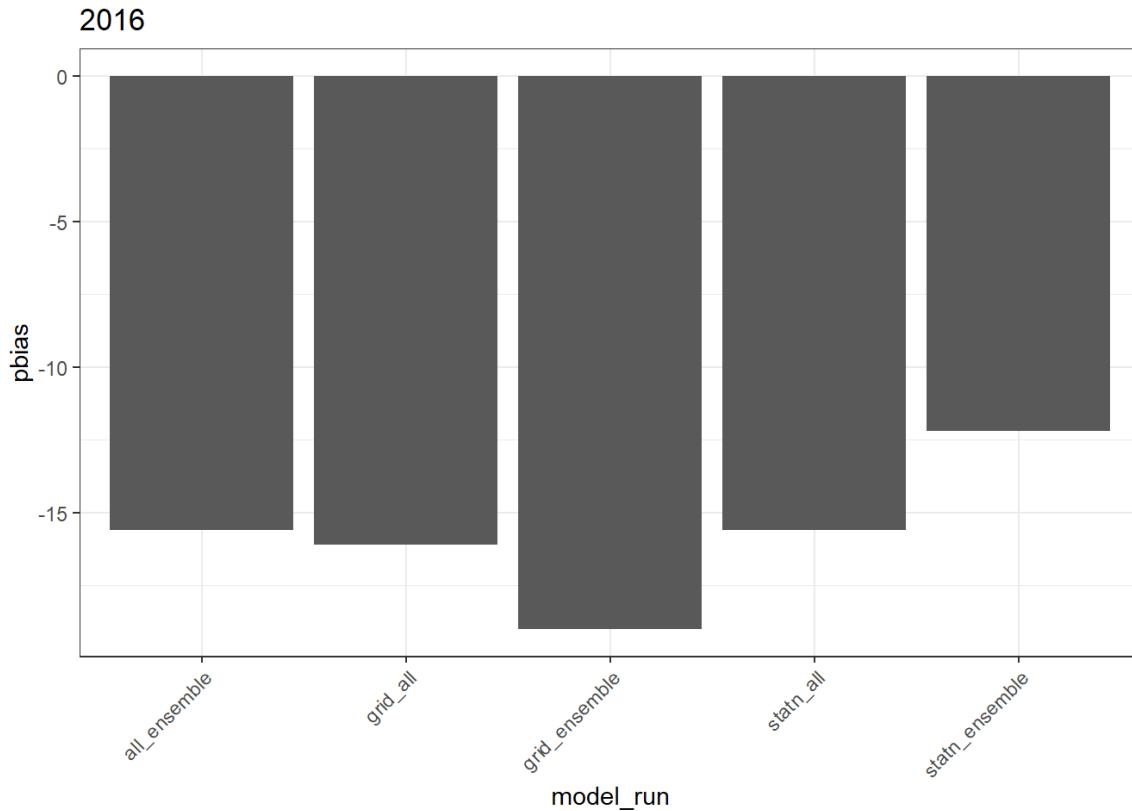
```
##  
## [[4]]
```



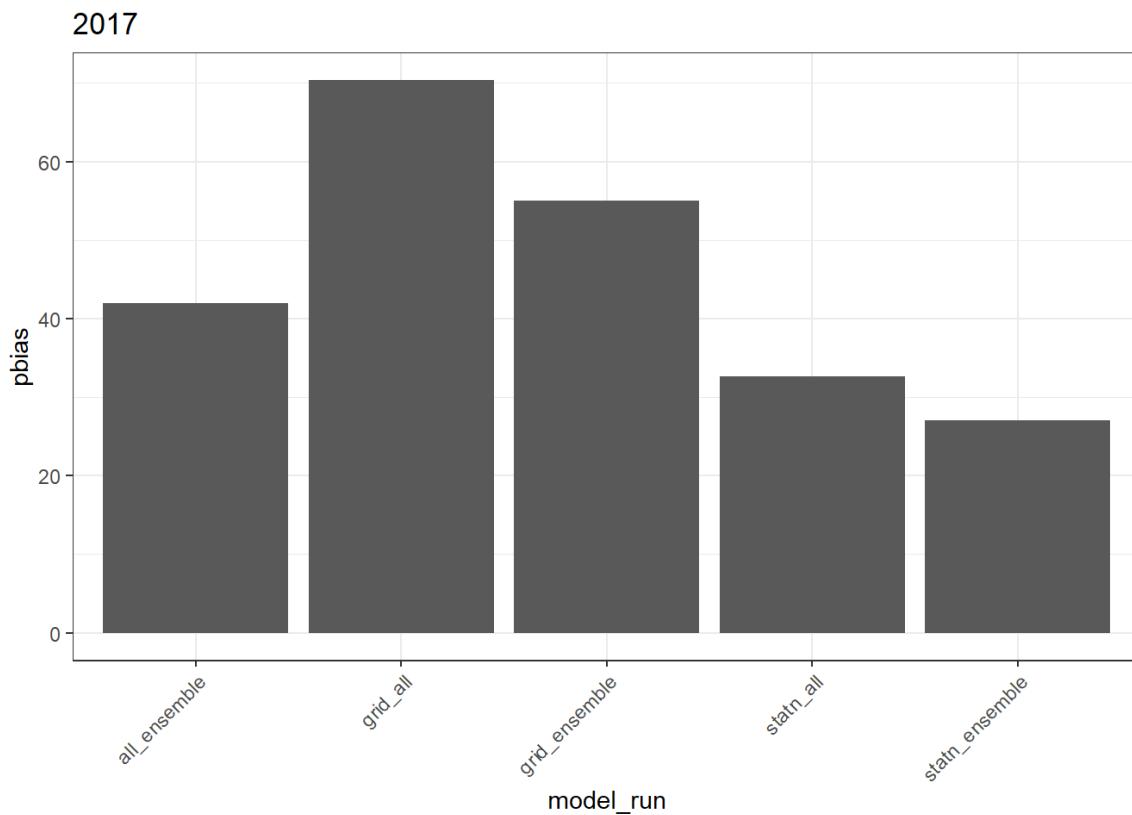
```
##  
## [[5]]
```



```
##  
## [[6]]
```

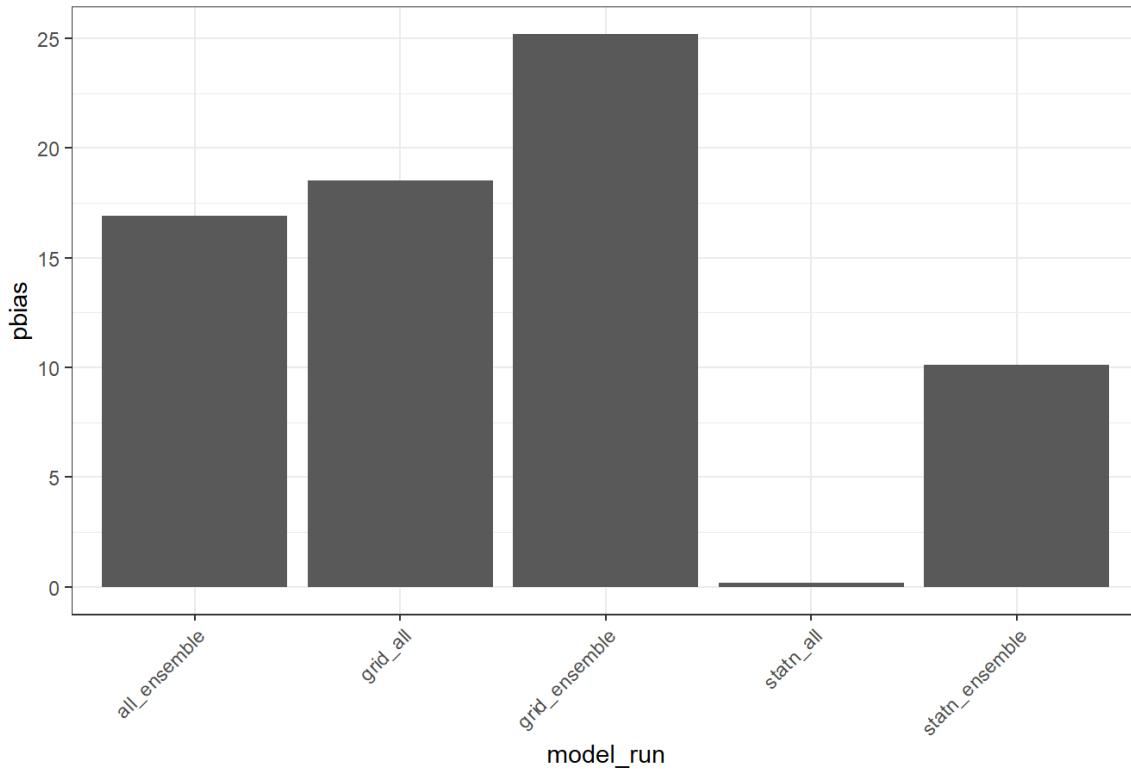


```
##  
## [[7]]
```



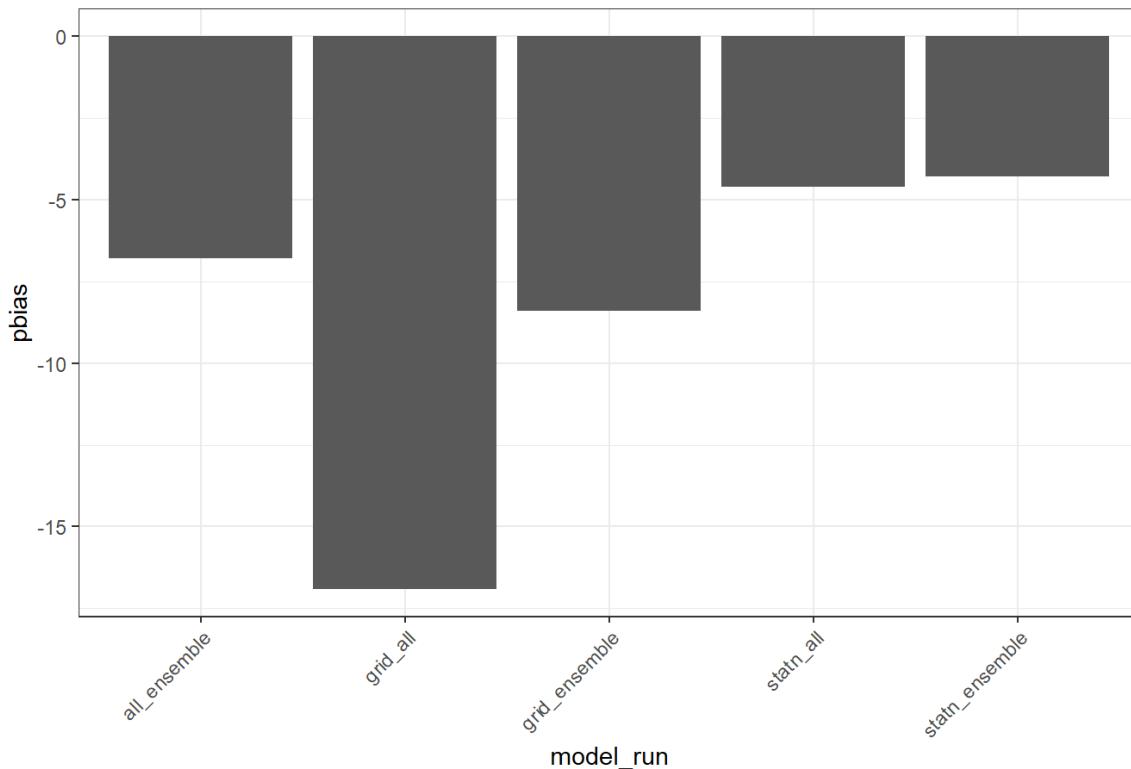
```
##  
## [[8]]
```

2018

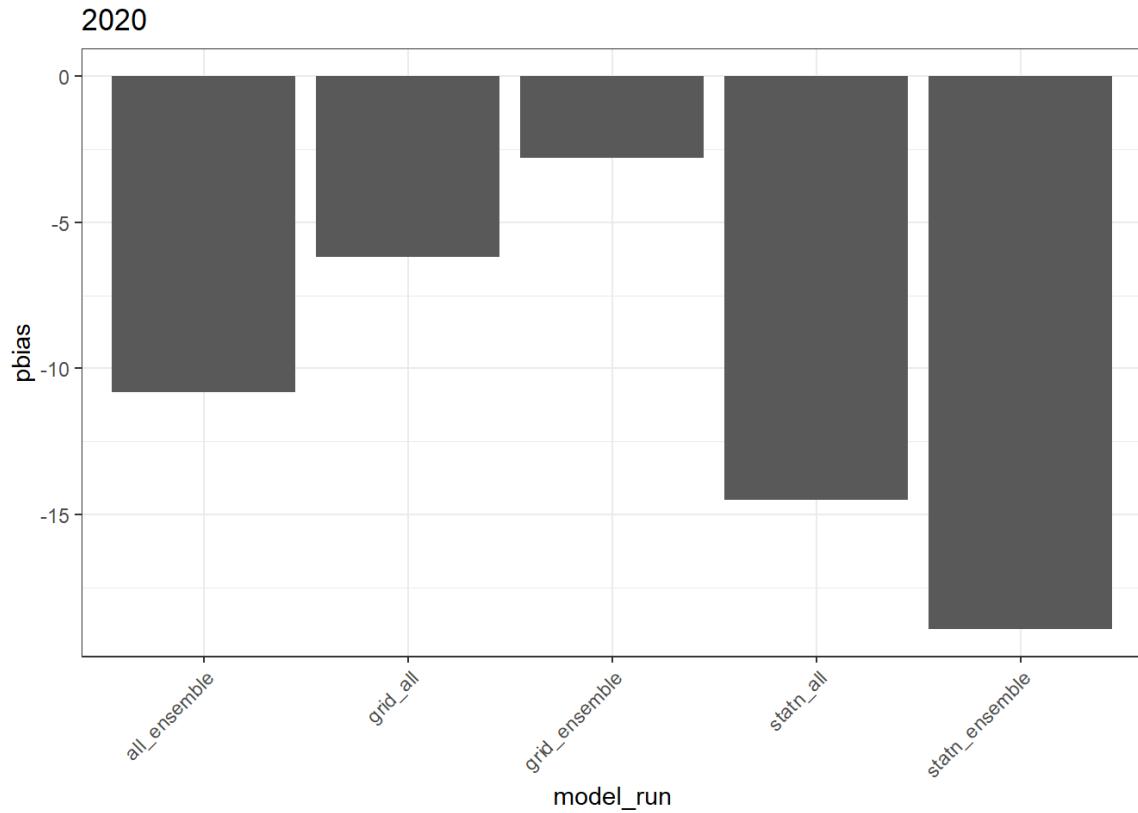


```
##  
## [[9]]
```

2019

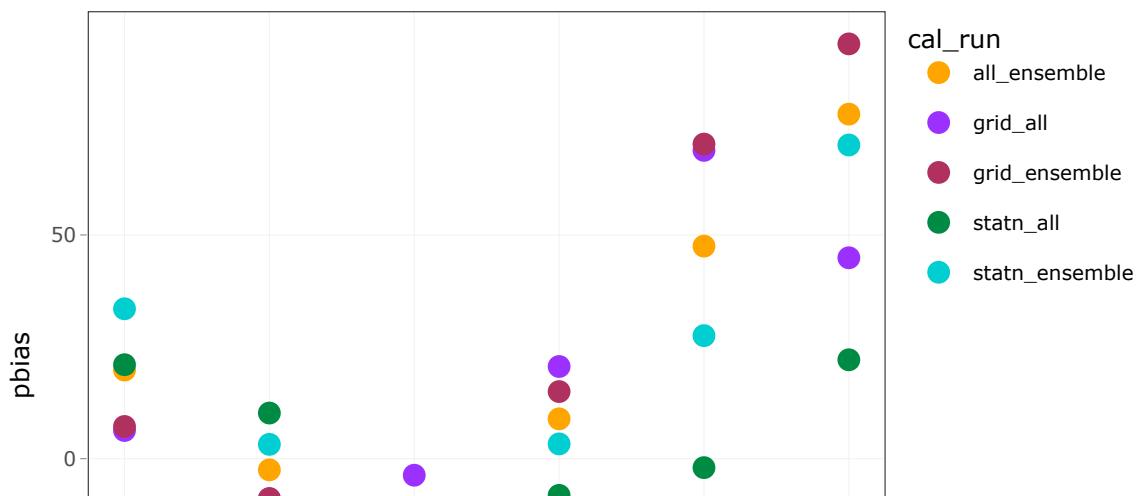


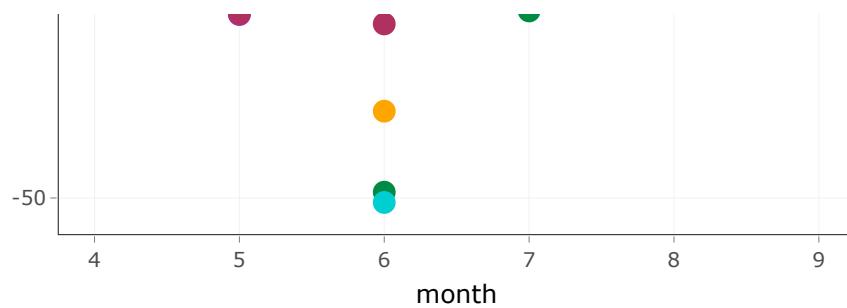
```
##  
## [[10]]
```



Monthly pbias for ensembles

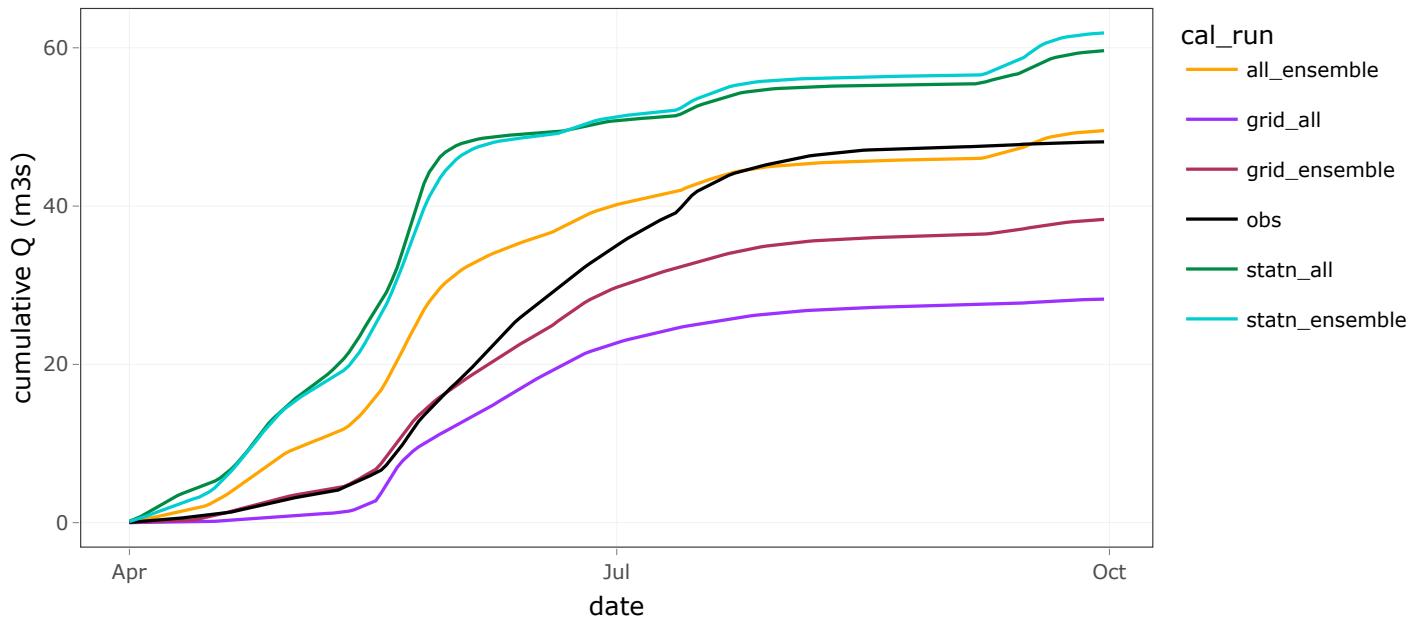
month	grid_ensemble	statn_ensemble	all_ensemble	grid_all	statn_all
4	7.2	33.5	19.8	6.3	21.0
5	-8.9	3.2	-2.5	-9.0	10.2
6	-11.1	-51.0	-30.6	-3.7	-48.7
7	15.0	3.3	8.9	20.6	-8.2
8	70.3	27.5	47.5	68.9	-2.0
9	92.7	70.1	77.0	44.9	22.1



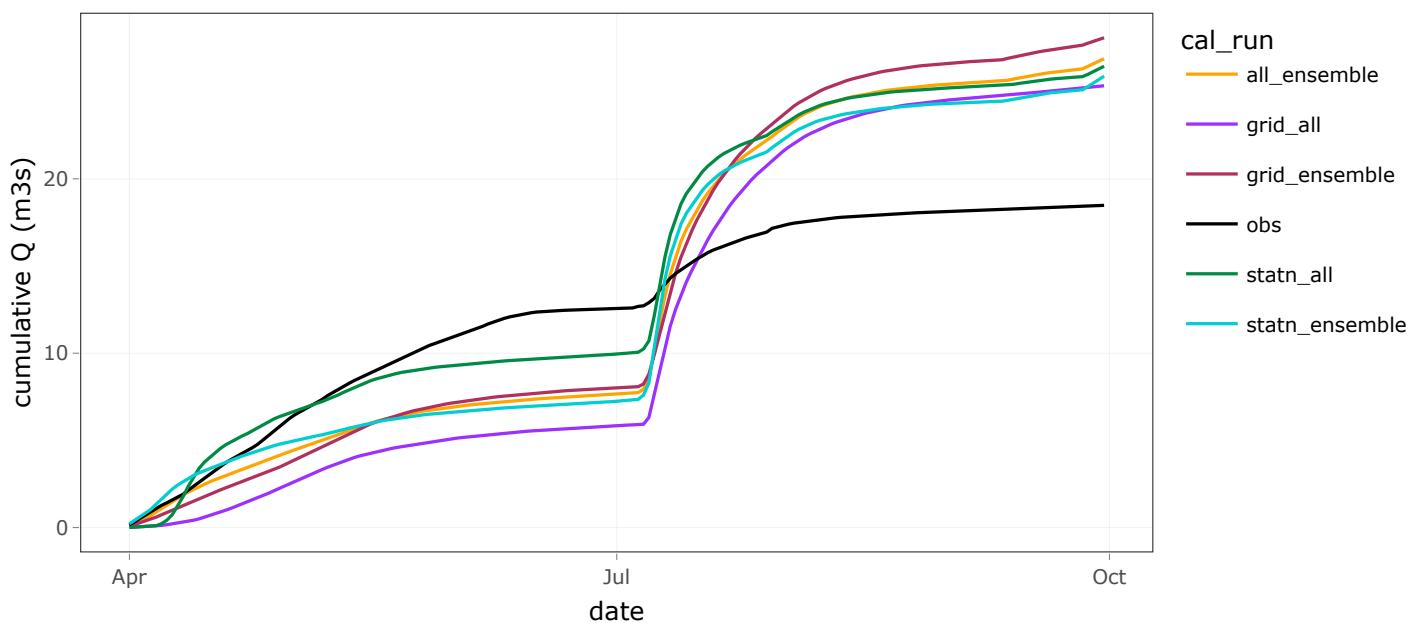


Cumulative Q

2011

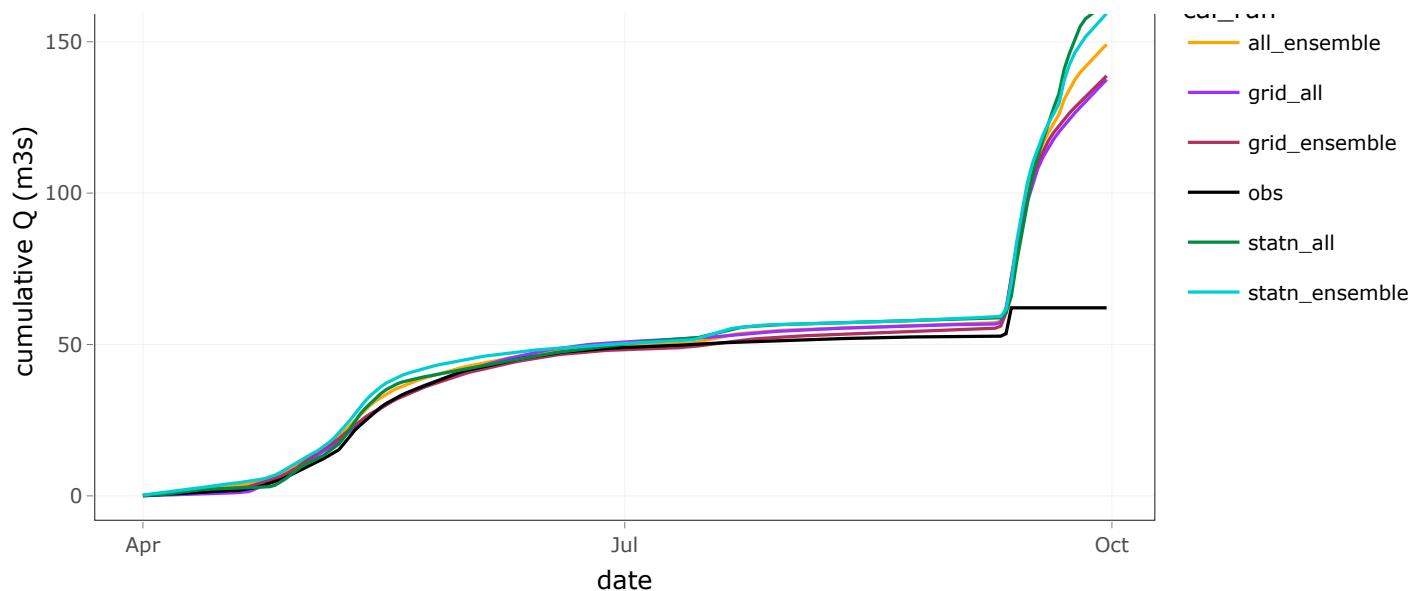


2012

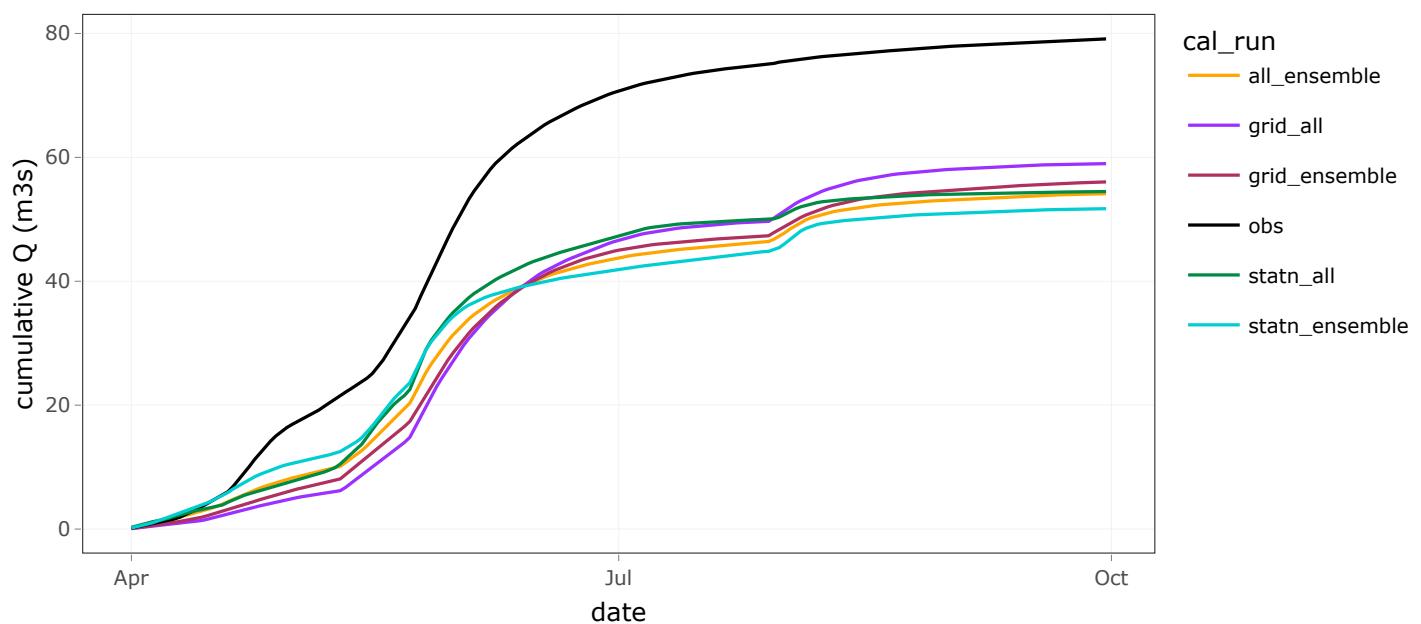


2013

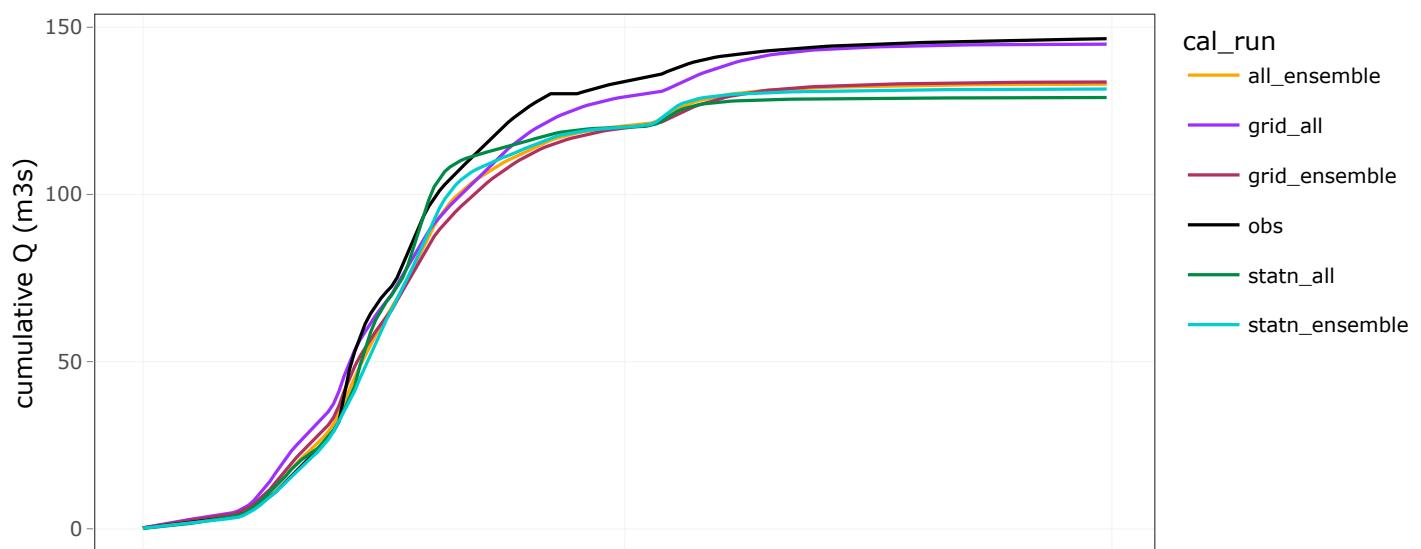
Fourmile Calibrations



2014



2015



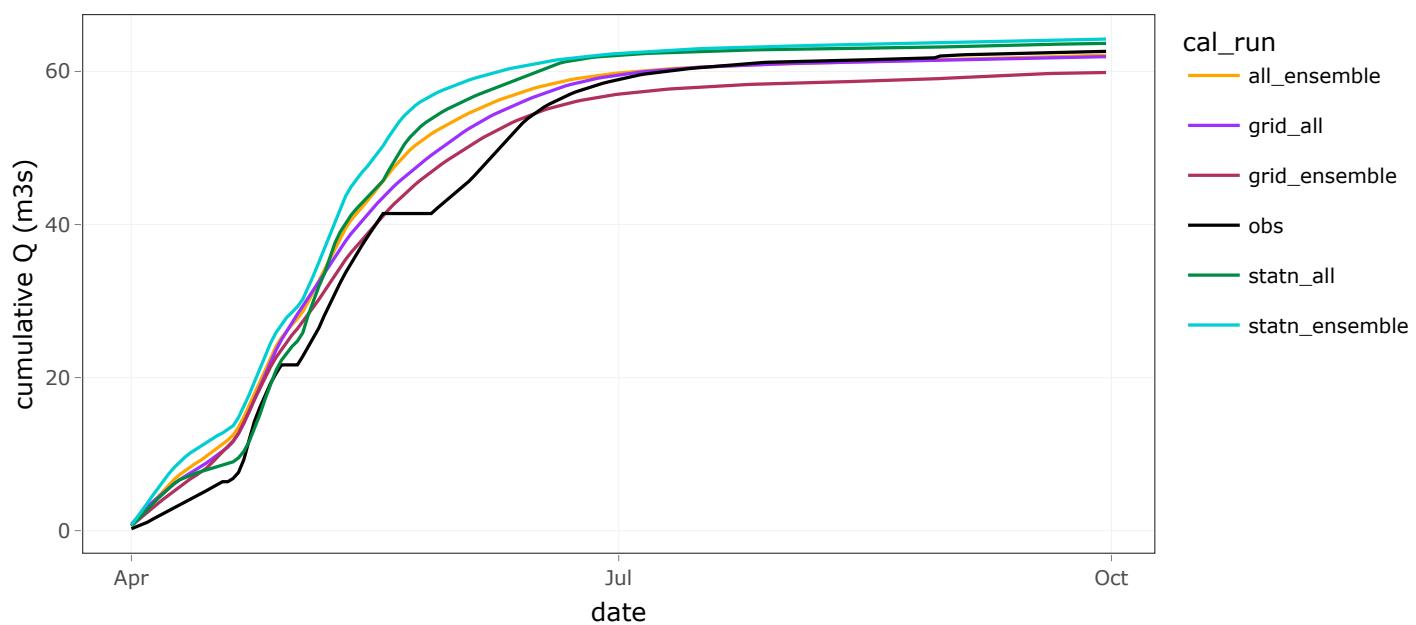
Apr

Jul

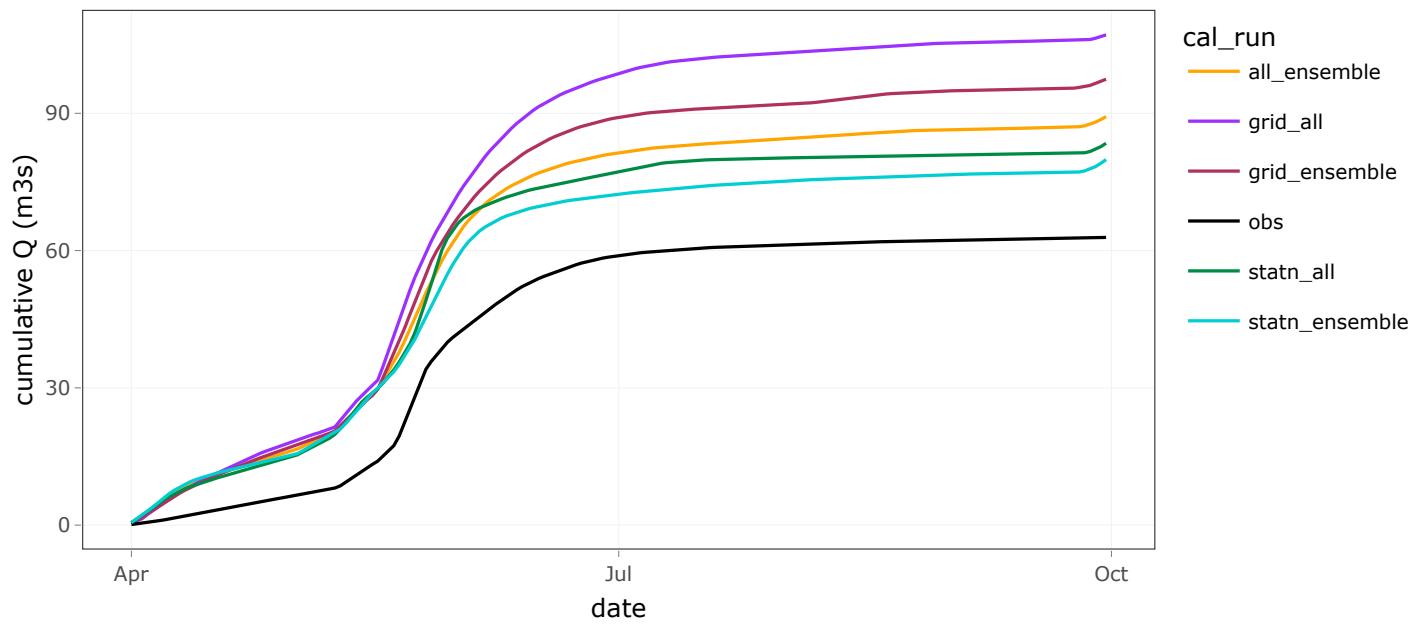
Oct

date

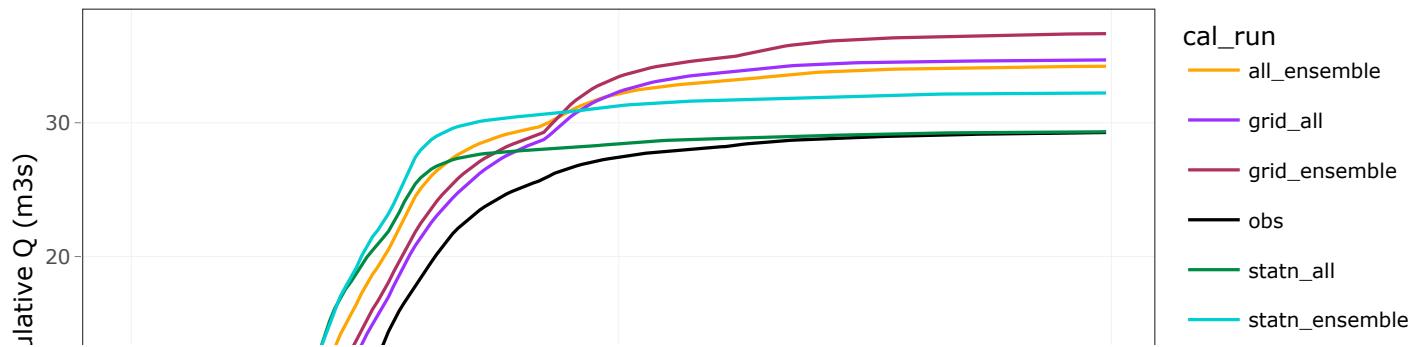
2016

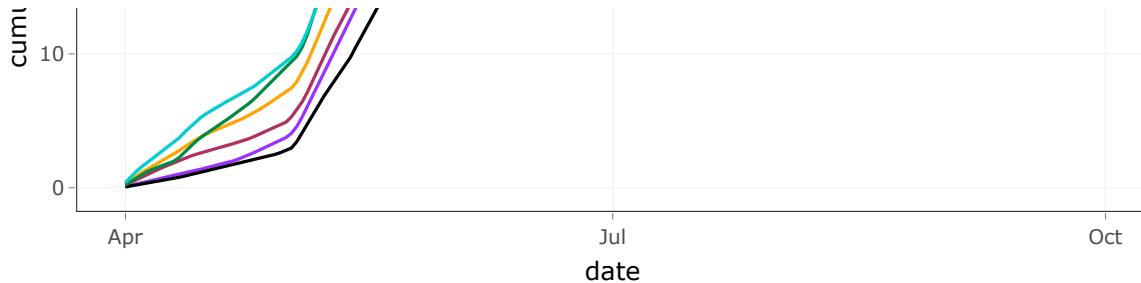


2017

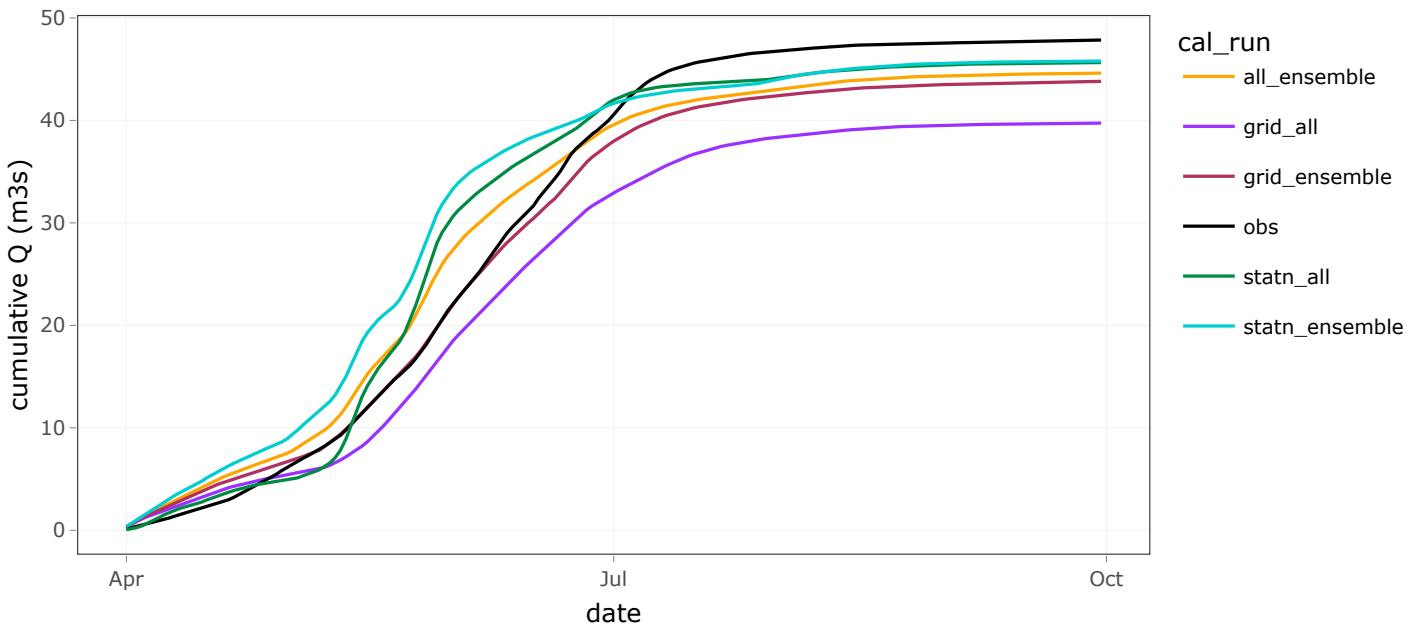


2018

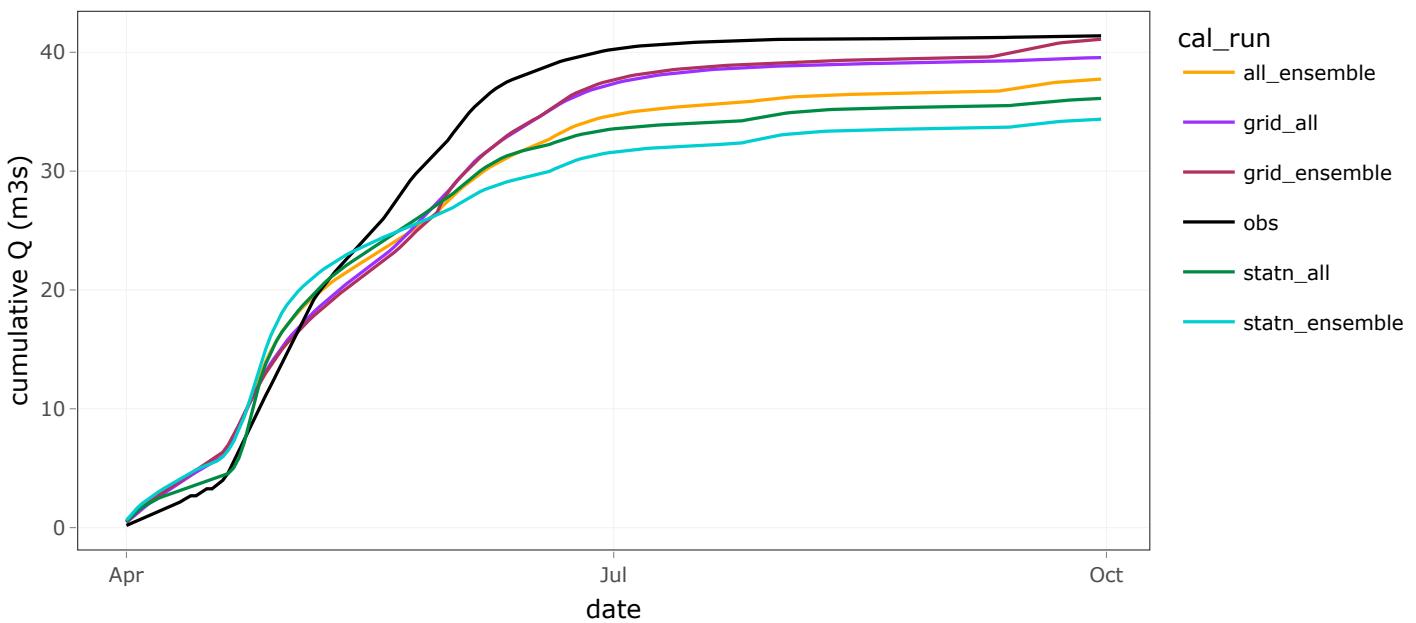




2019



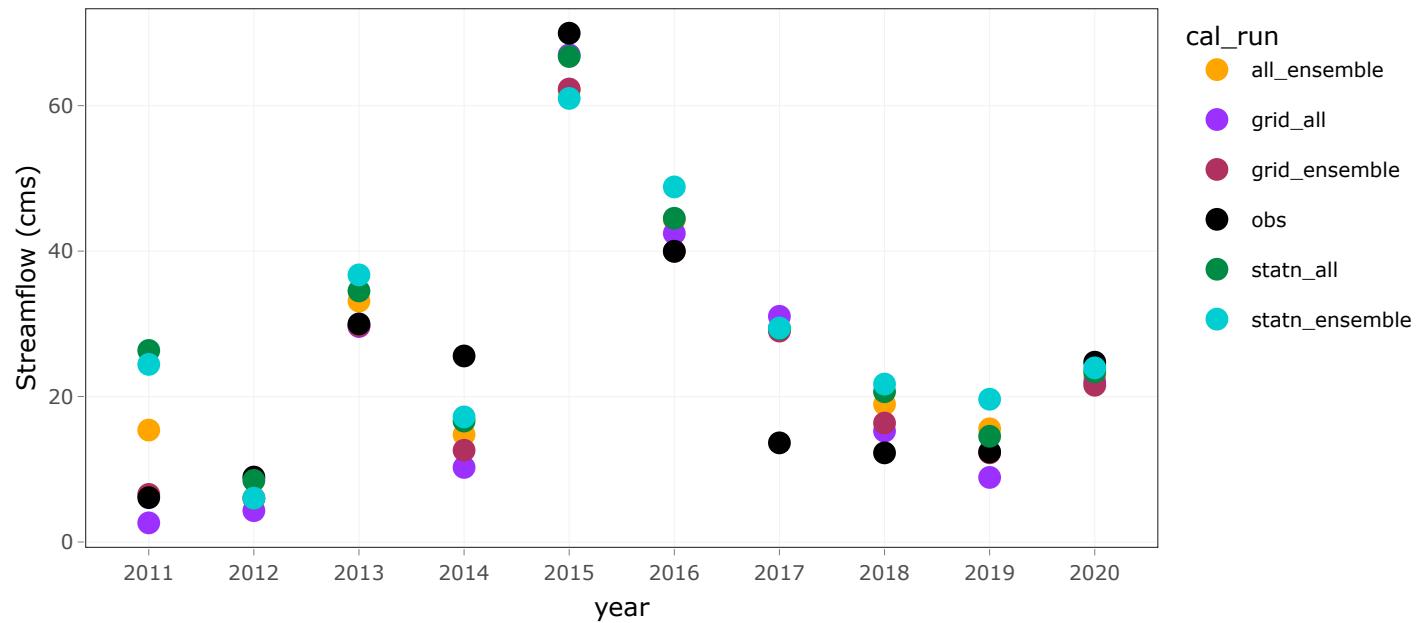
2020



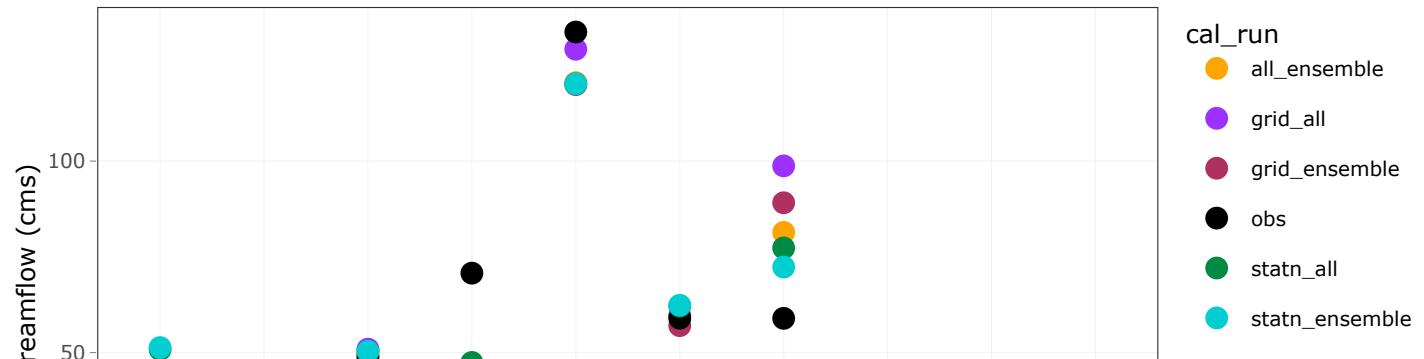
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```

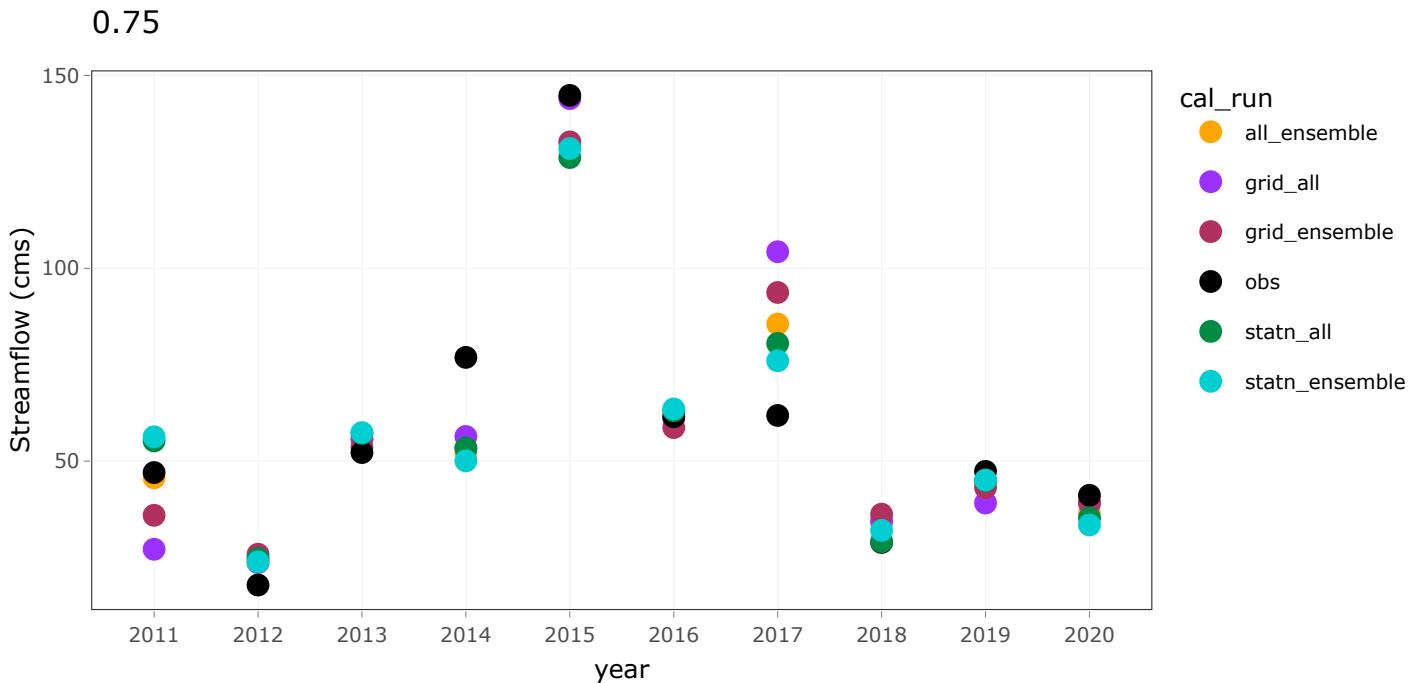
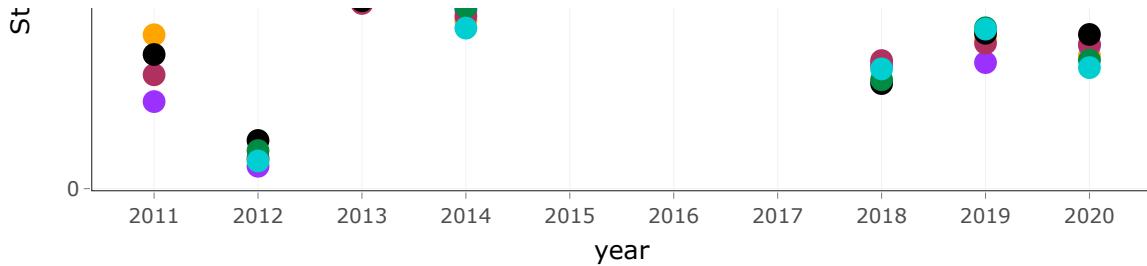
Percentiles

0.25



0.5

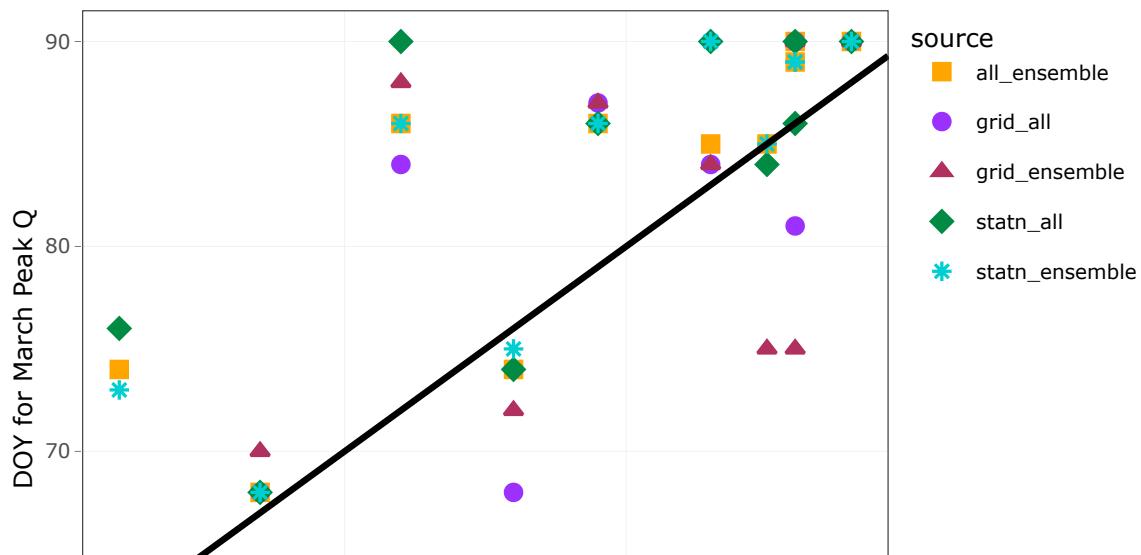


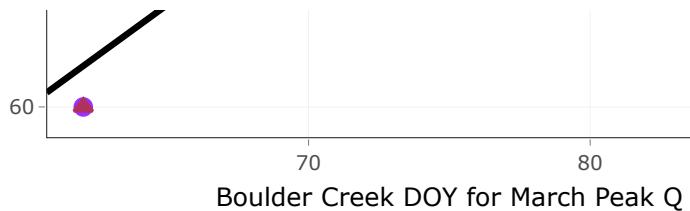


```
## [[1]]
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```

Max Q prior to April 1

DOY of peak Q in March



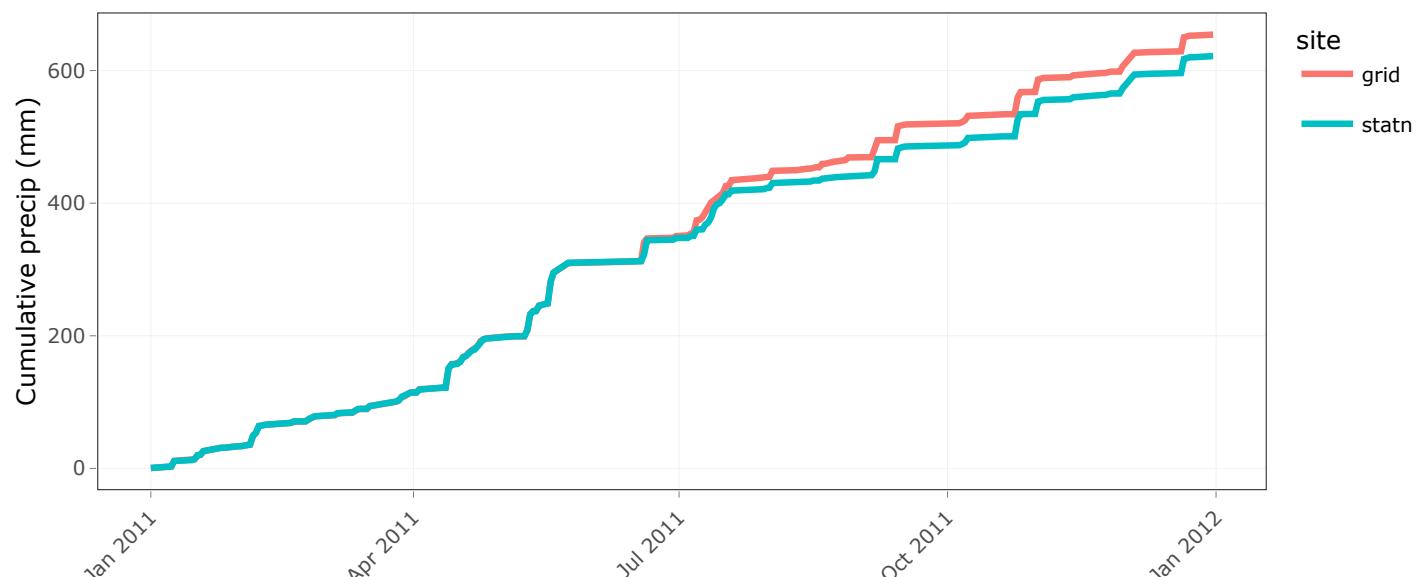


date	year	source	q_m3s	month	doy
2011-03-01	2011	grid_all	0.0067000	3	60
2011-03-01	2011	grid_ensemble	0.0280570	3	60
2011-03-03	2011	bouldcr	0.7645549	3	62
2011-03-14	2011	statn_ensemble	0.3548170	3	73
2011-03-15	2011	all_ensemble	0.1922614	3	74
2011-03-17	2011	statn_all	0.6248700	3	76
2012-03-01	2012	grid_all	0.0171300	3	61
2012-03-15	2012	grid_ensemble	0.0844870	3	75
2012-03-24	2012	statn_all	0.0117800	3	84
2012-03-25	2012	all_ensemble	0.2175677	3	85
2012-03-25	2012	bouldcr	0.6626142	3	85
2012-03-25	2012	statn_ensemble	0.4208190	3	85

Catchment results

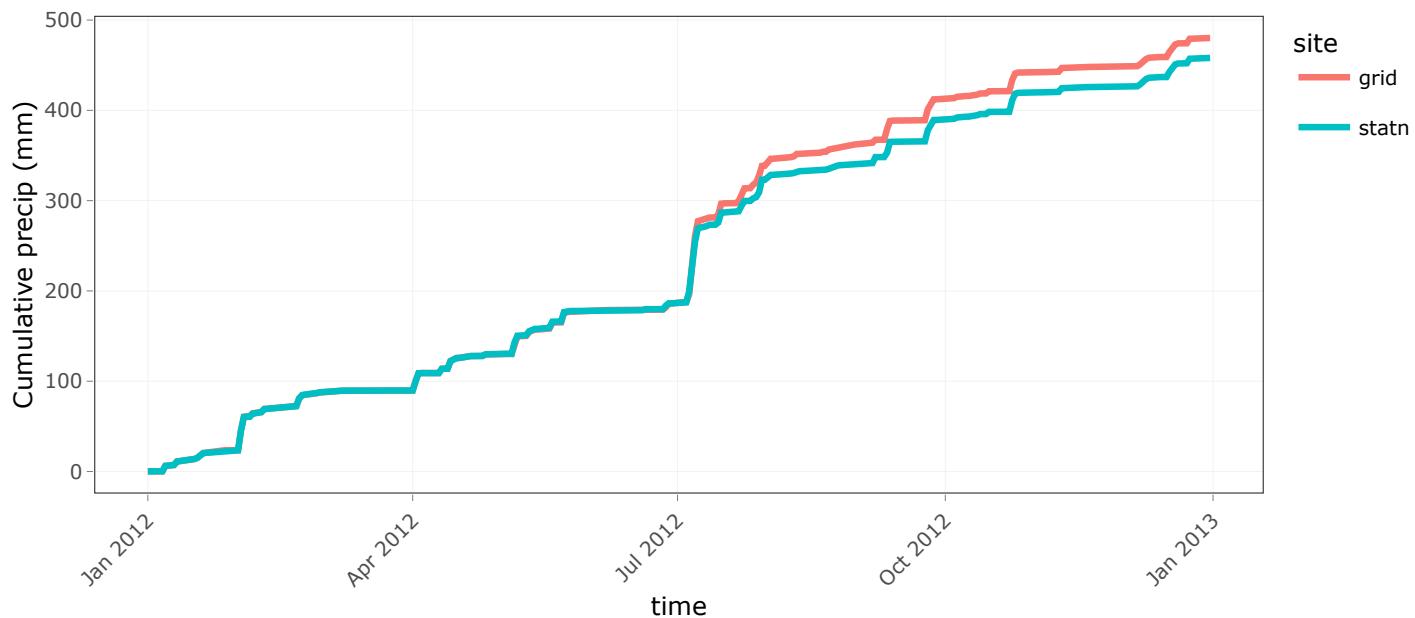
Precip

2011

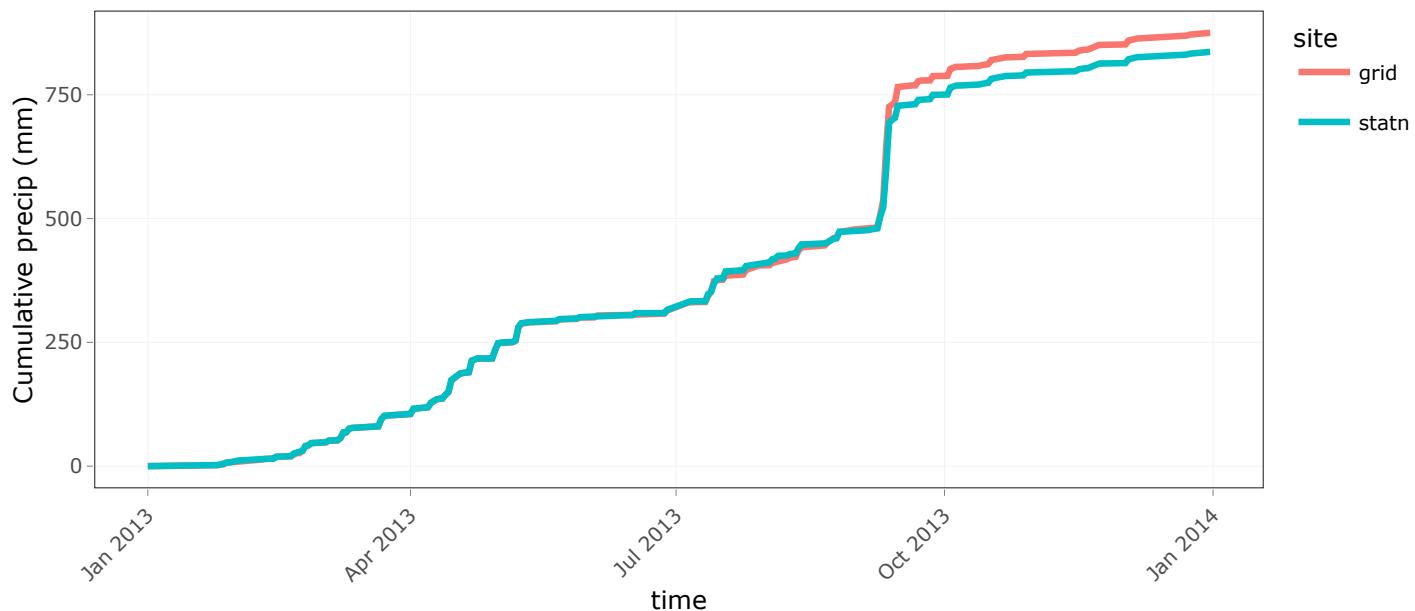


time

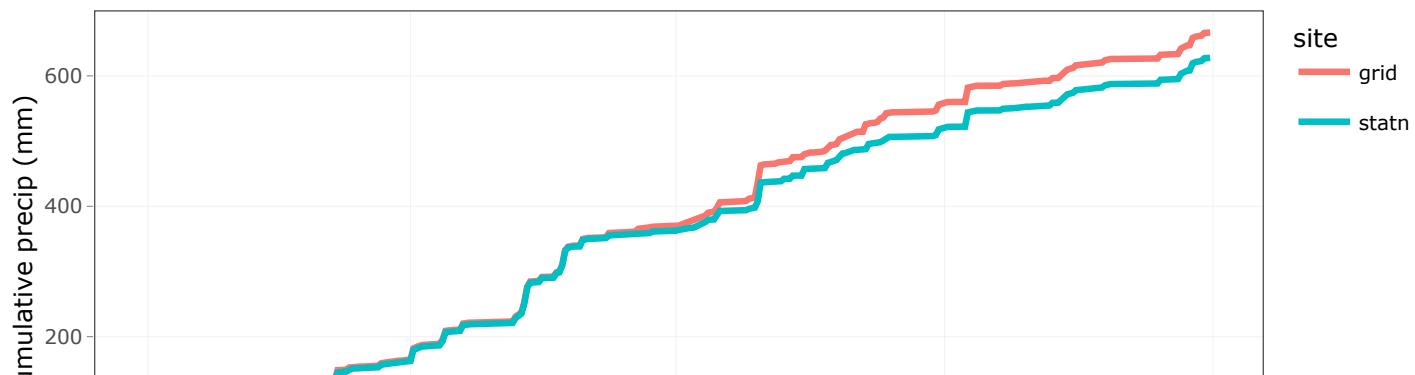
2012

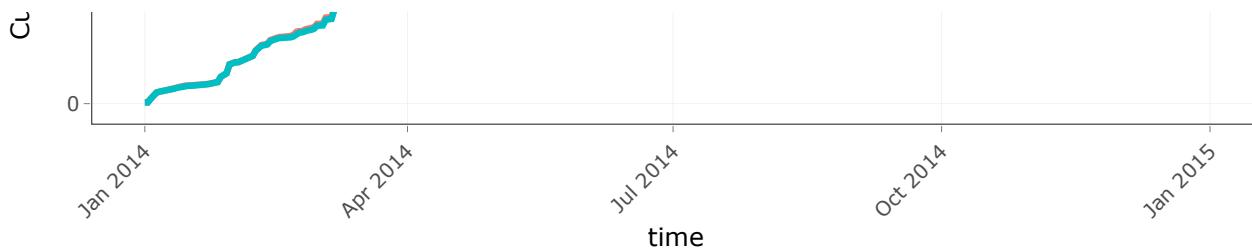


2013

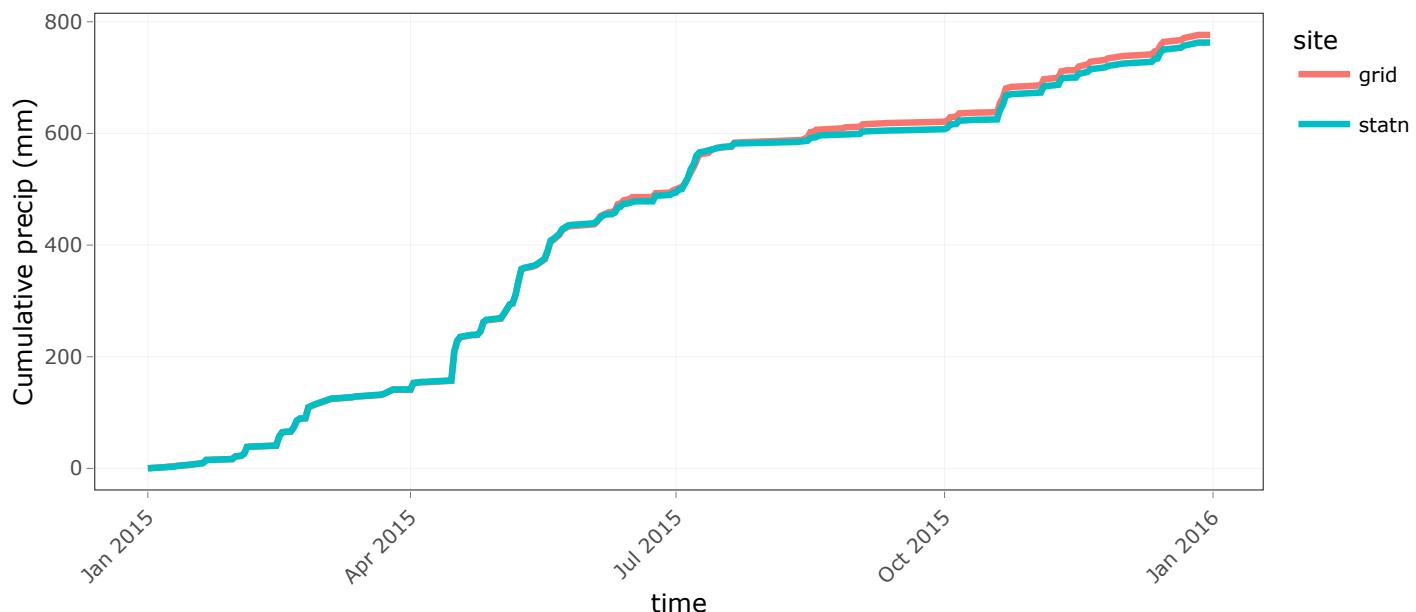


2014

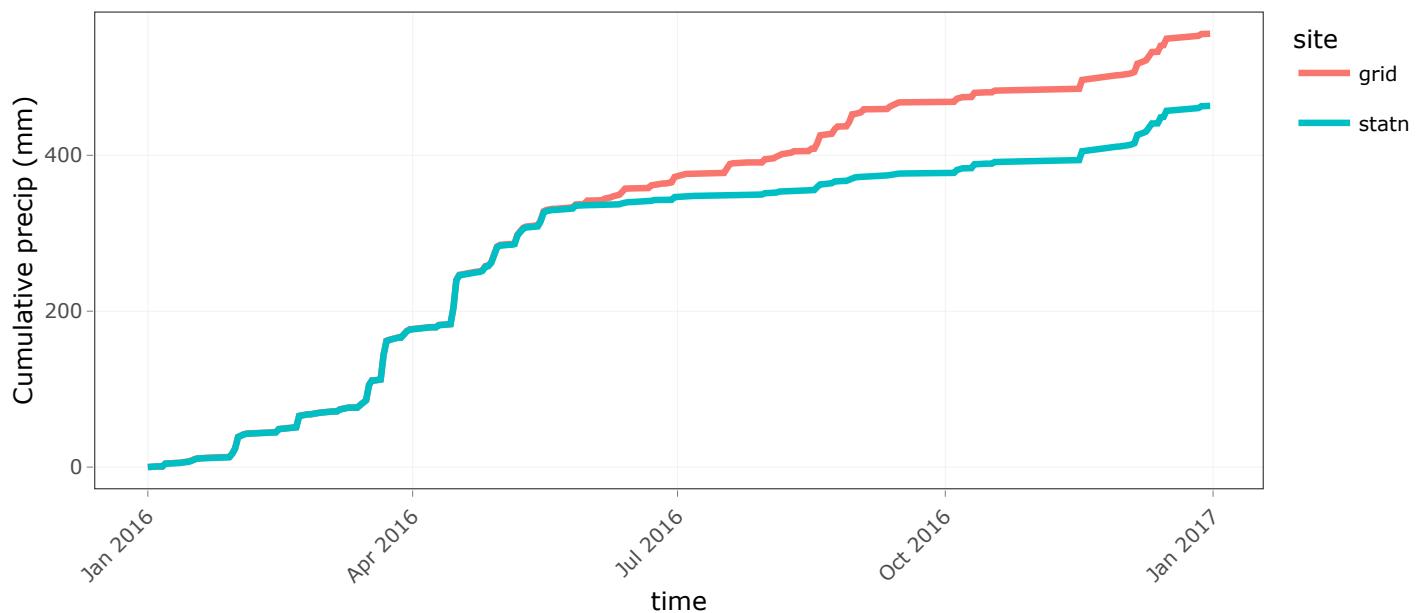




2015

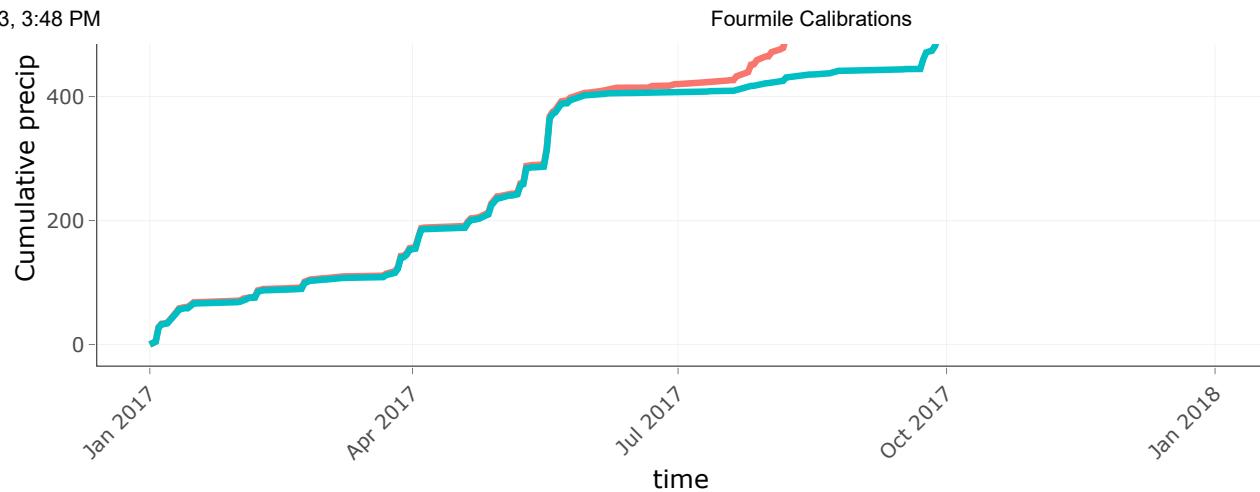


2016

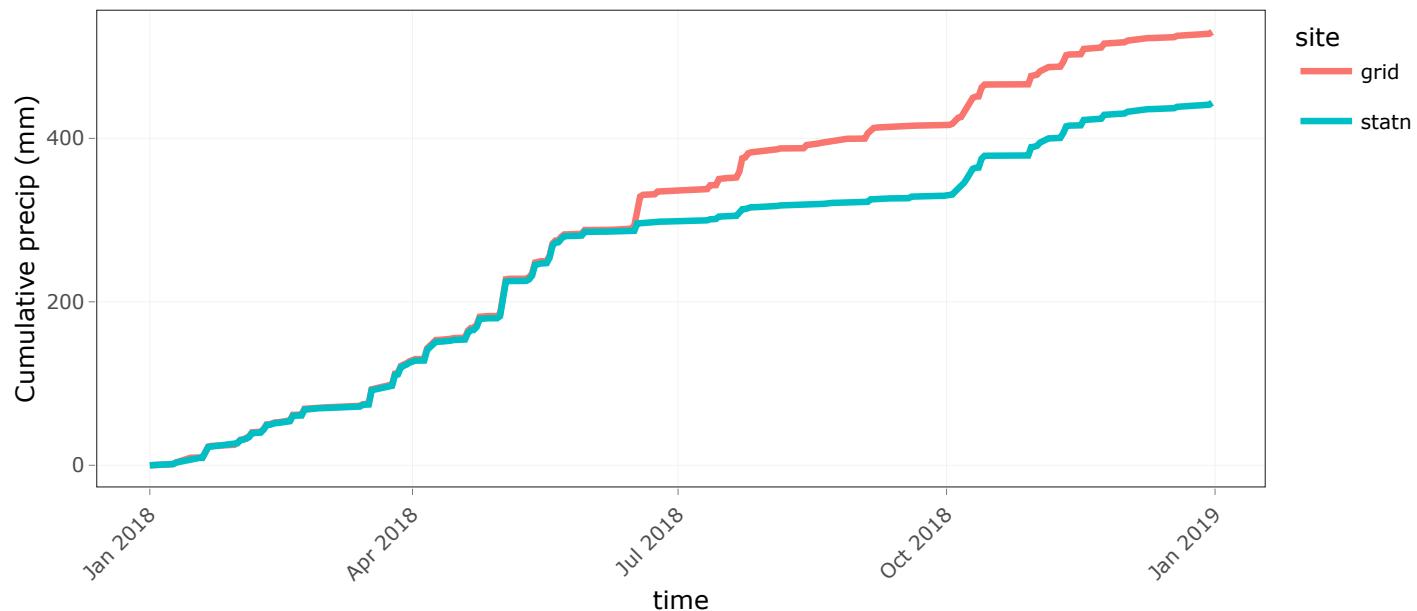


2017

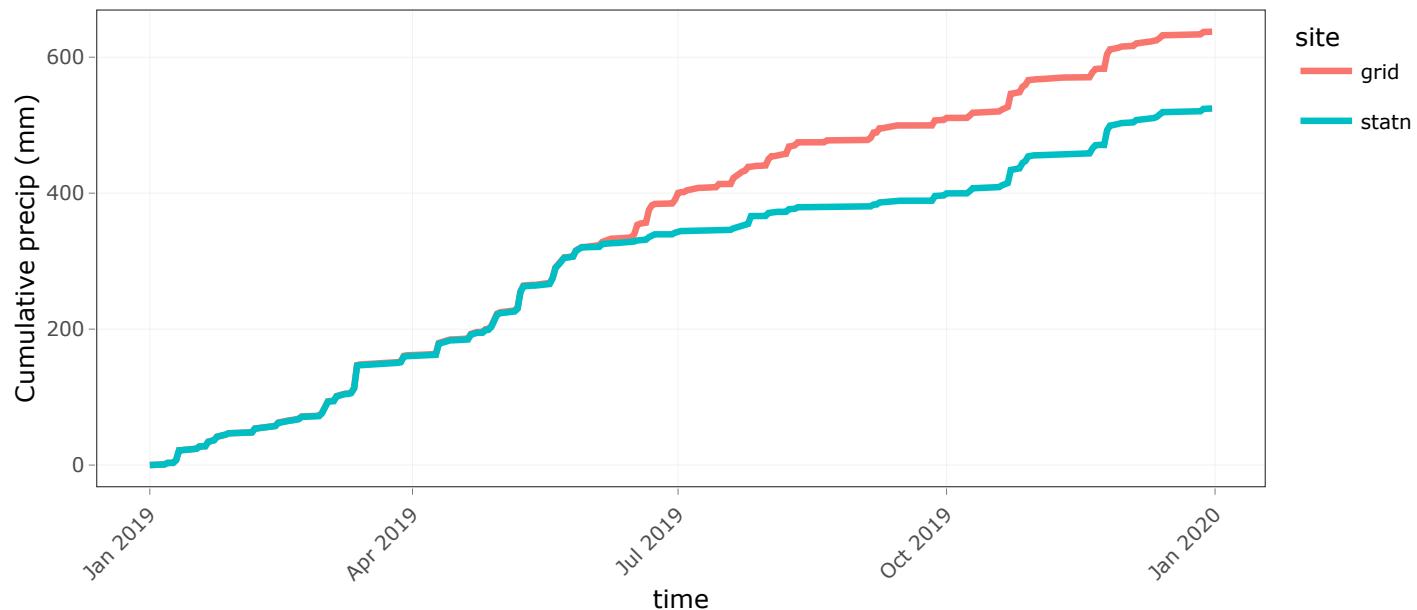




2018

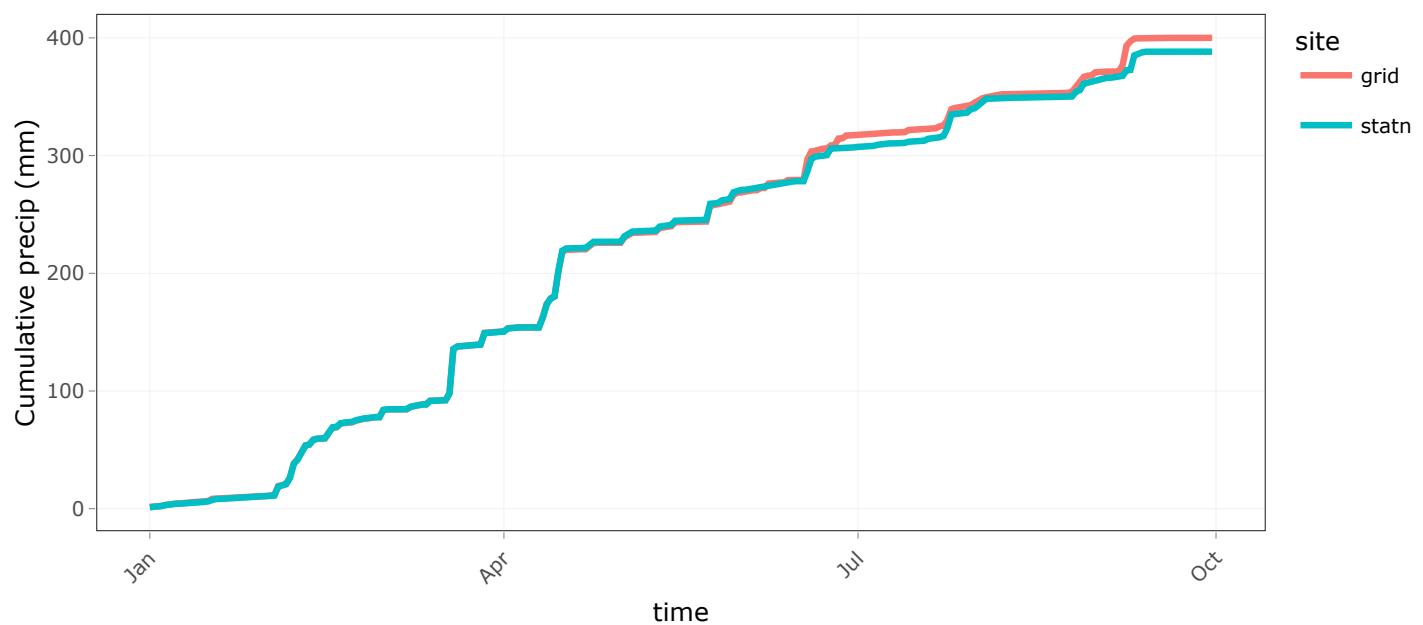


2019



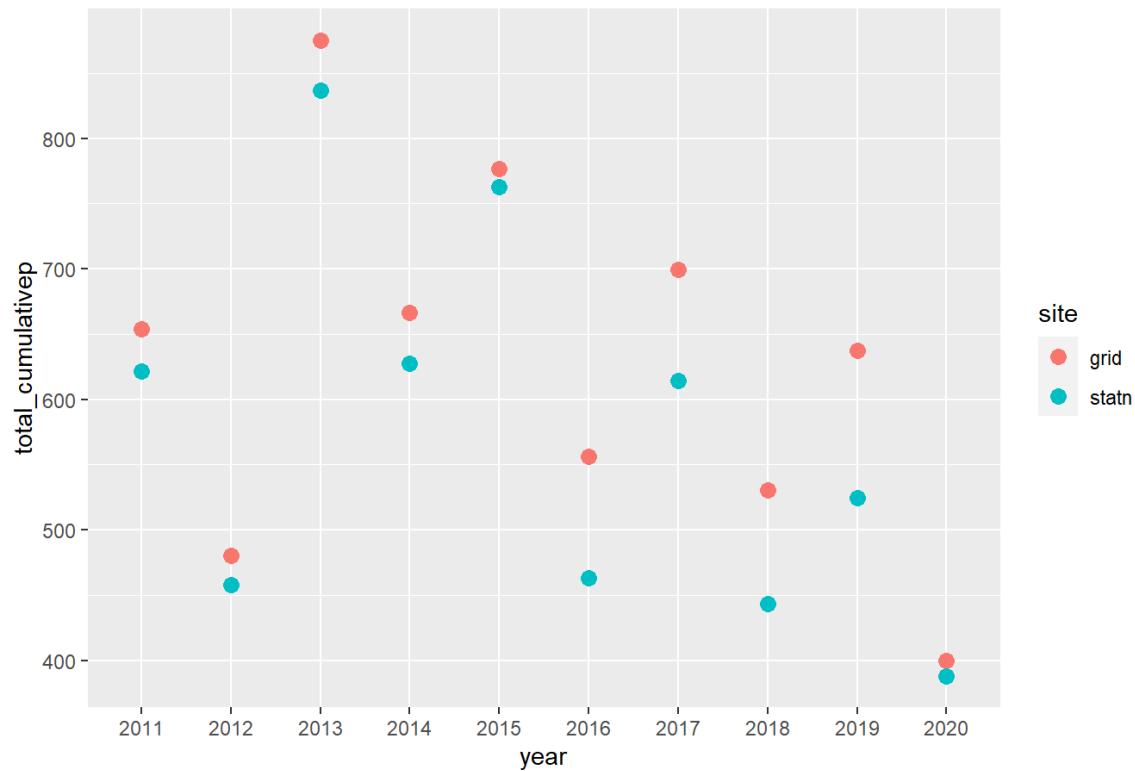
2020

2020



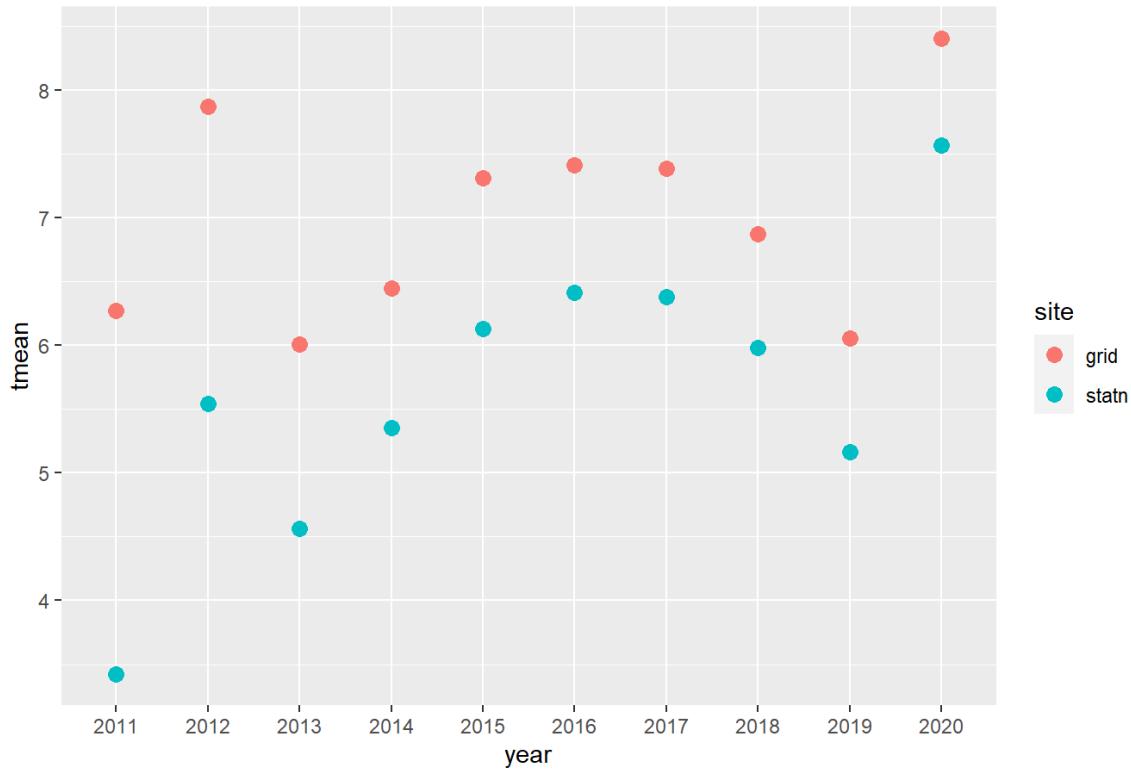
```
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## [[10]]
```

Total cumulative precip (mm) by year

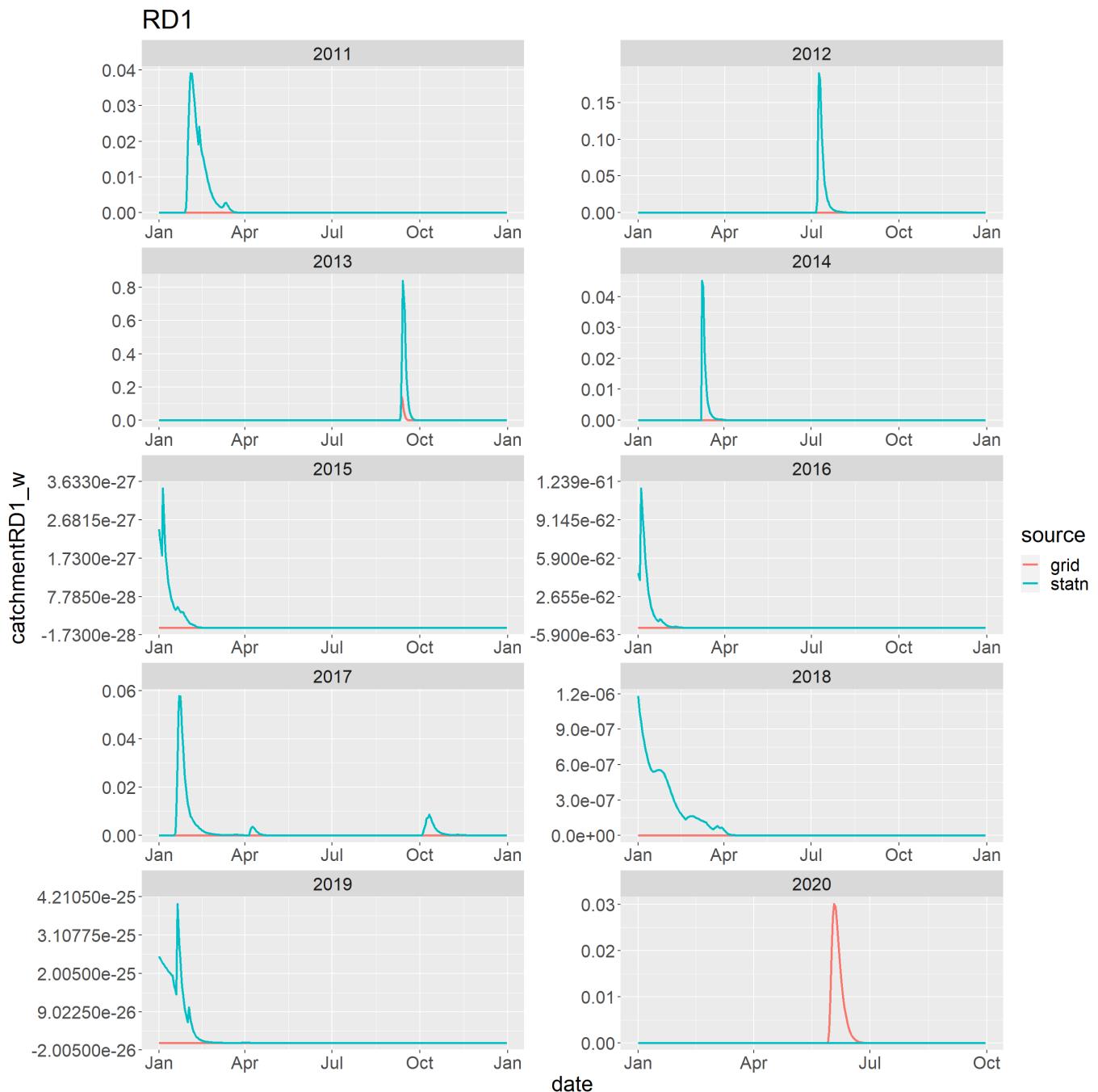


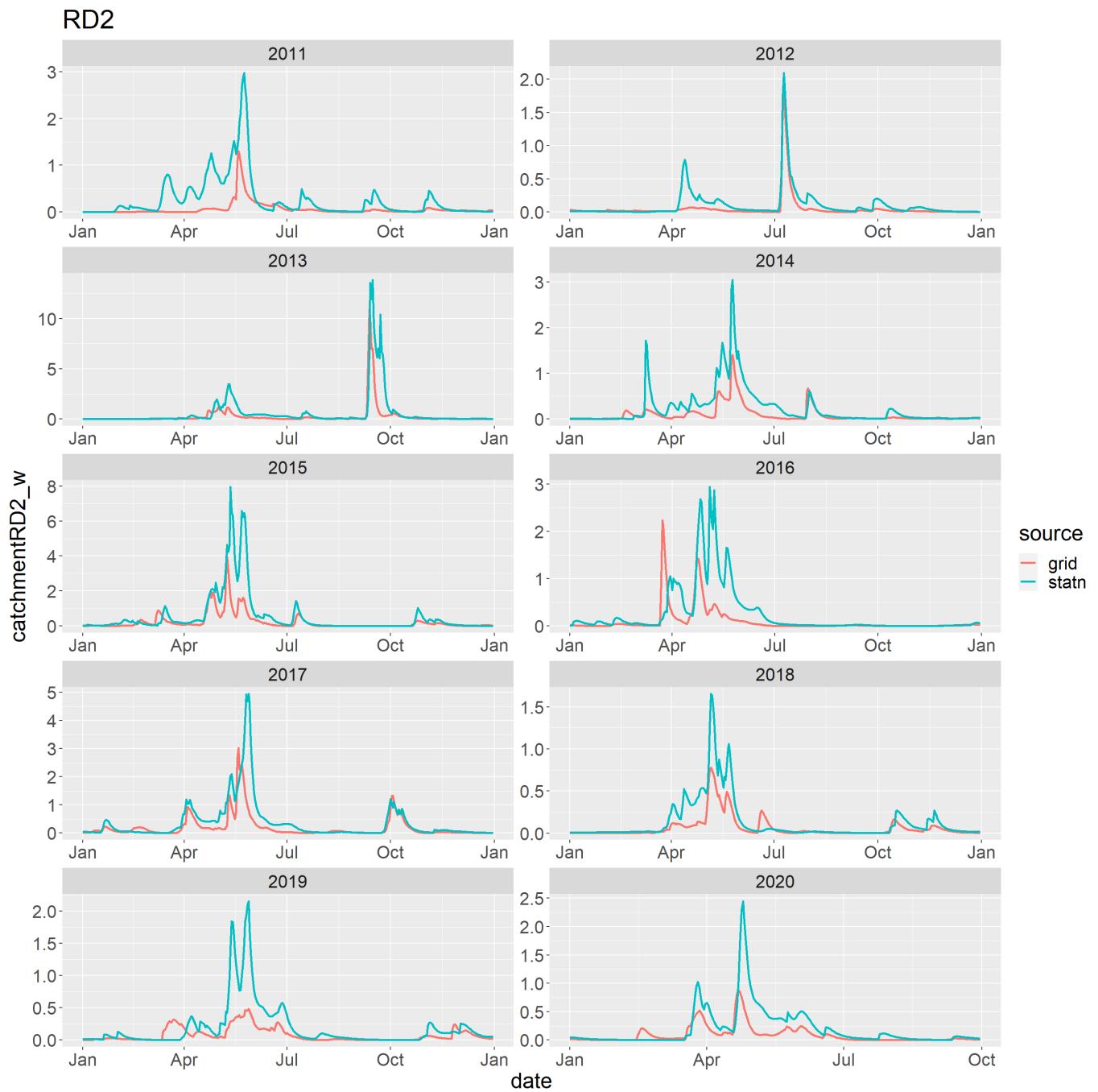
Tmean

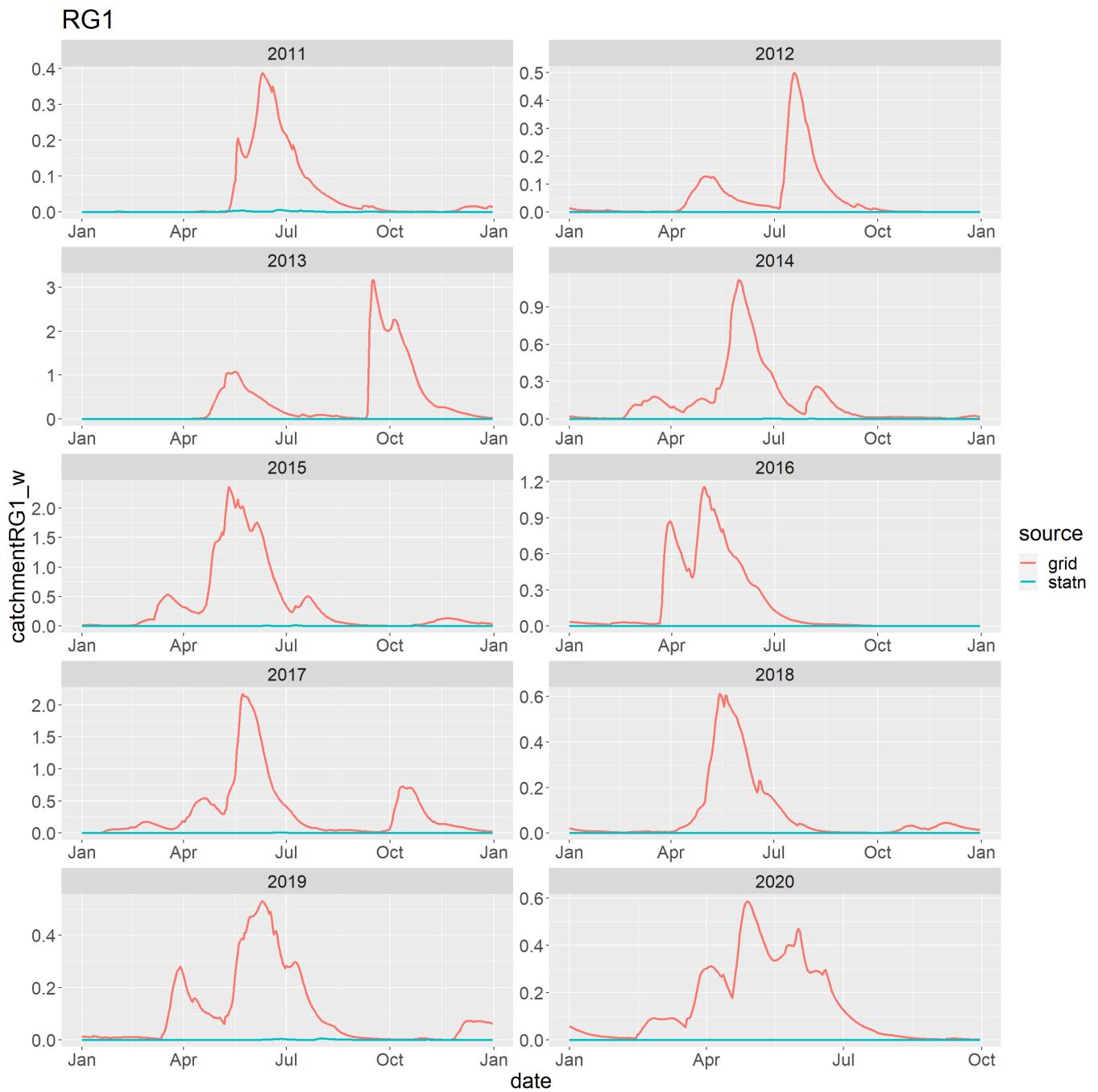
Average temp by year



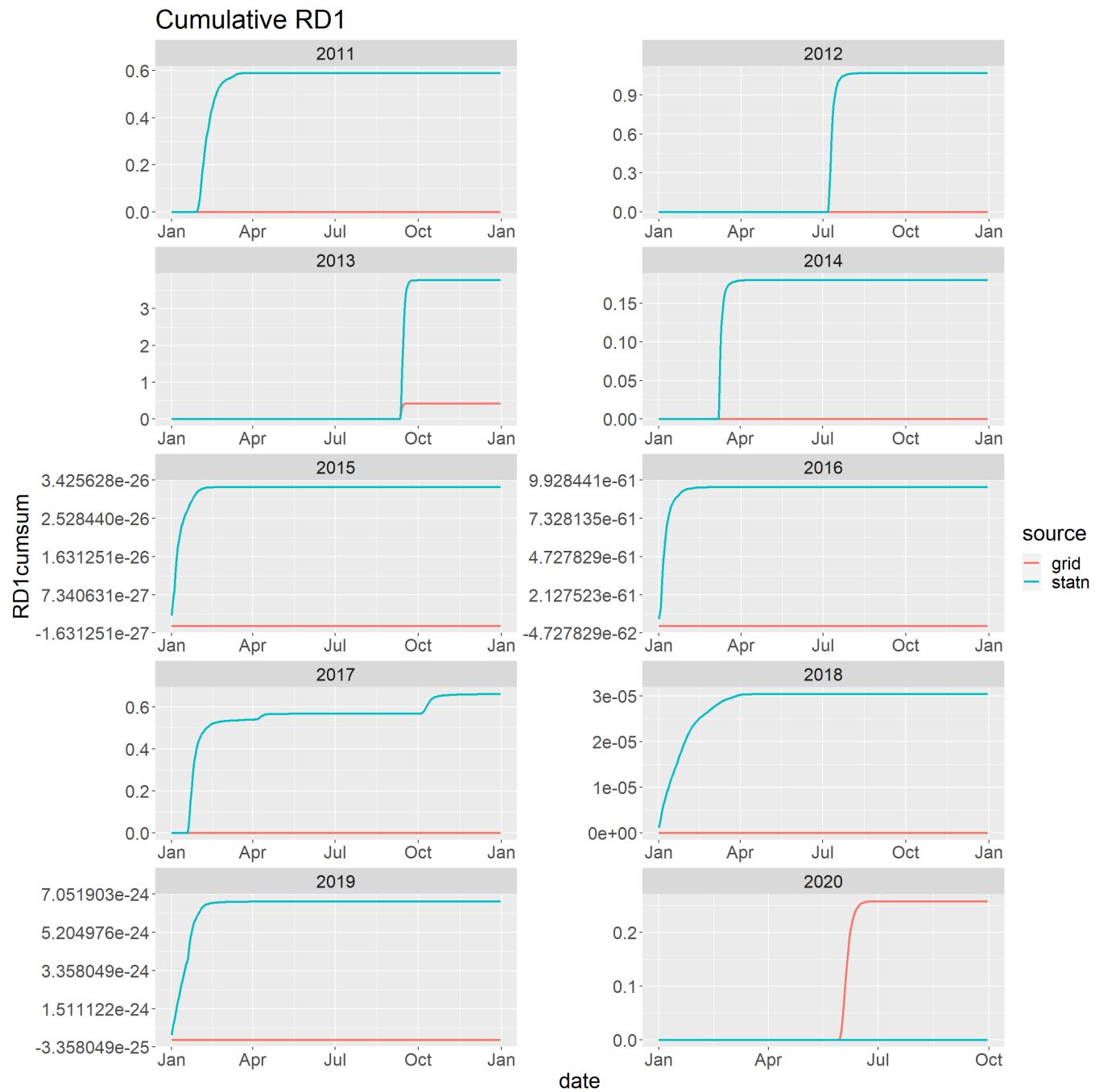
RD and RG



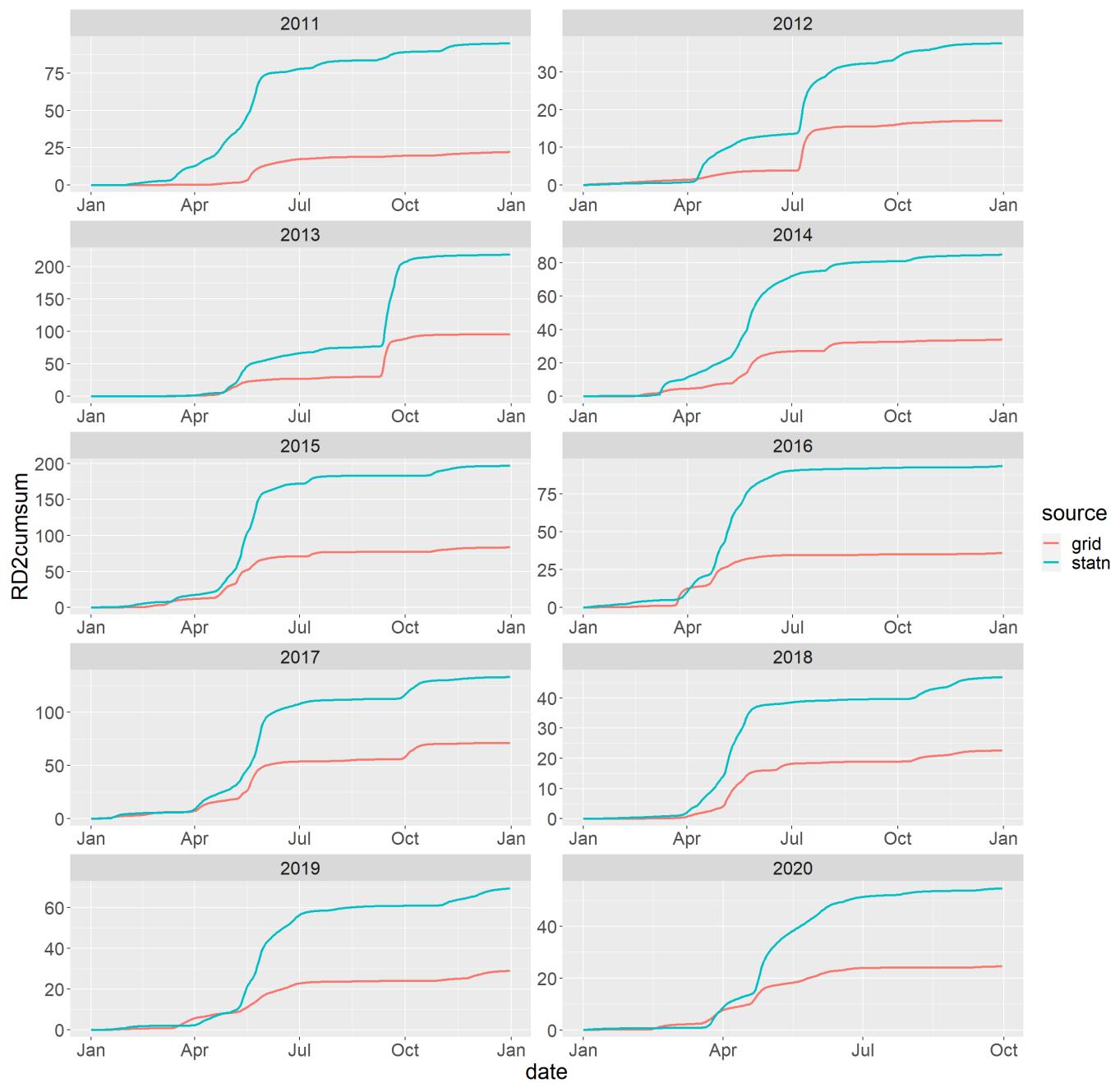


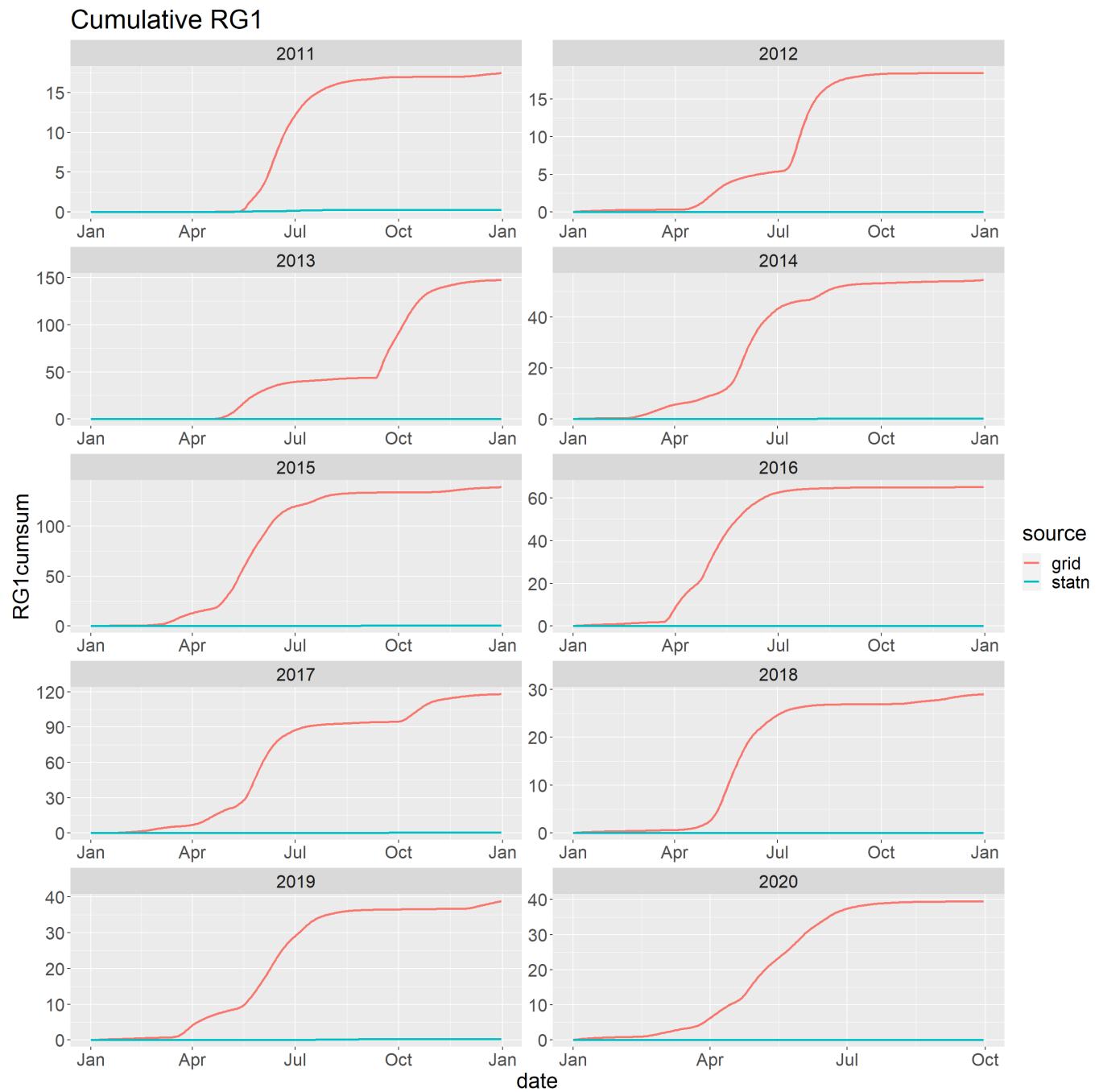




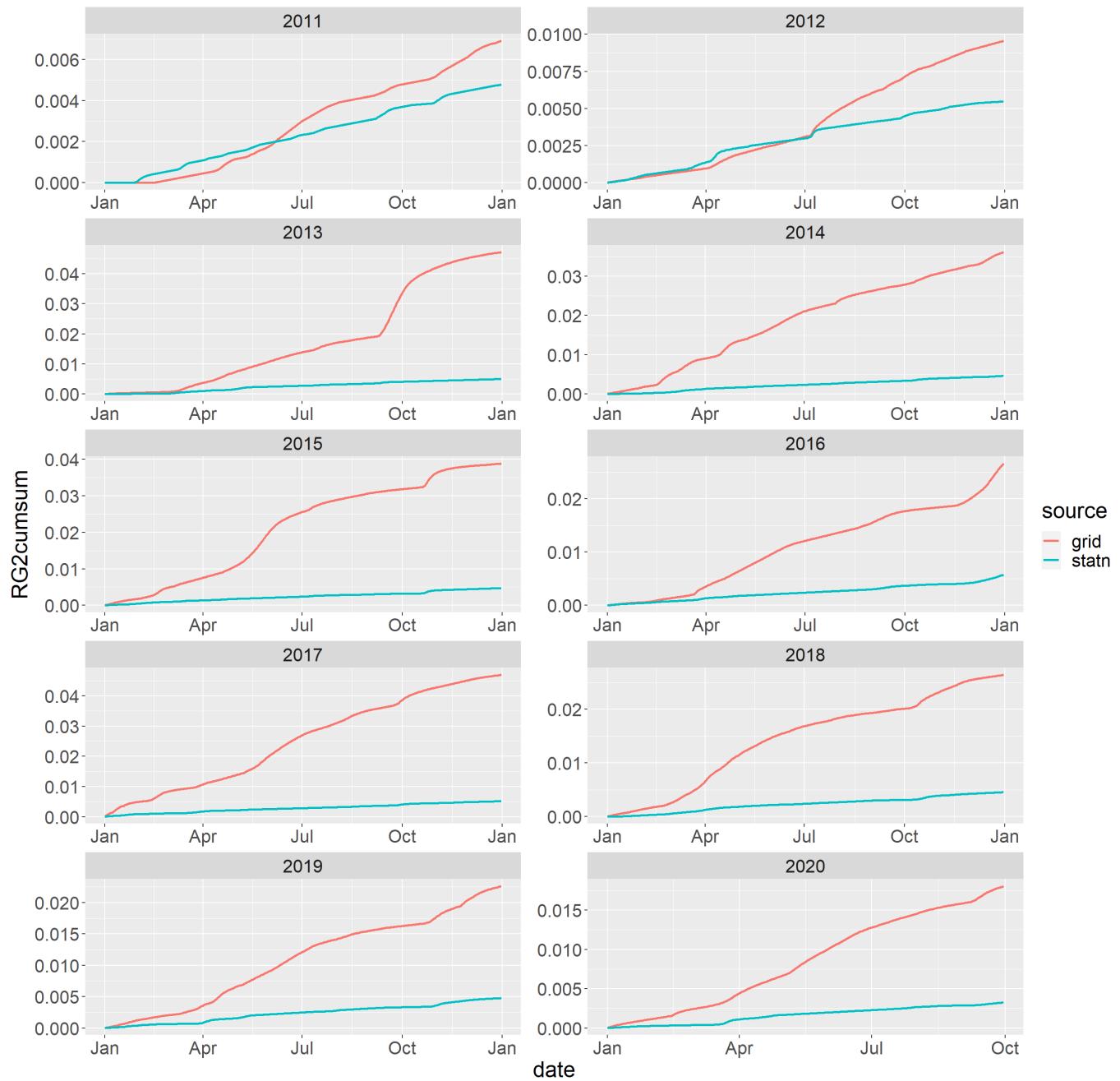


Cumulative RD2





Cumulative RG2

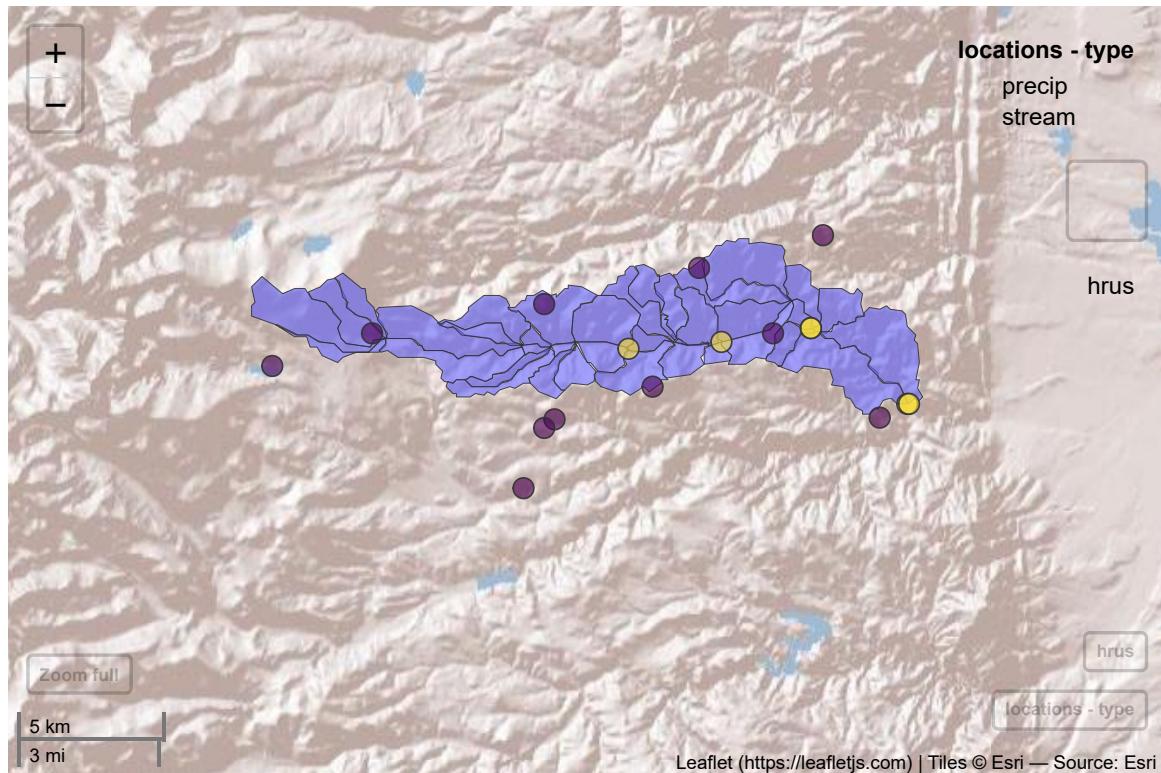


HRU results

HRU Map

```
## Reading layer `hrus_final` from data source
##   `C:\Users\sears\Documents\Repos\fourmile\data\GIS\hrus_final.shp'
##   using driver `ESRI Shapefile'
## Simple feature collection with 39 features and 15 fields
## Geometry type: POLYGON
## Dimension:     XY
## Bounding box:  xmin: 449828.4 ymin: 4429537 xmax: 472688.4 ymax: 4435507
## Projected CRS: WGS 84 / UTM zone 13N
```





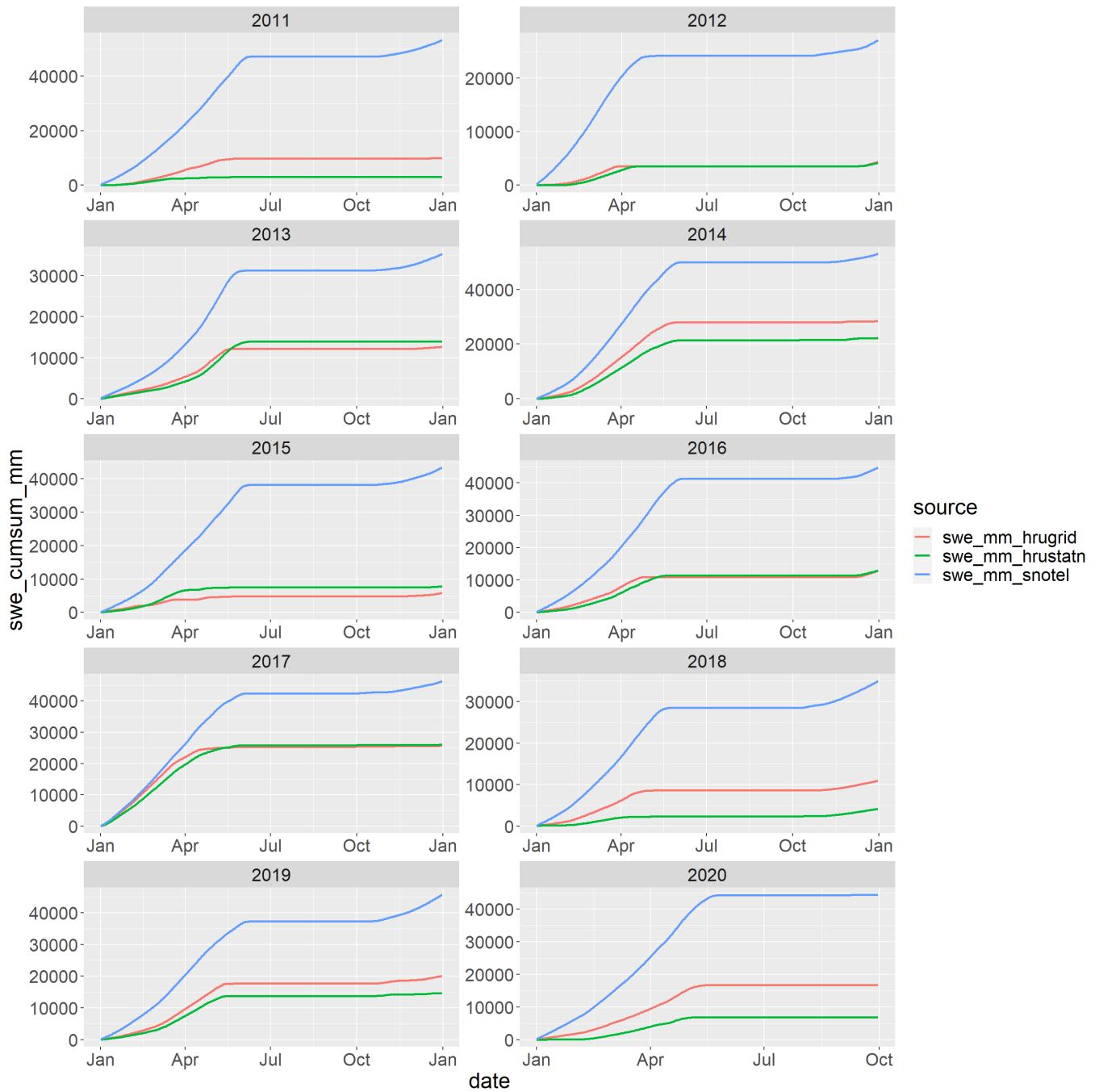
Niwot and HRU7

SWE and precip

```
## Warning: package 'snotelr' was built under R version 4.2.2
```

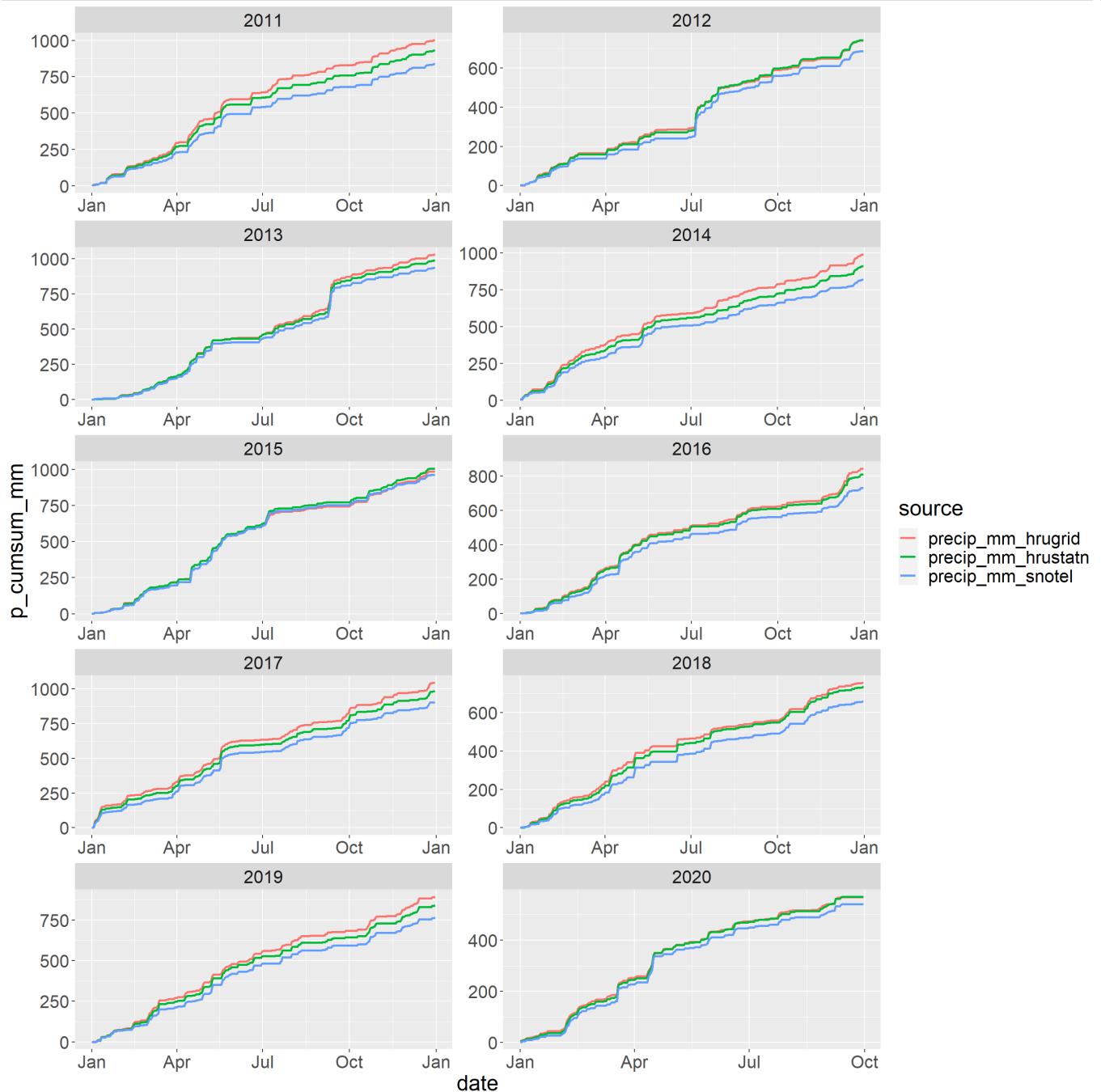
date	swe_mm_snotel	swe_mm_hrugrid	swe_mm_hrustatn
2011-01-01	139.7	0.00000	2.11659
2011-01-02	142.2	0.00000	2.11659
2011-01-03	144.8	0.00000	2.11659
2011-01-04	147.3	0.00000	2.11659
2011-01-05	147.3	0.00000	2.11659
2011-01-06	149.9	0.00000	2.11659
2011-01-07	149.9	0.00000	2.11659
2011-01-08	149.9	0.00000	2.11659
2011-01-09	152.4	0.00000	2.11659
2011-01-10	154.9	0.00000	2.11659
2011-01-11	154.9	0.00000	2.11659
2011-01-12	160.0	0.00000	2.11659

Fourmile Calibrations



2011-01-01	2.5	3.20035	3.18681
2011-01-02	2.5	1.79192	2.36157
2011-01-03	0.0	1.43580	0.61108
2011-01-04	0.0	0.03710	0.01564
2011-01-05	2.5	2.65119	2.89661
2011-01-06	0.0	0.74994	0.31608
2011-01-07	0.0	0.01843	0.00761
2011-01-08	2.5	1.35379	2.12400

date	precip_mm_snotel	precip_mm_hrgrid	precip_mm_hrustatn
2011-01-09	5.1	6.19417	5.62501
2011-01-10	2.5	2.06611	2.45520
2011-01-11	0.0	1.29039	0.61221

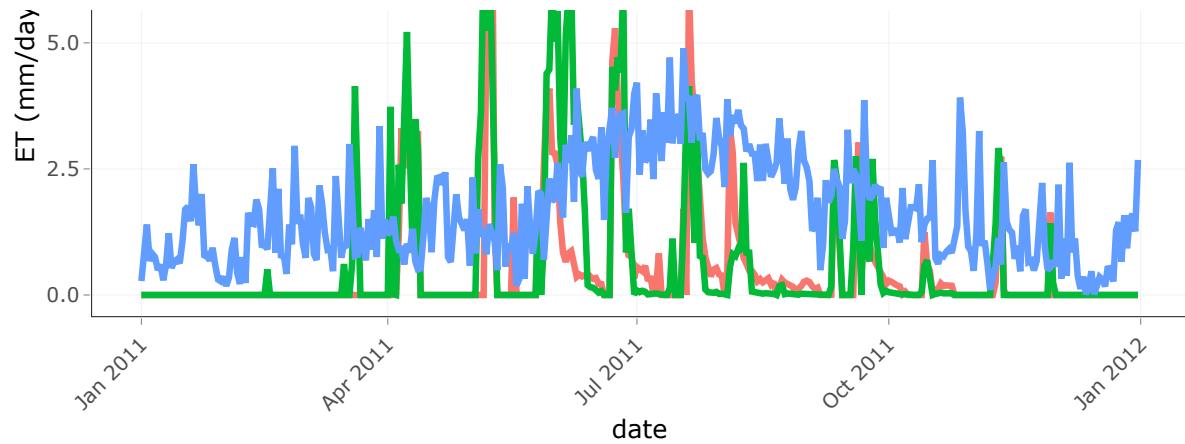


ET

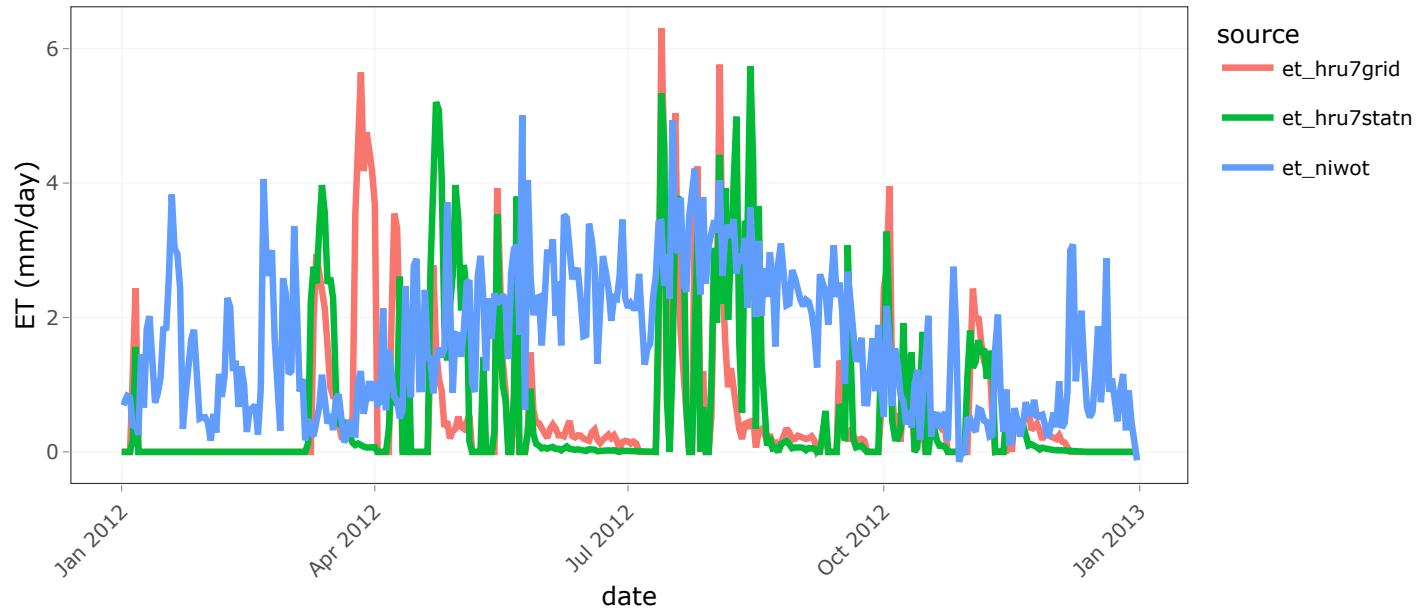
2011



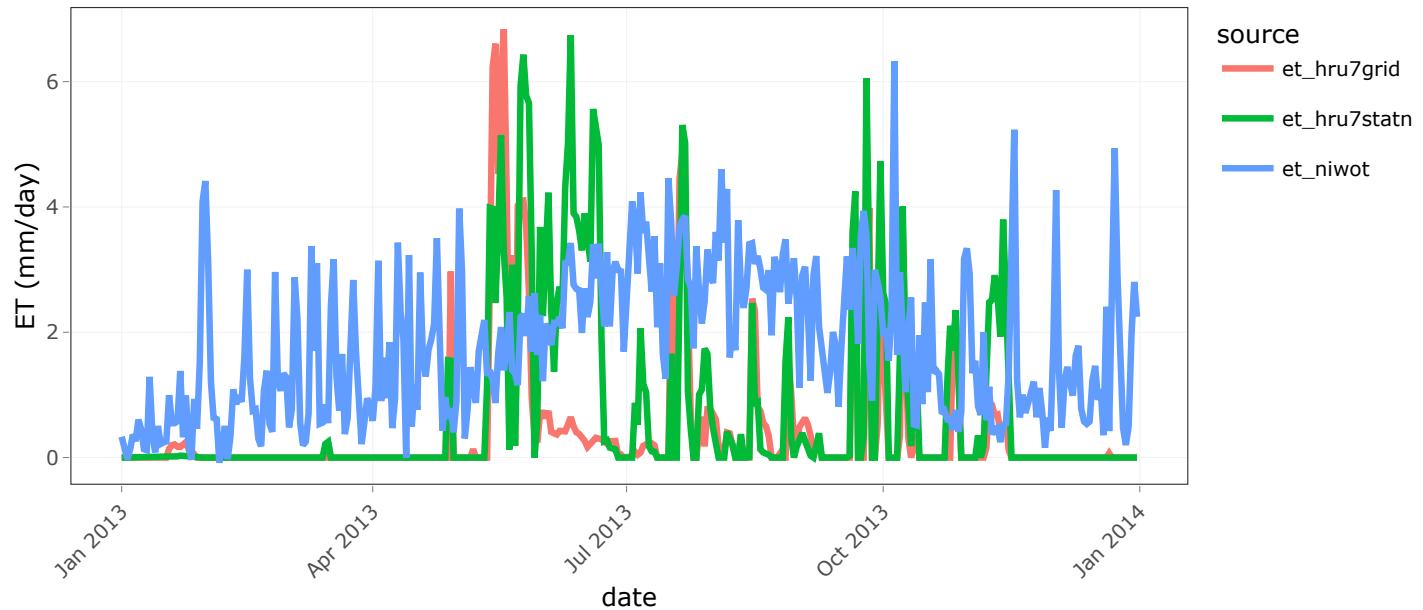
Fourmile Calibrations



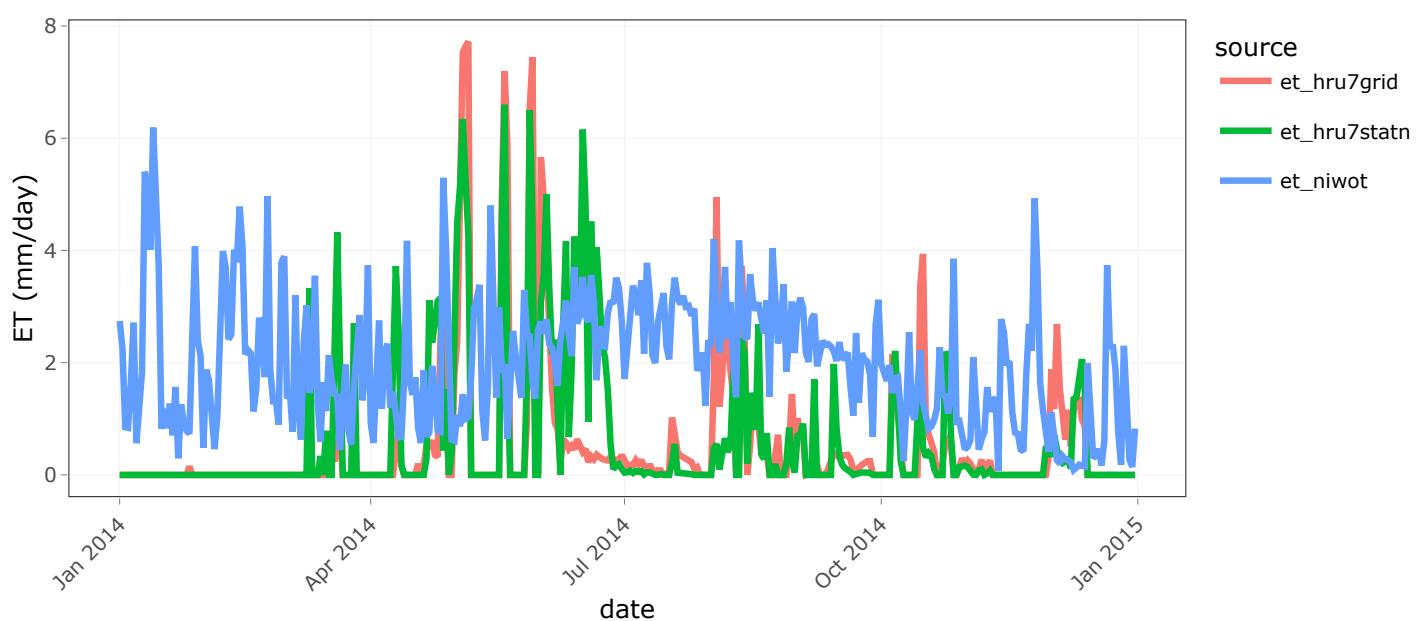
2012



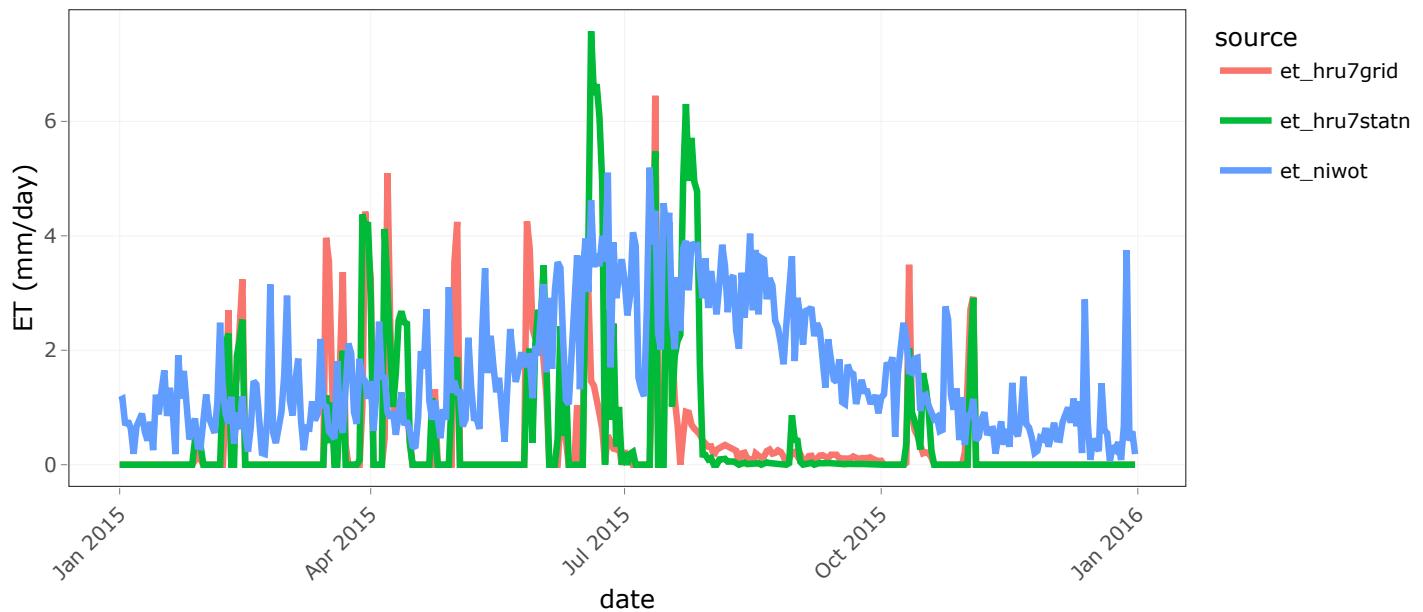
2013



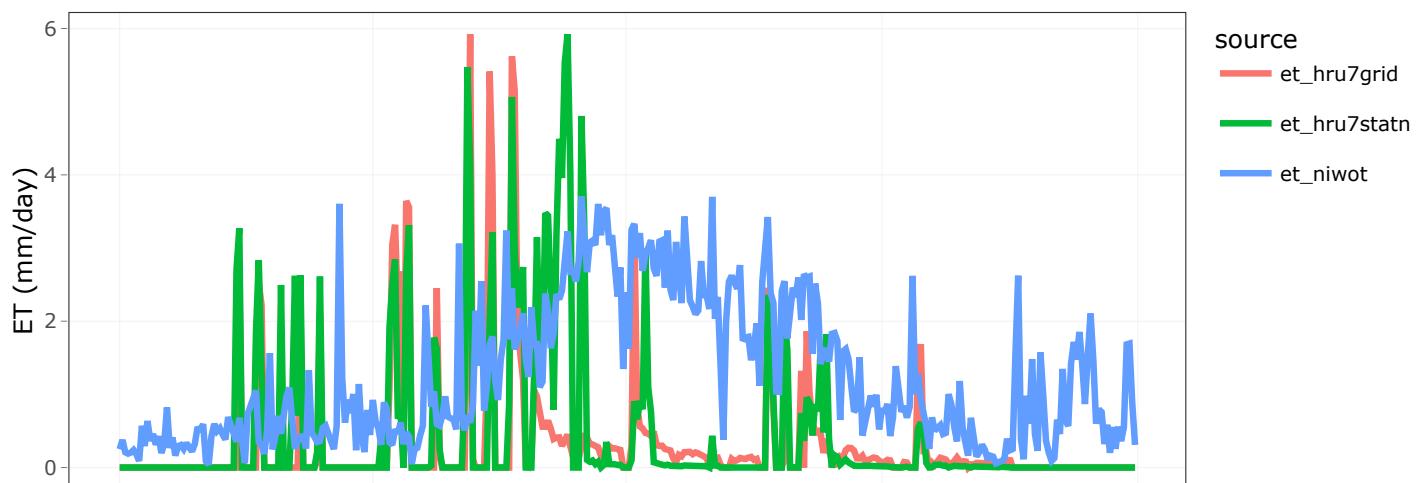
2014



2015

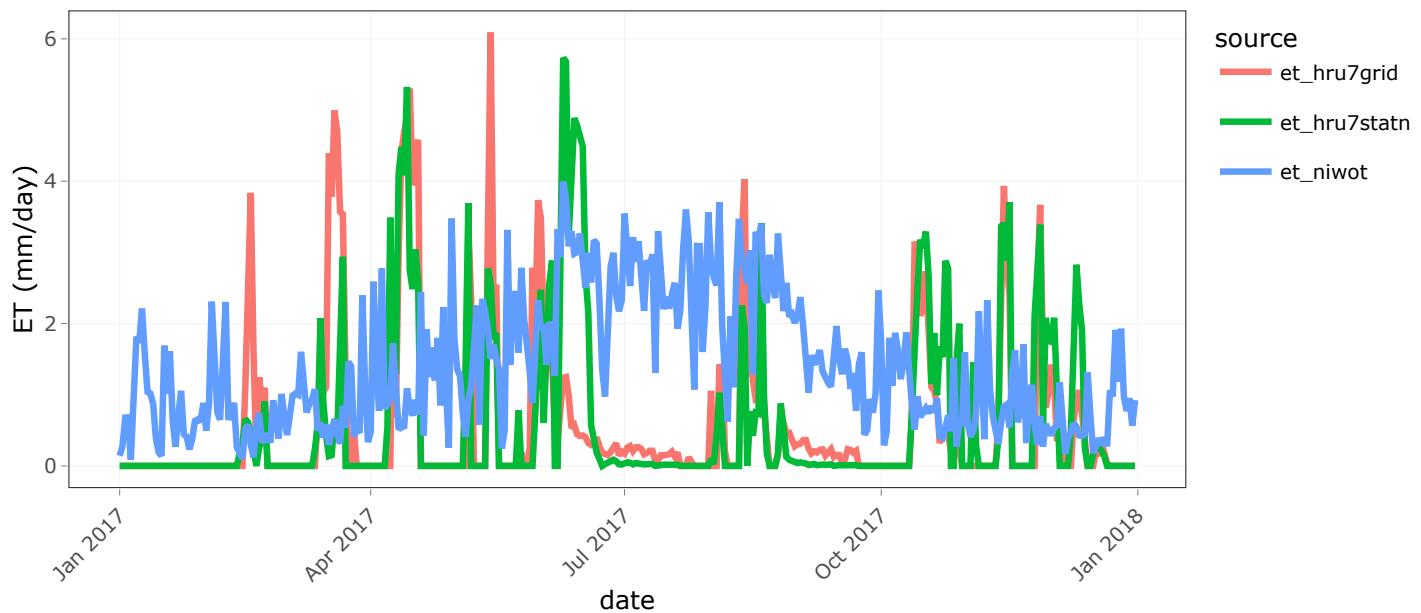


2016

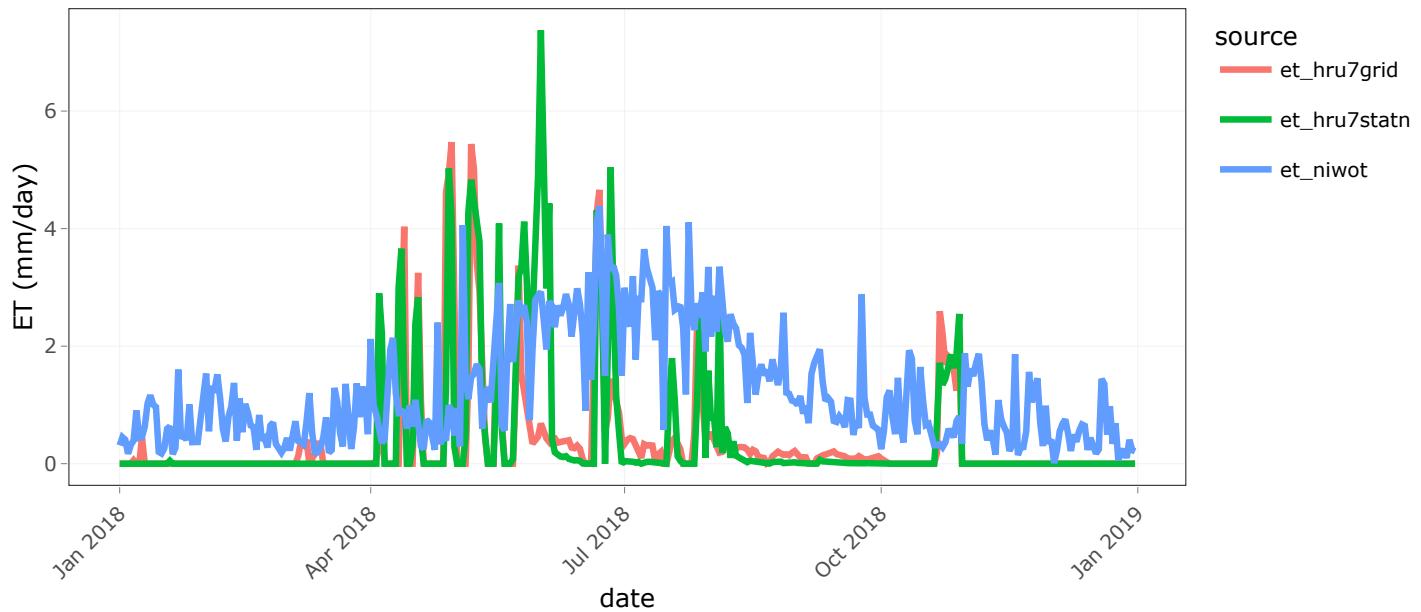




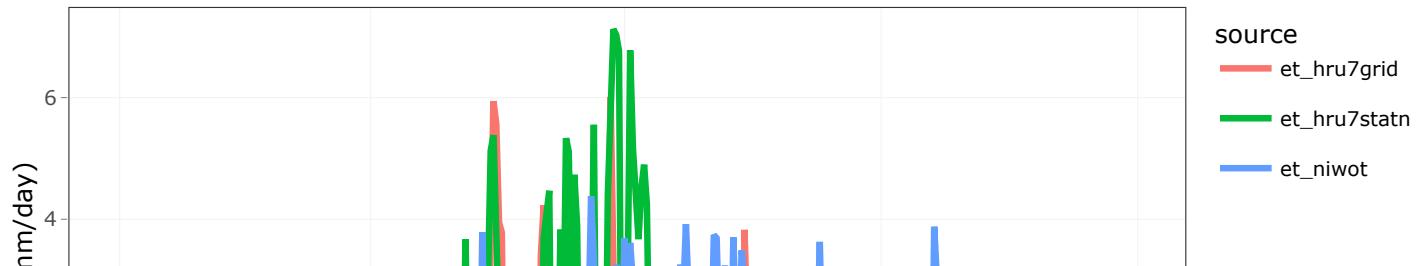
2017



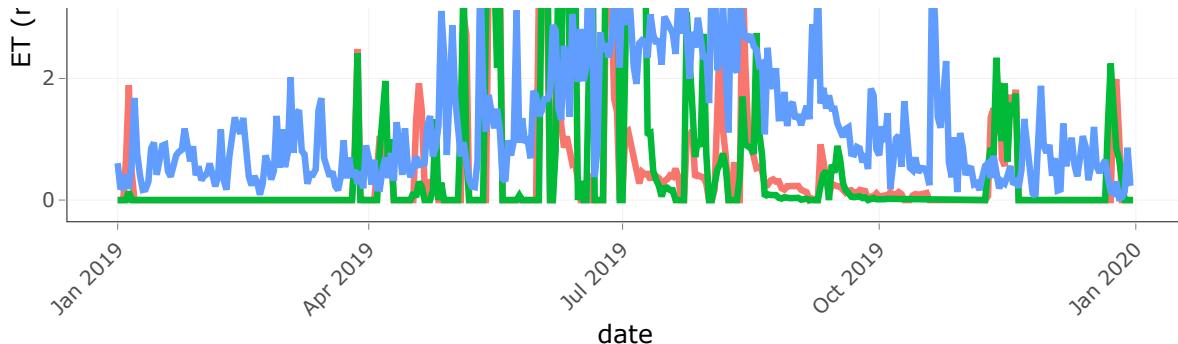
2018



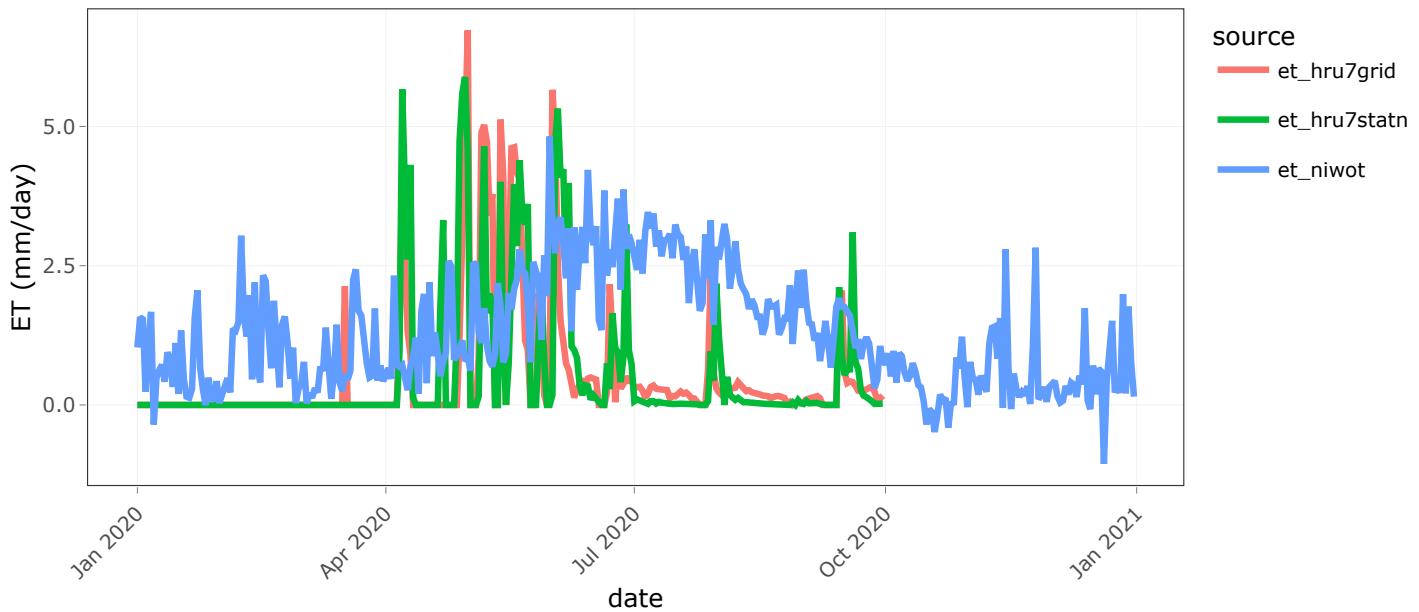
2019



Fourmile Calibrations

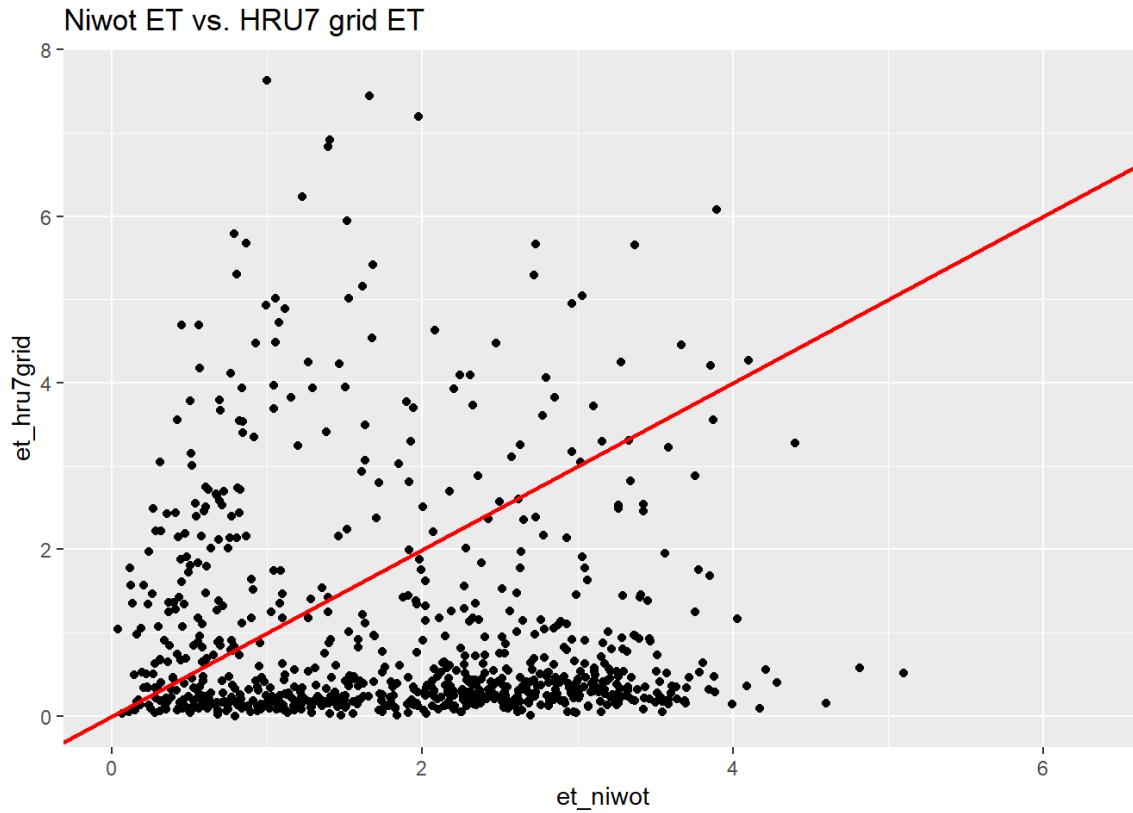


2020

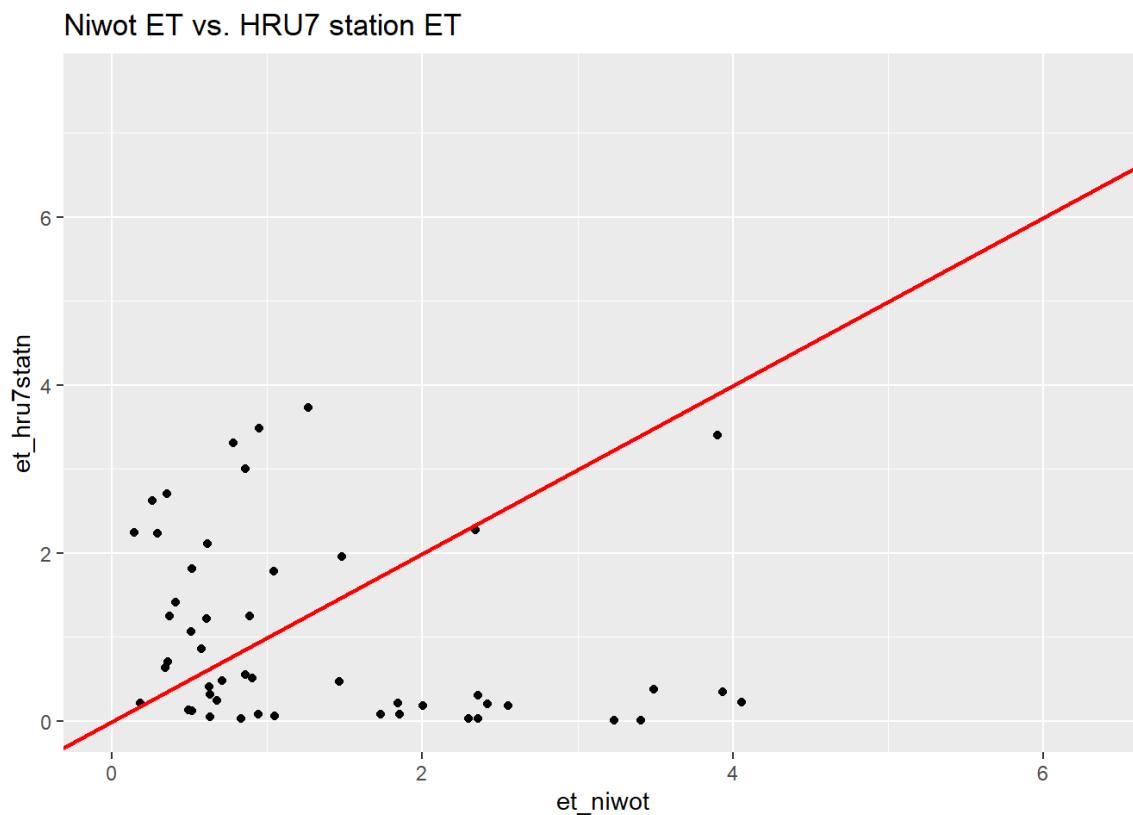


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```

```
## Warning: Removed 995 rows containing missing values (`geom_point()`).
```

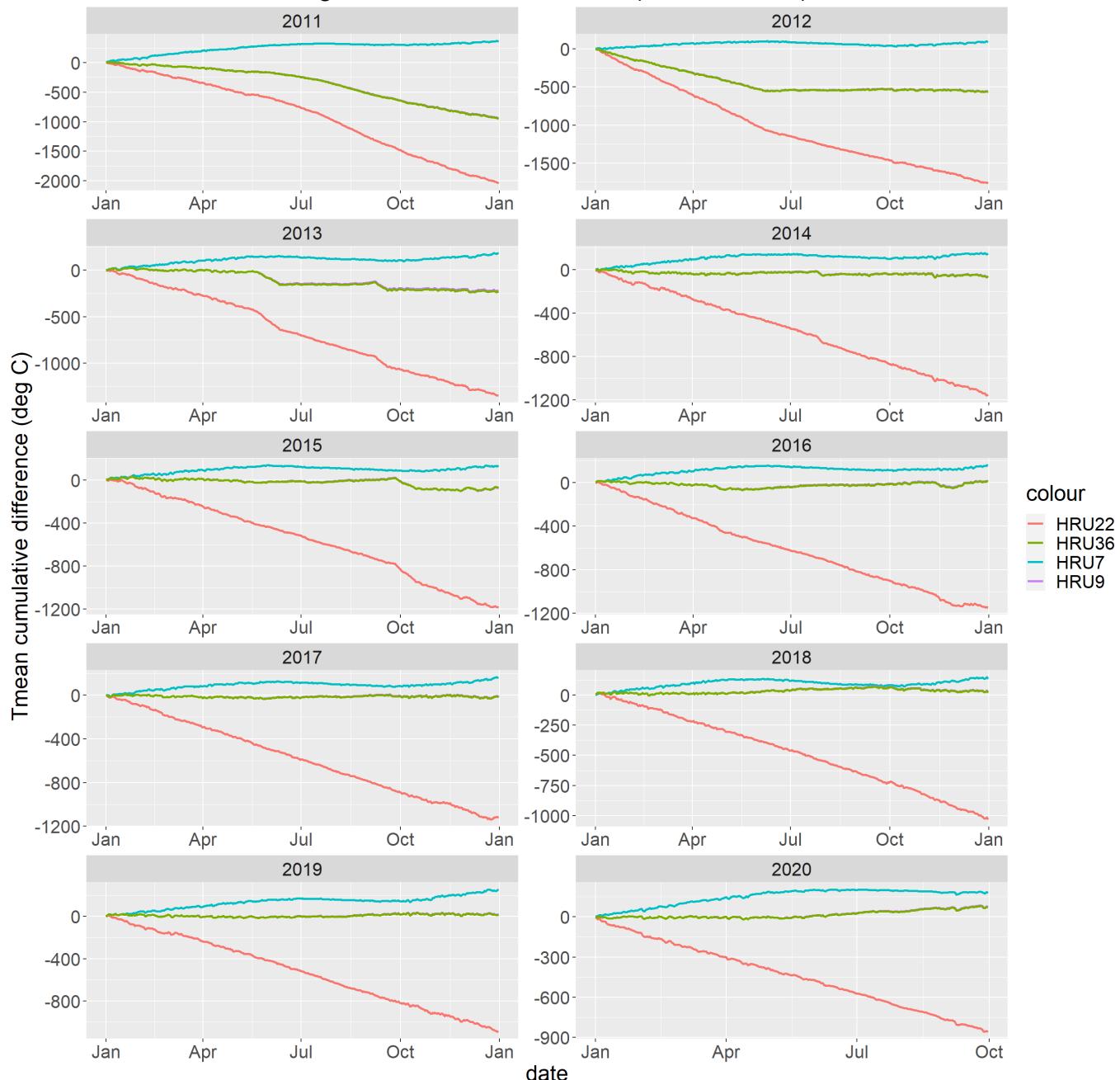


```
## Warning: Removed 2505 rows containing missing values (`geom_point()`).
```



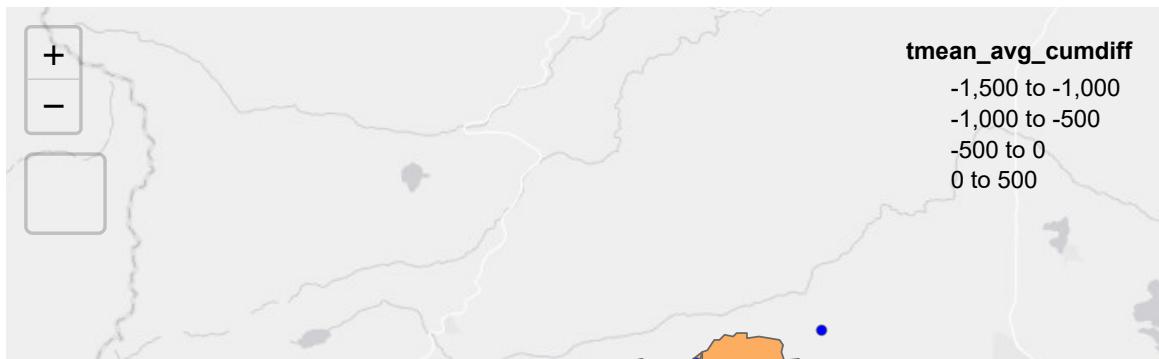
Tmean for HRUs 7, 9, 22, 36

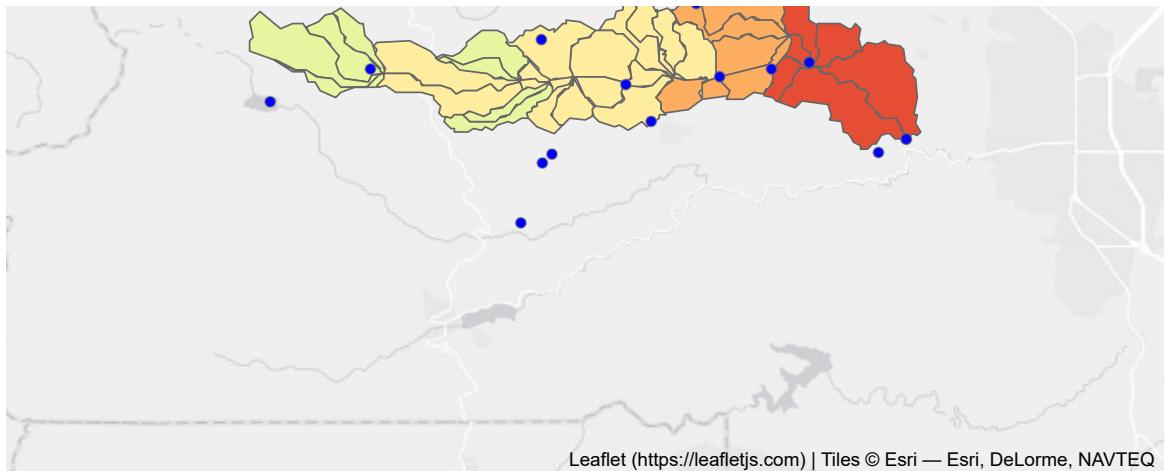
Tmean station and grid cumulative difference (Station - Grid)



Cumulative Tmean difference

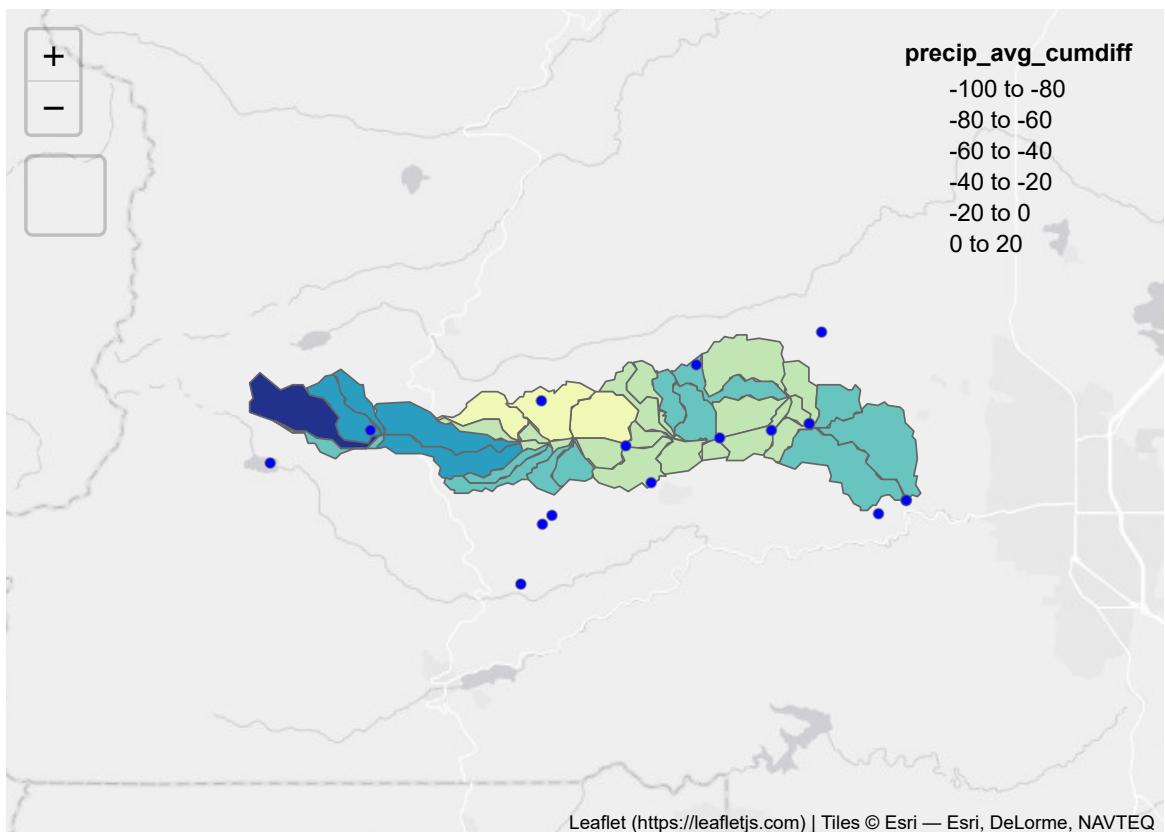
2011-2020 average of daily station-grid Tmean for DOY 365 (or 366)





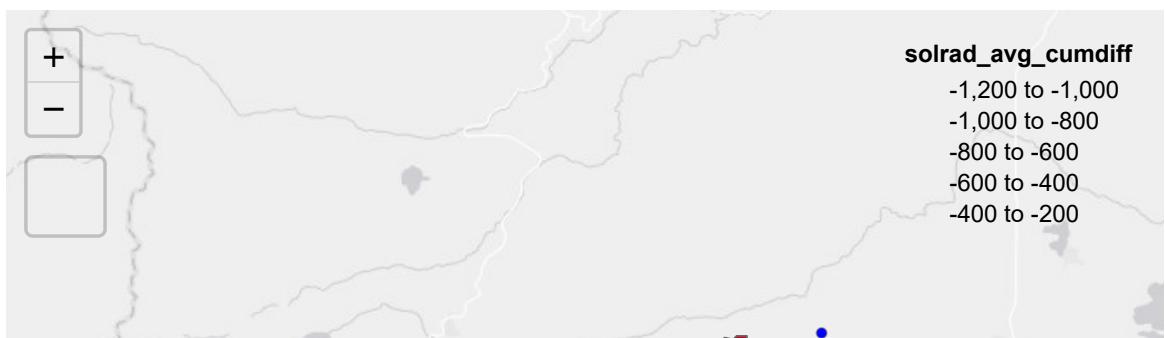
Cumulative Precip difference

2011-2020 average of daily station-grid precip for DOY 365 (or 366)



Cumulative solar radiation difference

2011-2020 average of daily station-grid solar rad for DOY 365 (or 366)



2/7/23, 3:48 PM

Fourmile Calibrations

