

Supplement to ‘Extent of gross underestimation of precipitation in India’

The following is an overview of the summary graphics and tables included in this supplement.

- Correction factors based on PBCOR
- Precipitation
 - Average annual precipitation, WY 2007-2014
 - * Maps of gridded average annual precipitation for each product
 - * Ratio of IMD and other products by river basin
 - Select Flooding Events
 - * Assam flooding, June 2012
 - * Jammu and Kashmir flooding, September 2014
 - * Kerala flooding, August 2018
 - Time series of basin-averaged precipitation and trends
- Evapotranspiration
 - GLEAM versus NTSG, comparison of basin-averaged values
- Effect of different heuristics on Scenario II
- Annual Changes in Terrestrial Water Storage (TWS)
- Time series charts
 - Time series of hydrometeorological data for each of the 73 off-balanced watersheds identified in this study using the IMD-APHRO dataset

The following is an overview of the tabular data included with this supplement.

- Streamflow gauging stations 242 gauging stations used in this study (CSV file, ‘stations_all.txt’); attributes include:
 - ghi_stn_id : Unique ID used to identify a station, 10 characters long, similar to GHI
 - disp_basin : Complete name of the River Basin
 - st : State associated with the station, CWC
 - site_name : Name of the station, CWC
 - riv_name : River/tributary, CWC

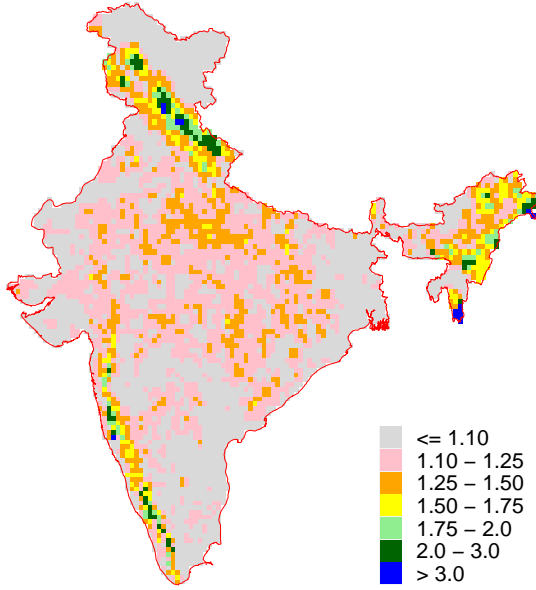
- `drai_area` : Catchment drainage area (sq km), CWC
- `shpArea_wgs` : Catchment drainage area (sq km), estimated in this study, similar to GHI
- `stn_lat` : Latitude of the station (decimal degrees), CWC
- `stn_lon` : Longitude of the station (decimal degrees), CWC
- `hydro_lat` : Latitude of the relocated station (decimal degrees), similar to GHI
- `hydro_lon` : Longitude of the relocated station (decimal degrees), similar to GHI
- List of 73 unbalanced watersheds identified in this study using the IMD-APHRO dataset (CSV file, ‘stations_73.txt’); attributes same as ‘stations_all.txt’
- Annual (WY-based) watershed-averaged hydrometeorological time series (CSV file, ‘hydromet_annual.txt’); for WY 1980-2019, whenever data is available, for all 242 stations; metrics include:
 - `ghi_stn_id` : Unique ID used to identify a station, 10 characters long, similar to GHI
 - `wyr`: water year
 - `dname`: P dataset name (one of the 12 used in this study, referred to by the ‘Alias’ used in Table 1 of the paper)
 - `prec_mcm` : P corresponding to each dataset, in mcm
 - `evap_gleam_mcm`, ET from GLEAM, in mcm
 - `flow_mcm_obs`, observed R , in mcm
 - `cgros`: annual cumulative maximum gross storage capacity, in mcm
 - `clive`: annual cumulative maximum live storage capacity, in mcm

The following is an overview of the **GIS data** included with this supplement.

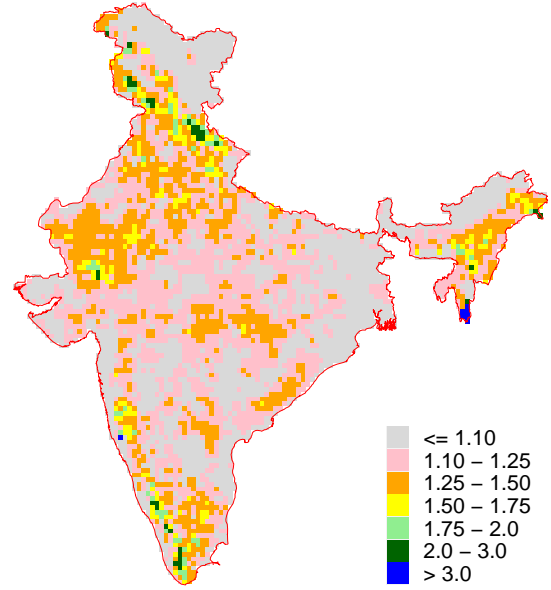
- GIS data on catchment boundaries of the 242 gauging stations (zip file, ‘gis_watersheds.zip’)
- GIS data on catchment boundaries of major river basins (zip file, ‘basin_bounds.zip’)

S1 PBCOR Correction Factors

(a) Ratio of PBCOR (CHELSA V1.2) and IMD



(b) Ratio of PBCOR (CHPclim V1) and IMD



(c) Ratio of PBCOR (WorldClim V2) and IMD

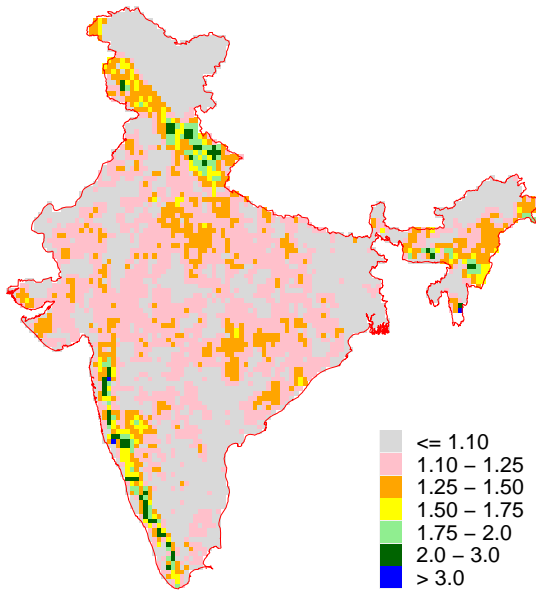


Figure S1: Ratio of bias-corrected annual P from PBCOR and annual P from IMD.

S2 Precipitation Products

S2.1 Average Annual Precipitation, WY 2007-2014

APHRO, WY 2007–2014, Average Precipitation (mm/year)

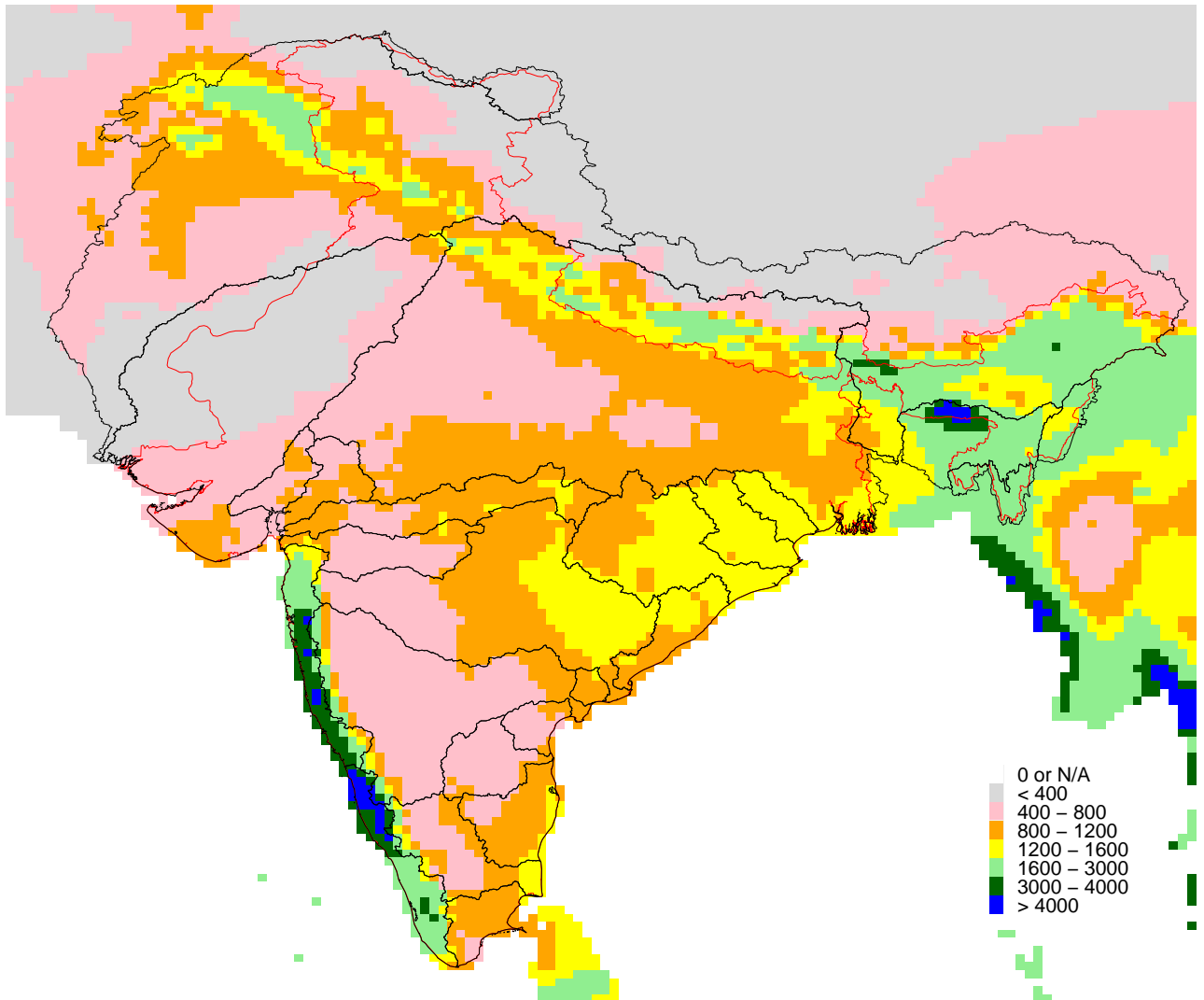


Figure S2: Annual average precipitation from APHRO.

CHIRPS, WY 2007–2014, Average Precipitation (mm/year)

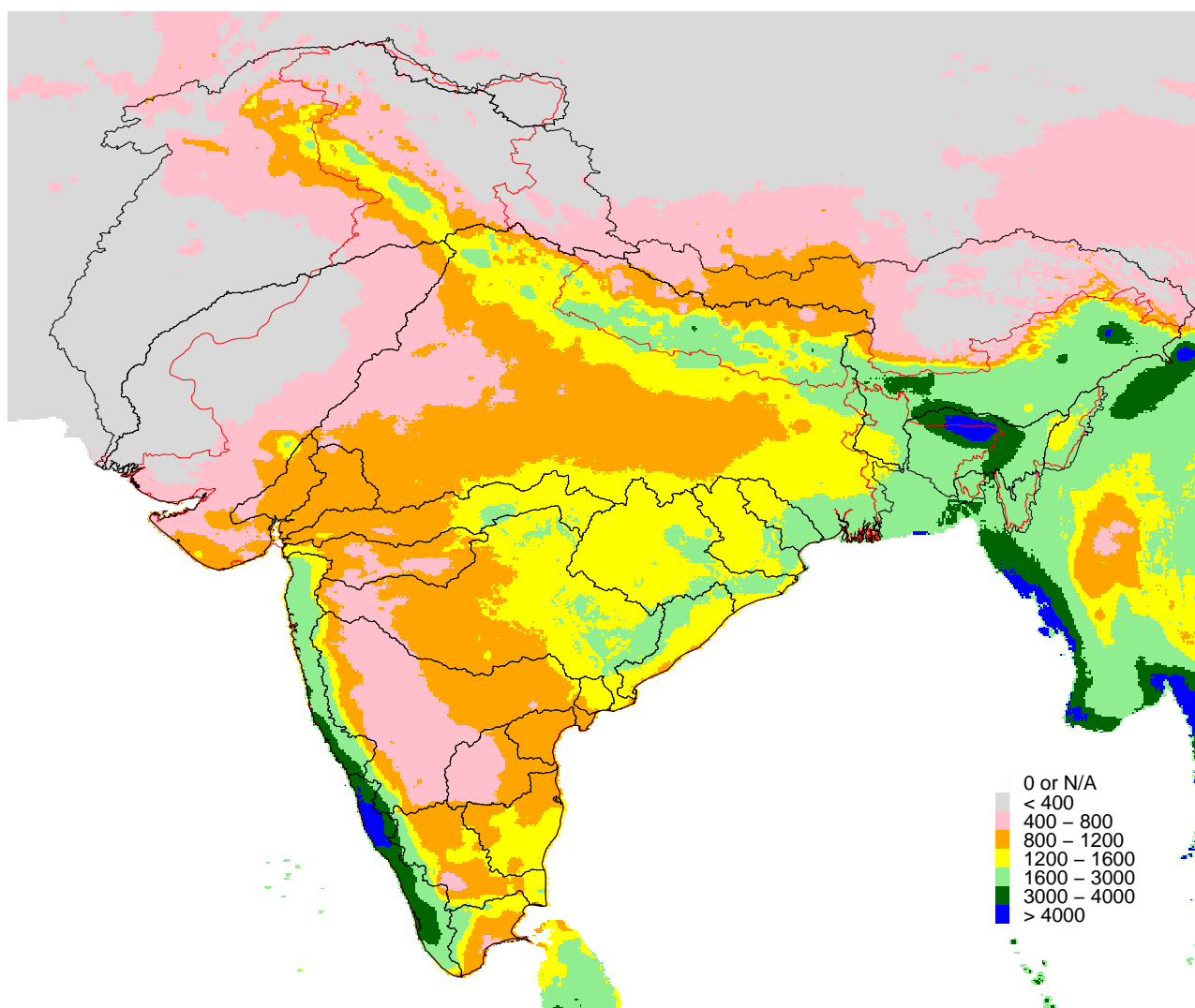


Figure S3: Annual average precipitation from CHIRPS.

CMORPH, WY 2007–2014, Average Precipitation (mm/year)

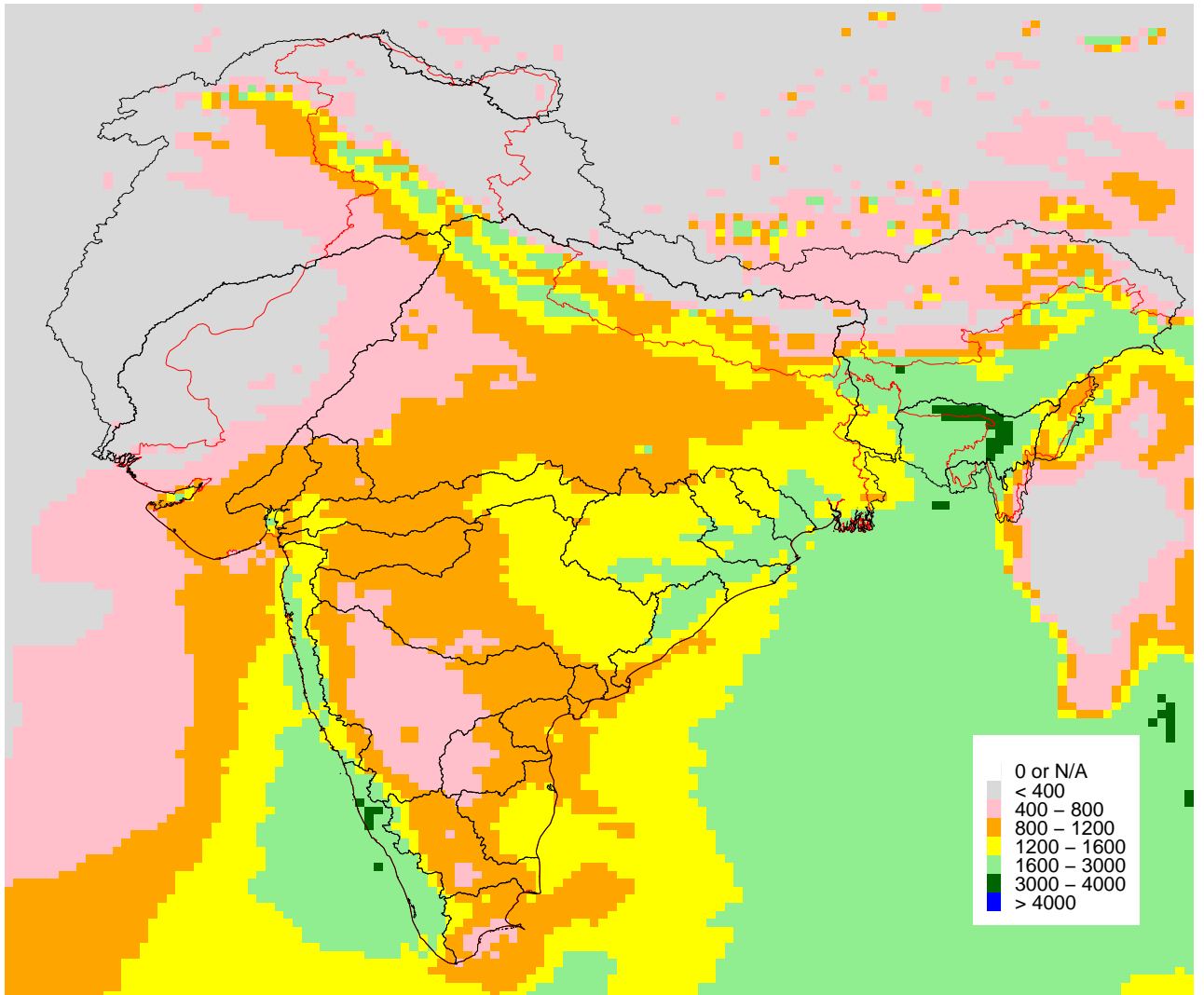


Figure S4: Annual average precipitation from CMORPH.

ERA5, WY 2007–2014, Average Precipitation (mm/year)

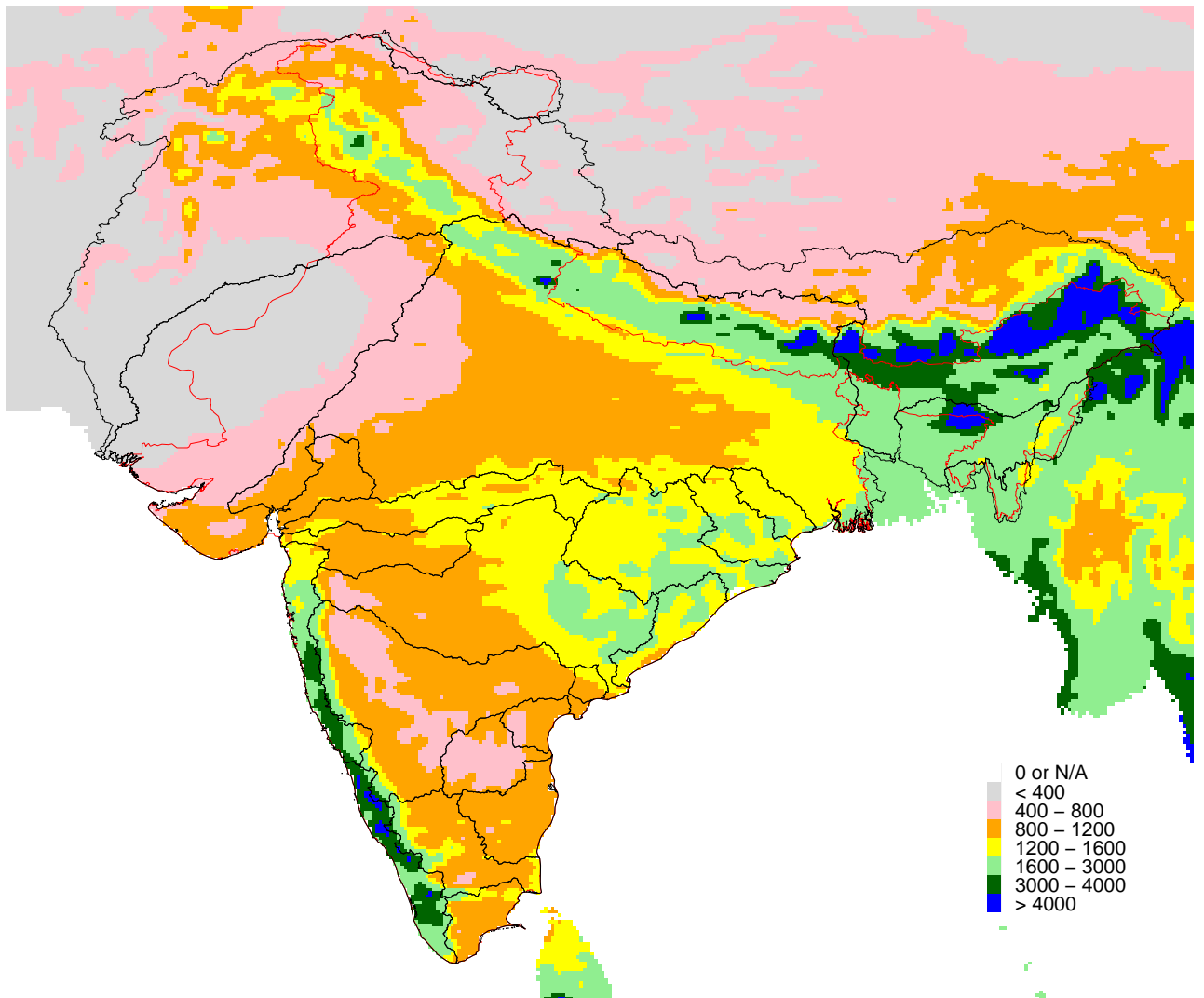


Figure S5: Annual average precipitation from ERA5.

GSMAP, WY 2007–2014, Average Precipitation (mm/year)

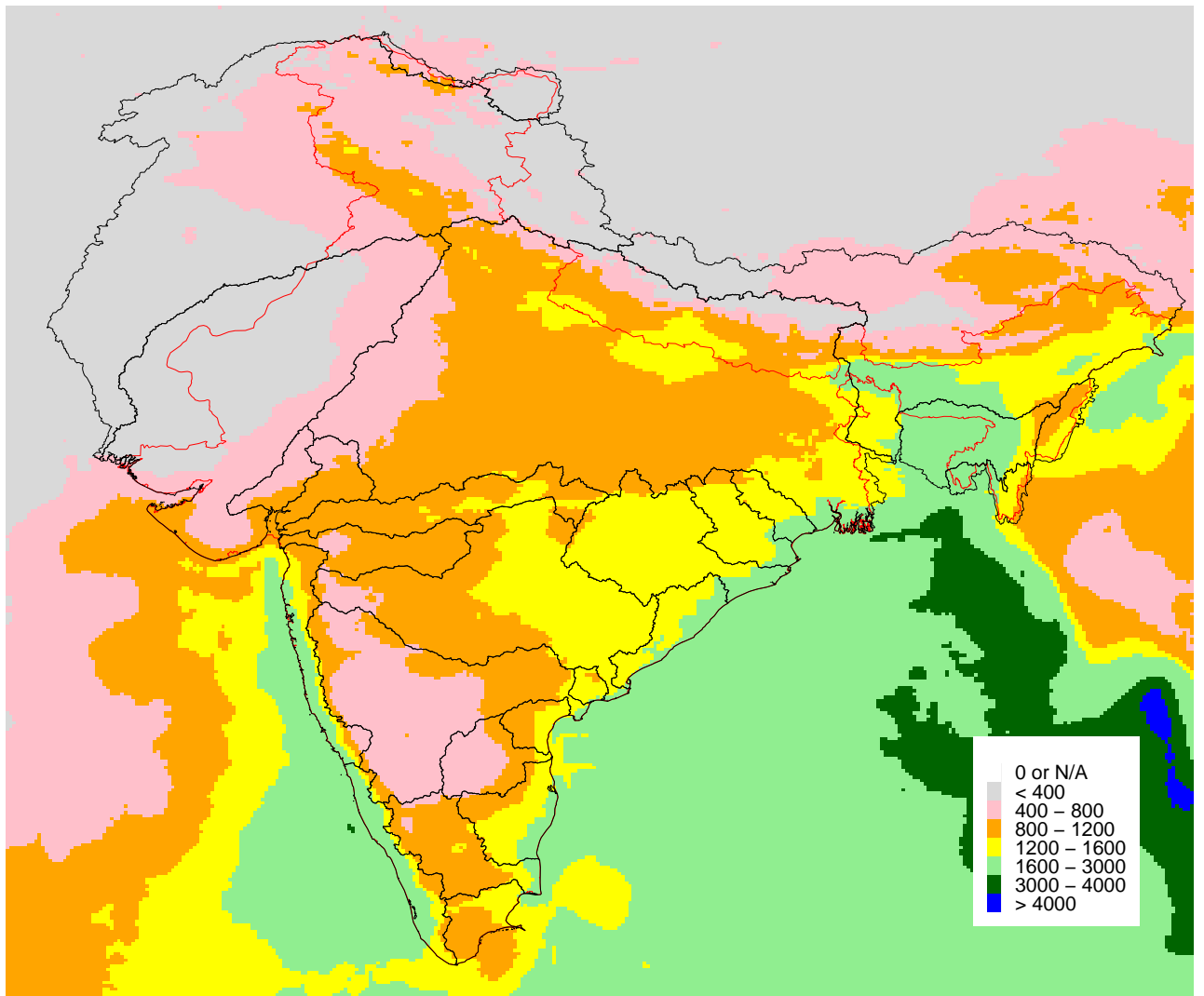


Figure S6: Annual average precipitation from GSMAP.

IMD, WY 2007–2014, Average Precipitation (mm/year)

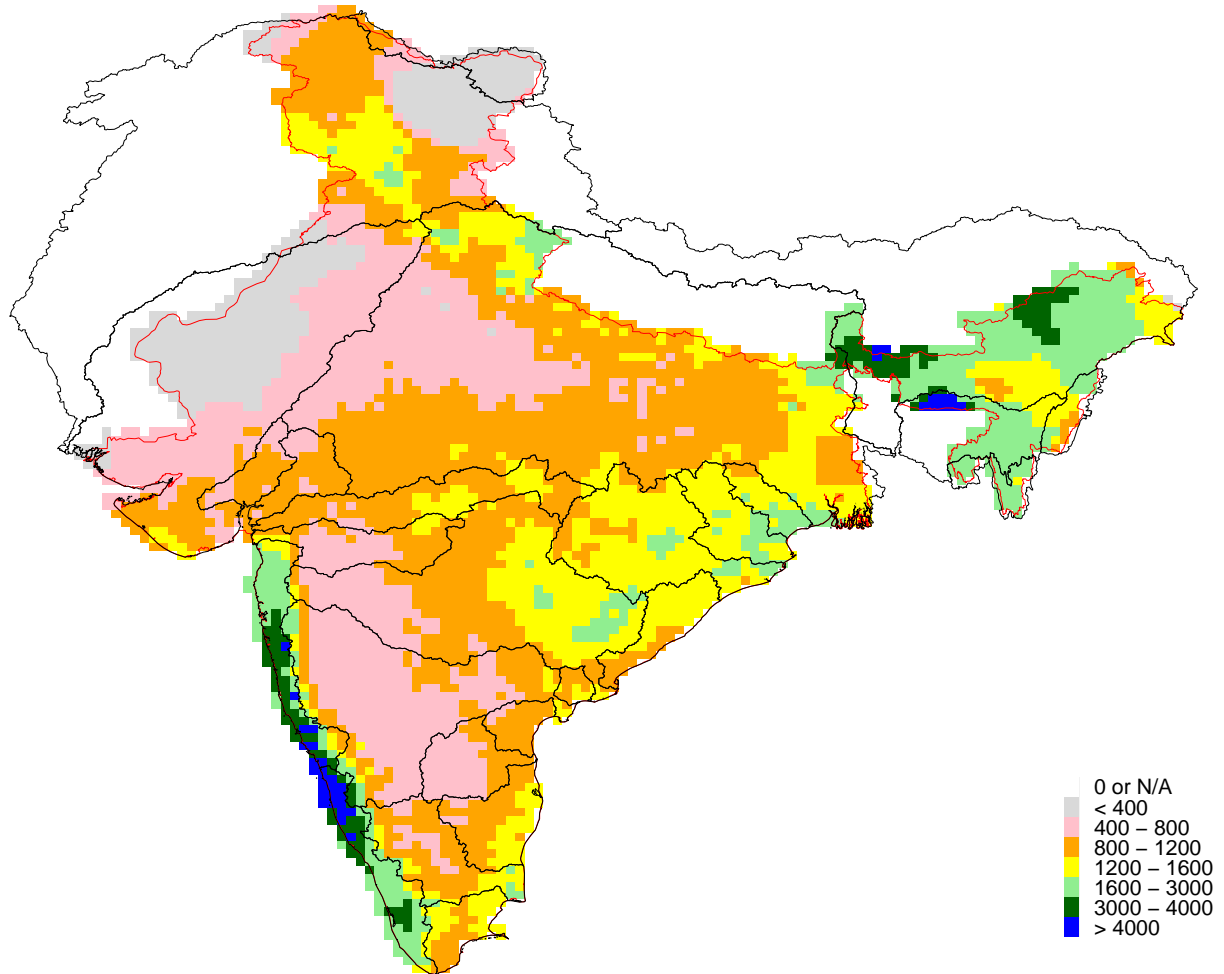


Figure S7: Annual average precipitation from IMD.

IMDAA, WY 2007–2014, Average Precipitation (mm/year)

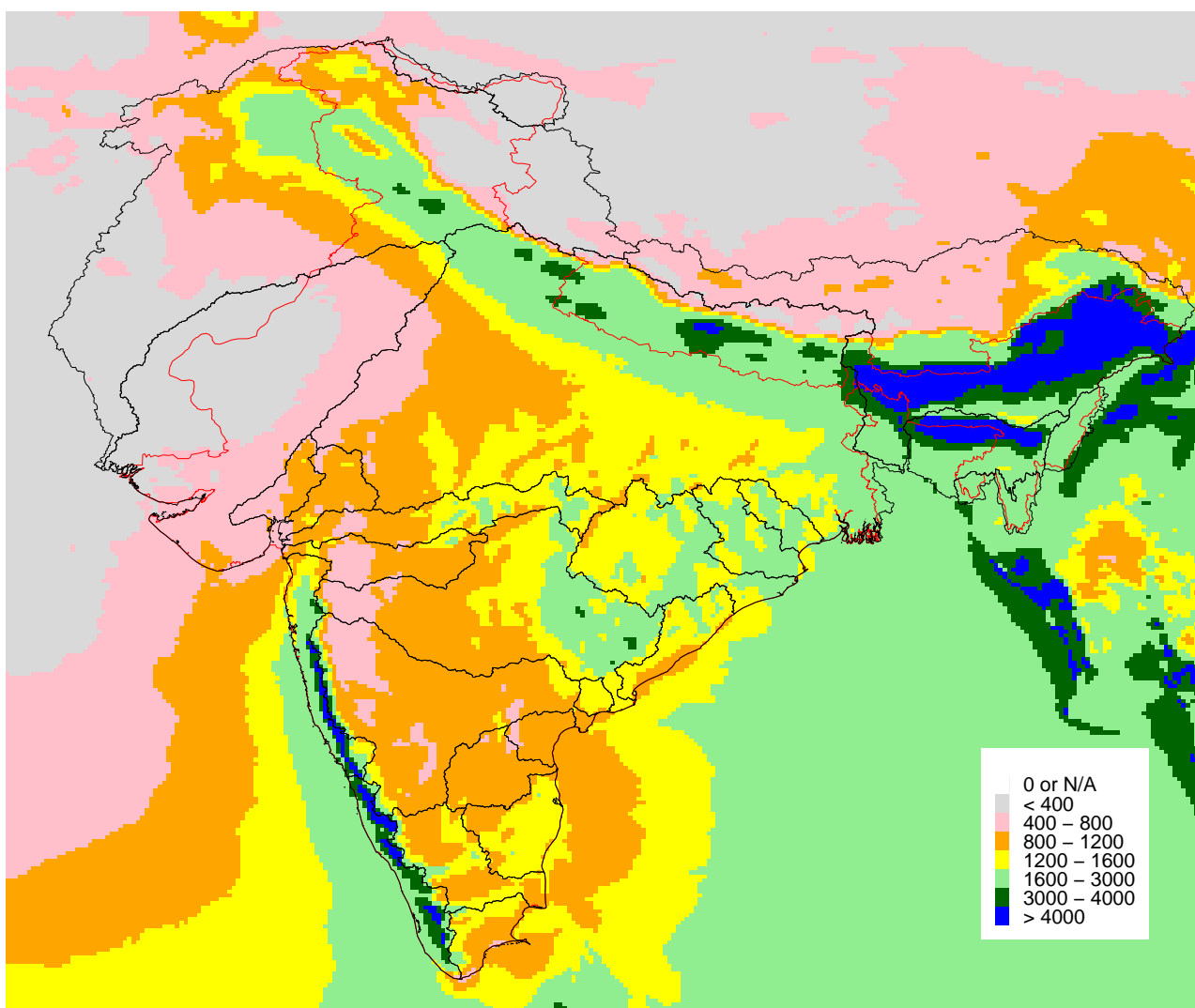


Figure S8: Annual average precipitation from IMDAA.

IMERG, WY 2007–2014, Average Precipitation (mm/year)

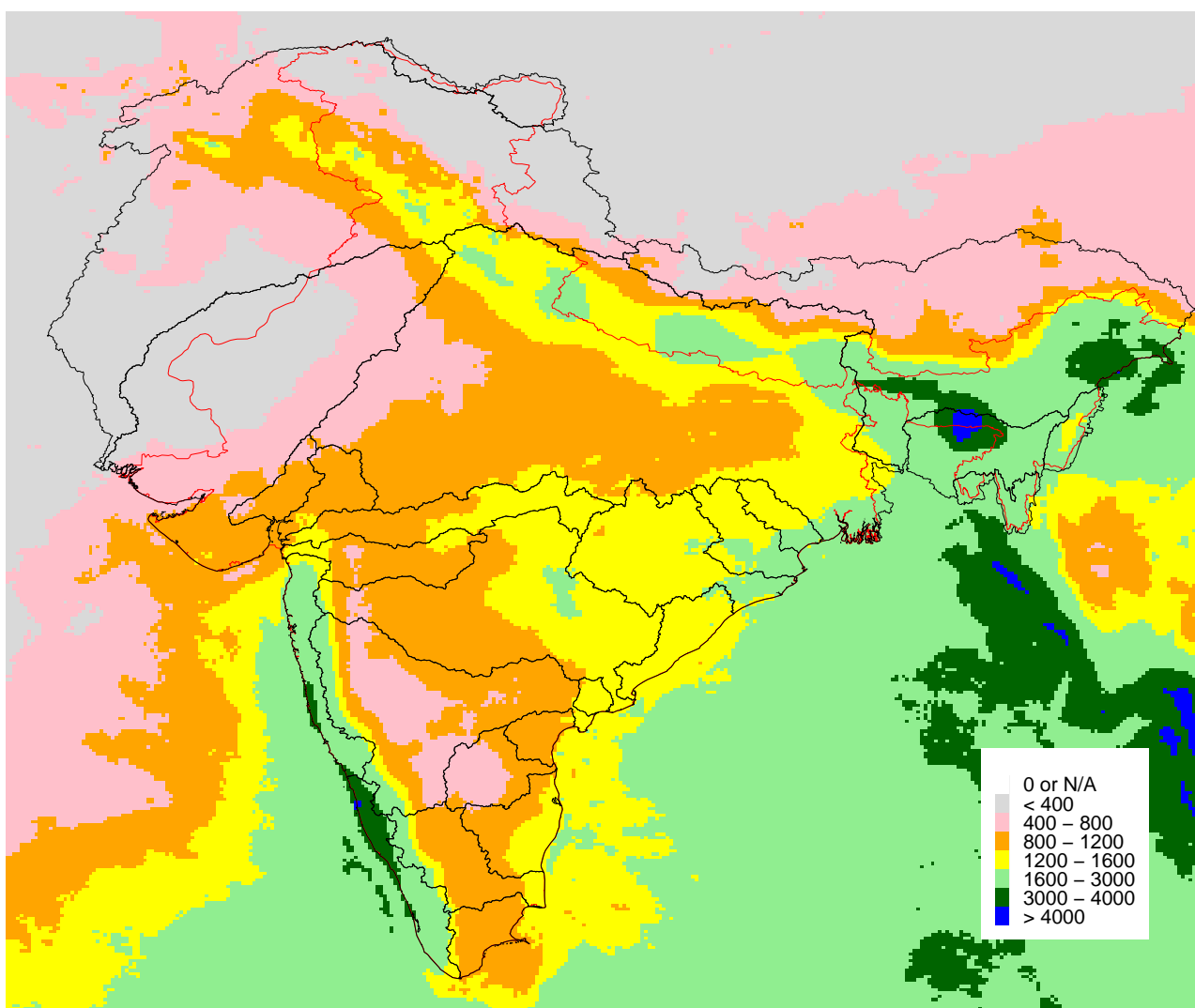


Figure S9: Annual average precipitation from IMERG.

MSWEP, WY 2007–2014, Average Precipitation (mm/year)

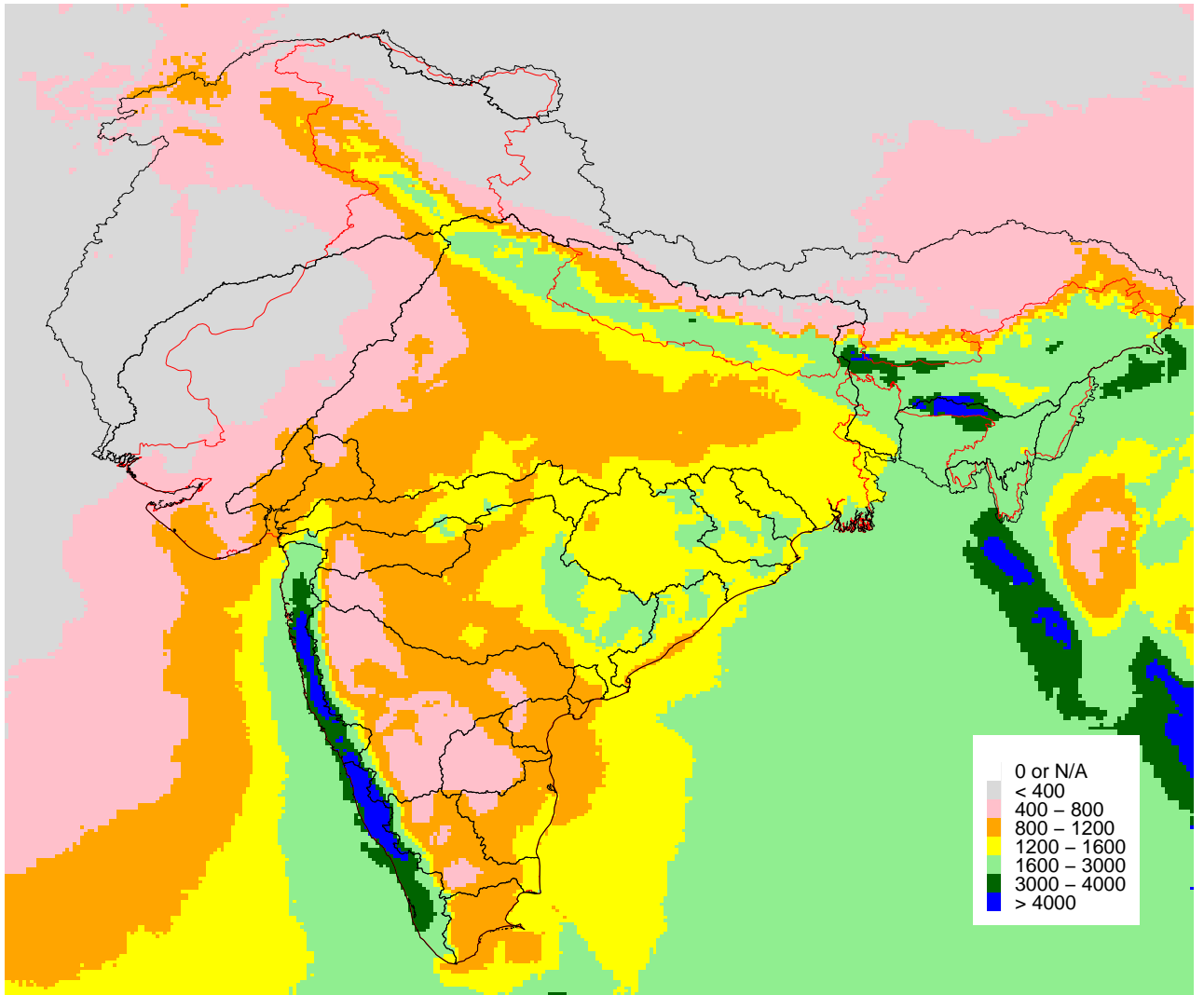


Figure S10: Annual average precipitation from MSWEP.

PERSIANN, WY 2007–2014, Average Precipitation (mm/year)

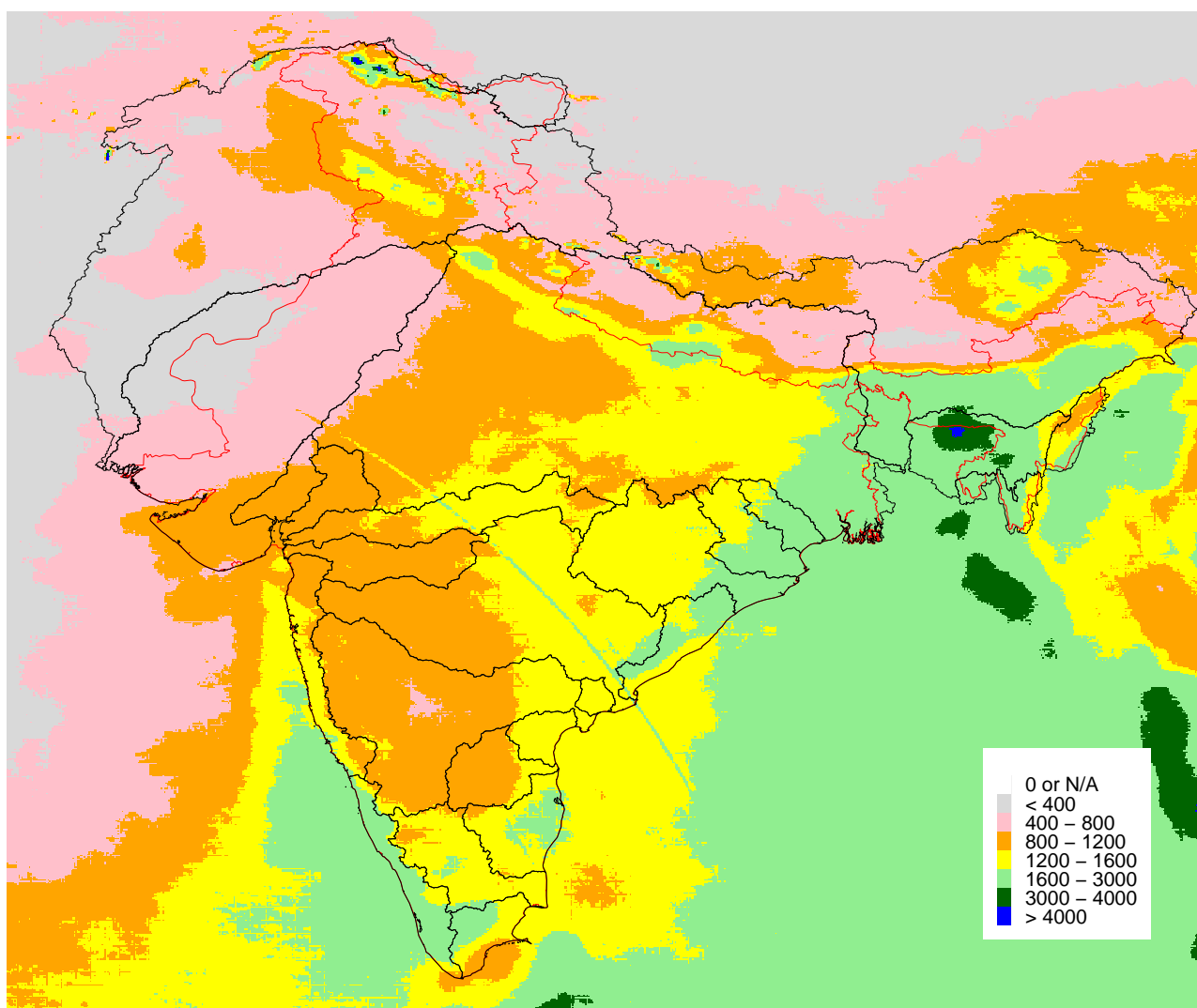


Figure S11: Annual average precipitation from PERSIANN.

SM2RAIN, WY 2007–2014, Average Precipitation (mm/year)

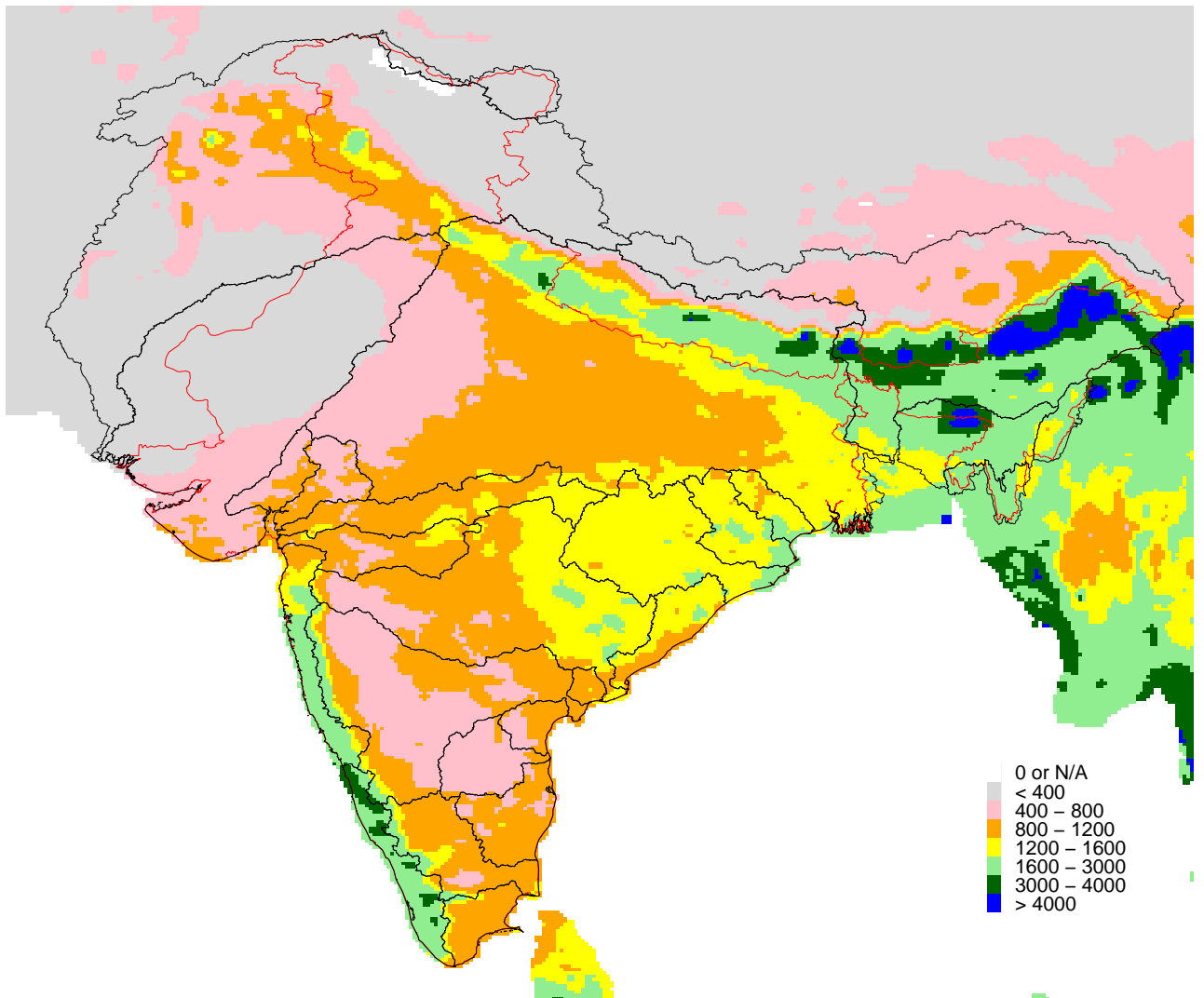


Figure S12: Annual average precipitation from SM2RAIN.

TERRA, WY 2007–2014, Average Precipitation (mm/year)

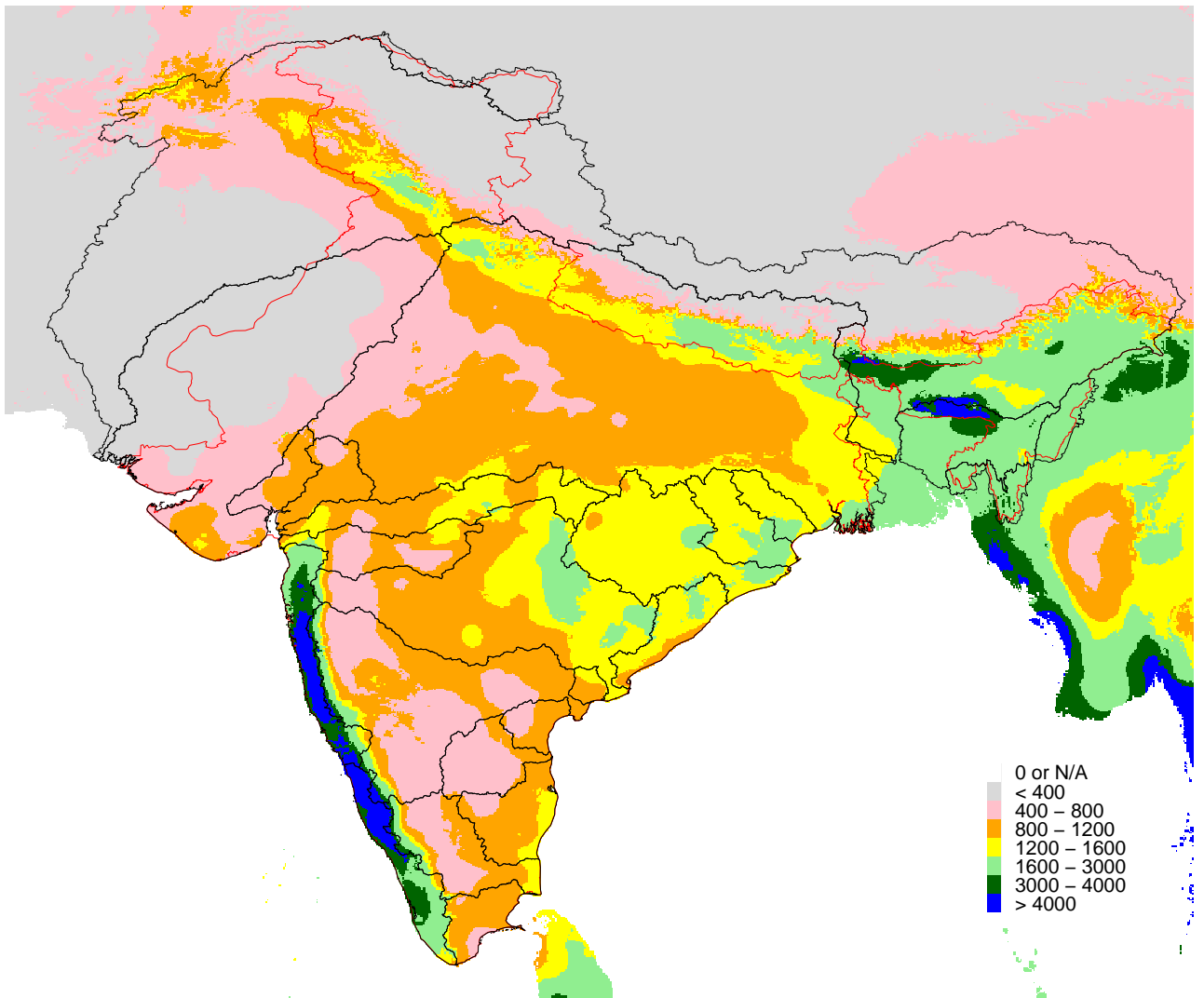


Figure S13: Annual average precipitation from TERRA.

Table S1: Annual P (mm/year) from IMD for WY 2007-2014, and the ratio of P from each dataset to P from IMD. Data is presented for each of the major river basins. The spatial domain is limited to the political boundaries of India where IMD data is available. Basin-scale aggregation of gridded P was performed only using the grids falling within India's boundaries.

Basin	IMD (mm)	APHRO	CHIRPS	CMORPH	ERA5	GSMAP	IMDAA	IMERG	MSWEP	PERSIANN	SM2RAIN	TERRA
All India	1,114	0.91	1.05	0.96	1.15	0.90	1.31	1.07	1.07	1.00	1.00	1.02
Barak	2,661	0.89	1.10	0.94	0.91	0.71	1.29	1.03	1.01	0.92	0.88	1.08
Brahmaputra	2,193	0.83	0.97	0.80	1.62	0.62	1.96	1.10	0.96	0.69	1.43	0.94
Ganga	983	0.91	1.14	1.09	1.18	1.03	1.44	1.16	1.16	1.24	1.06	1.03
Indus	886	0.82	0.71	0.60	1.07	0.67	1.33	0.76	0.68	0.90	0.53	0.59
Minor	1,681	1.10	1.23	0.84	1.13	0.81	1.32	1.23	1.33	1.00	1.09	1.38
North Ladakh	424	0.63	0.39	0.28	0.73	0.88	0.48	0.12	0.40	1.03	0.18	0.07
WFR Kutch	514	0.89	0.99	1.03	0.92	0.87	0.97	1.09	0.93	1.20	0.81	0.89
Brahmani-Baitarani	1,482	0.90	1.02	1.05	1.03	0.95	1.15	1.03	1.05	1.10	0.99	1.03
Cauvery	1,086	0.91	1.19	0.97	1.16	0.97	1.19	1.08	1.06	1.26	1.03	0.99
EFR North	1,127	0.93	1.15	1.18	1.13	1.26	1.13	1.14	1.14	1.39	1.02	1.08
EFR South	1,110	0.89	1.11	1.02	0.94	1.15	1.14	1.00	0.96	1.36	0.87	0.92
Godavari	1,116	0.91	1.12	1.02	1.13	1.02	1.23	1.09	1.12	1.11	1.01	1.11
Krishna	857	0.94	1.05	1.00	1.16	0.94	1.20	1.19	1.18	1.24	1.03	1.16
Mahanadi	1,343	0.93	1.12	1.10	1.13	1.04	1.16	1.09	1.11	1.12	1.06	1.08
Mahi	865	0.91	1.14	1.11	1.10	0.99	1.11	1.14	1.09	1.17	0.92	1.07
Narmada	1,079	0.92	1.15	1.09	1.15	1.01	1.16	1.10	1.14	1.15	1.04	1.08
Pennar	757	0.90	1.01	1.09	1.04	1.05	1.28	1.07	0.98	1.44	0.93	0.94
Sabarnati	837	0.91	1.15	1.19	1.00	0.91	0.97	1.09	1.03	1.13	0.93	0.99
Subernarekha	1,473	0.92	1.10	1.08	0.99	1.00	1.12	1.02	1.03	1.26	0.96	0.99
Tapi	856	0.91	1.08	1.20	1.27	1.10	1.07	1.20	1.18	1.25	1.14	1.08
WFR North	2,671	1.00	0.87	0.58	0.81	0.53	0.88	0.88	1.19	0.46	0.71	1.29
WFR South	2,906	0.99	1.07	0.76	1.01	0.59	1.06	0.91	1.23	0.68	0.87	1.16

S2.2 Select Flooding Events

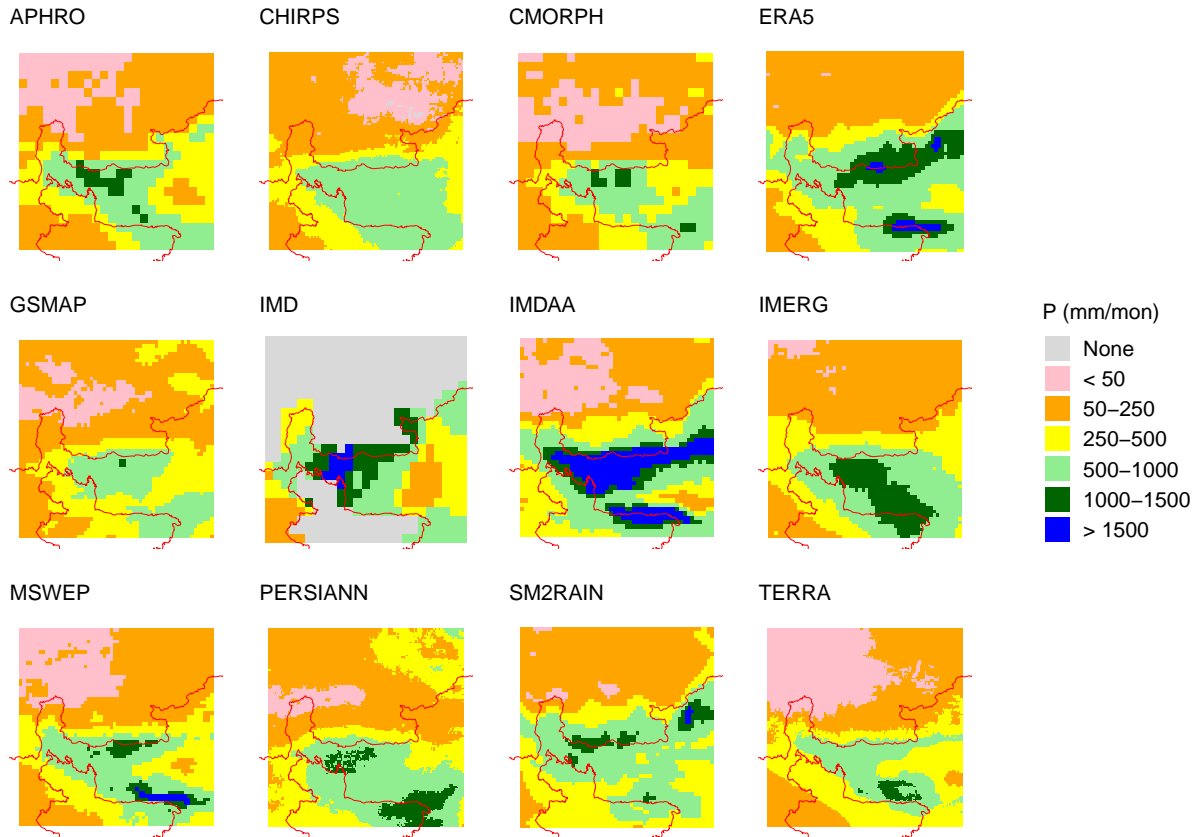


Figure S14: Total monthly P from various data sources for June 2012. Flooding in the state of Assam (Northeastern India) is the event of interest.

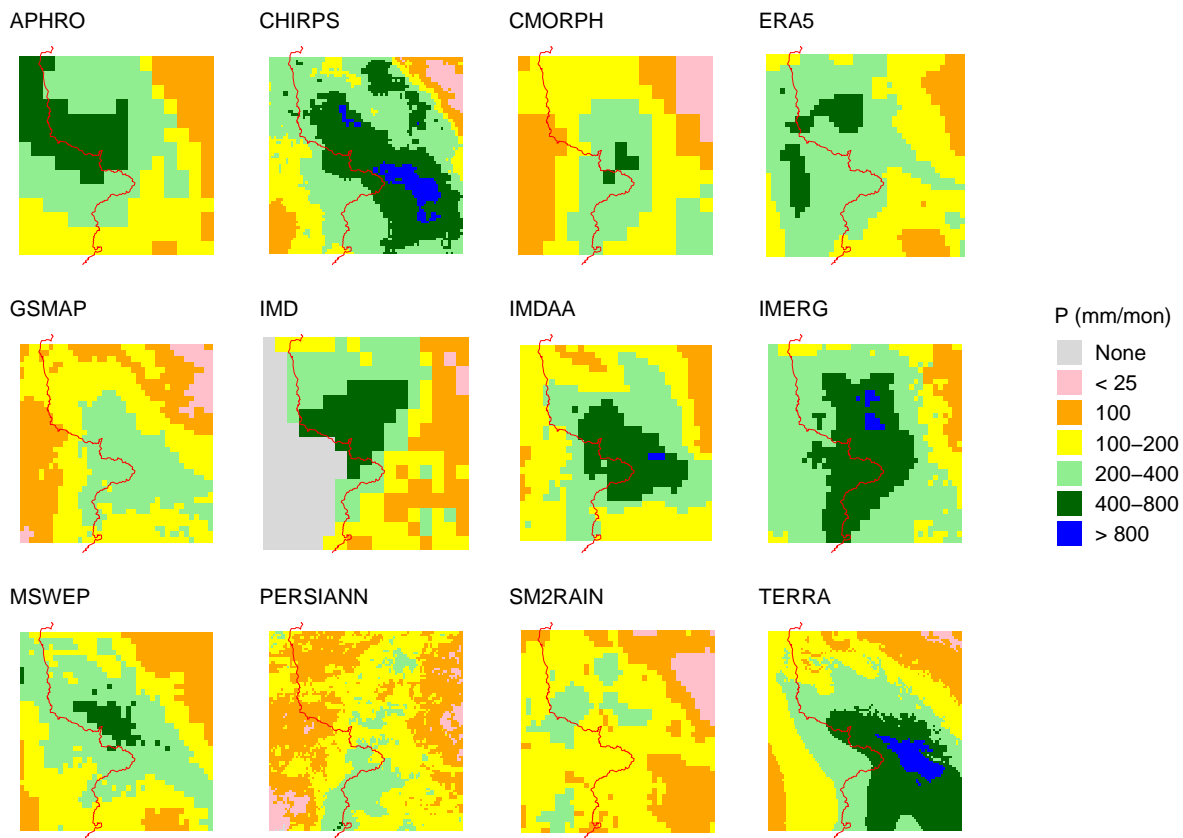


Figure S15: Total monthly P from various data sources for September 2014. Flooding in the state of Jammu and Kashmir (Northernmost India) is the event of interest.

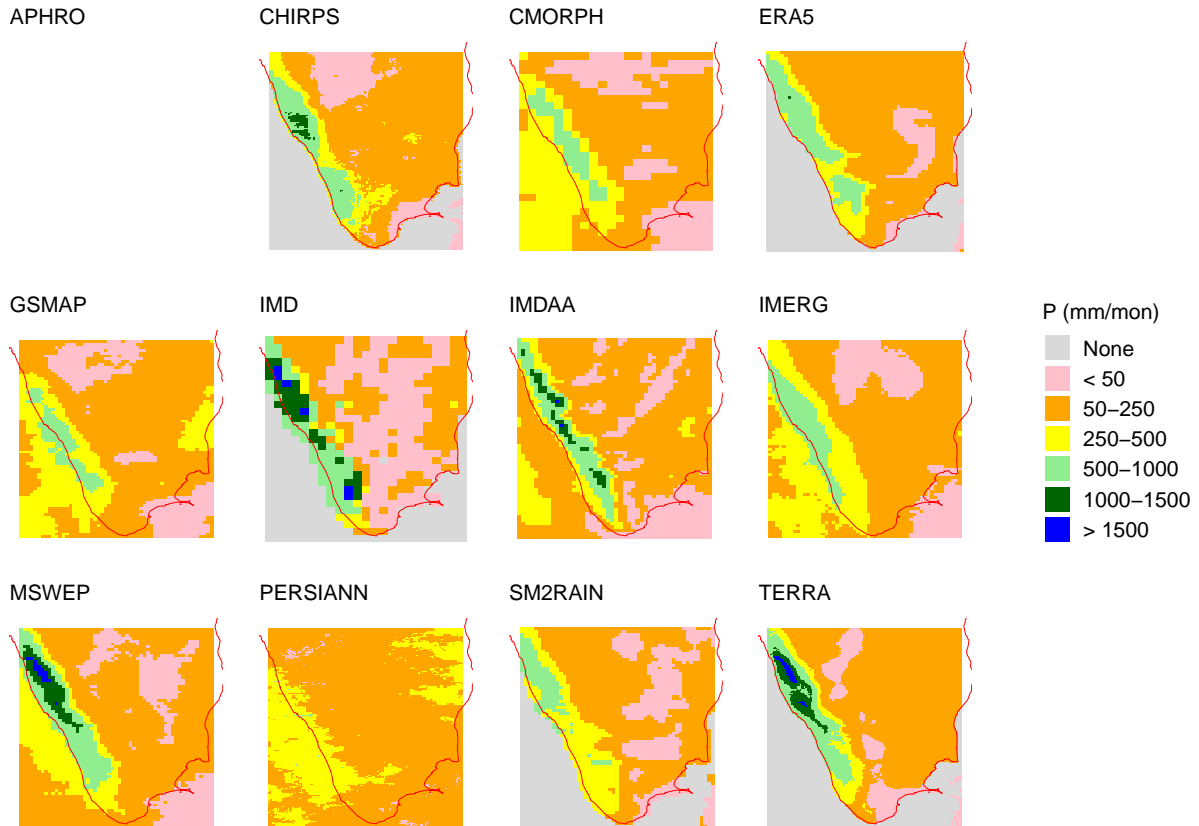


Figure S16: Total monthly P from various data sources for August 2018. Flooding in the state of Kerala (Southwestern India) is the event of interest. Data from APHRODITE is not available for WY 2018.

S2.3 Trends in Precipitation

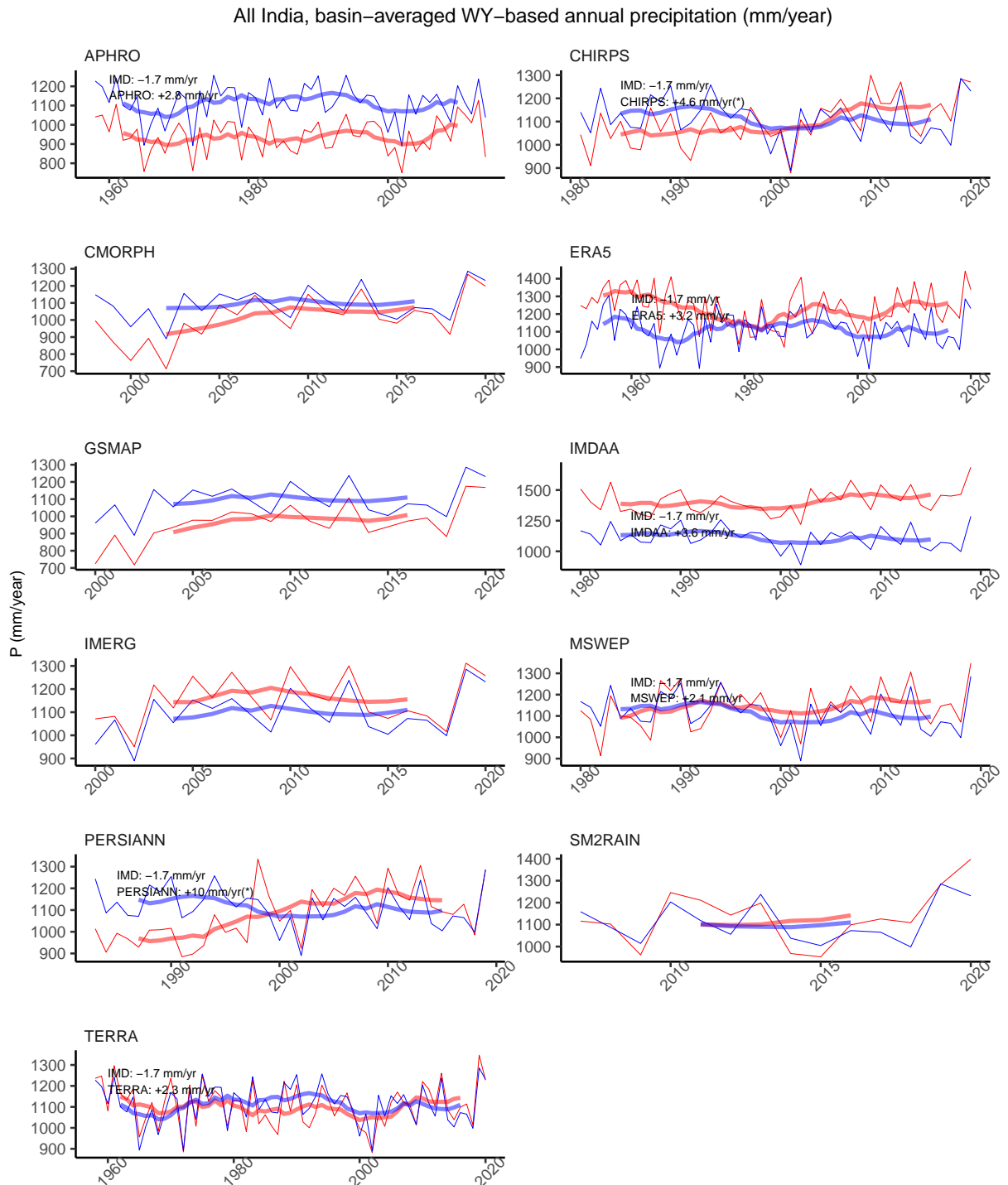


Figure S17: Annual P across India from IMD (blue) and other datasets (red). 9-year moving average values shown by the thick line. Theil-Sen slope for the period WY 1985-2014 is presented in units of mm/year, with statistically significant values indicated by ‘(*)’.

Barak, basin-averaged WY-based annual precipitation (mm/year)

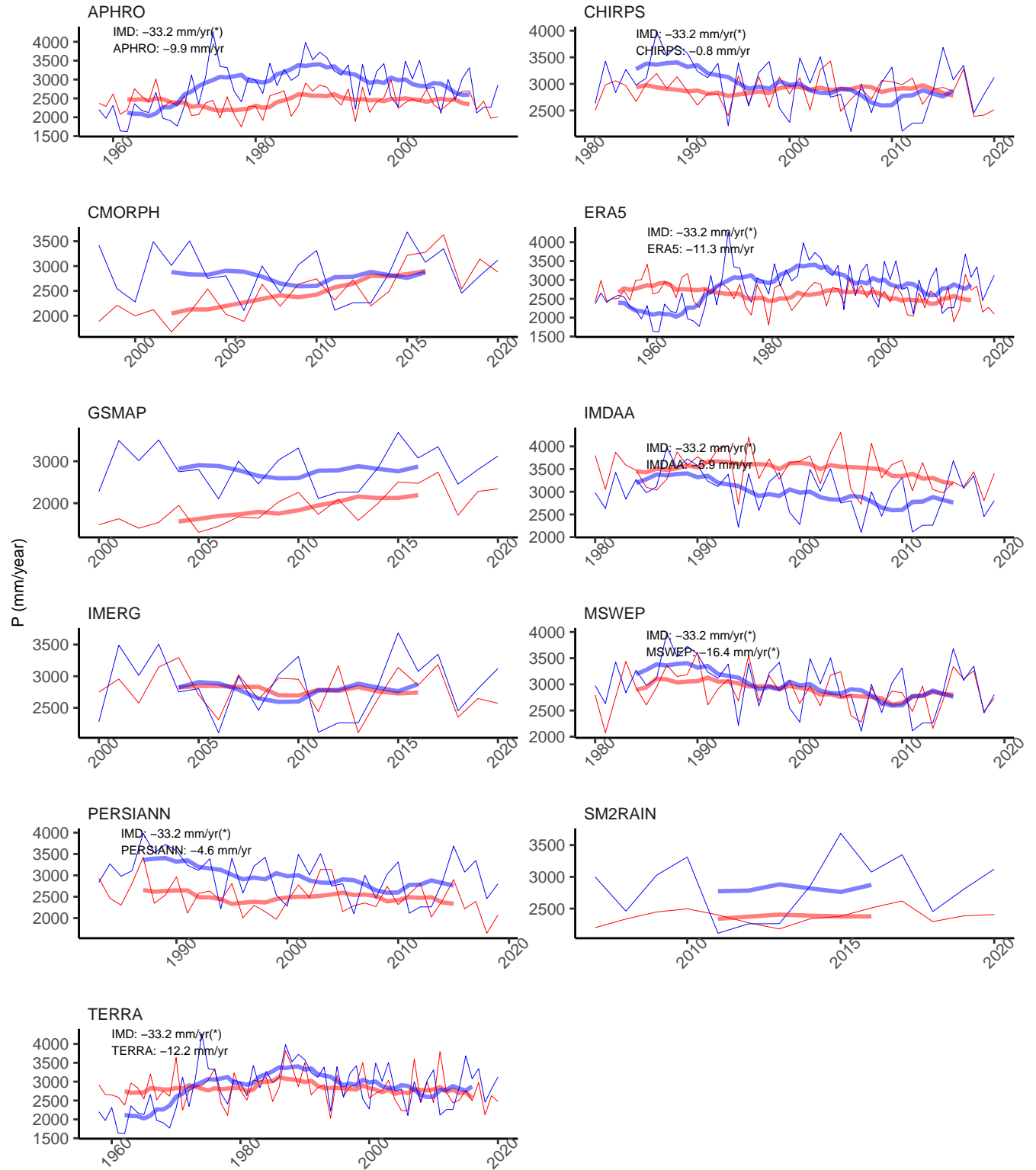


Figure S18: Same as Figure S17, except for the Barak Basin.

Brahmaputra, basin-averaged WY-based annual precipitation (mm/year)

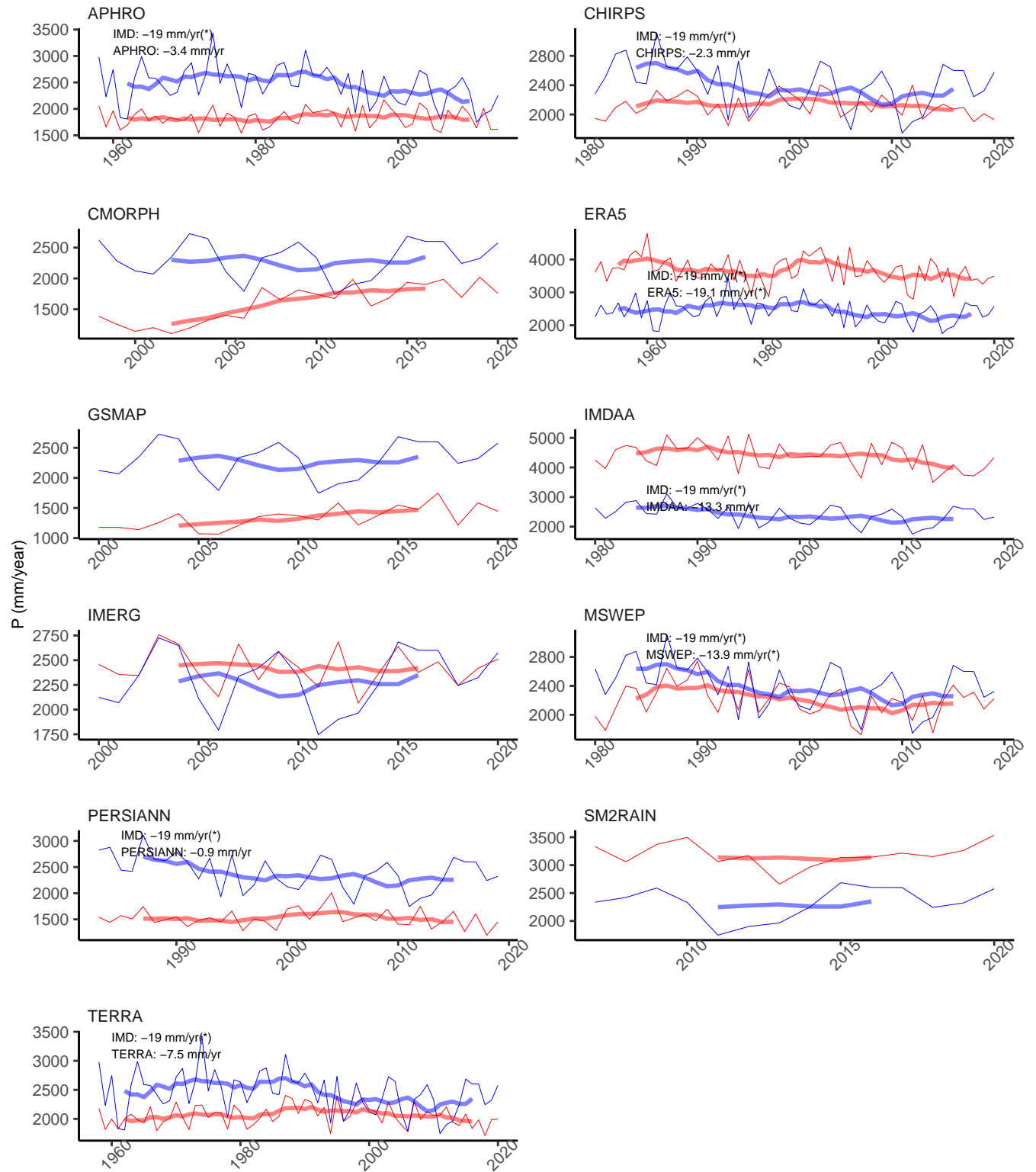


Figure S19: Same as Figure S17, except for the Brahmaputra Basin.

Ganga, basin-averaged WY-based annual precipitation (mm/year)

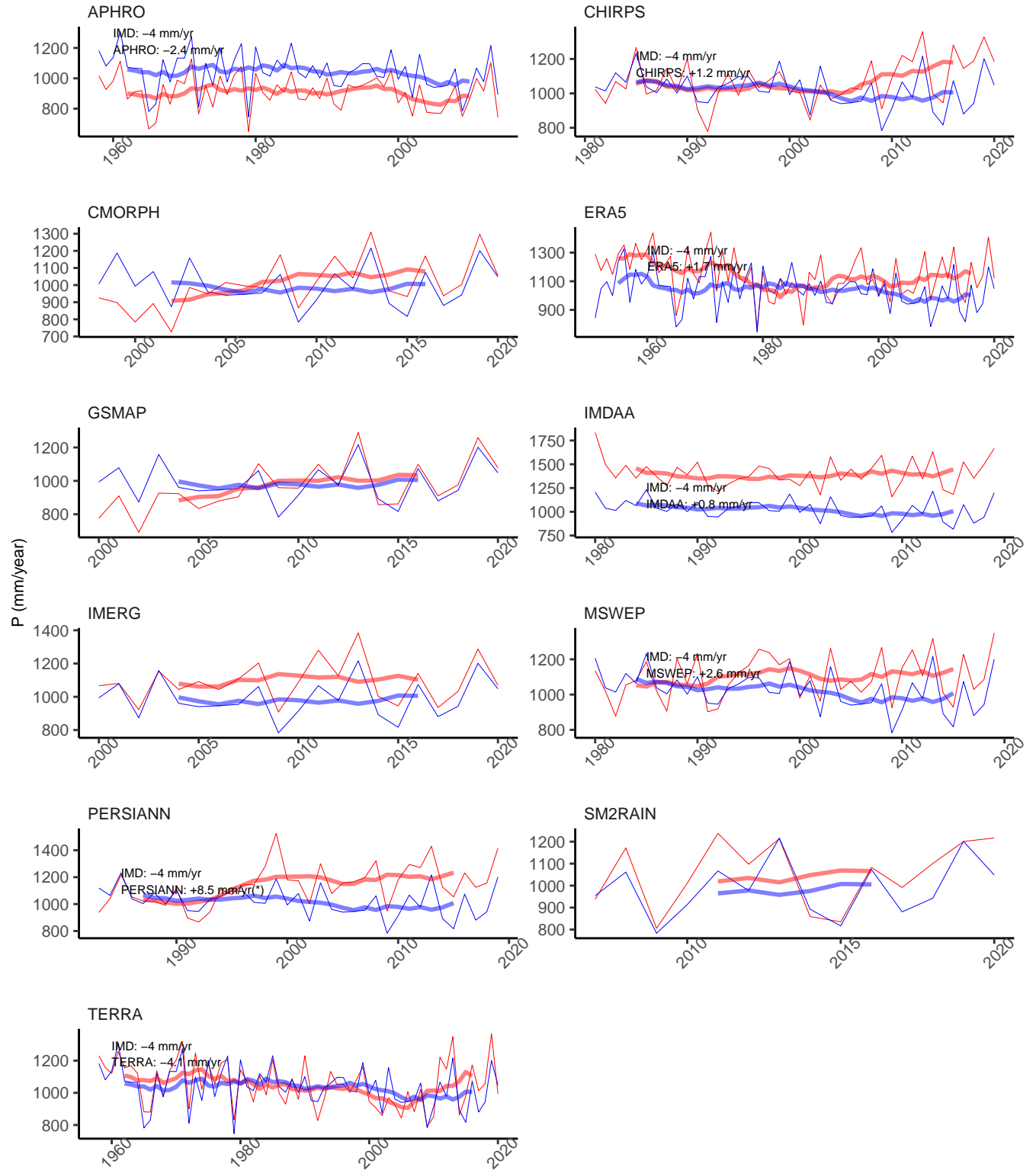


Figure S20: Same as Figure S17, except for the Ganga Basin.

Indus, basin-averaged WY-based annual precipitation (mm/year)

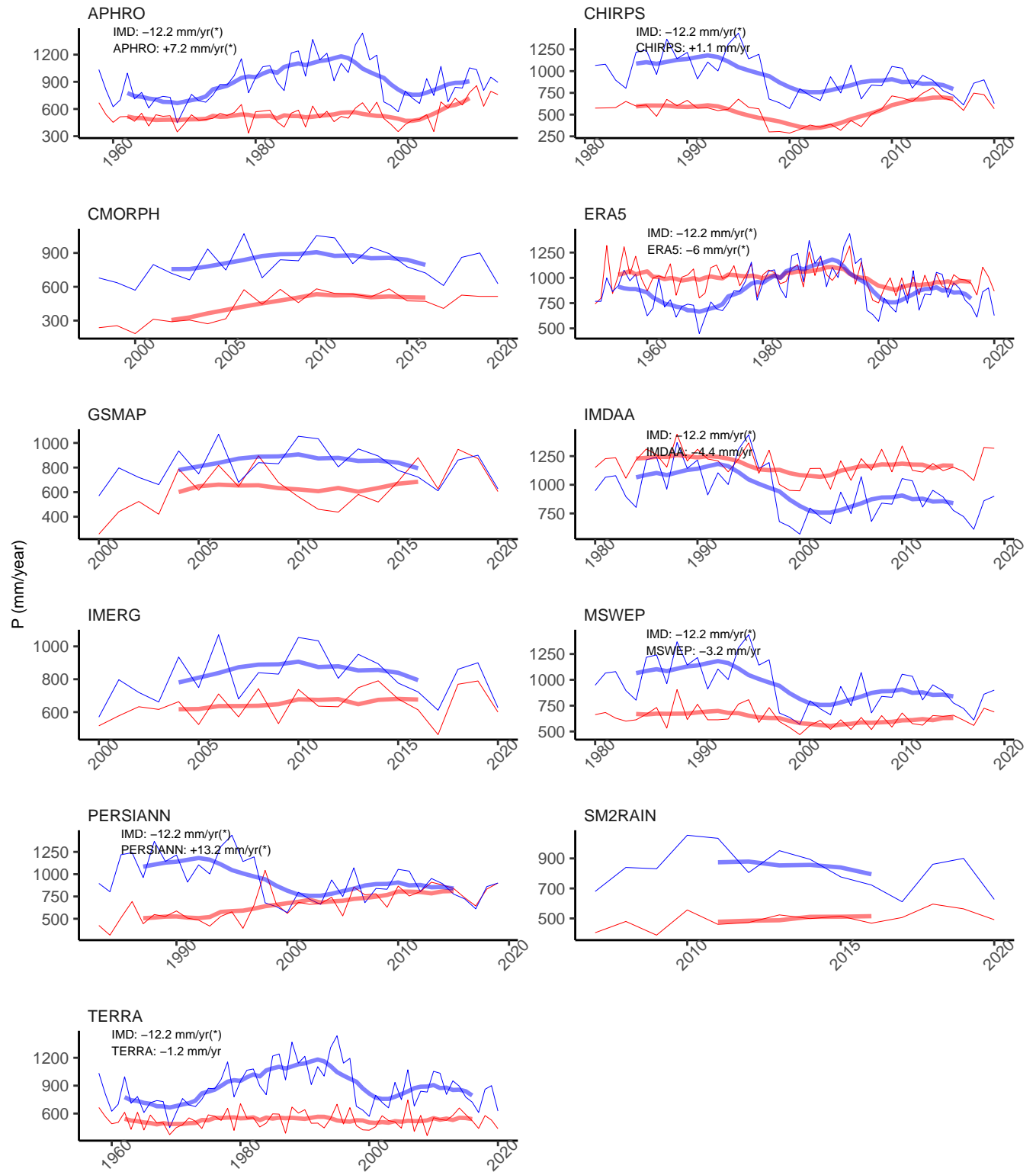


Figure S21: Same as Figure S17, except for the Indus Basin.

Minor, basin-averaged WY-based annual precipitation (mm/year)

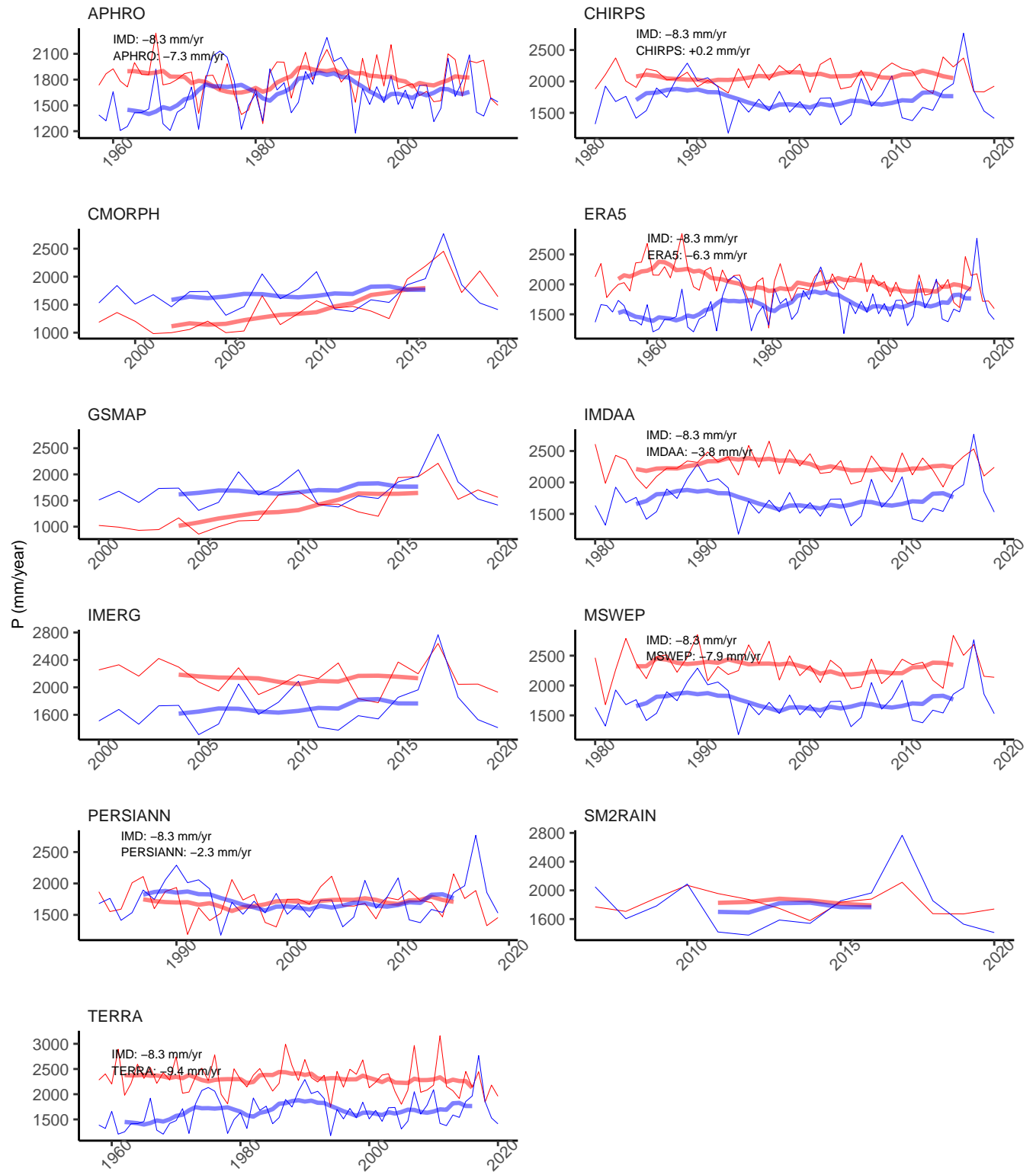


Figure S22: Same as Figure S17, except for the Minor Basin.

North Ladakh, basin-averaged WY-based annual precipitation (mm/year)

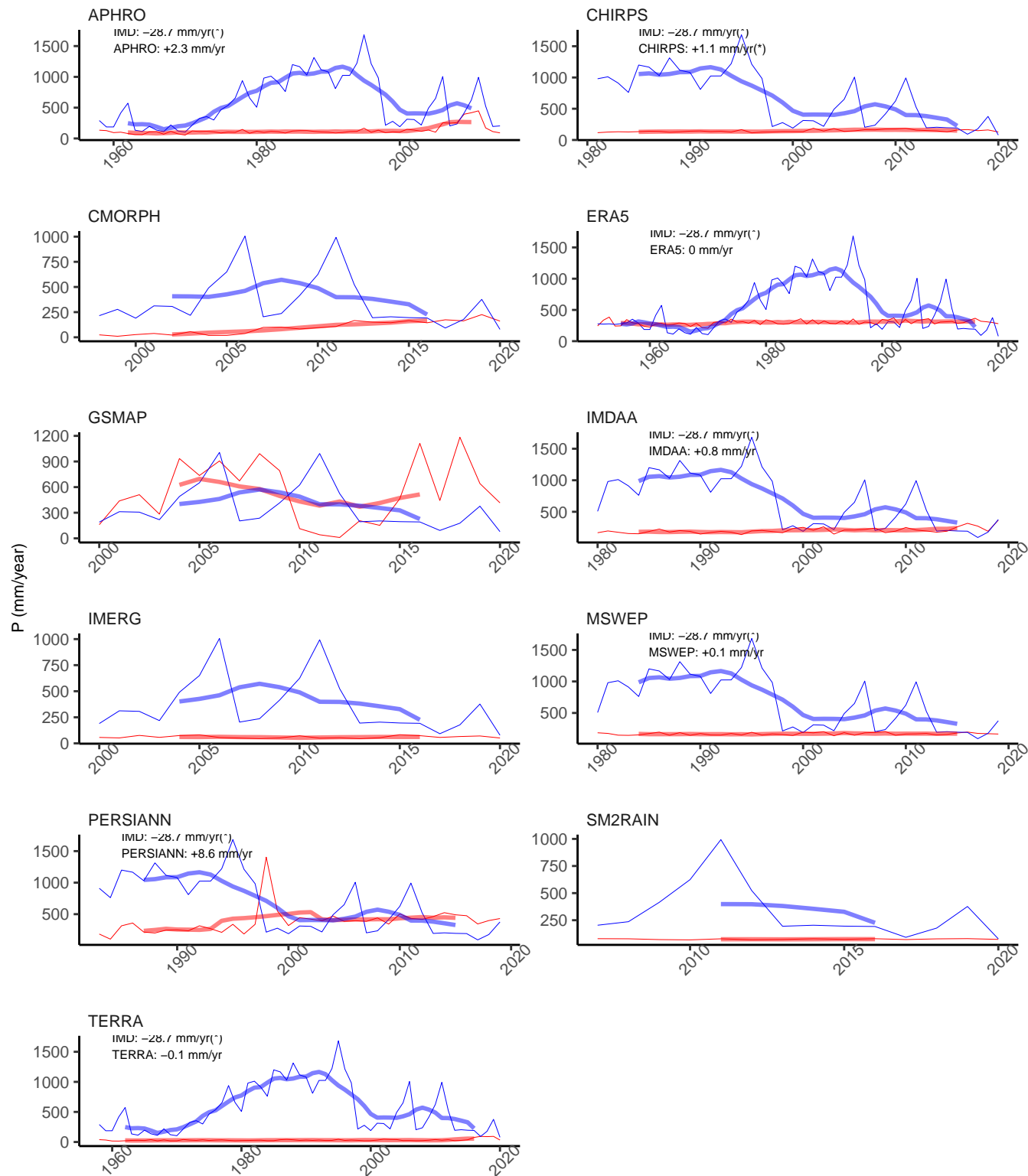


Figure S23: Same as Figure S17, except for the North Ladakh Basin.

WFR Kutch, basin-averaged WY-based annual precipitation (mm/year)

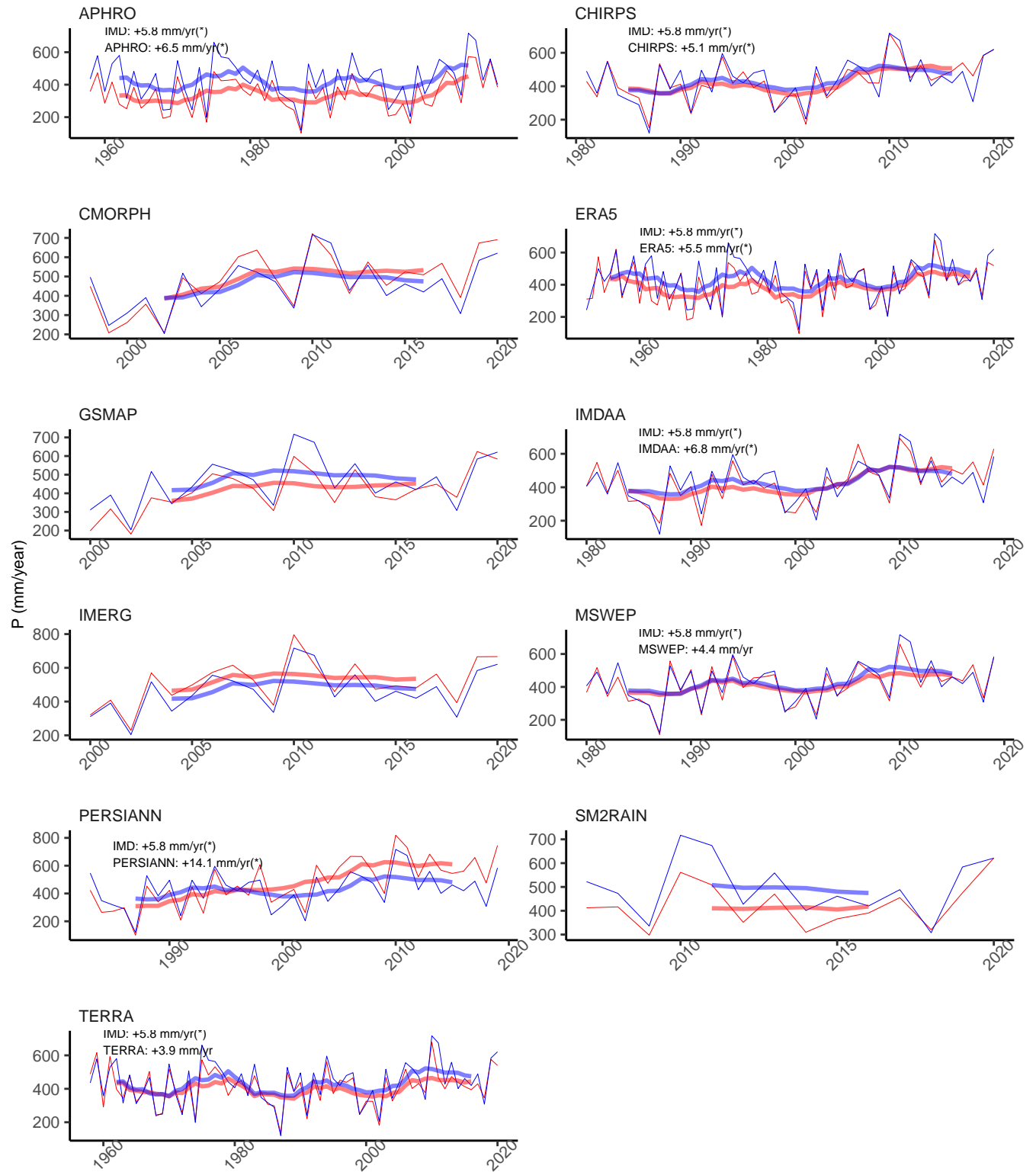


Figure S24: Same as Figure S17, except for the WFR Kutch Basin.

Brahmani–Baitarani, basin-averaged WY-based annual precipitation (mm/year)

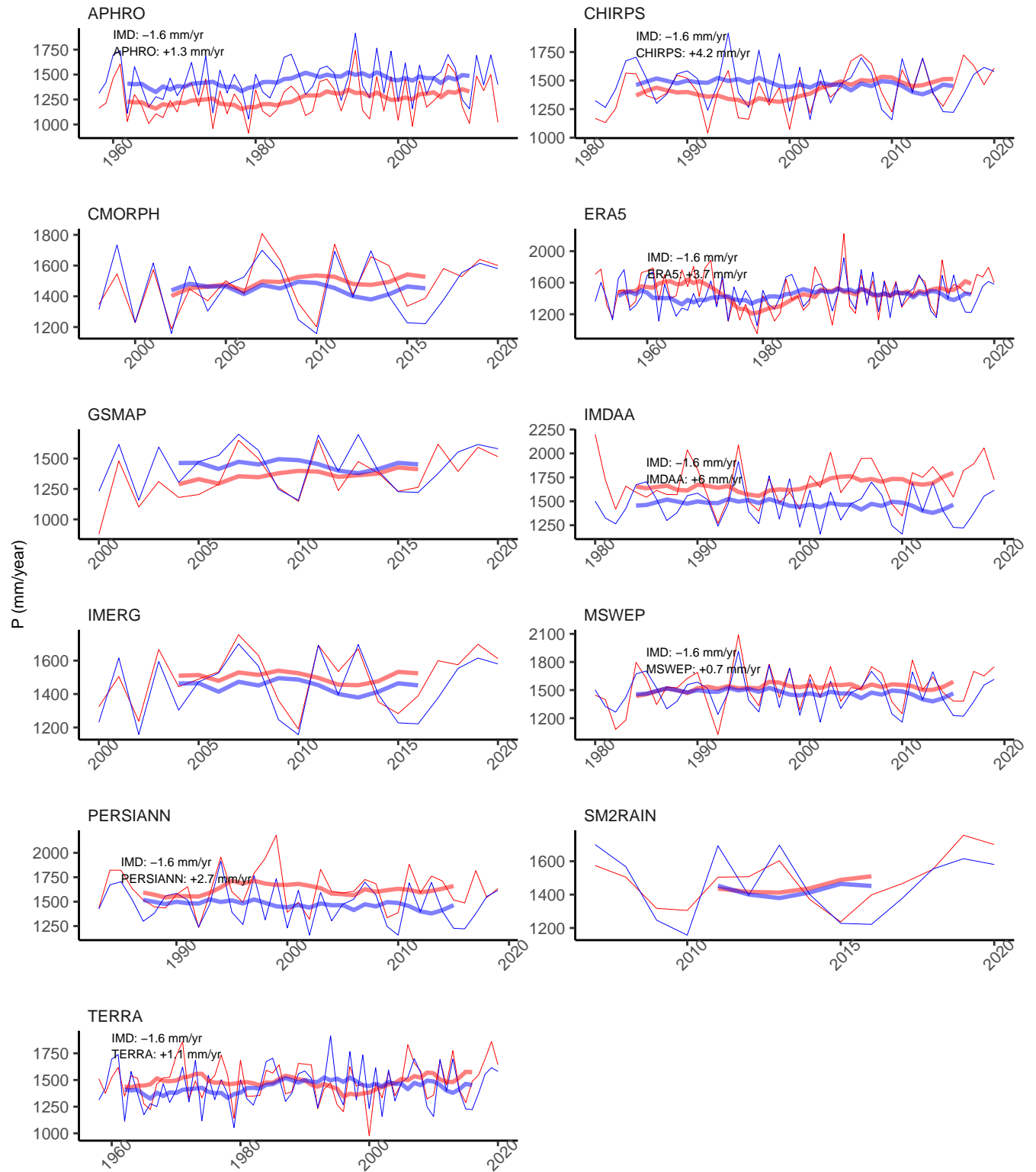


Figure S25: Same as Figure S17, except for the Brahmani-Baitarani Basin.

Cauvery, basin-averaged WY-based annual precipitation (mm/year)

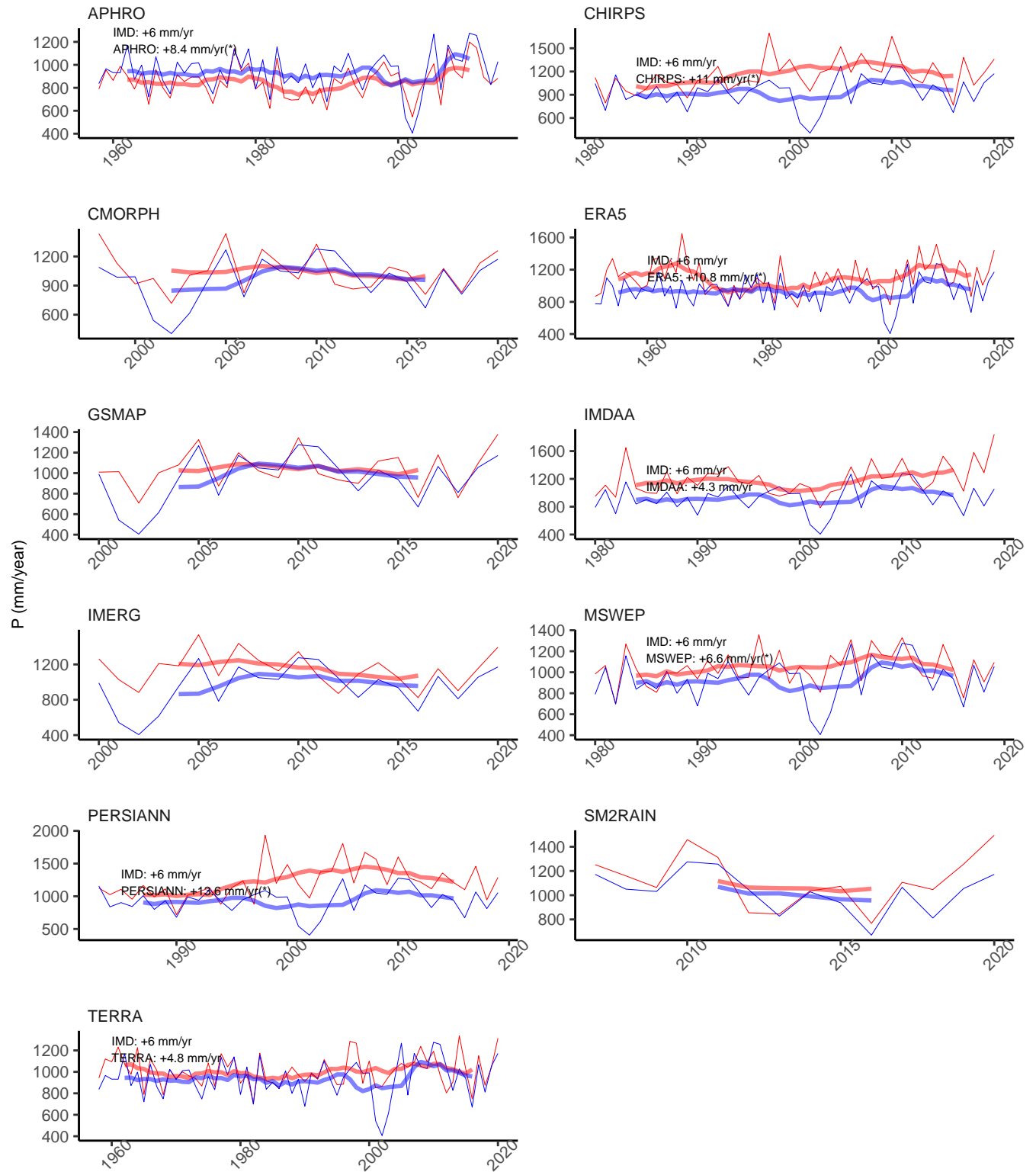


Figure S26: Same as Figure S17, except for the Cauvery Basin.

EFR North, basin-averaged WY-based annual precipitation (mm/year)

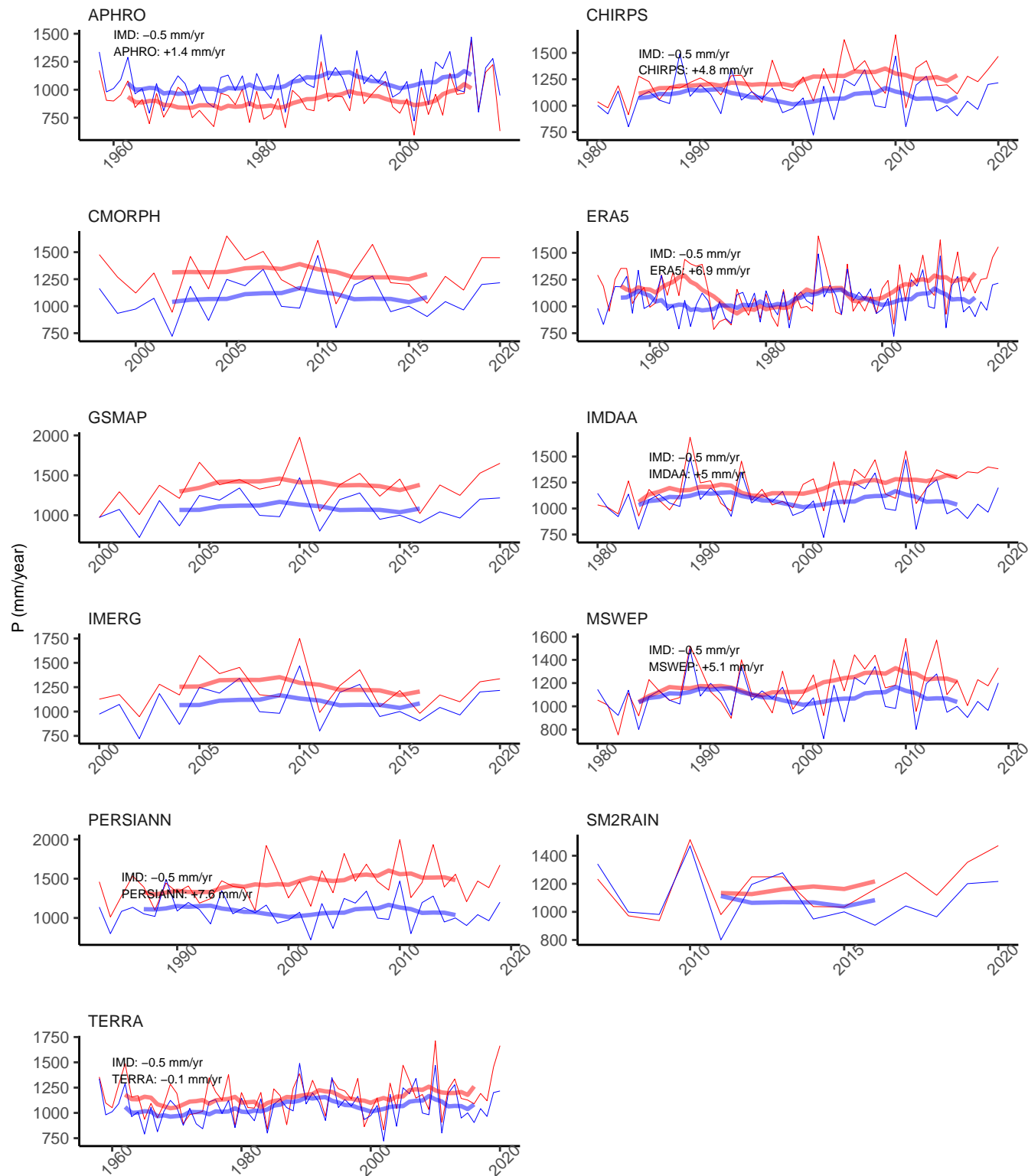


Figure S27: Same as Figure S17, except for the EFR North Basin.

EFR South, basin-averaged WY-based annual precipitation (mm/year)

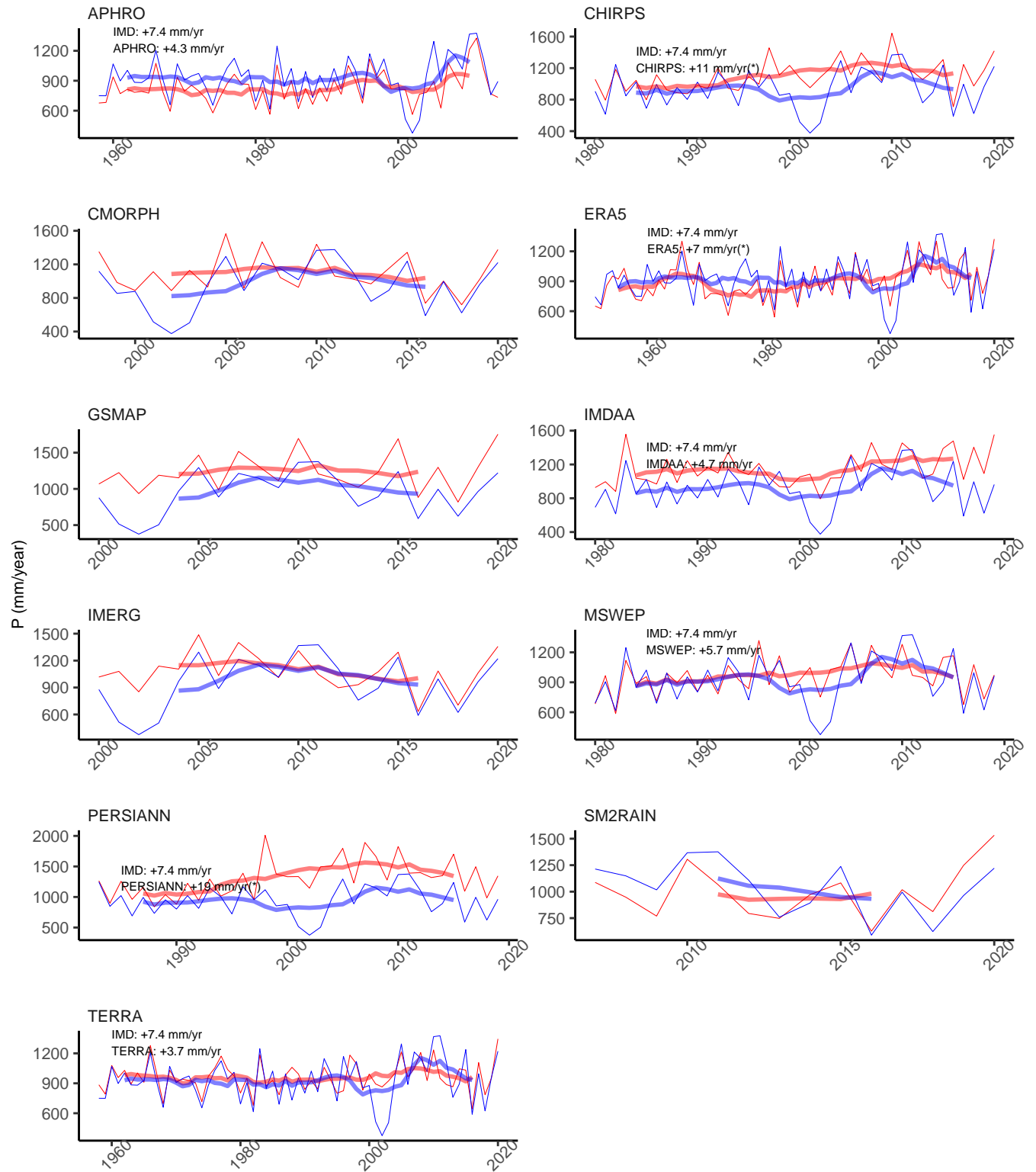


Figure S28: Same as Figure S17, except for the EFR South Basin.

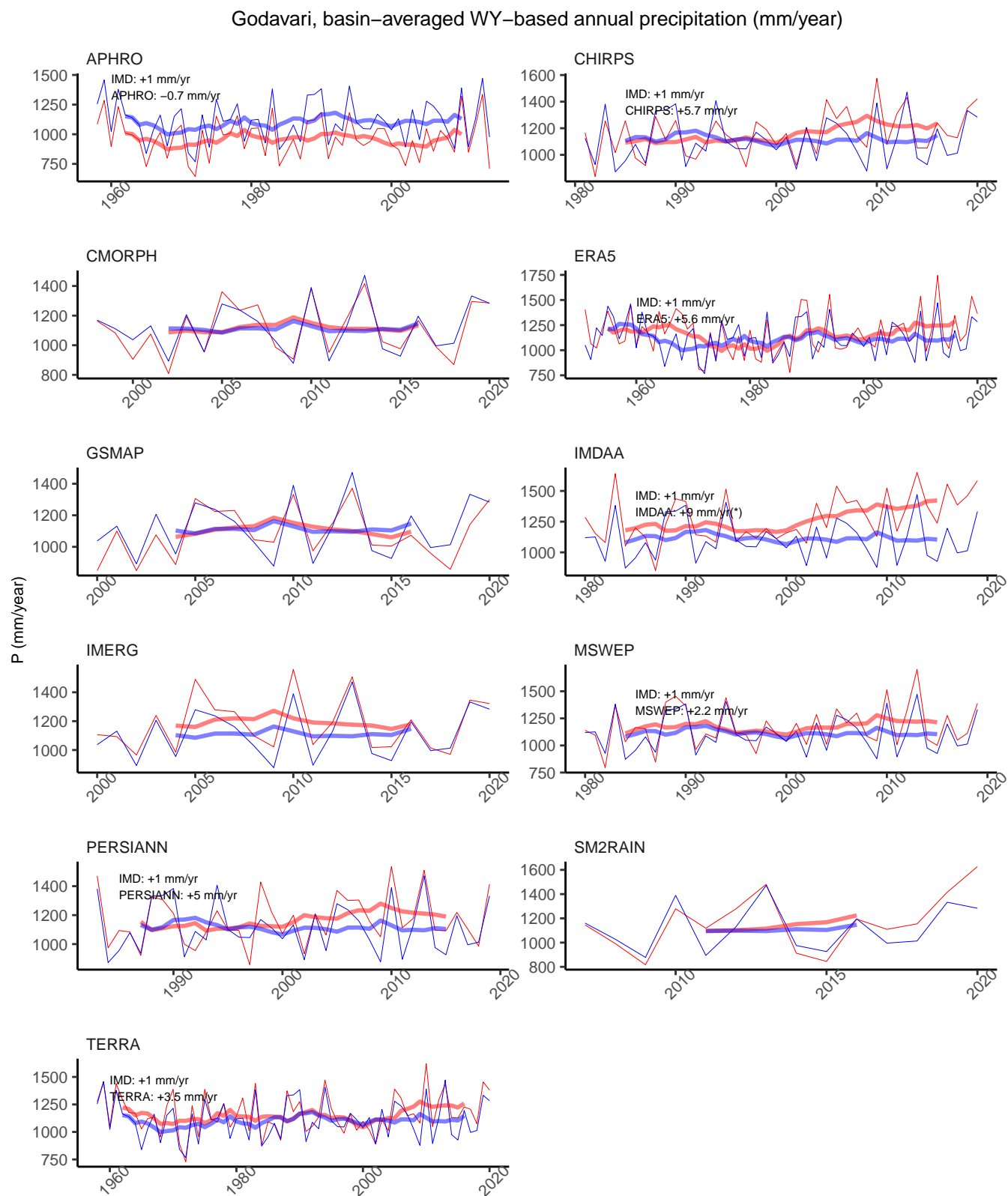


Figure S29: Same as Figure S17, except for the Godavari Basin.

Krishna, basin-averaged WY-based annual precipitation (mm/year)

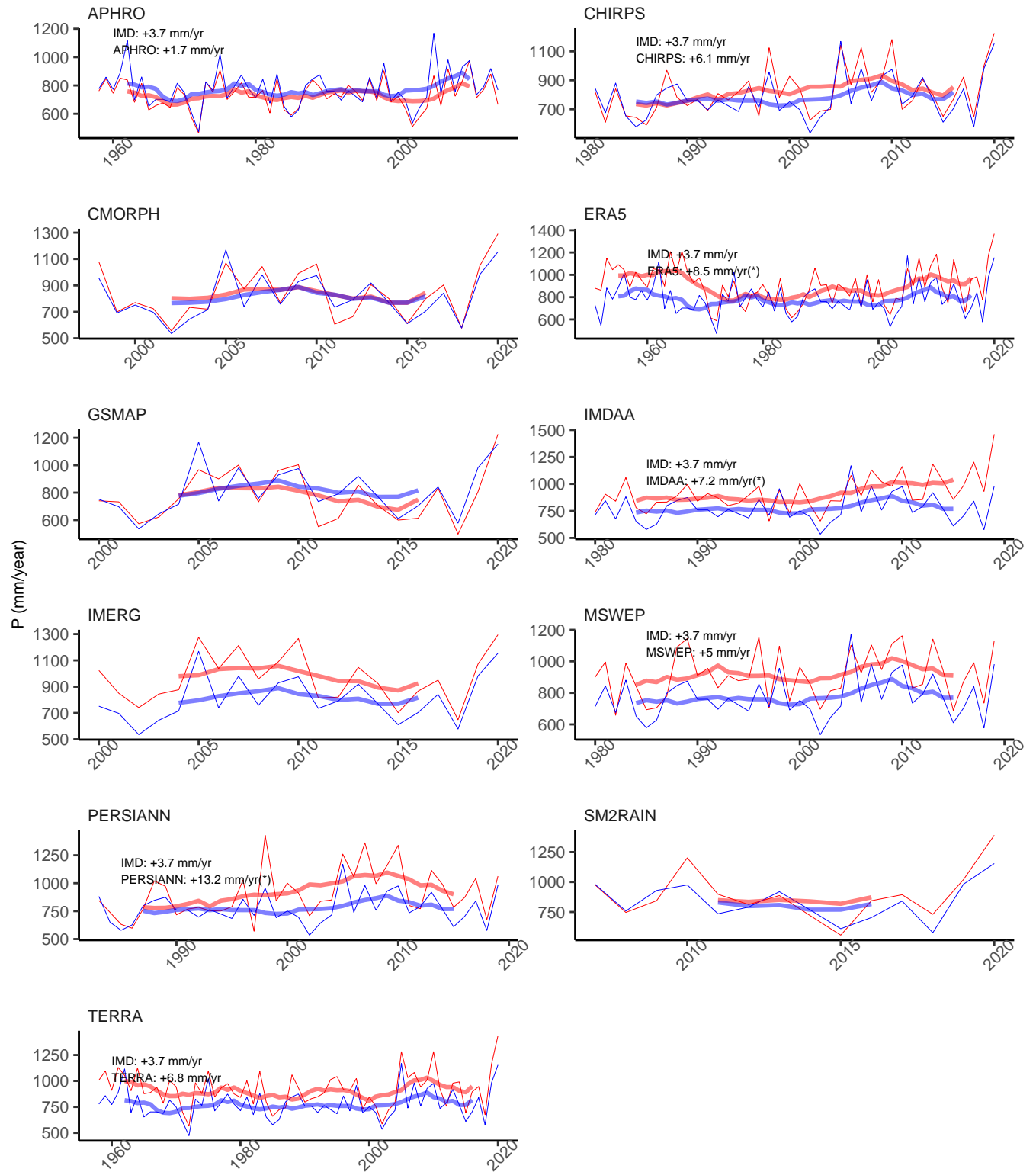


Figure S30: Same as Figure S17, except for the Krishna Basin.

Mahanadi, basin-averaged WY-based annual precipitation (mm/year)

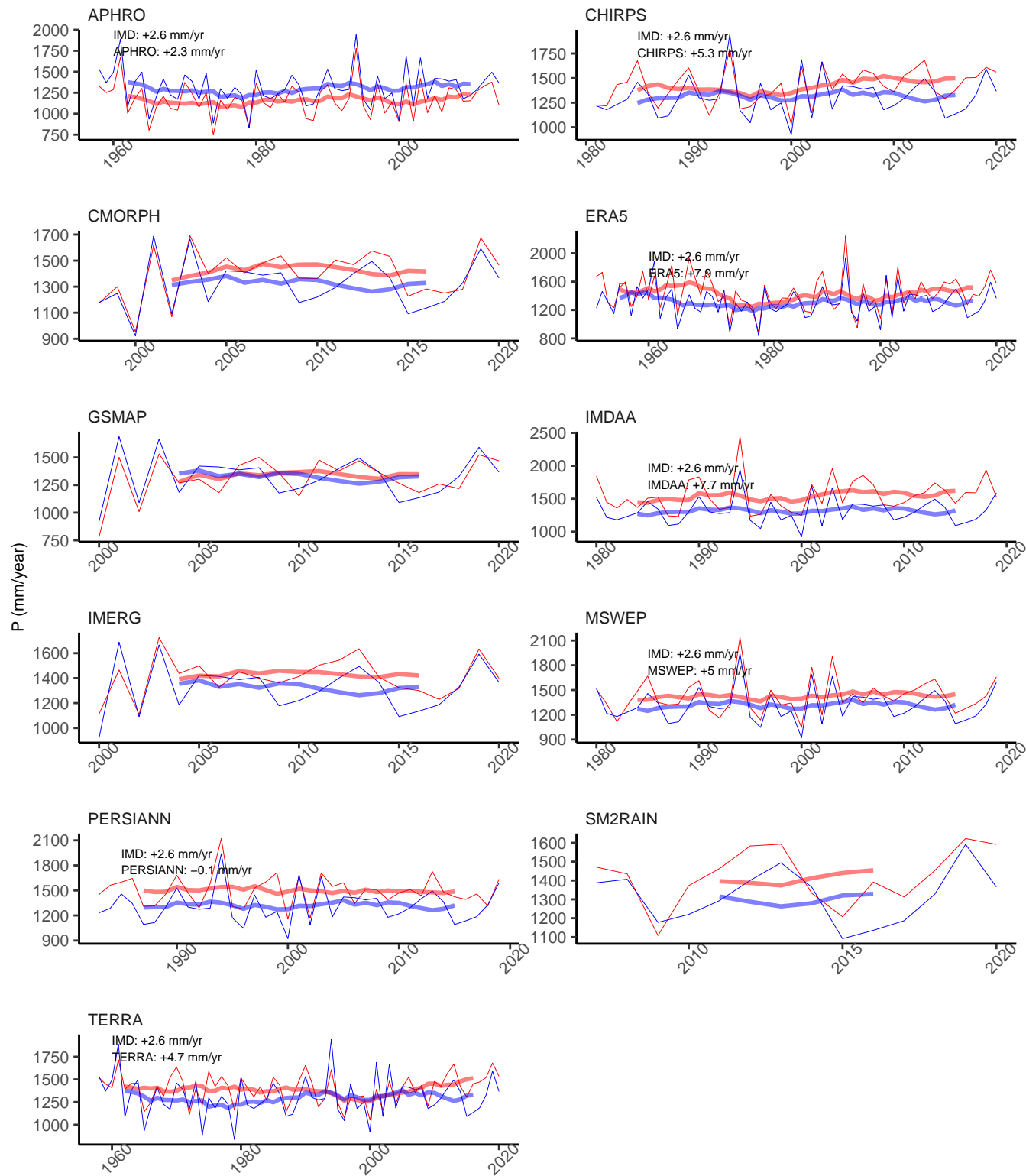


Figure S31: Same as Figure S17, except for the Mahanadi Basin.

Mahi, basin-averaged WY-based annual precipitation (mm/year)

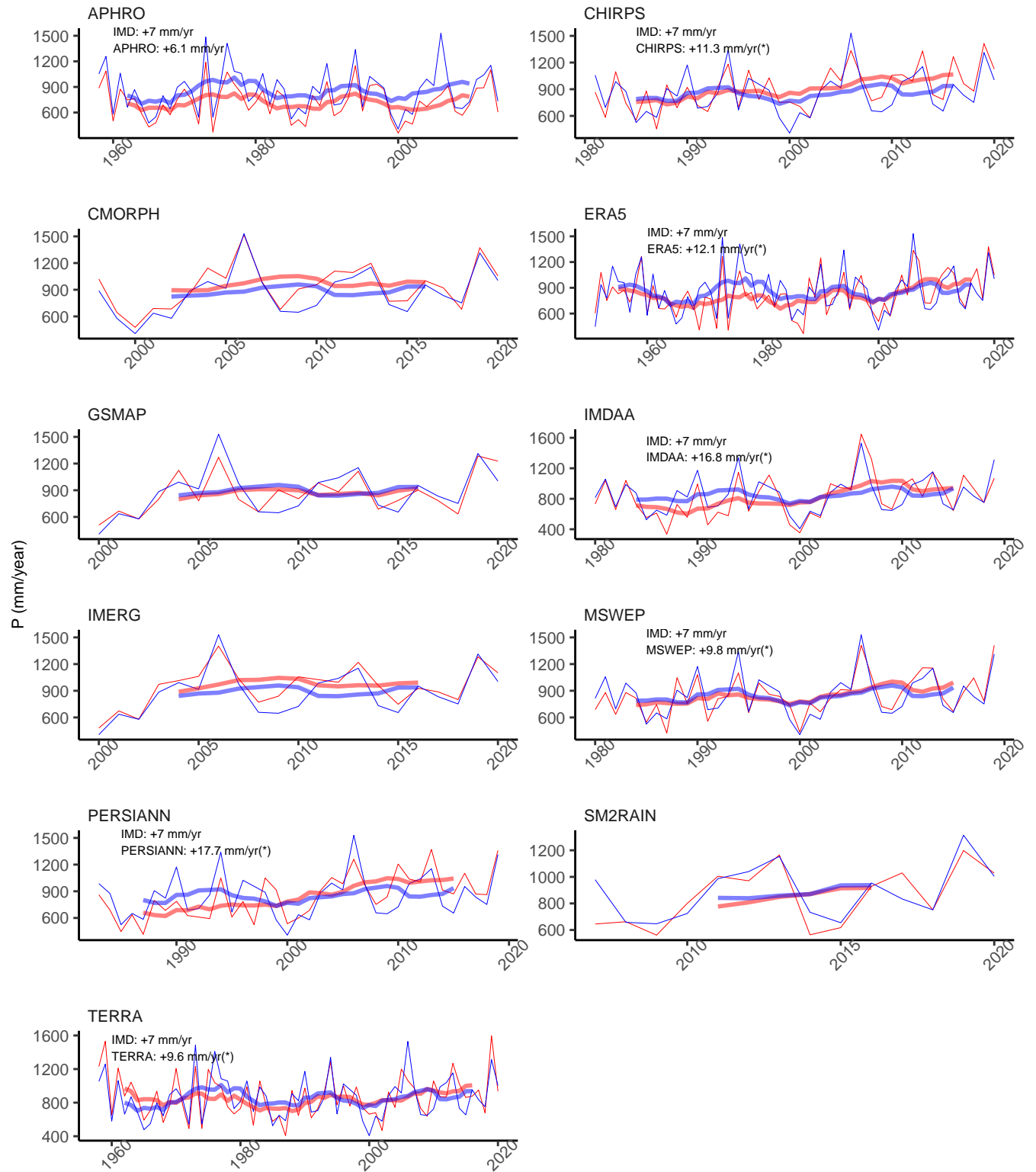


Figure S32: Same as Figure S17, except for the Mahi Basin.

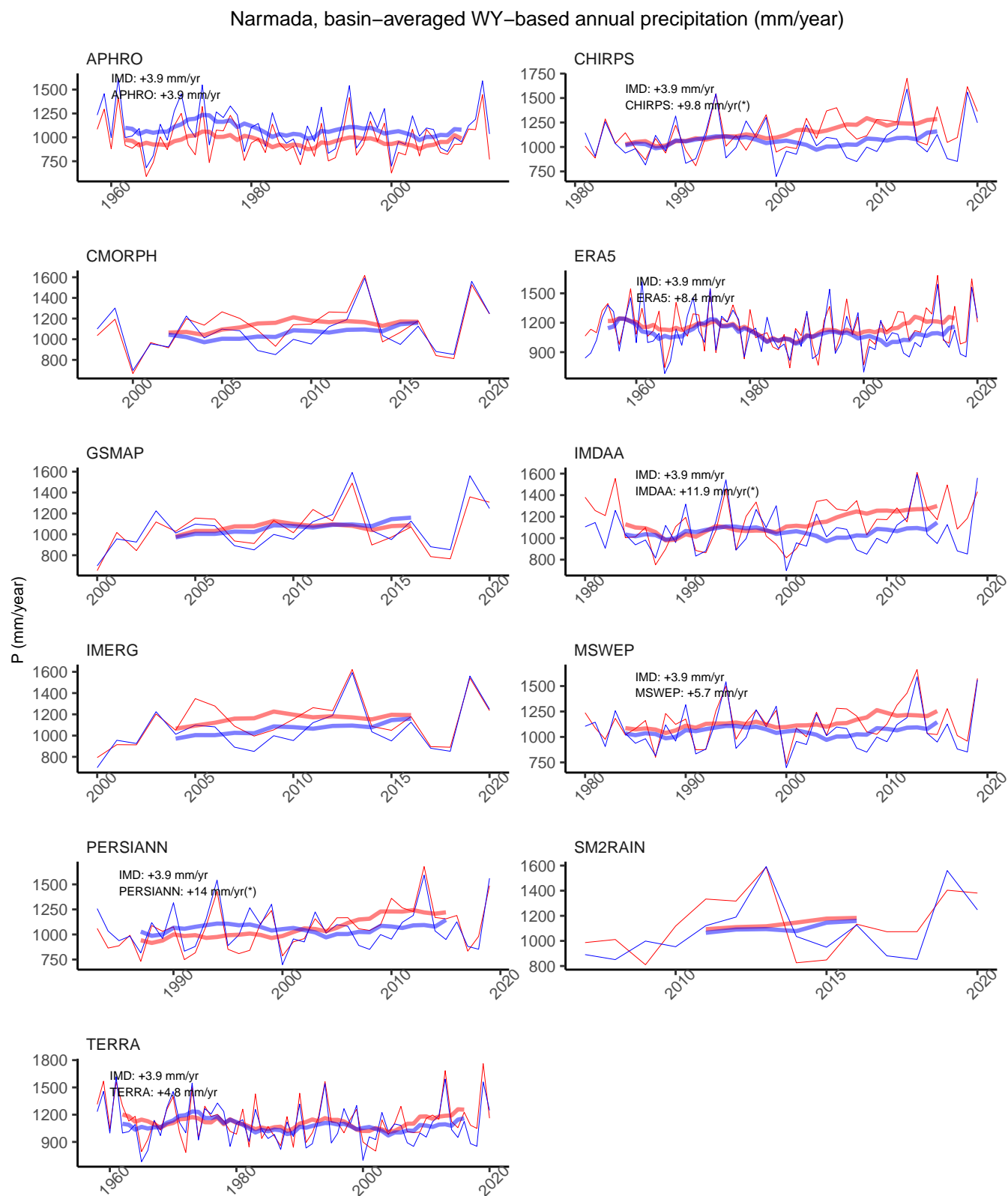


Figure S33: Same as Figure S17, except for the Narmada Basin.

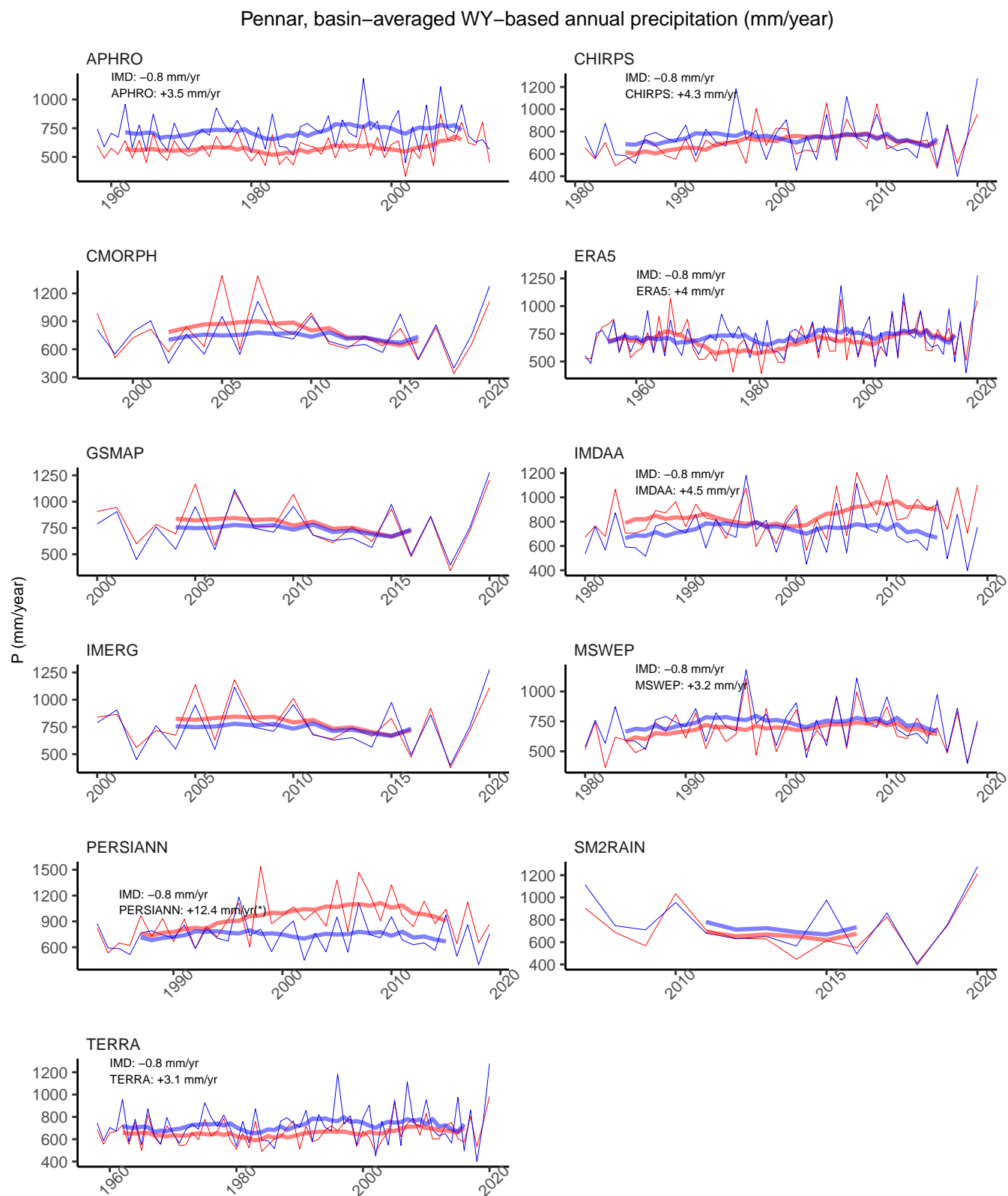


Figure S34: Same as Figure S17, except for the Pennar Basin.

Sabarmati, basin-averaged WY-based annual precipitation (mm/year)

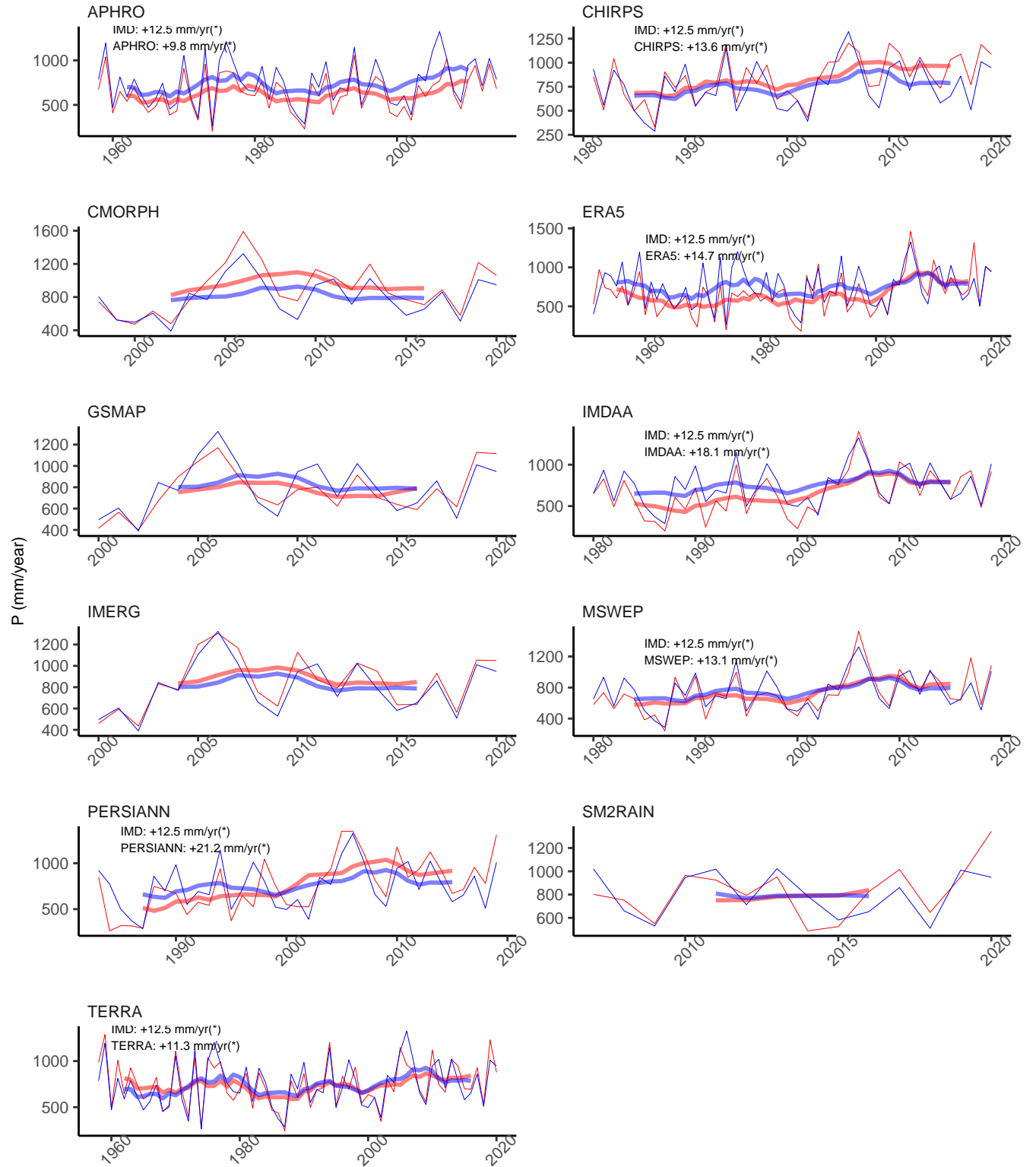


Figure S35: Same as Figure S17, except for the Sabarmati Basin.

Subernarekha, basin-averaged WY-based annual precipitation (mm/year)

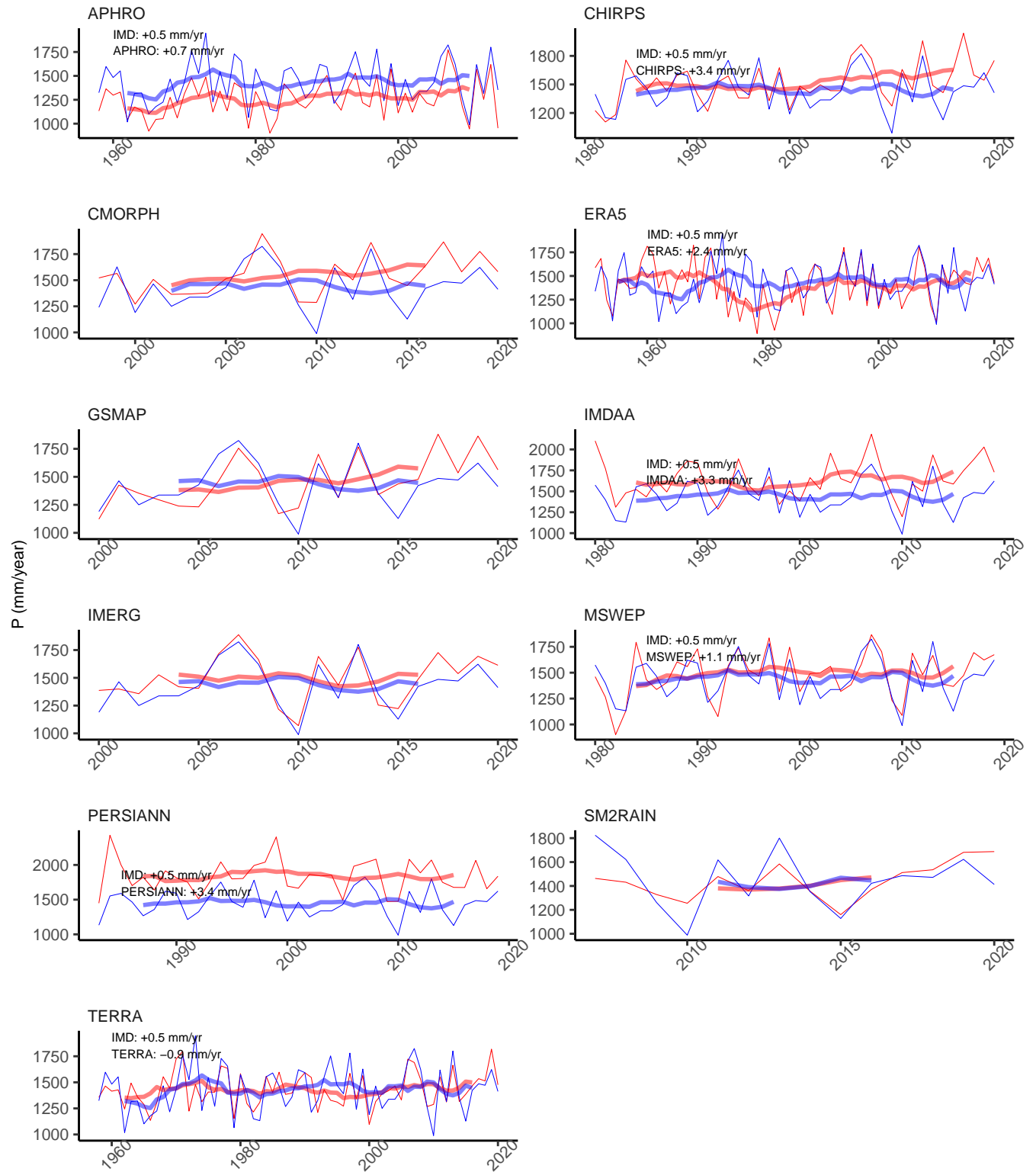


Figure S36: Same as Figure S17, except for the Subernarekha Basin.

Tapi, basin-averaged WY-based annual precipitation (mm/year)

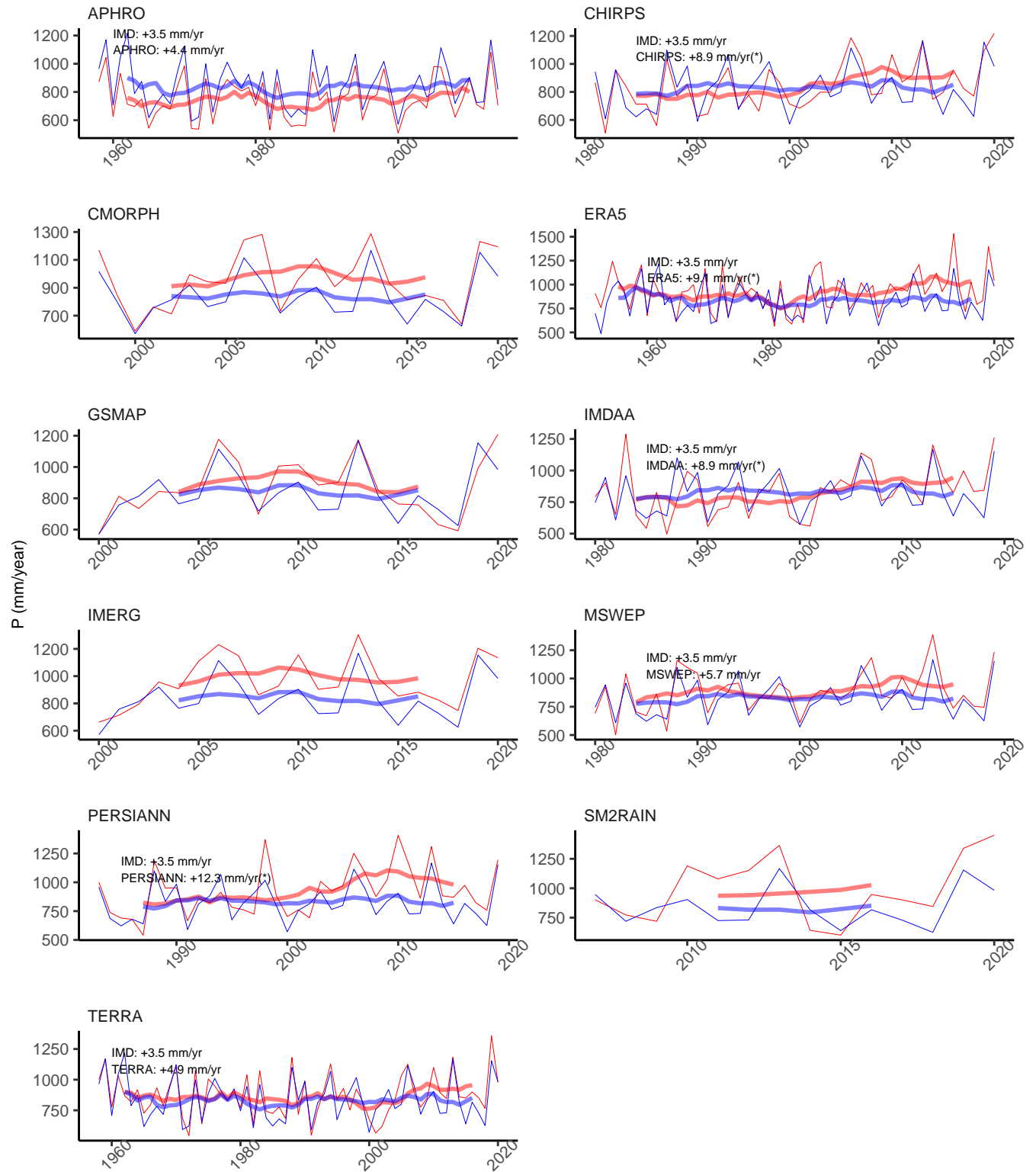


Figure S37: Same as Figure S17, except for the Tapi Basin.

WFR North, basin-averaged WY-based annual precipitation (mm/year)

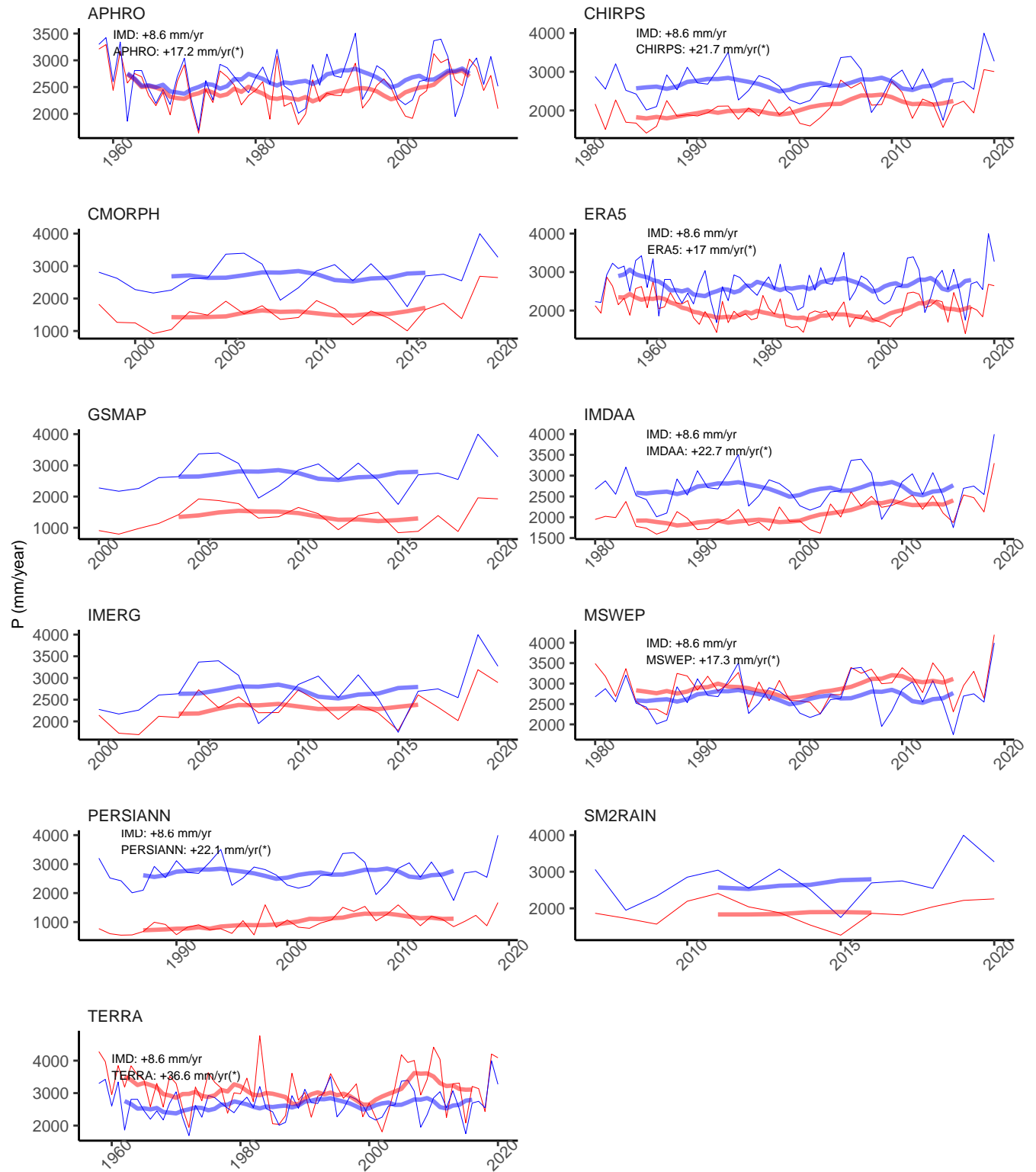


Figure S38: Same as Figure S17, except for the WFR North Basin.

WFR South, basin-averaged WY-based annual precipitation (mm/year)

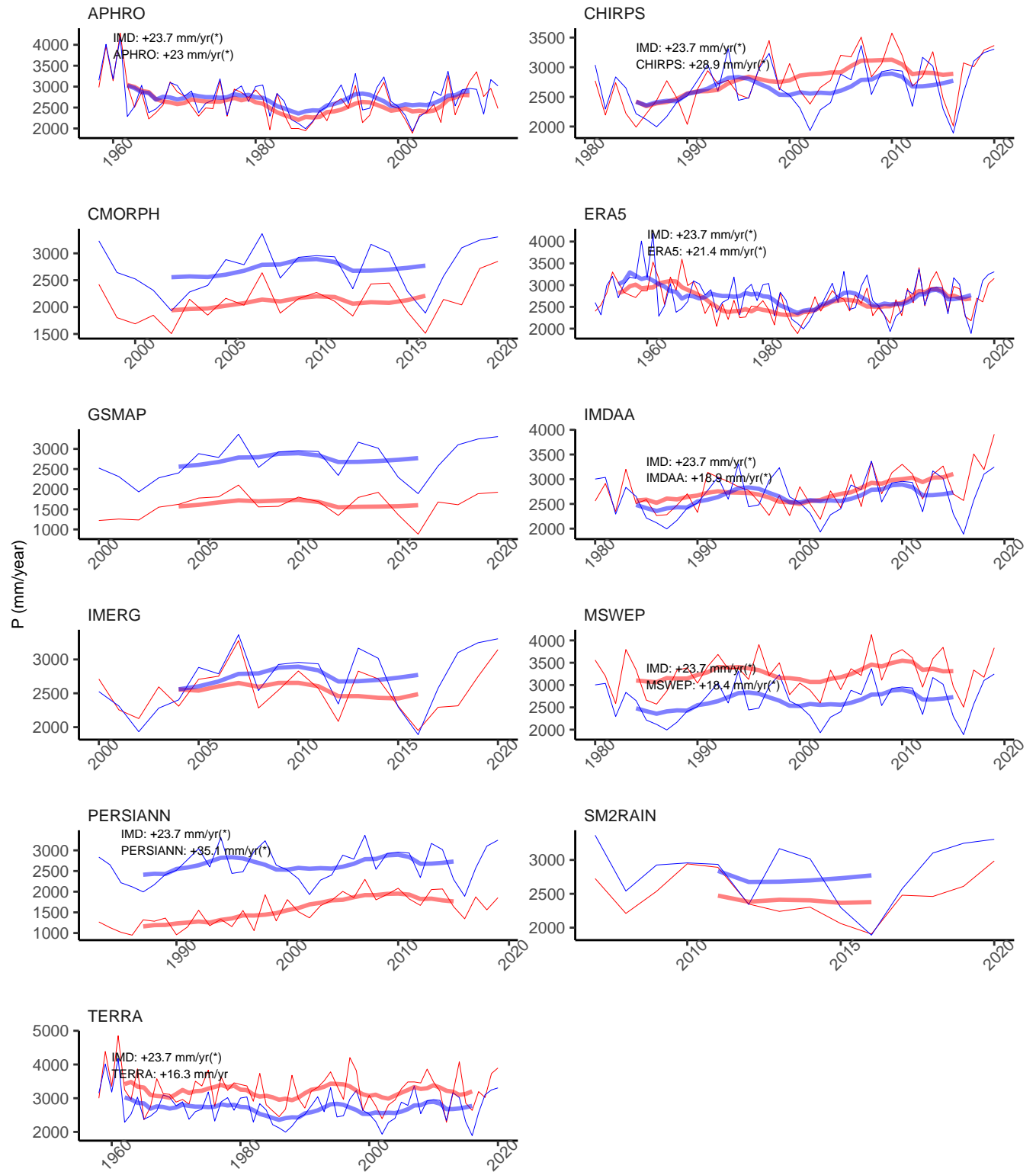


Figure S39: Same as Figure S17, except for the WFR South Basin.

S2.4 IMD versus Other Products

Table S2: Trend in annual basin-aggregated P (mm/year) for WY 1985-2014 for select datasets. Statistically significant values are indicated by ‘(*)’.

Basin	IMD	APHRO	CHIRPS	ERA5	IMDAA	MSWEP	PERSIANN	TERRA
All India	-1.7	+2.8	+4.6(*)	+3.2	+3.6	+2.1	+10(*)	+2.3
Barak	-33.2(*)	-9.9	-0.8	-11.3	-5.9	-16.4(*)	-4.6	-12.2
Brahmaputra	-19(*)	-3.4	-2.3	-19.1(*)	-13.3	-13.9(*)	-0.9	-7.5
Ganga	-4	-2.4	+1.2	+1.7	+0.8	+2.6	+8.5(*)	-4.1
Indus	-12.2(*)	+7.2(*)	+1.1	-6(*)	-4.4	-3.2	+13.2(*)	-1.2
Minor	-8.3	-7.3	+0.2	-6.3	-3.8	-7.9	-2.3	-9.4
North Ladakh	-28.7(*)	+2.3	+1.1(*)	0	+0.8	+0.1	+8.6	-0.1
WFR Kutch	+5.8(*)	+6.5(*)	+5.1(*)	+5.5(*)	+6.8(*)	+4.4	+14.1(*)	+3.9
Brahmani-Baitarani	-1.6	+1.3	+4.2	+3.7	+6	+0.7	+2.7	+1.1
Cauvery	+6	+8.4(*)	+11(*)	+10.8(*)	+4.3	+6.6(*)	+13.6(*)	+4.8
EFR North	-0.5	+1.4	+4.8	+6.9	+5	+5.1	+7.6	-0.1
EFR South	+7.4	+4.3	+11(*)	+7(*)	+4.7	+5.7	+19(*)	+3.7
Godavari	+1	-0.7	+5.7	+5.6	+9(*)	+2.2	+5	+3.5
Krishna	+3.7	+1.7	+6.1	+8.5(*)	+7.2(*)	+5	+13.2(*)	+6.8
Mahanadi	+2.6	+2.3	+5.3	+7.9	+7.7	+5	-0.1	+4.7
Mahi	+7	+6.1	+11.3(*)	+12.1(*)	+16.8(*)	+9.8(*)	+17.7(*)	+9.6(*)
Narmada	+3.9	+3.9	+9.8(*)	+8.4	+11.9(*)	+5.7	+14(*)	+4.8
Pennar	-0.8	+3.5	+4.3	+4	+4.5	+3.2	+12.4(*)	+3.1
Sabarmati	+12.5(*)	+9.8(*)	+13.6(*)	+14.7(*)	+18.1(*)	+13.1(*)	+21.2(*)	+11.3(*)
Subernarekha	+0.5	+0.7	+3.4	+2.4	+3.3	+1.1	+3.4	-0.9
Tapi	+3.5	+4.4	+8.9(*)	+9.1(*)	+8.9(*)	+5.7	+12.3(*)	+4.9
WFR North	+8.6	+17.2(*)	+21.7(*)	+17(*)	+22.7(*)	+17.3(*)	+22.1(*)	+36.6(*)
WFR South	+23.7(*)	+23(*)	+28.9(*)	+21.4(*)	+18.9(*)	+18.4(*)	+35.1(*)	+16.3

S3 Evapotranspiration

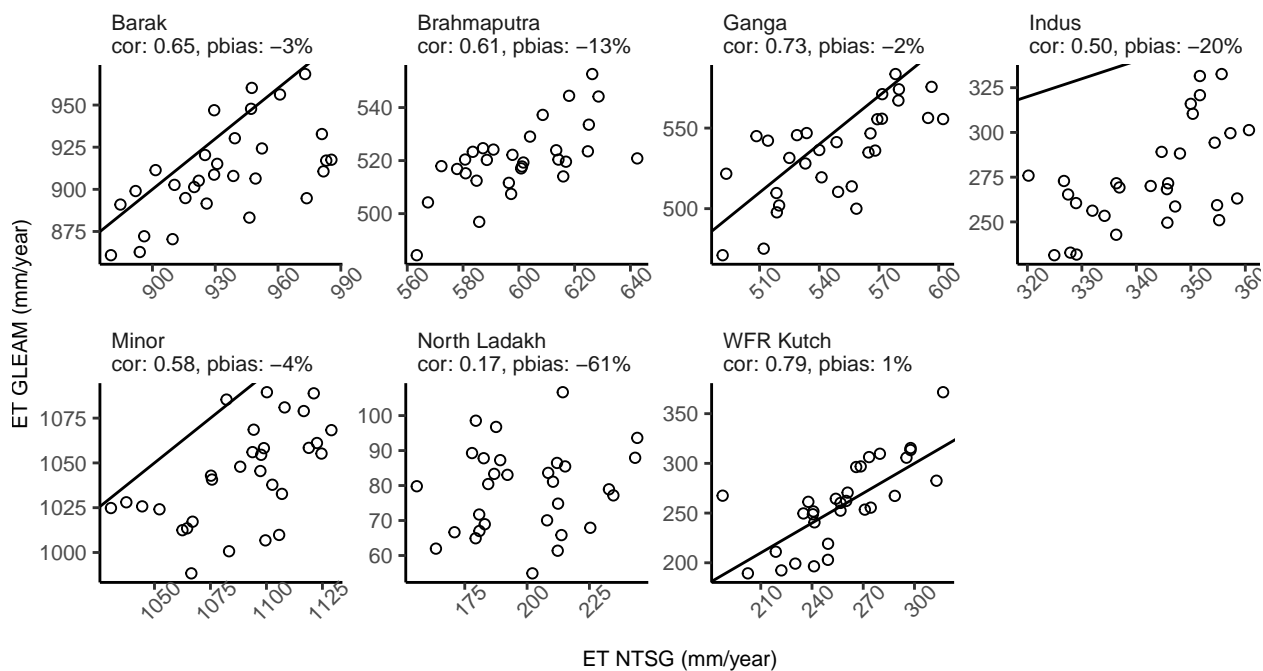


Figure S40: Basin-averaged annual ET from NTSG and GLEAM for the major river basins of Northern India, for the overlap period of WY 1982-2012. The solid line shows the 1:1 correspondence line. 'cor' indicates the Spearman rank correlation, while 'pbias' is the percent bias (GLEAM relative to NTSG).

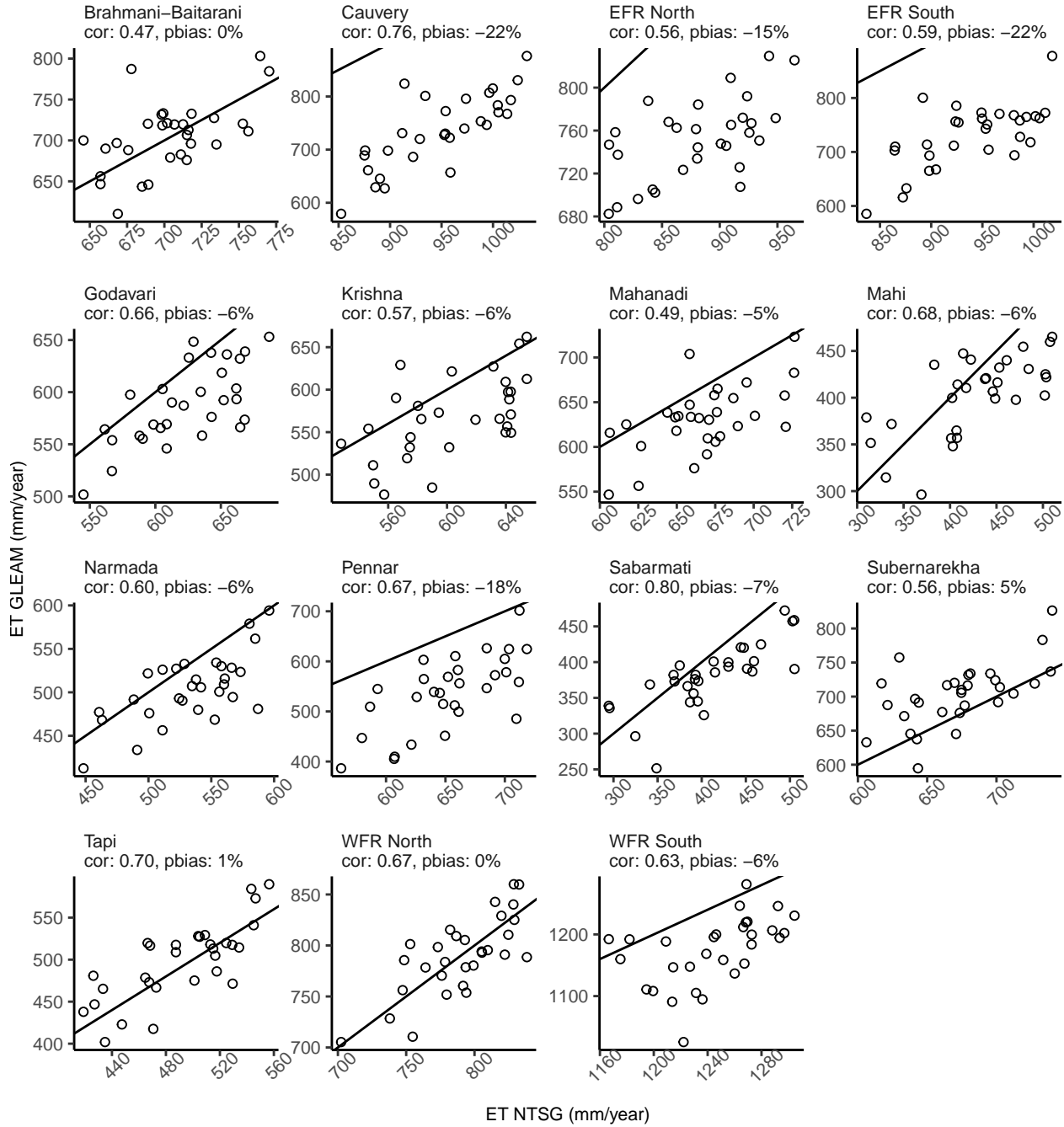
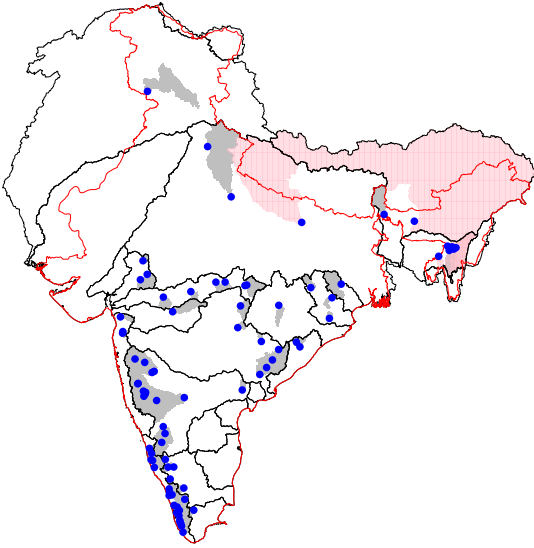


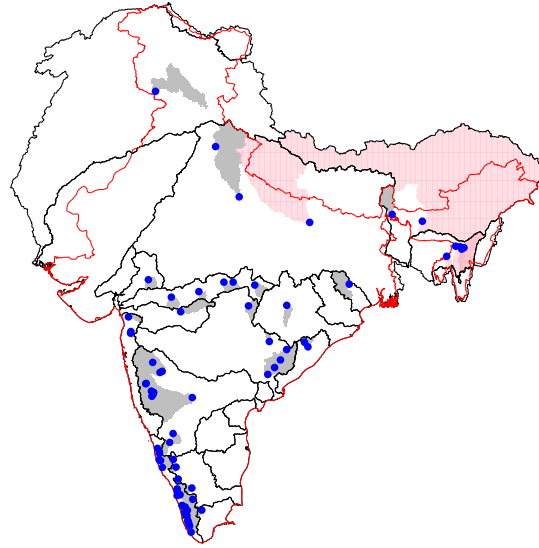
Figure S41: Basin-averaged annual ET from NTSG and GLEAM for the major river basins of Peninsular India, for the overlap period of WY 1982-2012. The solid line shows the 1:1 correspondence line. 'cor' indicates the Spearman rank correlation, while 'pbias' is the percent bias (GLEAM relative to NTSG).

S4 Effect of different heuristics on Scenario II

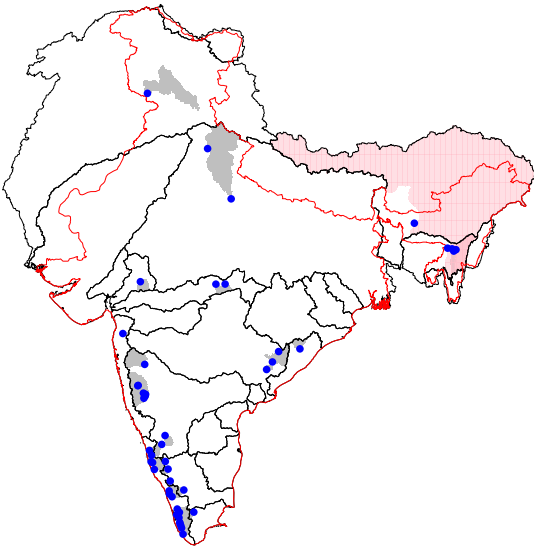
Scenario II: 0.60, 1.10



Scenario II: 0.70, 1.20



Scenario II: 0.80, 1.30



Scenario II: 0.90, 1.40

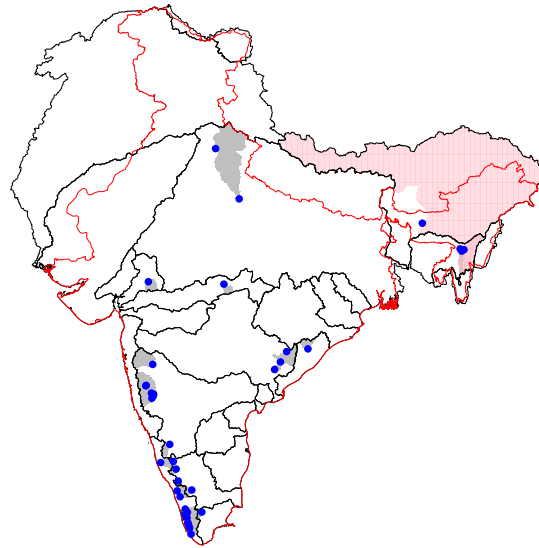


Figure S42: Watersheds where Scenario II is realized when using different sets of heuristics within Eq. 5.

Table S3: Same as Table 3 in the paper, except for heuristics of 0.60 and 1.10 in Scenario II.

Product	North India				Peninsular India			
	Total	Scenario I	Scenario II	% Off-balanced	Total	Scenario I	Scenario II	% Off-balanced
APHRO	782	92	112	26.1%	5,788	349	624	16.8%
CHIRPS	782	76	62	17.6%	6,036	306	515	13.6%
CMORPH	436	61	63	28.4%	3,493	315	281	17.1%
ERA5	782	7	91	12.5%	6,153	245	489	11.9%
GSMAP	382	76	52	33.5%	3,132	441	222	21.2%
IMD-APHRO	782	32	104	17.4%	6,153	414	542	15.5%
IMDAA	782	8	24	4.1%	6,153	179	434	10.0%
IMERG	382	19	39	15.2%	3,132	169	264	13.8%
MSWEP	782	60	95	19.8%	6,153	122	361	7.8%
PERSIANN	782	89	93	23.3%	5,796	767	407	20.3%
SM2RAIN	195	9	24	16.9%	1,784	116	132	13.9%
TERRA	782	75	98	22.1%	6,153	153	451	9.8%

Table S4: Same as Table 3 in the paper, except for heuristics of 0.80 and 1.30 in Scenario II.

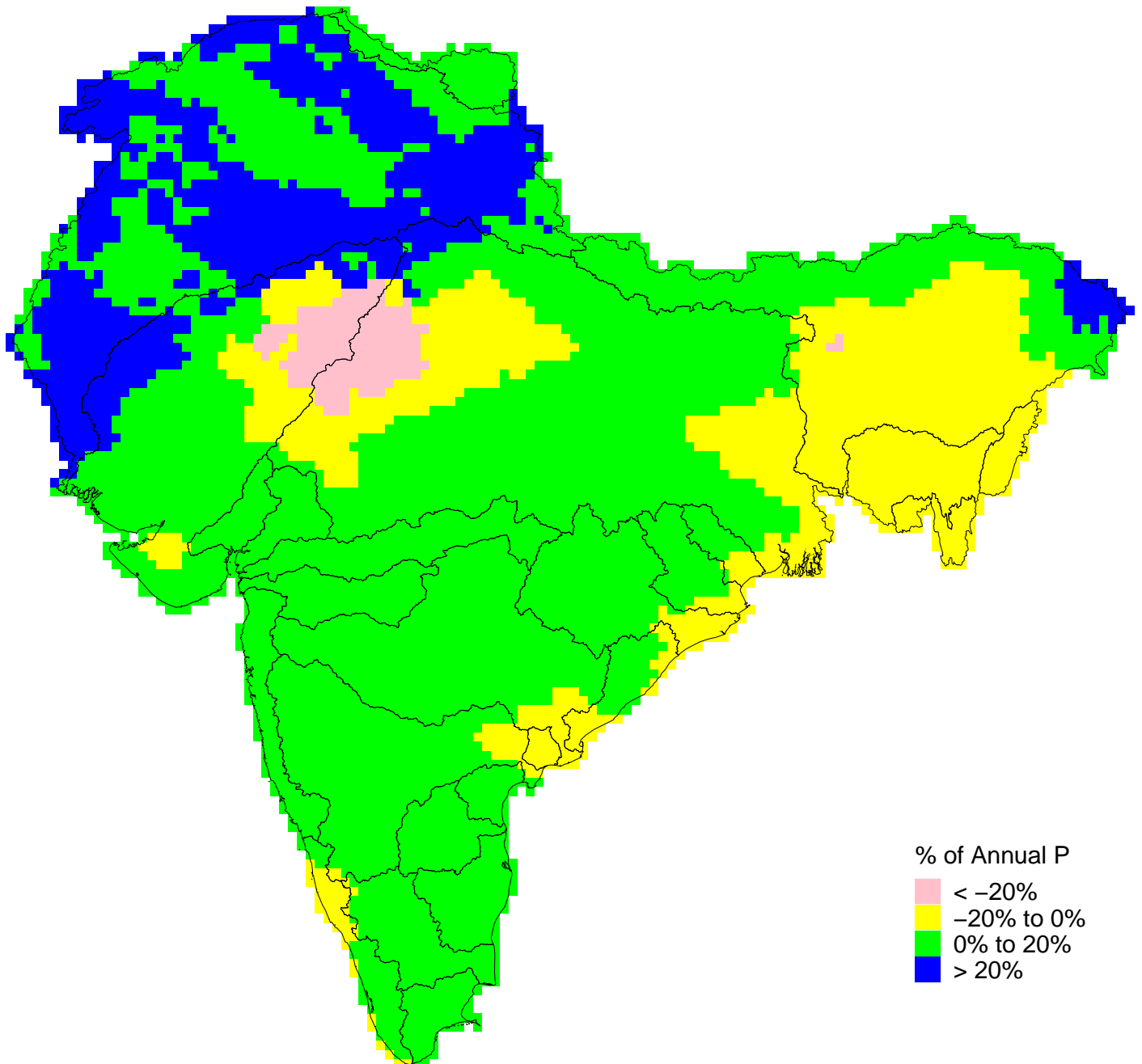
Product	North India				Peninsular India			
	Total	Scenario I	Scenario II	% Off-balanced	Total	Scenario I	Scenario II	% Off-balanced
APHRO	782	92	40	16.9%	5,788	349	203	9.5%
CHIRPS	782	76	25	12.9%	6,036	306	150	7.5%
CMORPH	436	61	18	18.1%	3,493	315	113	12.2%
ERA5	782	7	16	2.9%	6,153	245	139	6.2%
GSMAP	382	76	27	27.0%	3,132	441	84	16.8%
IMD-APHRO	782	32	28	7.7%	6,153	414	206	10.1%
IMDAA	782	8	4	1.5%	6,153	179	102	4.6%
IMERG	382	19	7	6.8%	3,132	169	83	8.1%
MSWEP	782	60	23	10.6%	6,153	122	89	3.4%
PERSIANN	782	89	43	16.9%	5,796	767	157	15.9%
SM2RAIN	195	9	7	8.2%	1,784	116	39	8.7%
TERRA	782	75	29	13.3%	6,153	153	102	4.1%

Table S5: Same as Table 3 in the paper, except for heuristics of 0.90 and 1.40 in Scenario II.

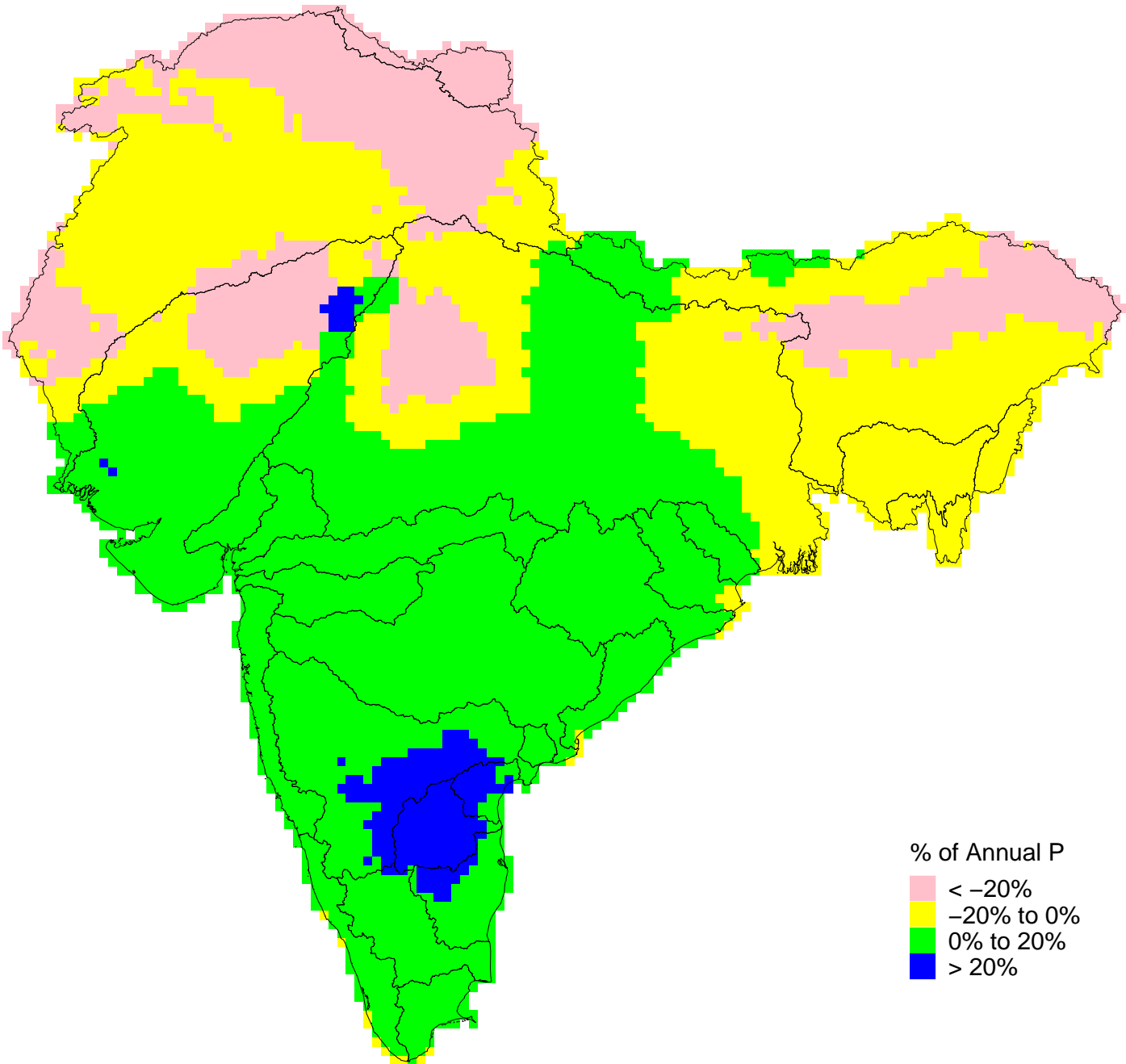
Product	North India				Peninsular India			
	Total	Scenario I	Scenario II	% Off-balanced	Total	Scenario I	Scenario II	% Off-balanced
APHRO	782	92	15	13.7%	5,788	349	79	7.4%
CHIRPS	782	76	9	10.9%	6,036	306	44	5.8%
CMORPH	436	61	6	15.4%	3,493	315	46	10.3%
ERA5	782	7	2	1.1%	6,153	245	35	4.5%
GSMAP	382	76	14	23.6%	3,132	441	37	15.3%
IMD-APHRO	782	32	11	5.5%	6,153	414	80	8.0%
IMDAA	782	8	1	1.1%	6,153	179	30	3.4%
IMERG	382	19	1	5.2%	3,132	169	34	6.5%
MSWEP	782	60	10	8.9%	6,153	122	33	2.5%
PERSIANN	782	89	17	13.6%	5,796	767	64	14.3%
SM2RAIN	195	9	1	5.1%	1,784	116	19	7.6%
TERRA	782	75	13	11.2%	6,153	153	32	3.0%

S5 Annual Changes in TWS

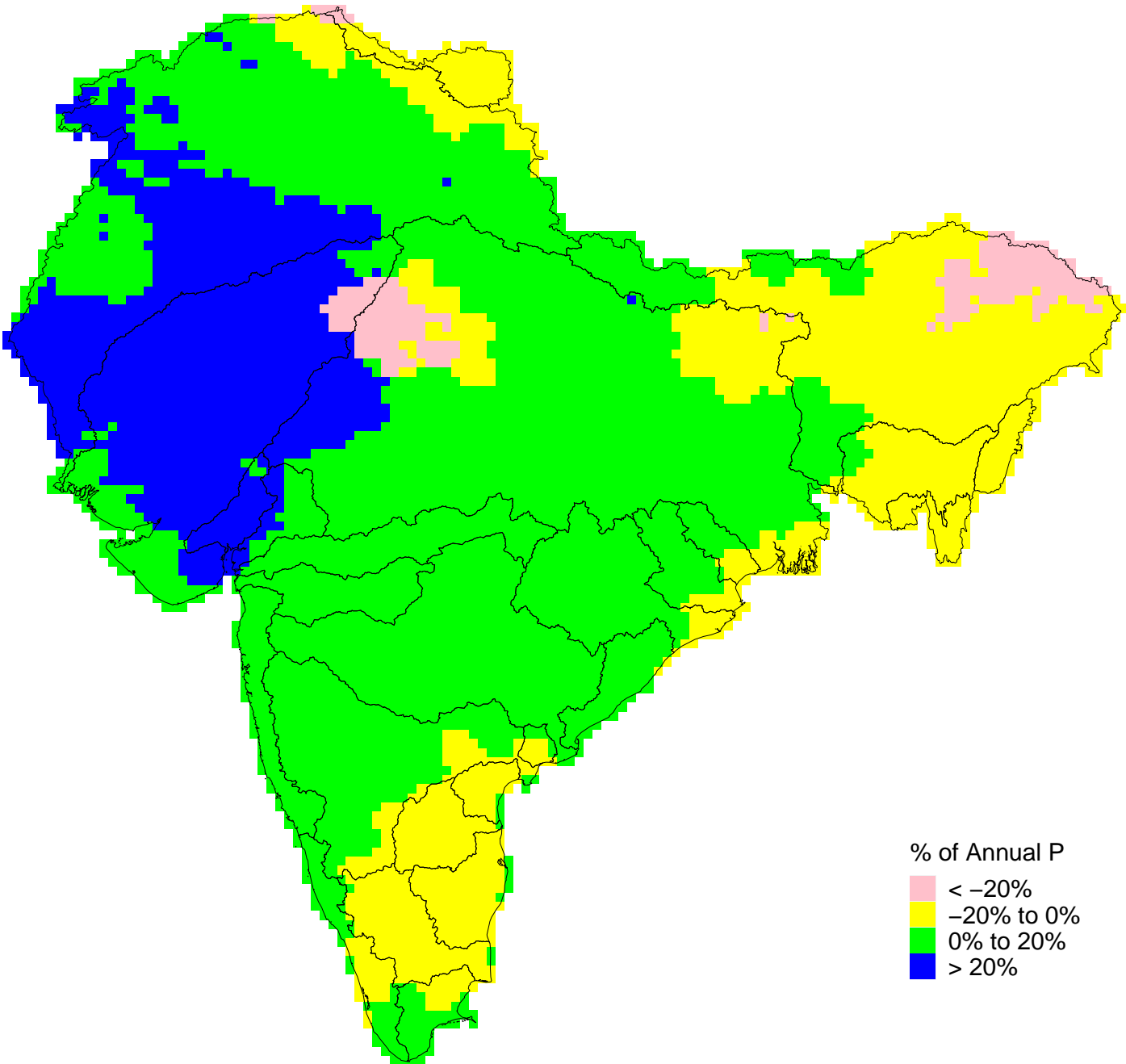
Delta TWS, WY 2004



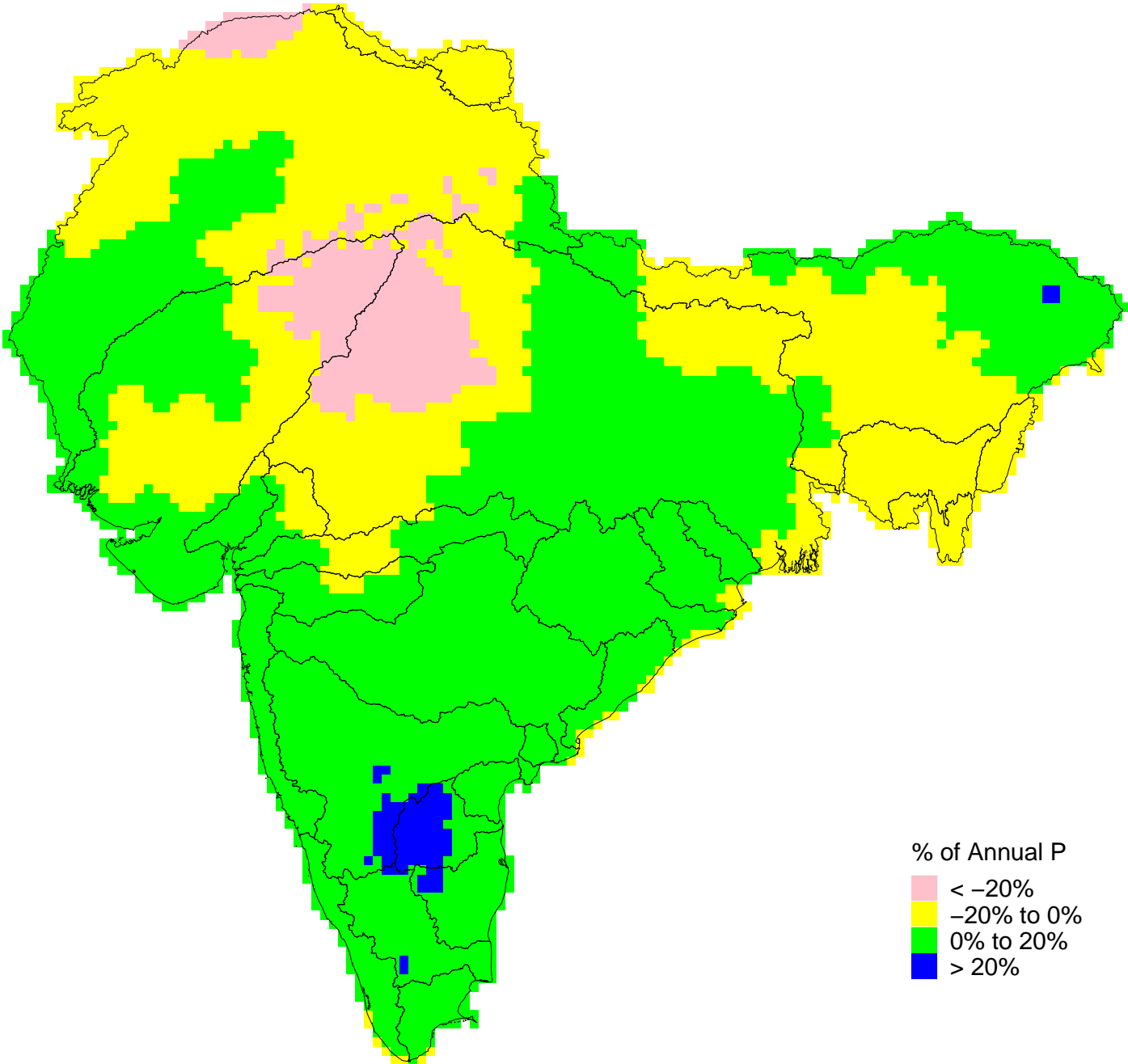
Delta TWS, WY 2005



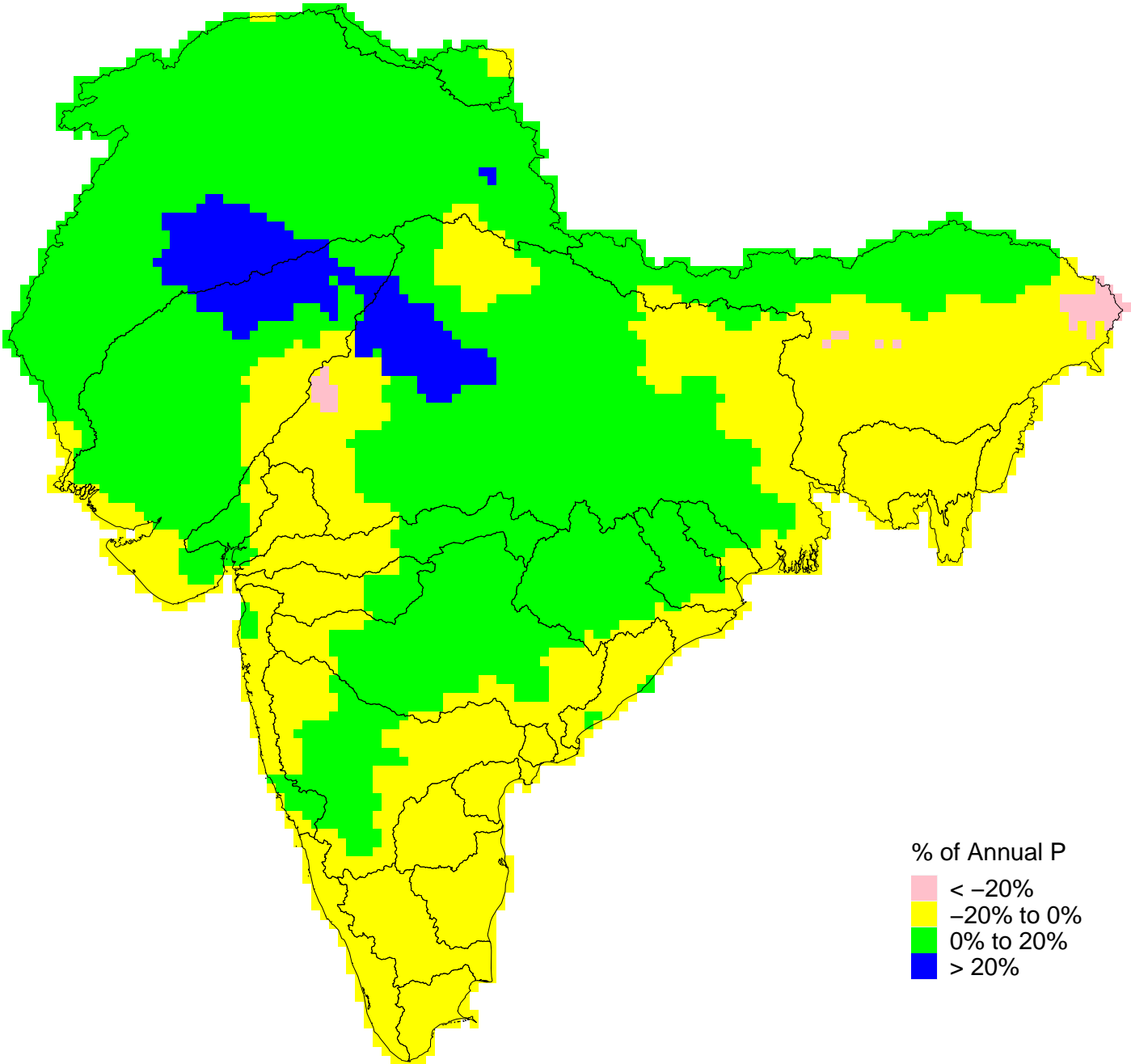
Delta TWS, WY 2006



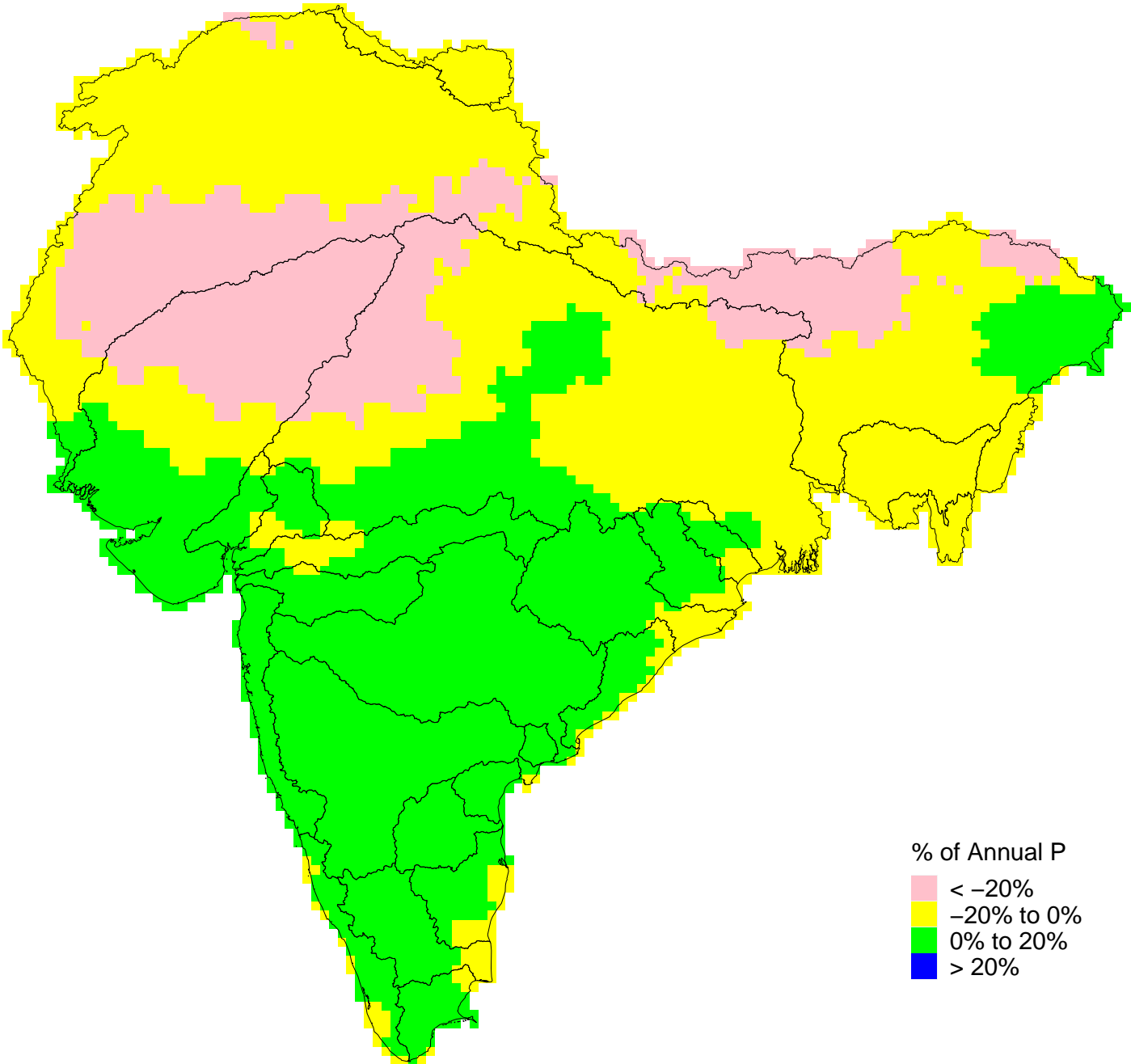
Delta TWS, WY 2007



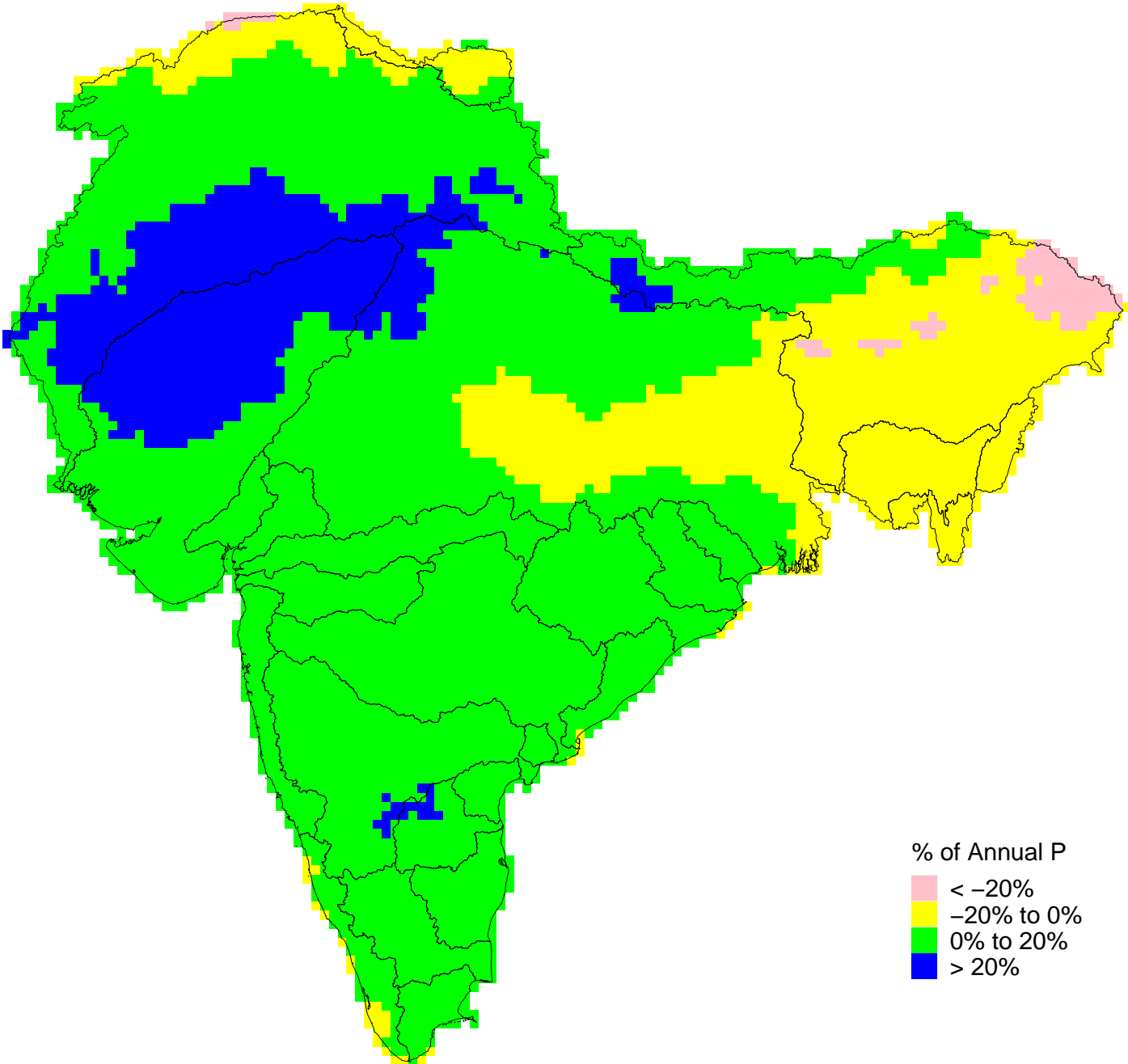
Delta TWS, WY 2008



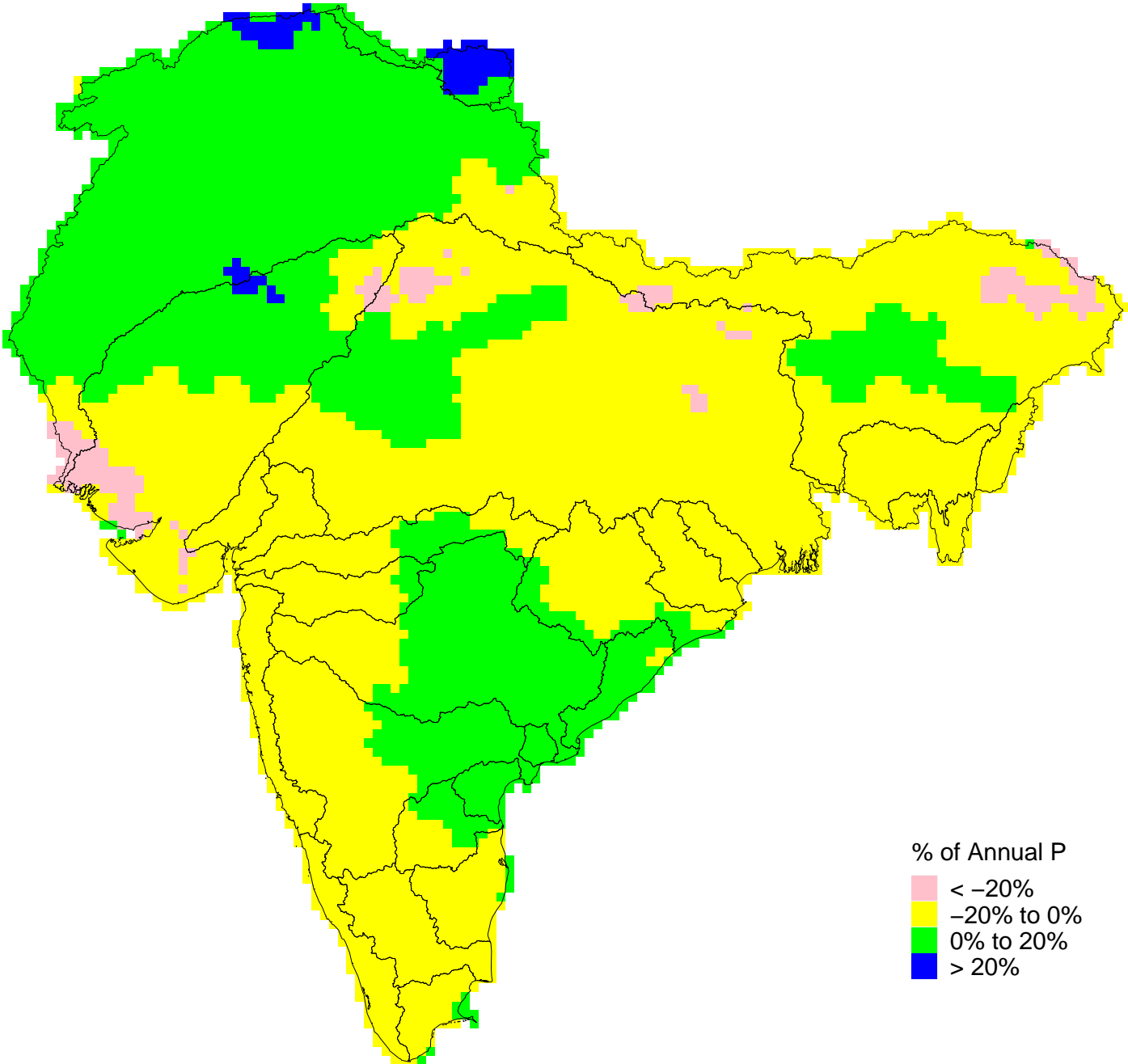
Delta TWS, WY 2009



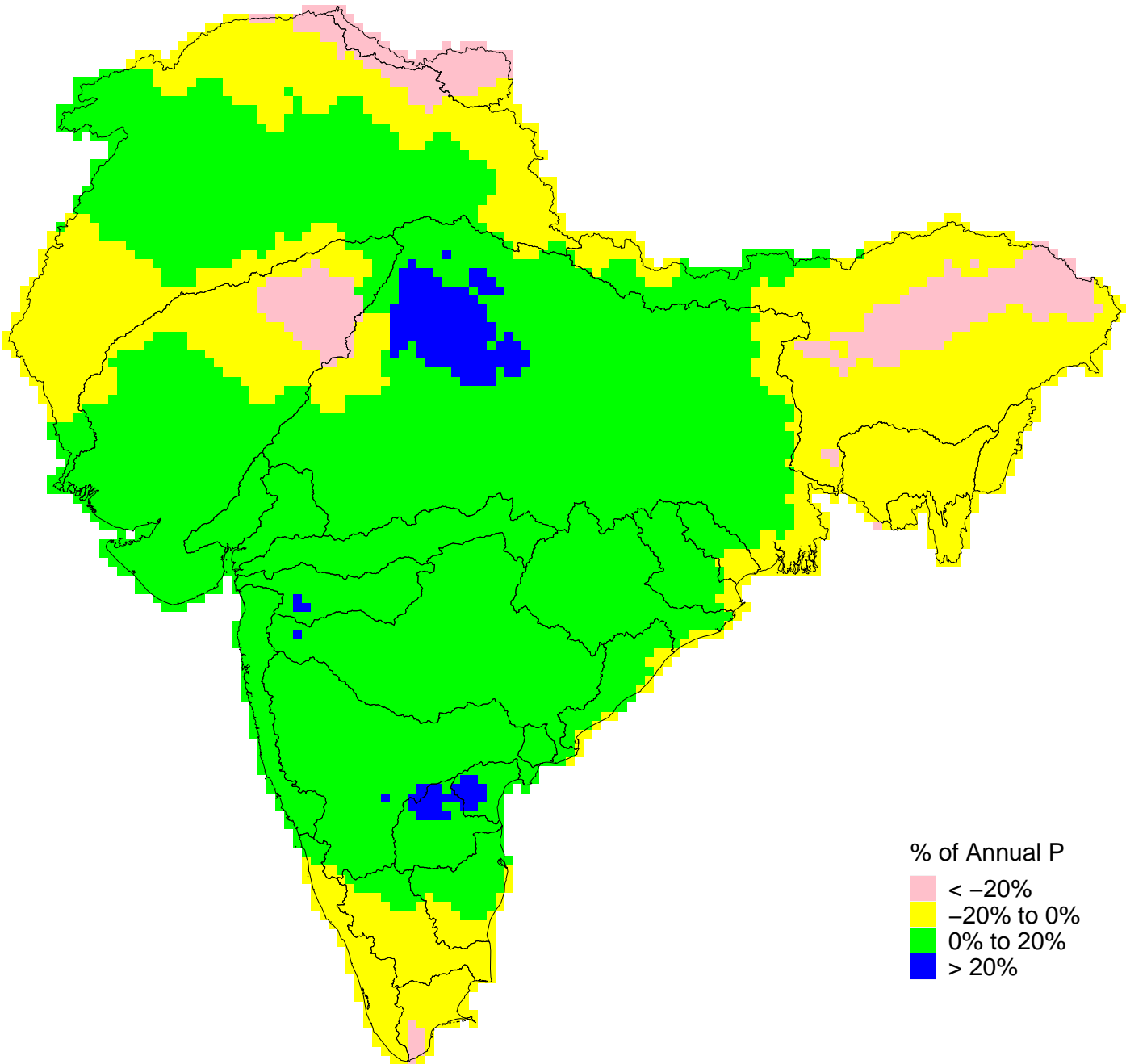
Delta TWS, WY 2010



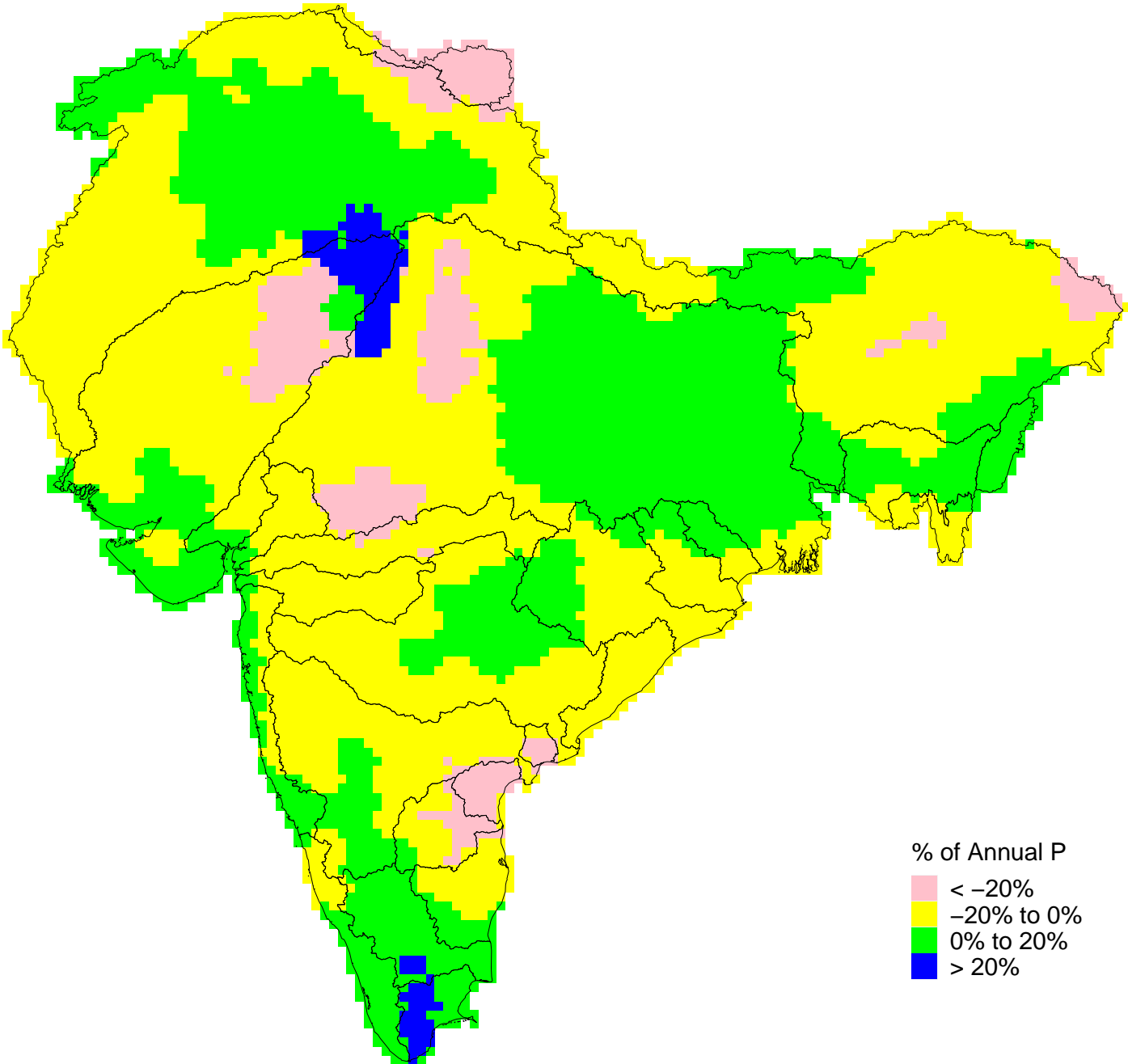
Delta TWS, WY 2012



Delta TWS, WY 2013

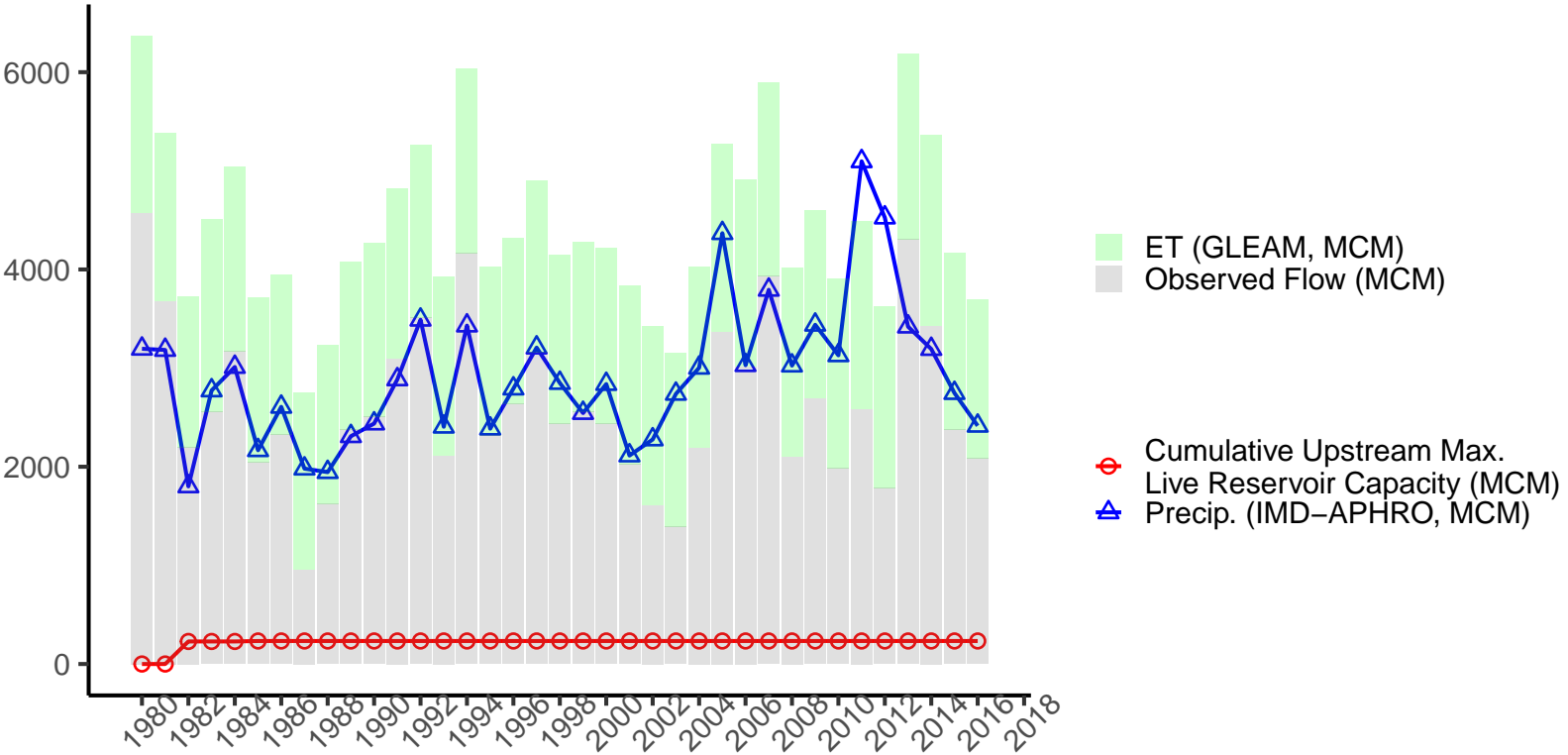


Delta TWS, WY 2014

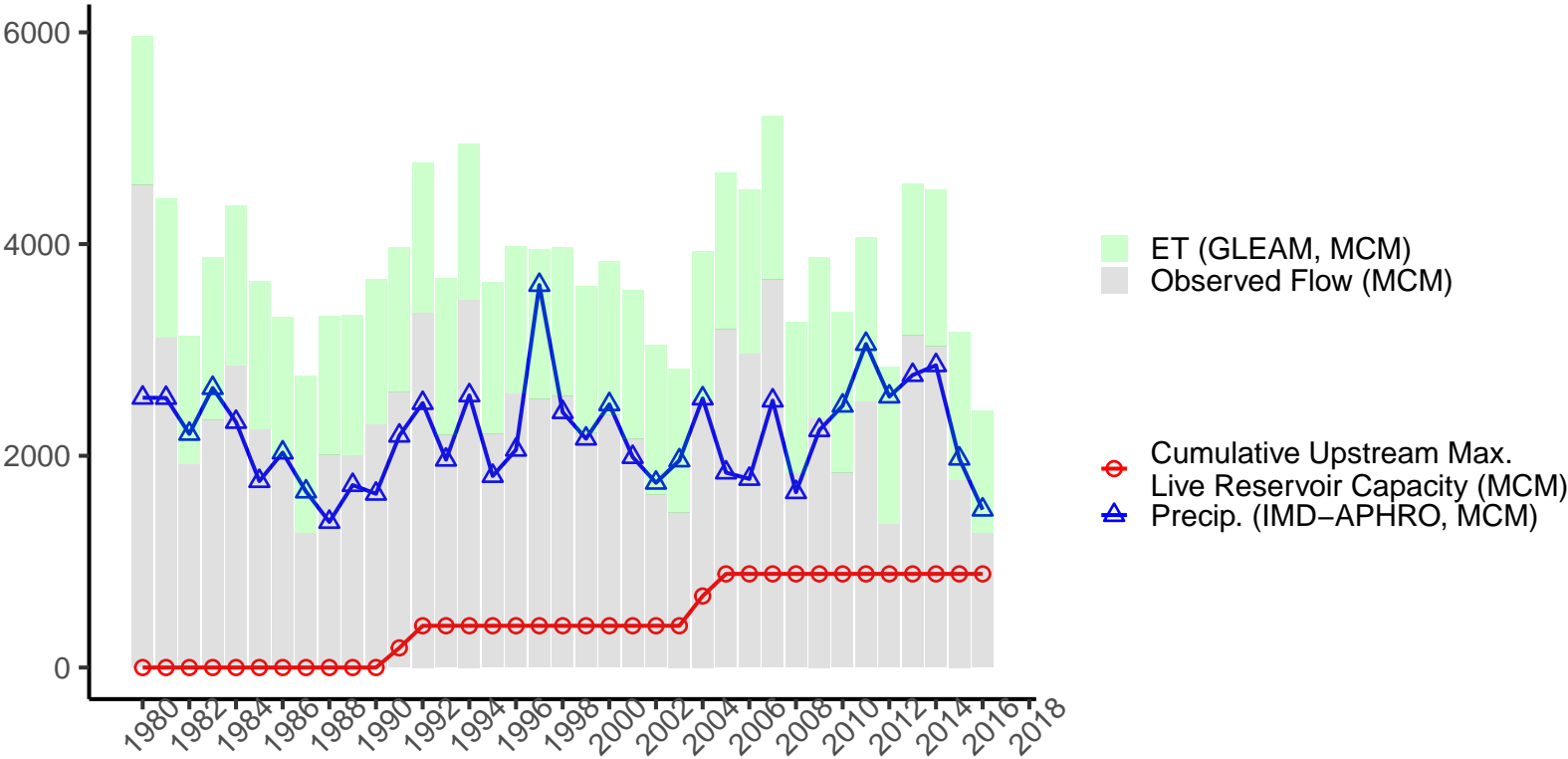


S6 Time series charts

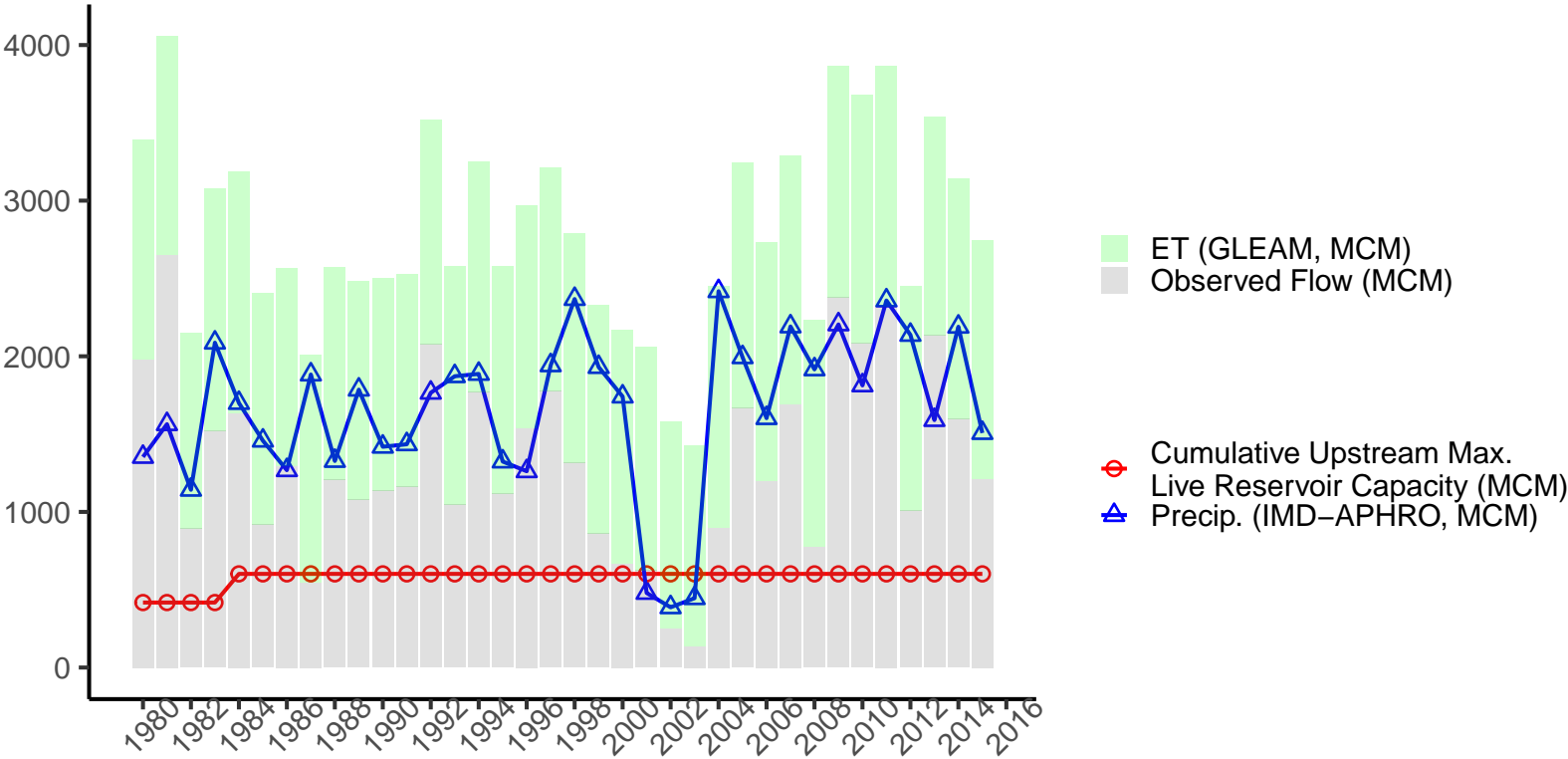
Station: Kudige, River: Cauvery
GHI ID: cauv_kudig, Catch. Area: 1743 sq. km



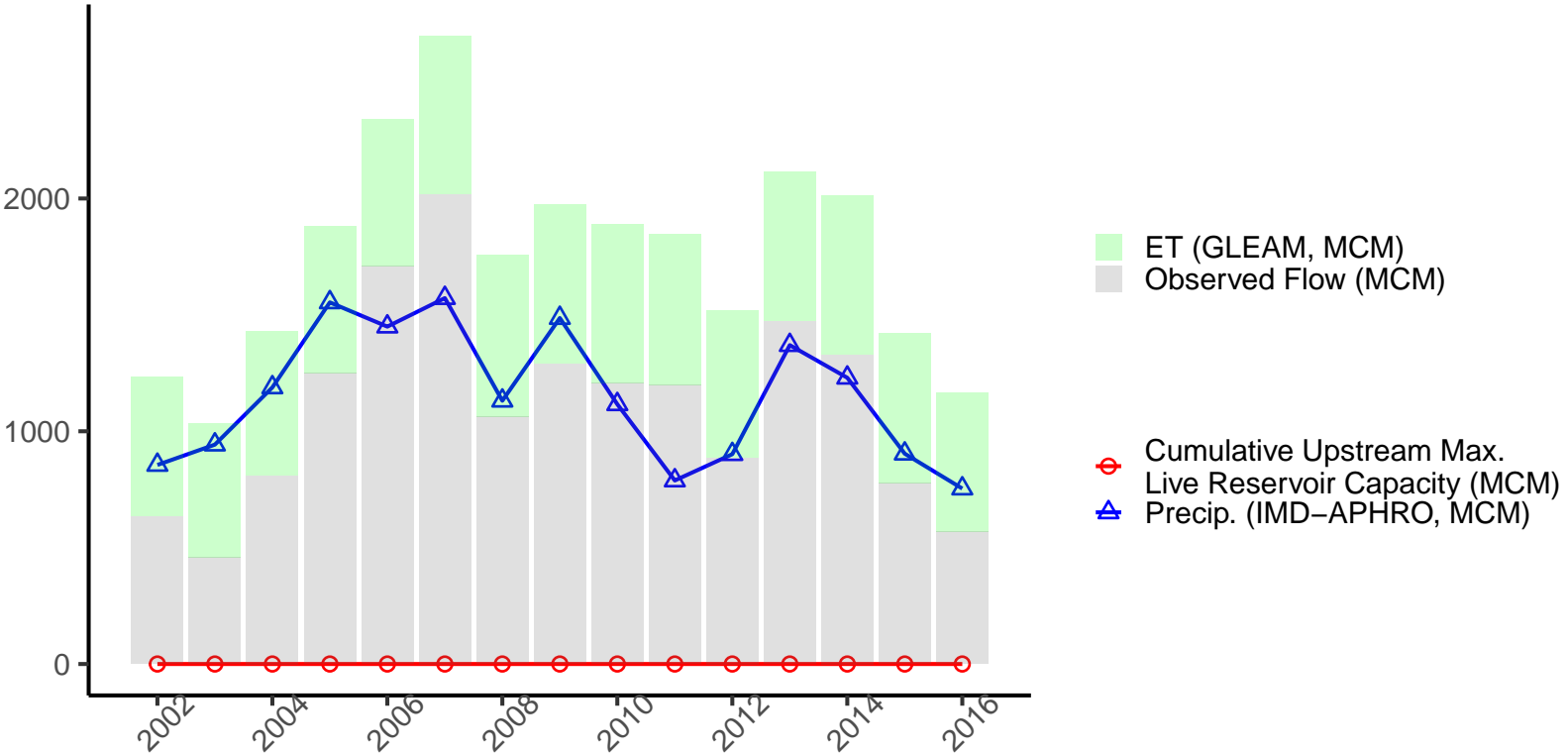
Station: Muthankera, River: Cauvery/Kabini
GHI ID: cauv_mutha, Catch. Area: 1235 sq. km



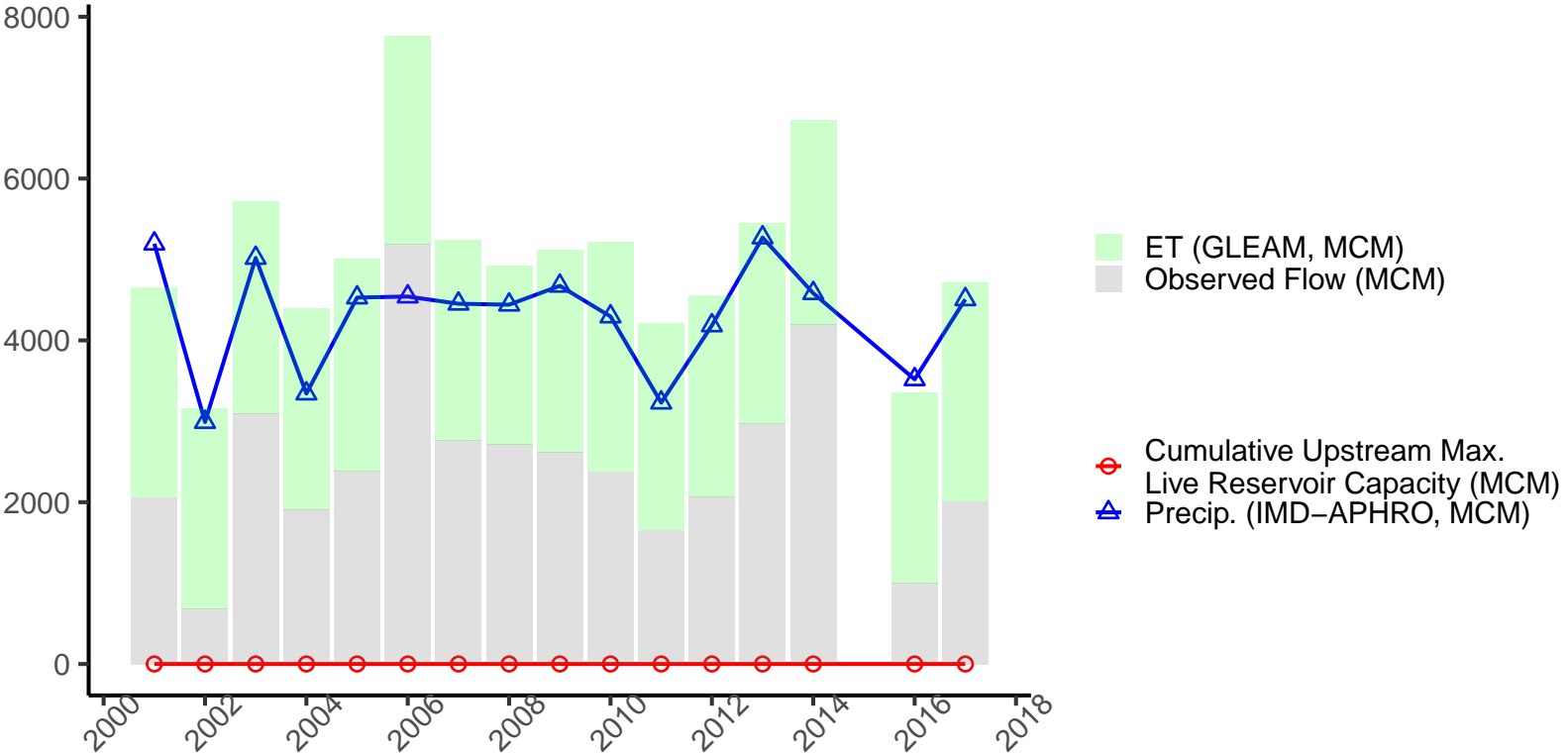
Station: Nellithurai, River: Cauvery/Bhavani
GHI ID: cauv_nelli, Catch. Area: 1499 sq. km



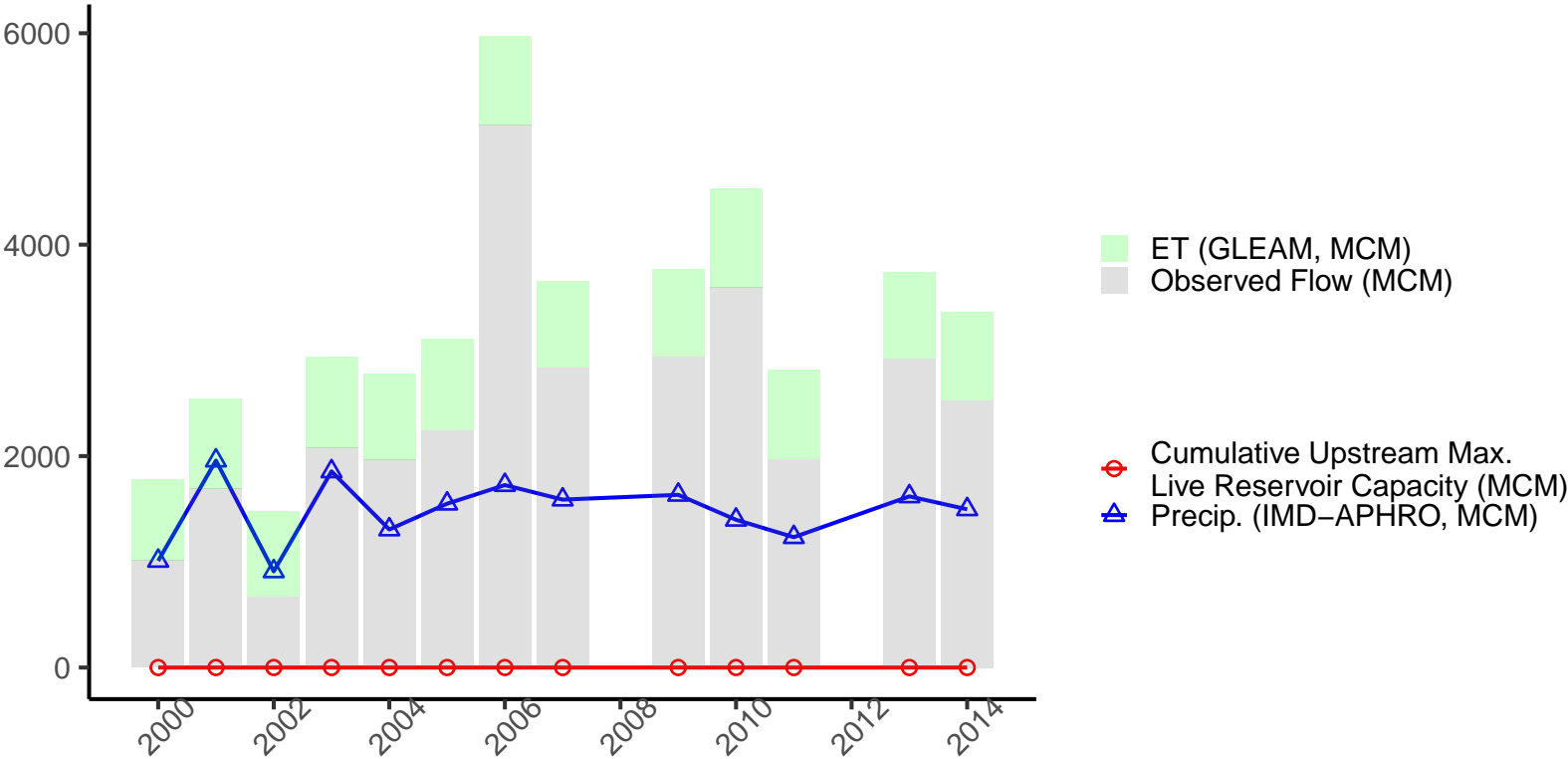
Station: Sakleshpur, River: Cauvery/Hemavati
GHI ID: cauv_sakle, Catch. Area: 616 sq. km



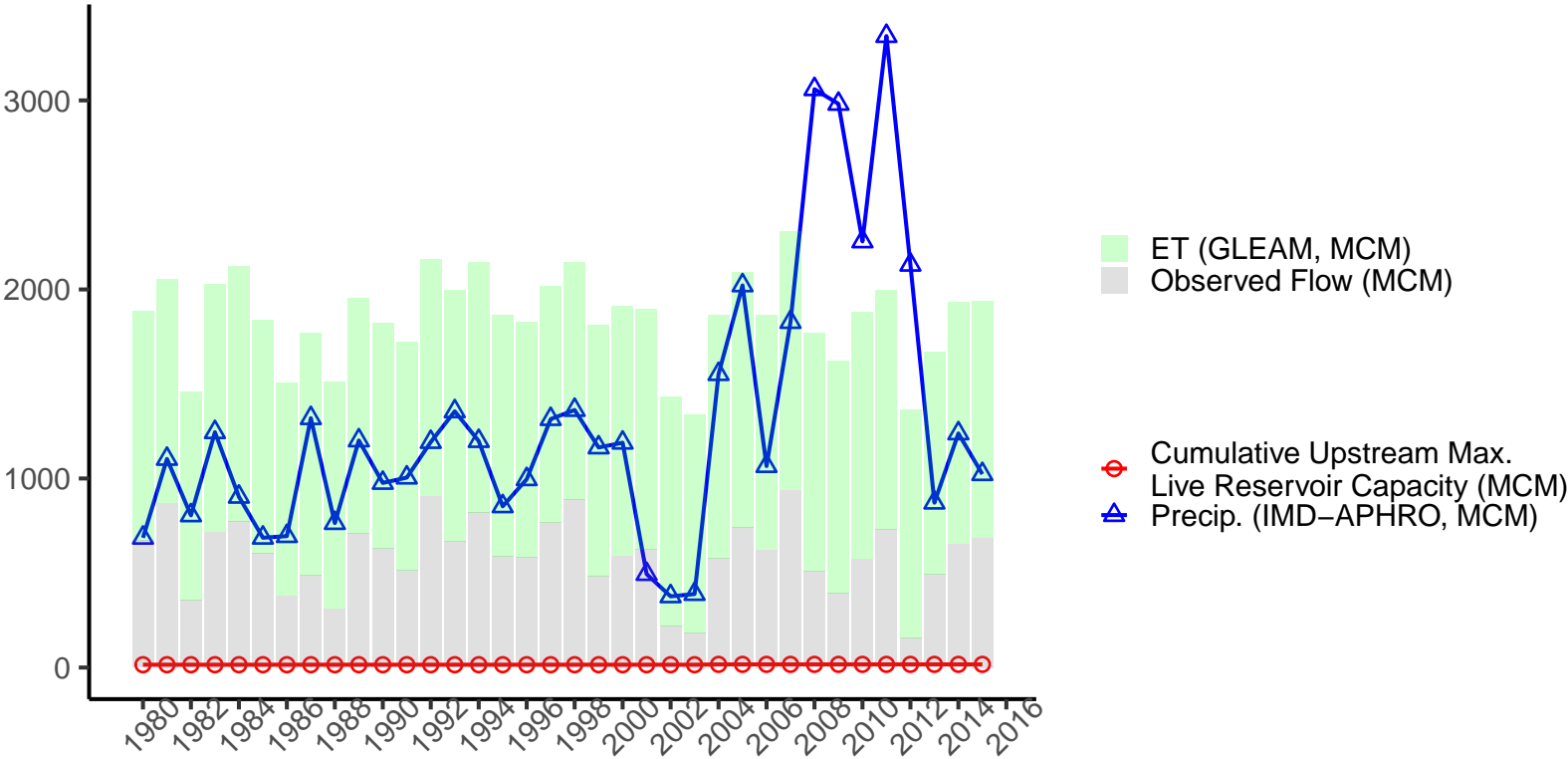
Station: Gudari, River: Vamsadhara
GHI ID: efrn_gudar, Catch. Area: 3147 sq. km



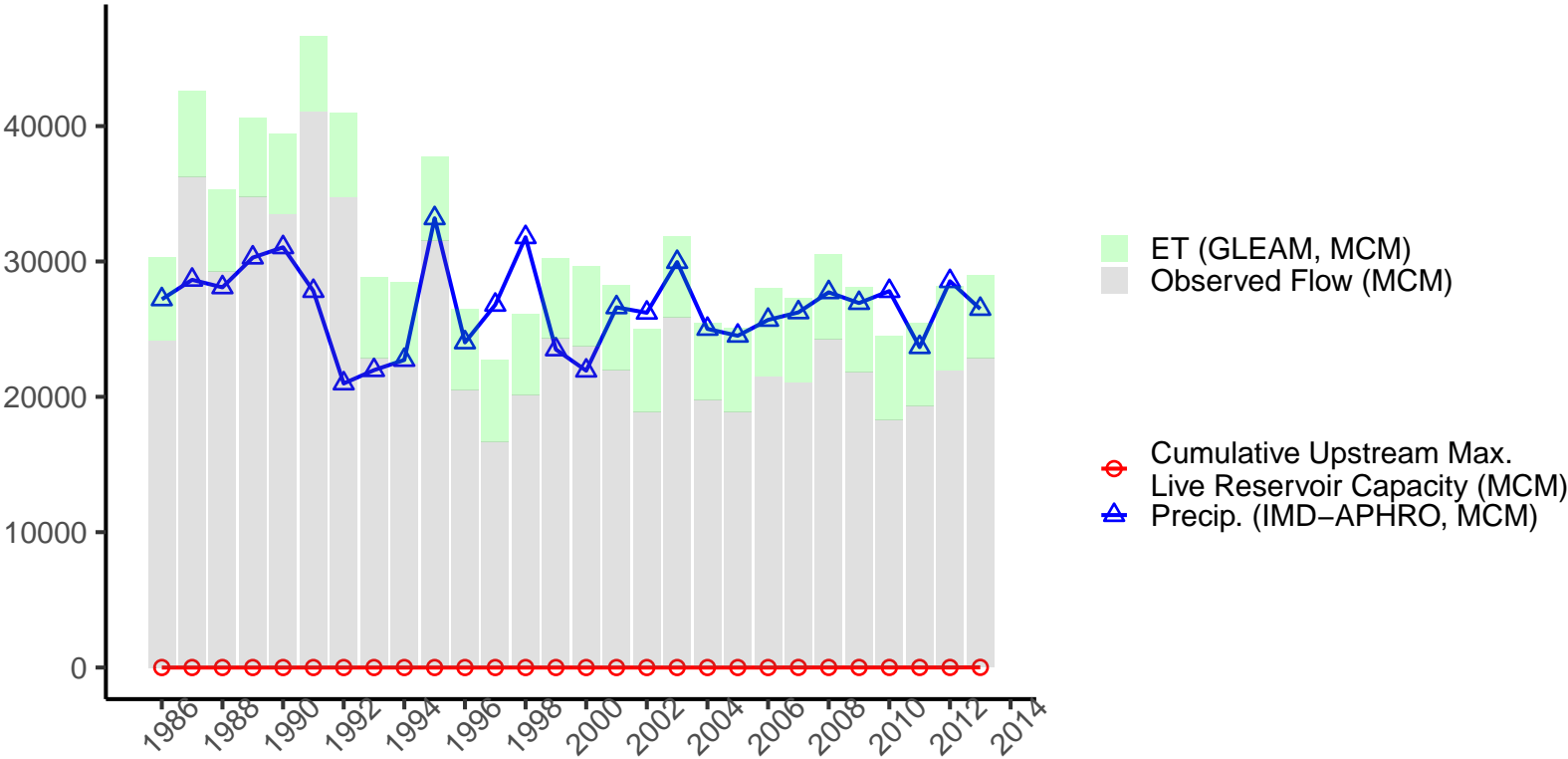
Station: Kutragada, River: Vamsadhara
GHI ID: efrn_kutra, Catch. Area: 1080 sq. km



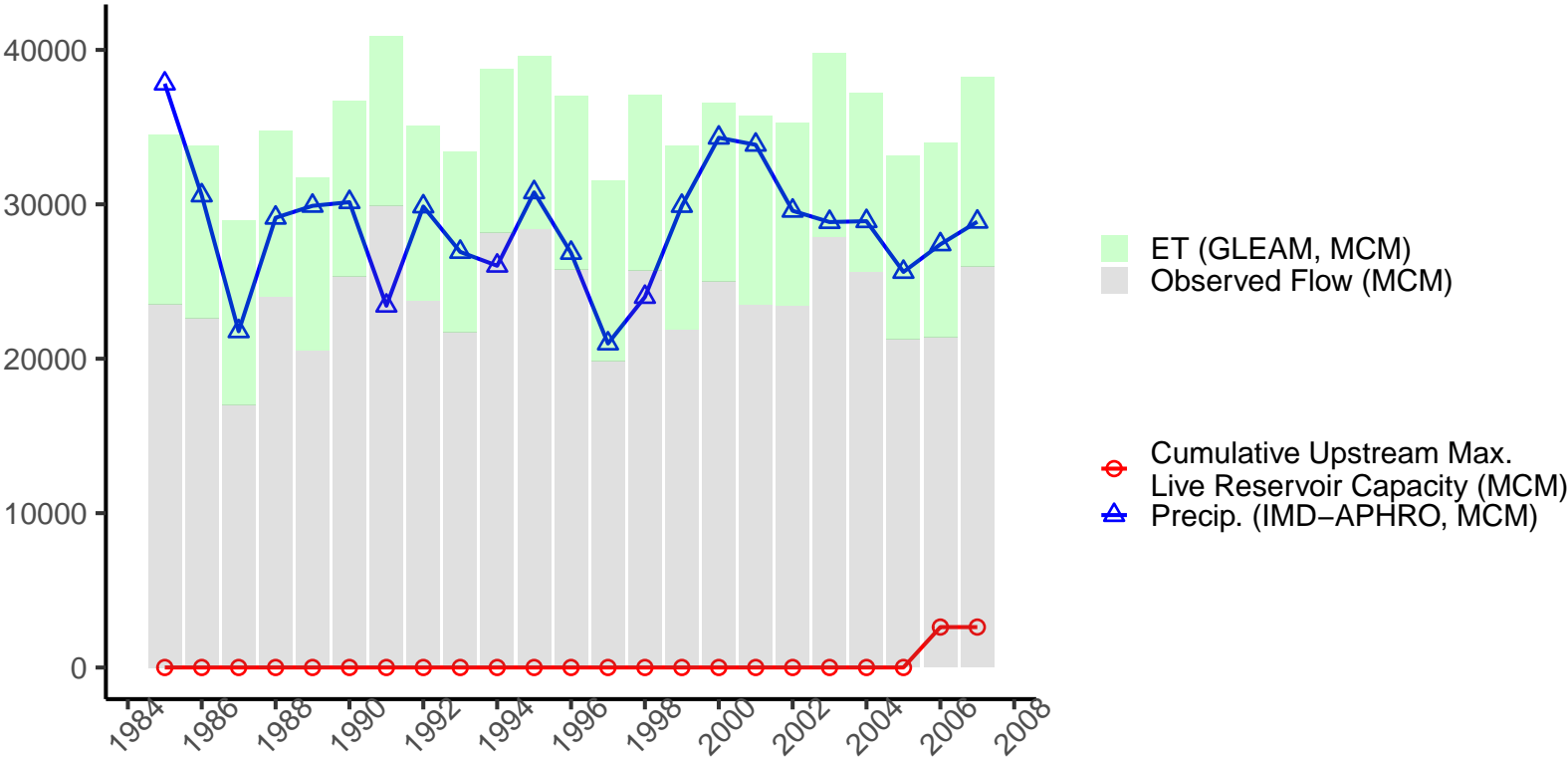
Station: Theni, River: Vaigai/Suruliar
GHI ID: efrs_theni, Catch. Area: 1364 sq. km



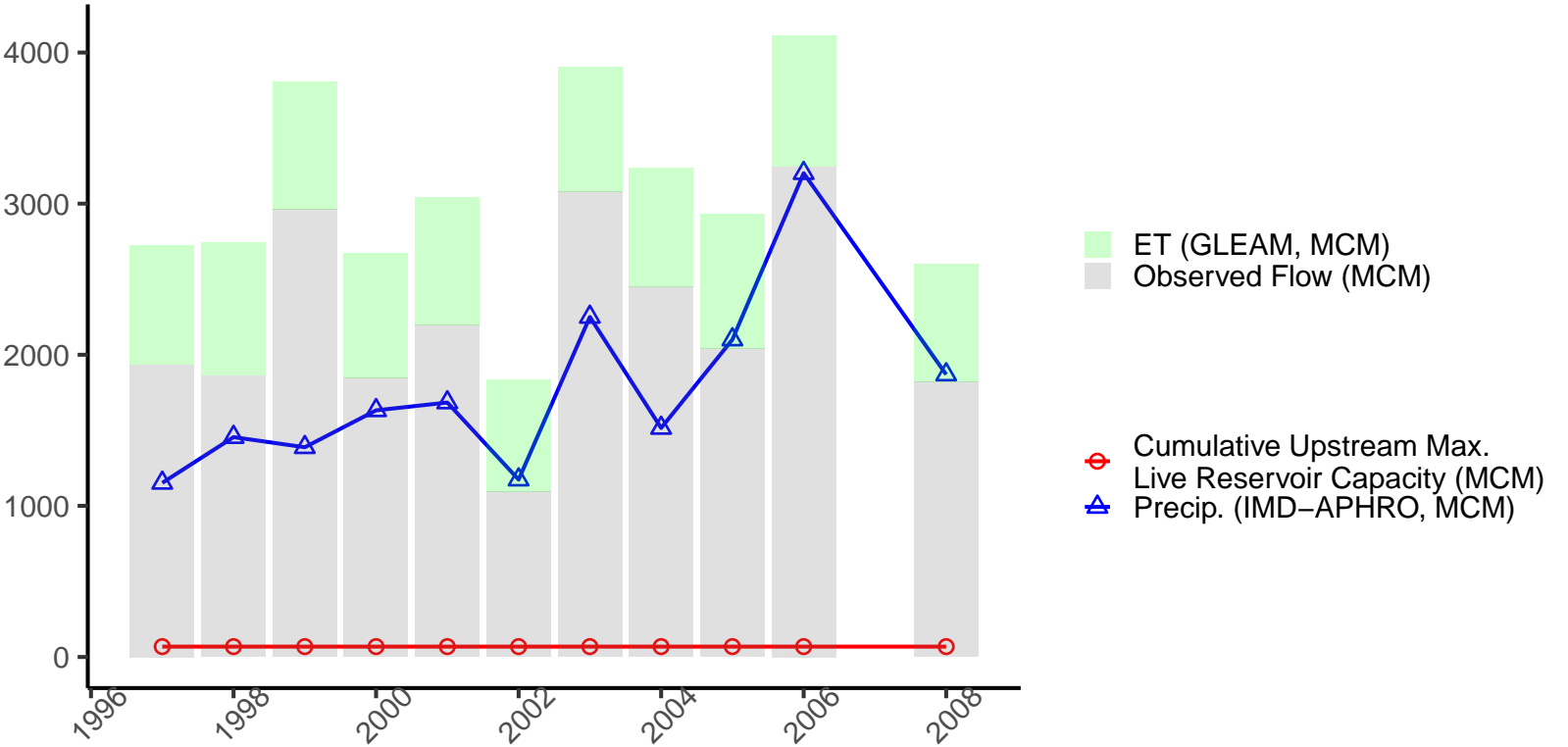
Station: Domohani, River: Brahmaputra/Teesta
GHI ID: gbm_x_domoh, Catch. Area: 9648 sq. km



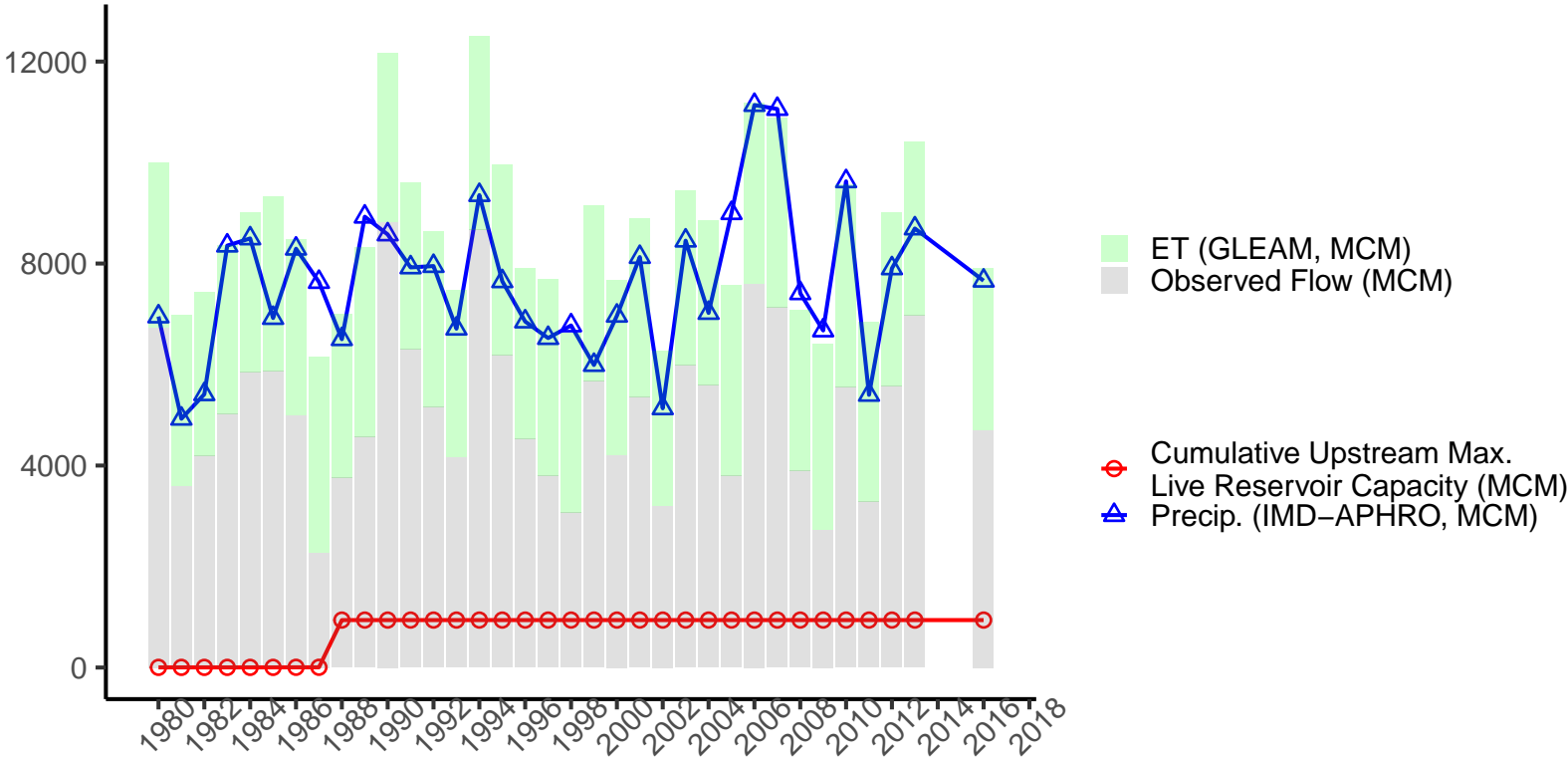
Station: Rishikesh, River: Ganga
GHI ID: gbm_x_rishi, Catch. Area: 21897 sq. km



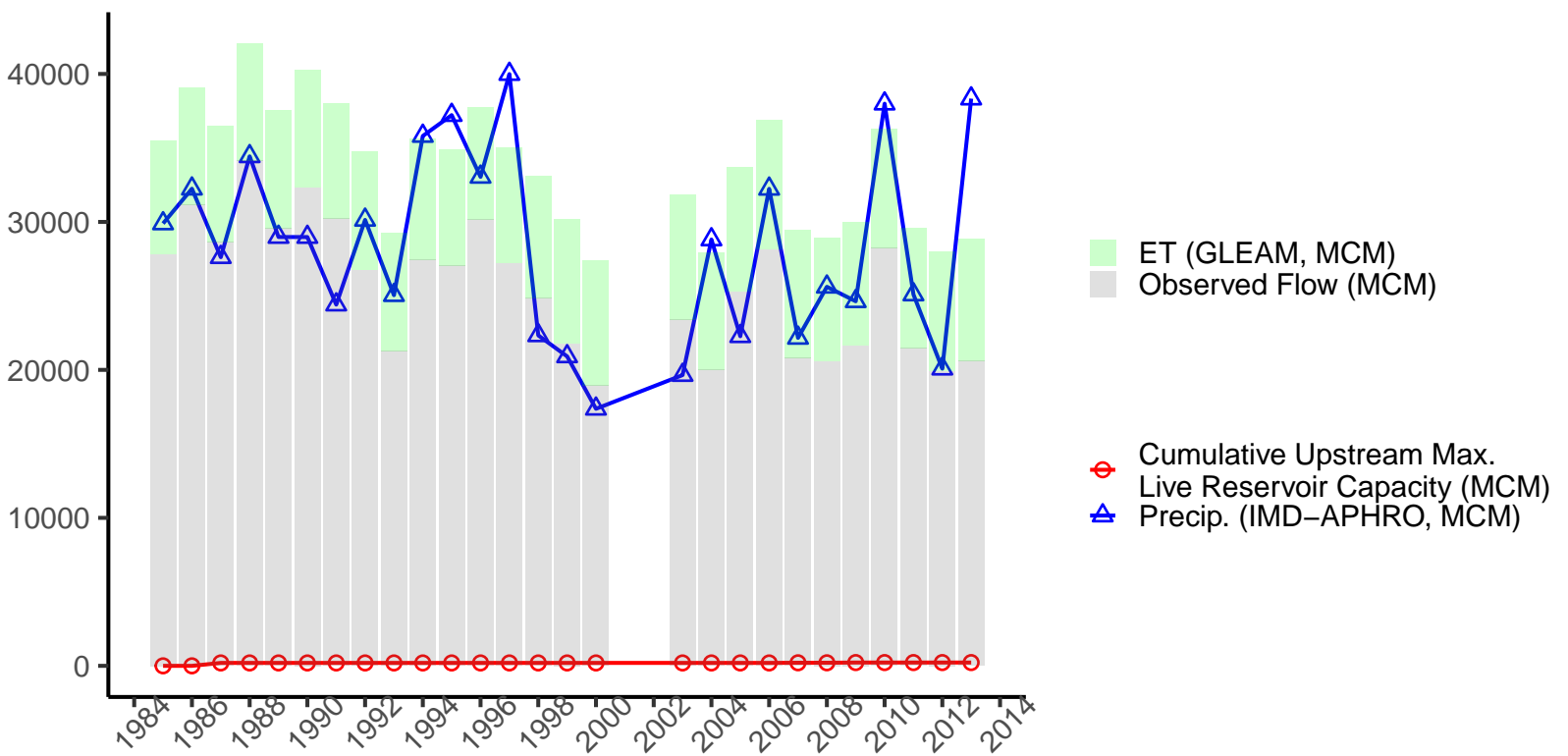
Station: Potteru (Seasonal), River: Godavari/Sabari/Potteru Vagu
GHI ID: goda_potte, Catch. Area: 1175 sq. km



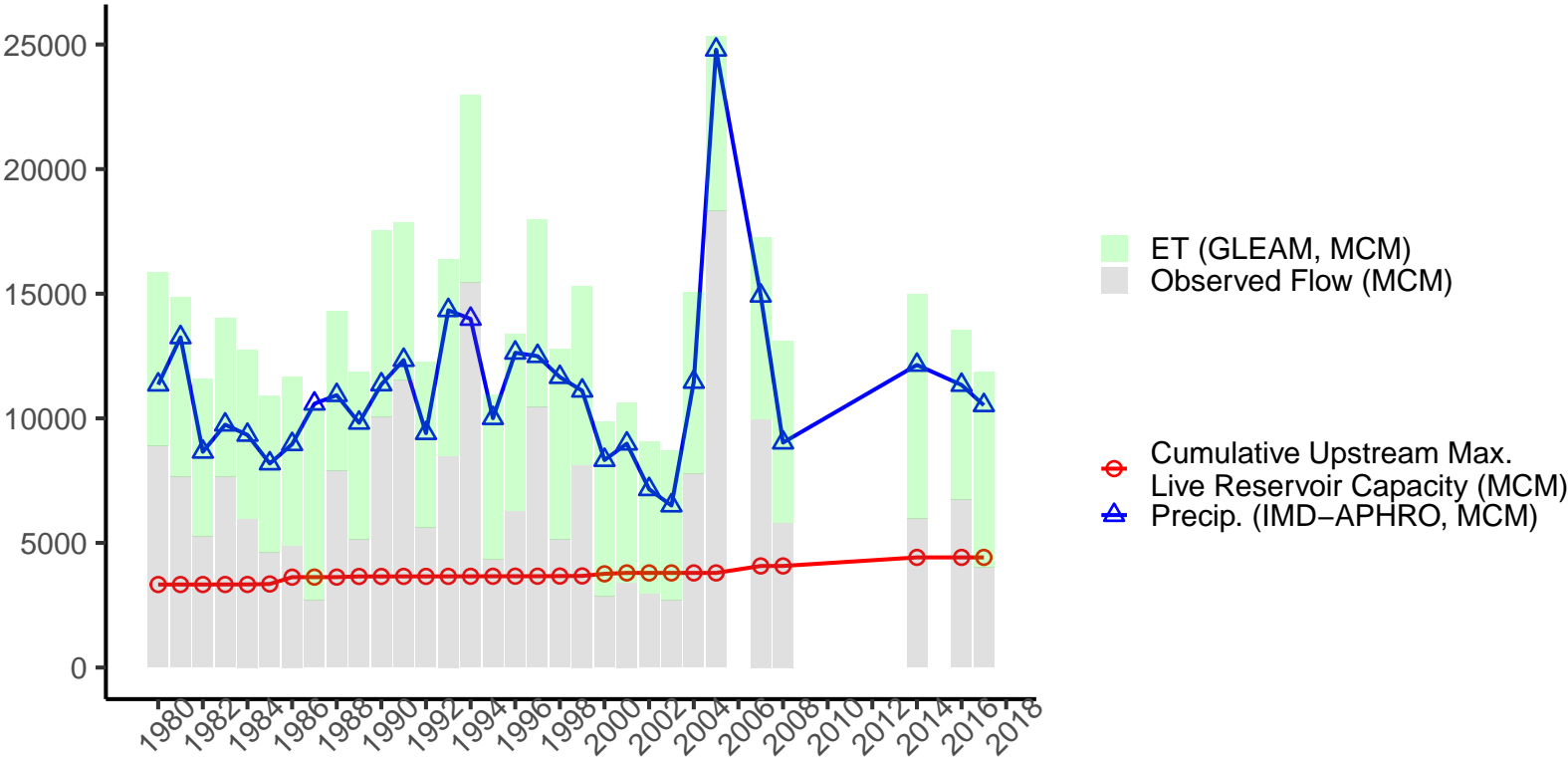
Station: Saradaput, River: Godavari/Sabari
GHI ID: goda_sarad, Catch. Area: 5098 sq. km



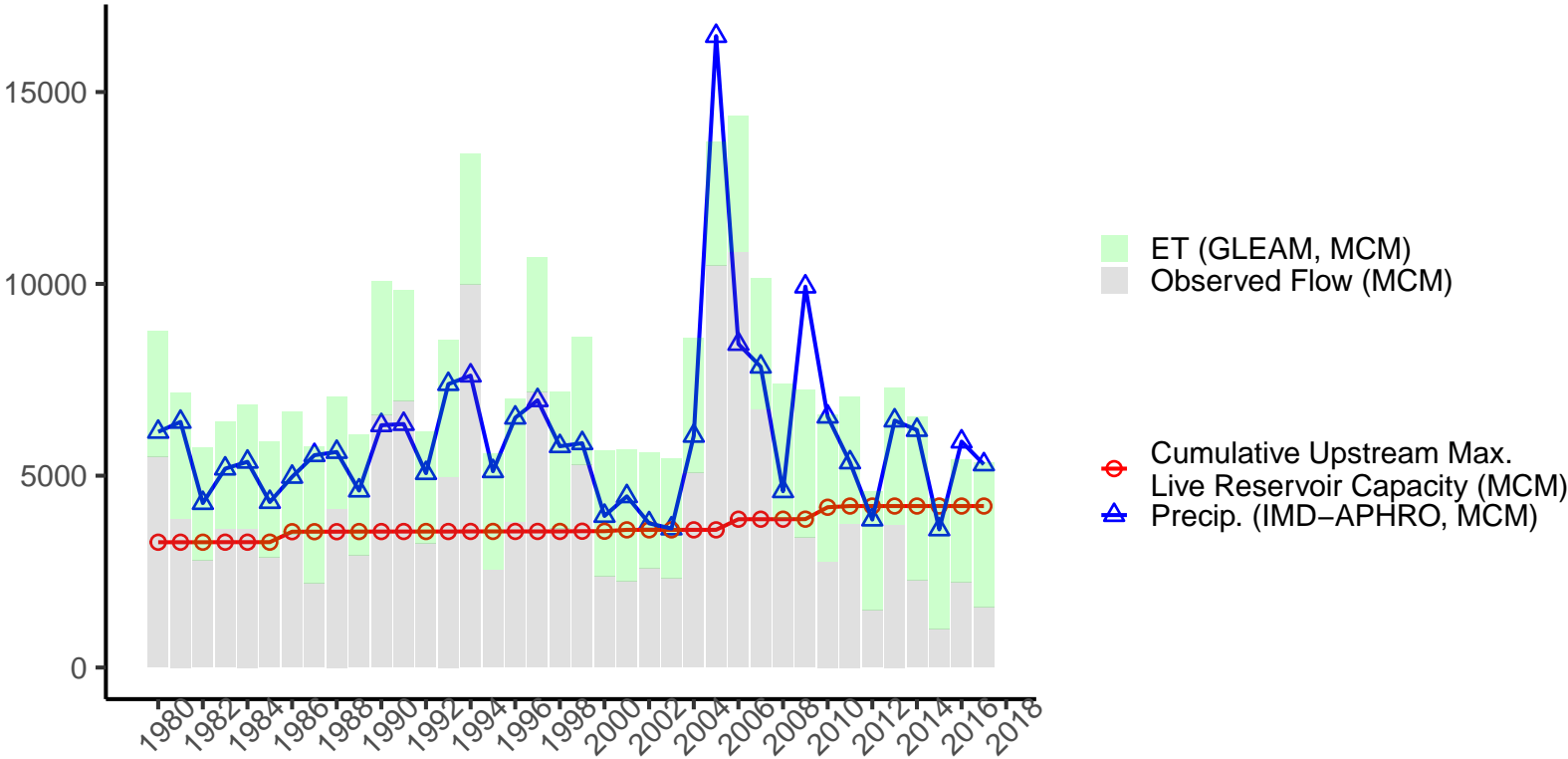
Station: Akhnoor, River: Chenab
GHI ID: indu_akhno, Catch. Area: 22691 sq. km



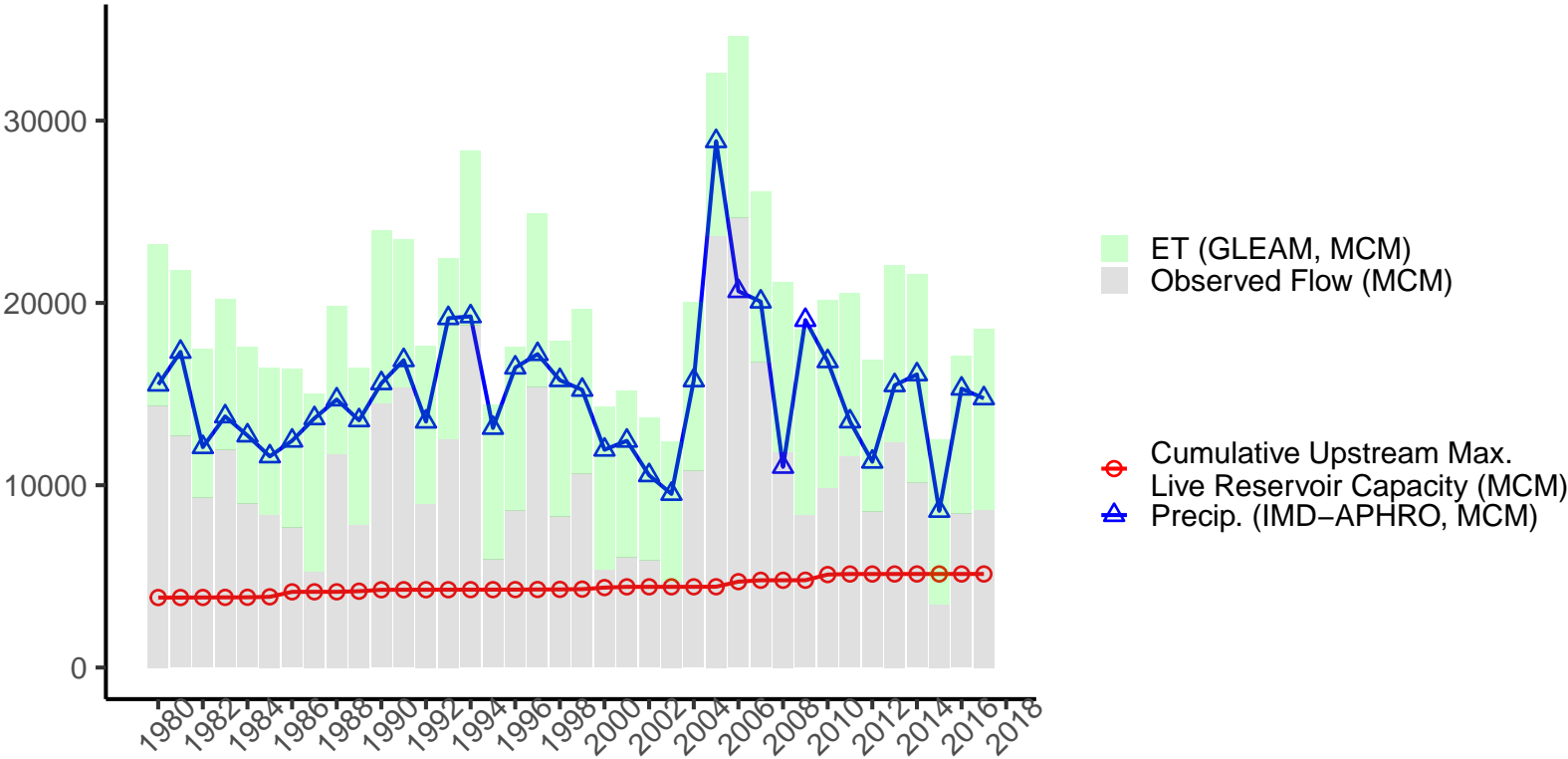
Station: Arjunwad (Seasonal), River: Krishna
GHI ID: kris_arjun, Catch. Area: 12280 sq. km



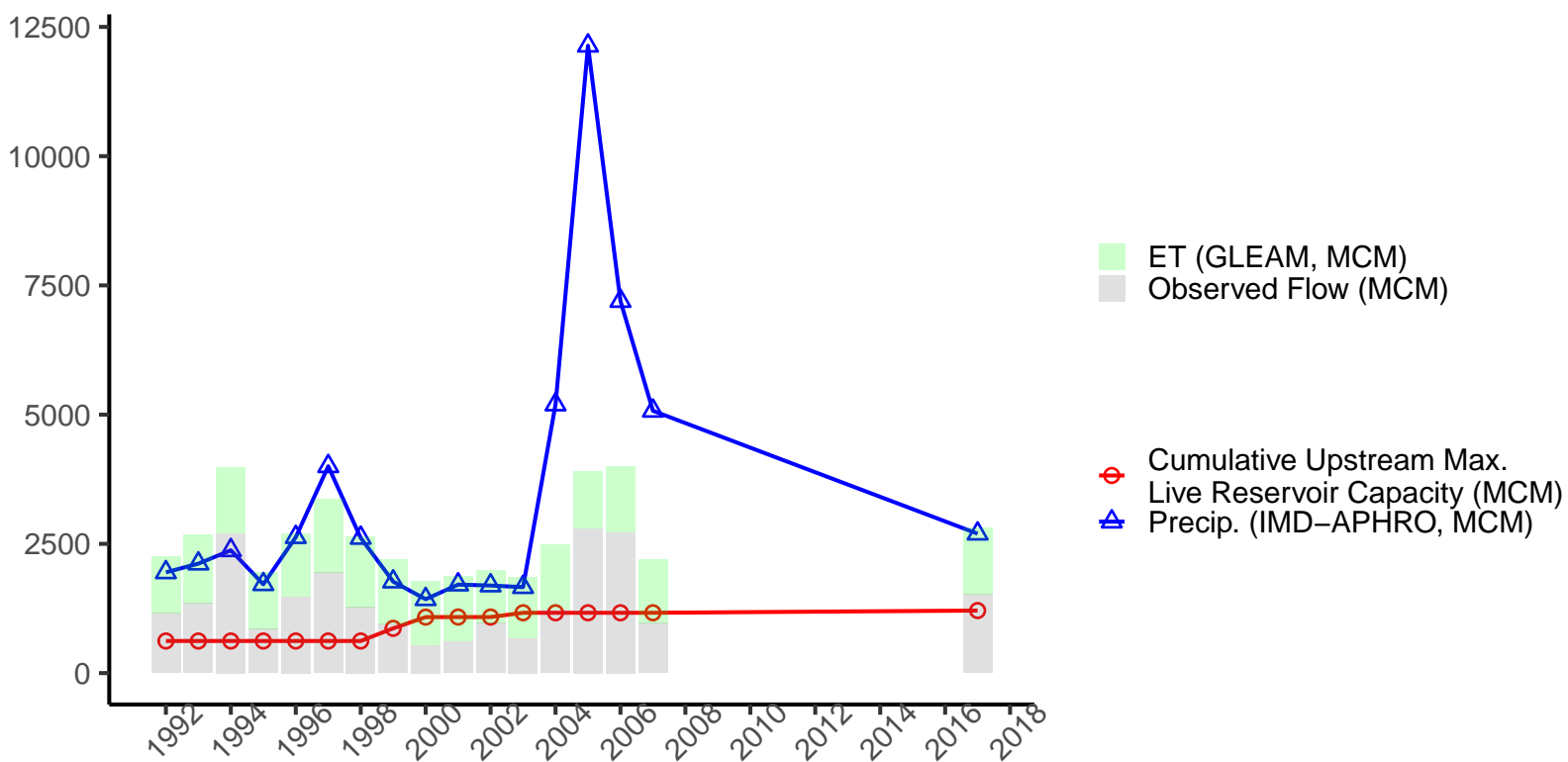
Station: Karad, River: Krishna
GHI ID: kris_karad, Catch. Area: 5432 sq. km



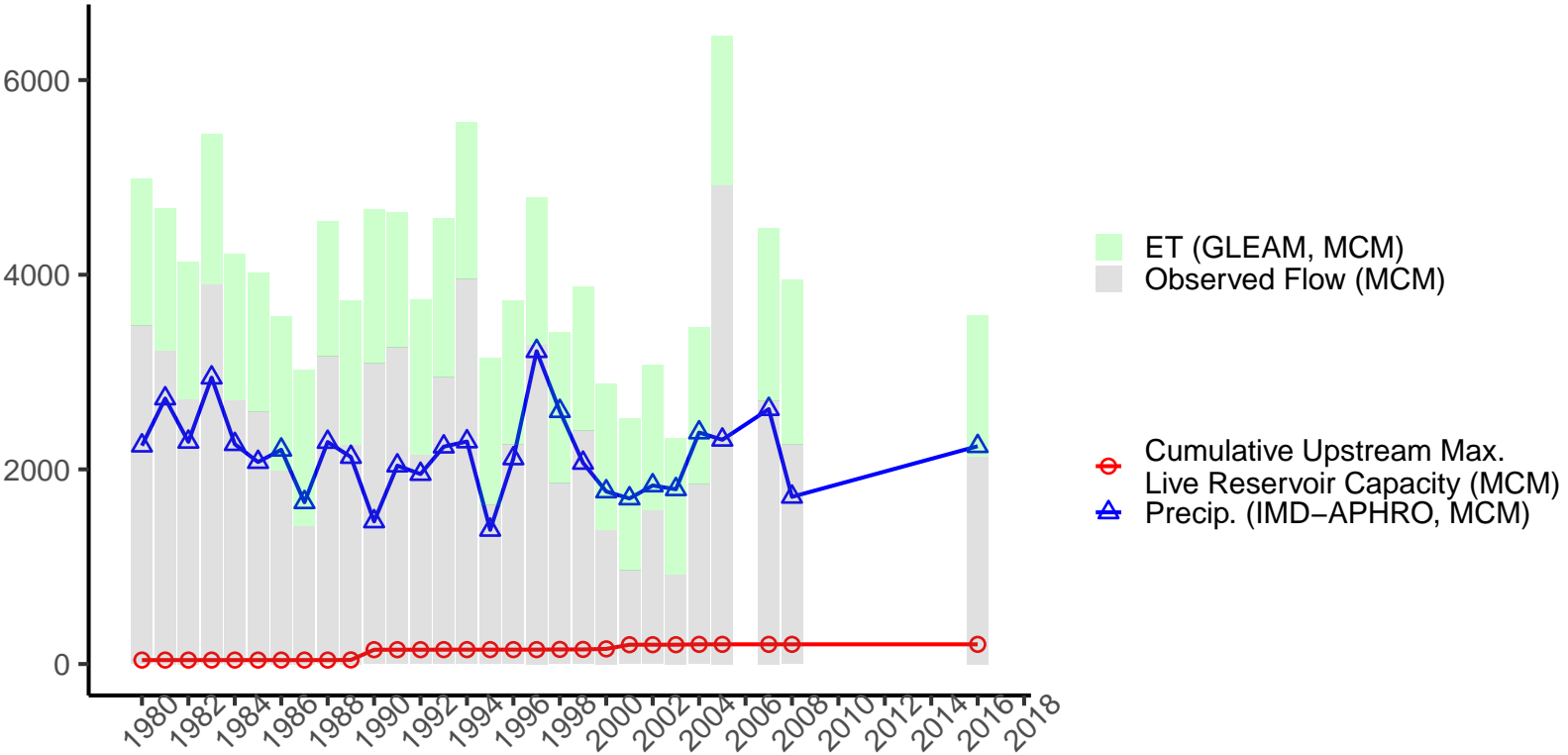
Station: Kurundwad, River: Krishna
GHI ID: kris_kurun, Catch. Area: 15265 sq. km



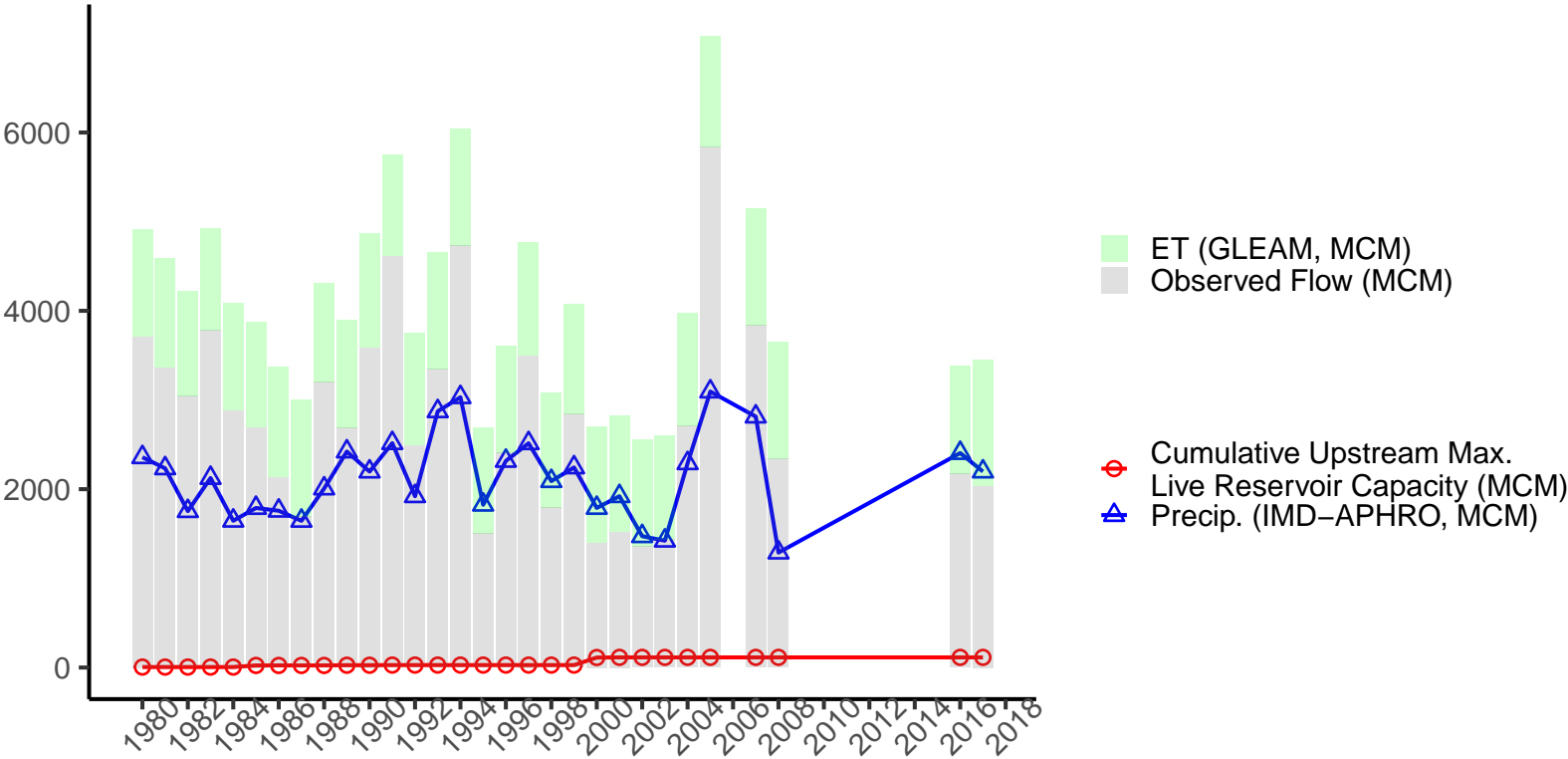
Station: Phulgaon (Seasonal), River: Krishna/Bhima
GHI ID: kris_phulg, Catch. Area: 2142 sq. km



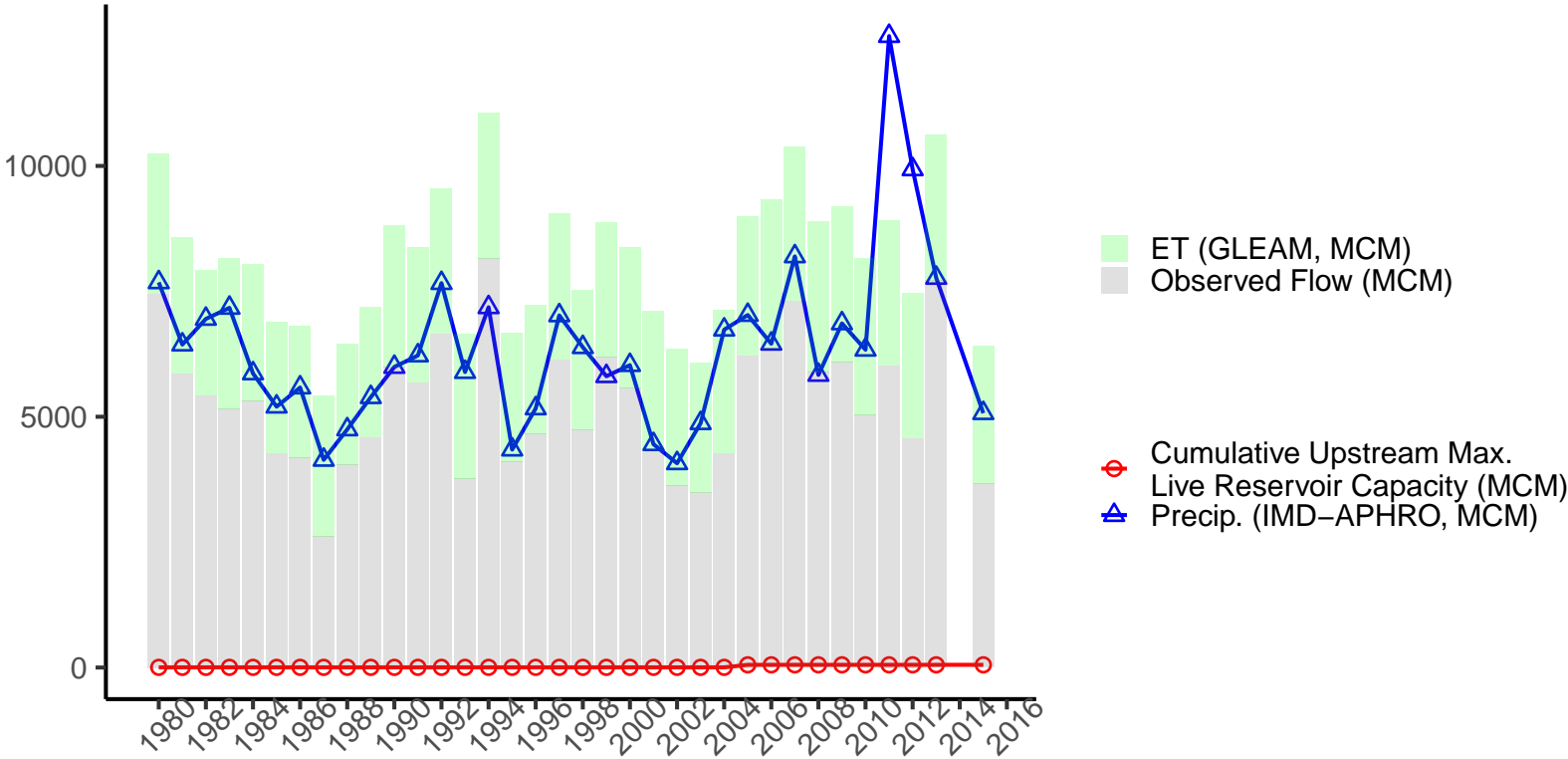
Station: Sadalga (Seasonal), River: Krishna/Dudhganga
GHI ID: kris_sadal, Catch. Area: 2285 sq. km



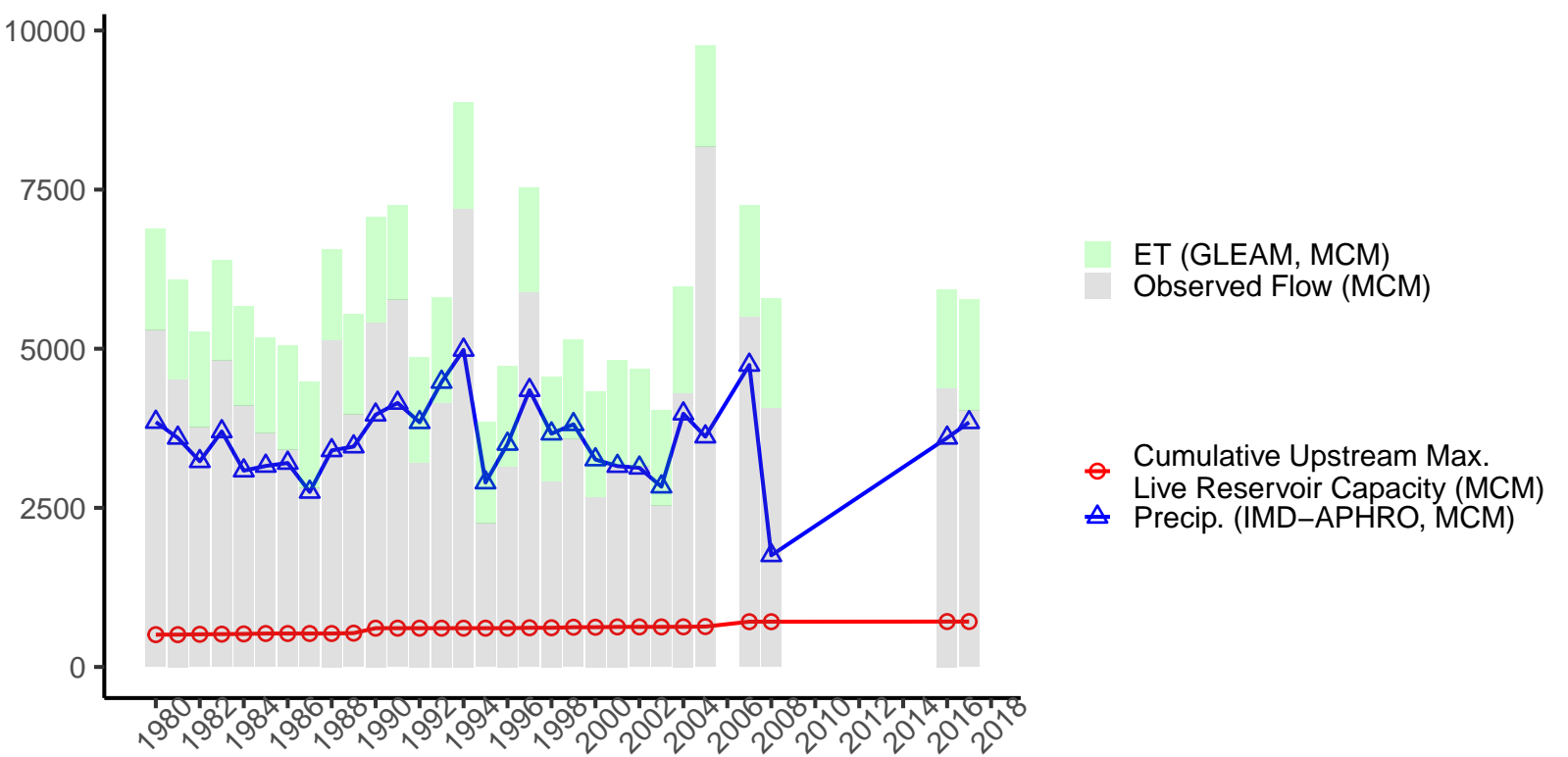
Station: Samdoli (Seasonal), River: Krishna/Varna
GHI ID: kris_samdo, Catch. Area: 2010 sq. km



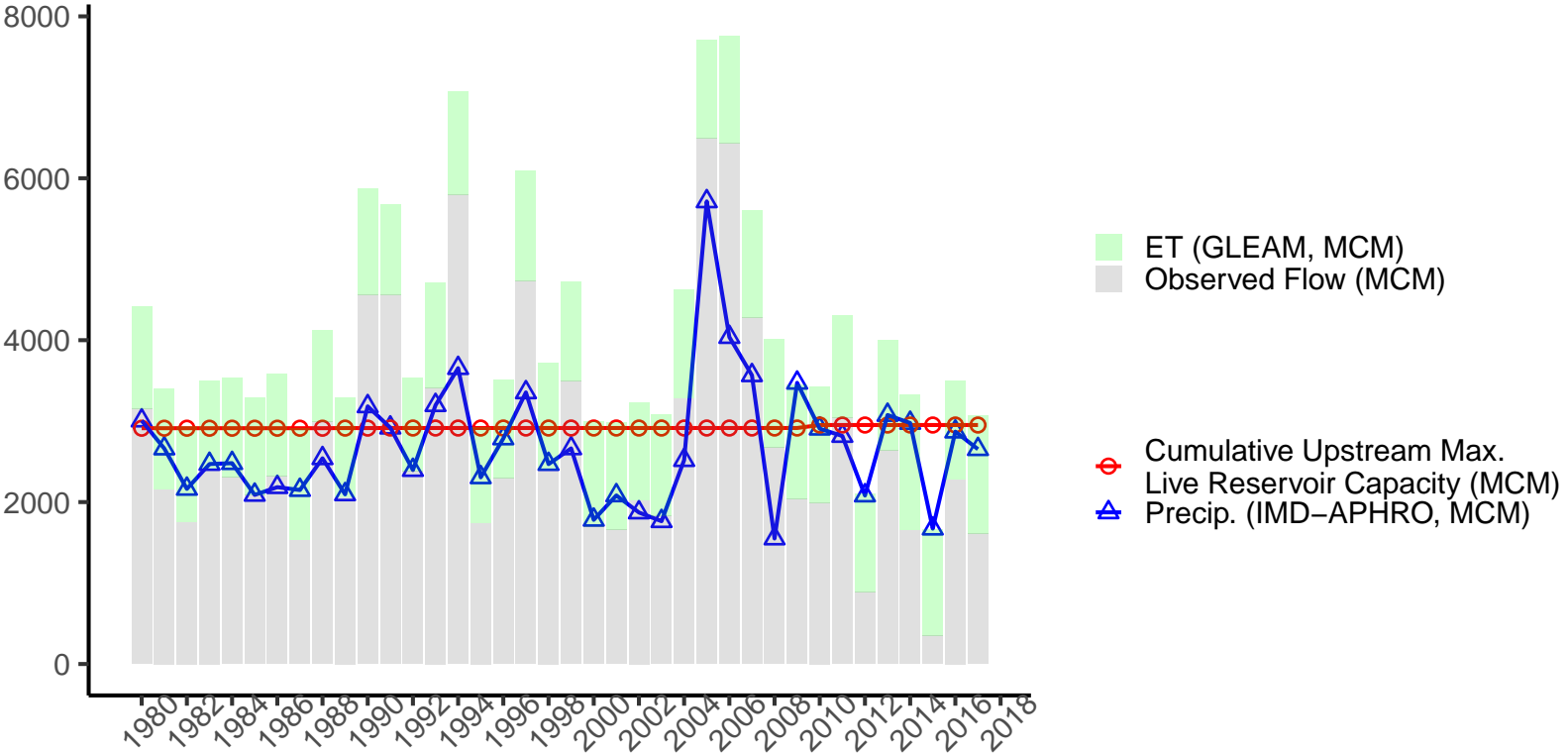
Station: Shimoga, River: Tungabhadra/Tunga
GHI ID: kris_shimo, Catch. Area: 2761 sq. km



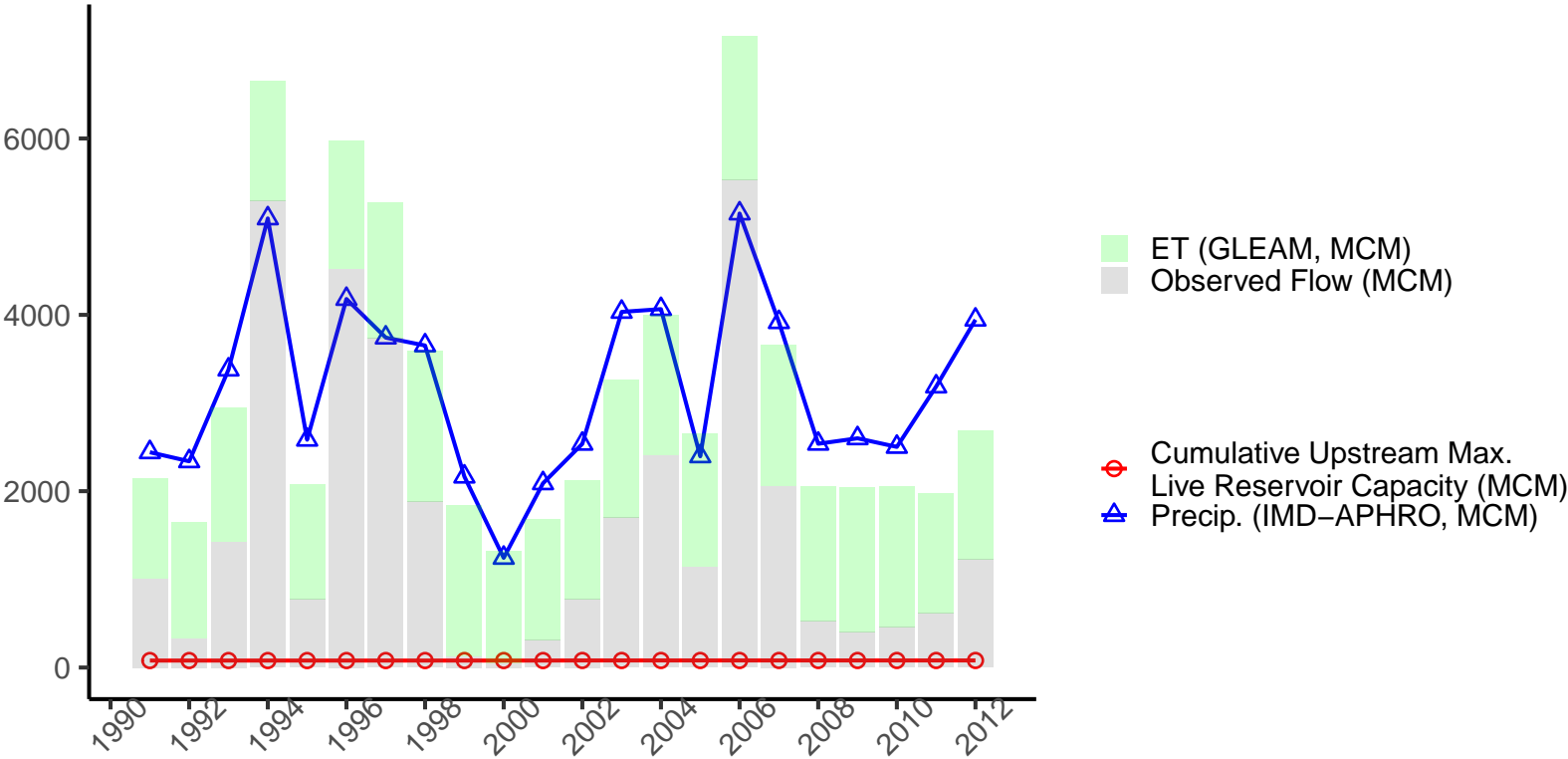
Station: Terwad (Seasonal), River: Krishna/Panchganga
GHI ID: kris_terwa, Catch. Area: 2444 sq. km



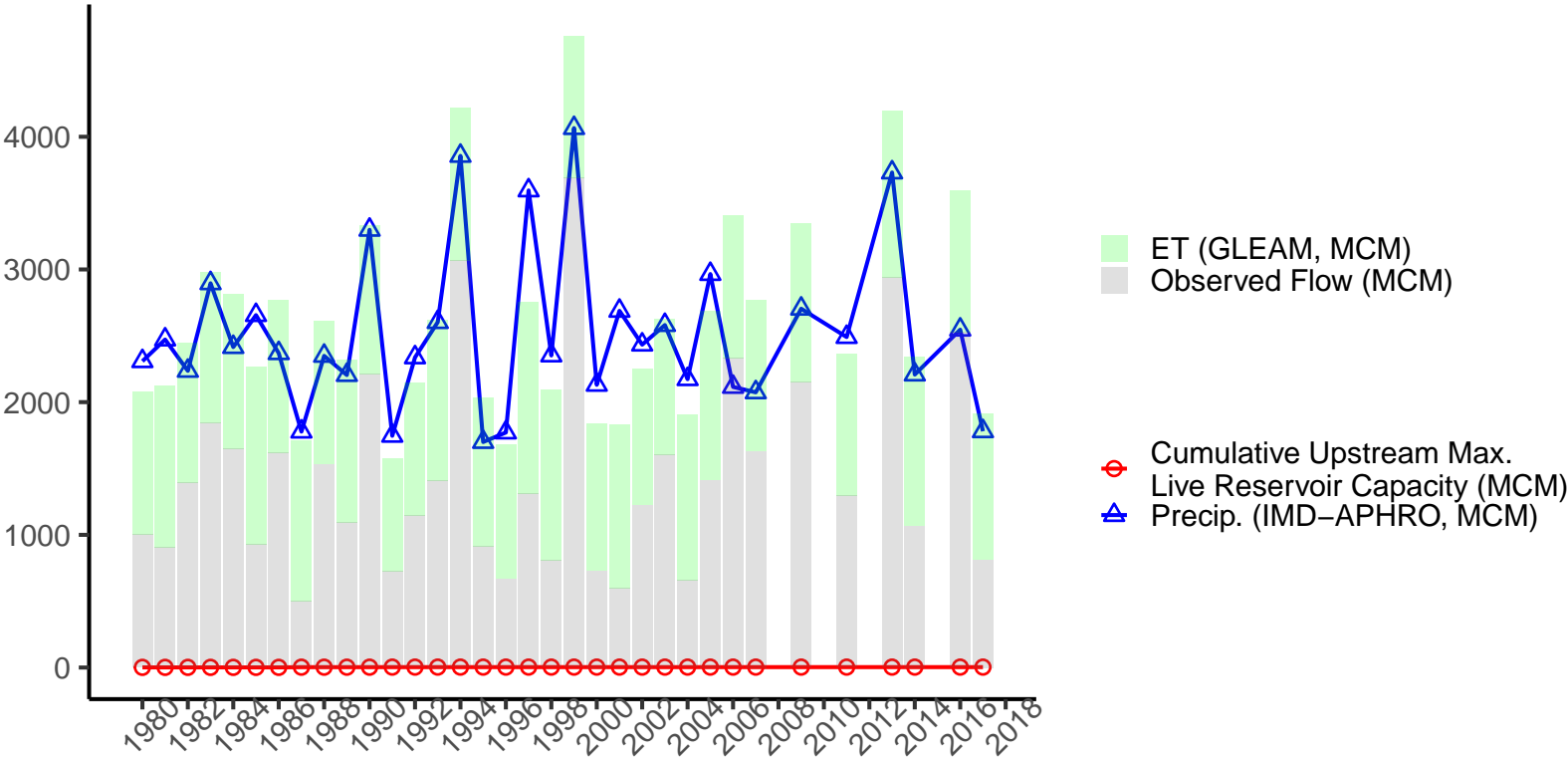
Station: Warunjli, River: Krishna/Koyna
GHI ID: kris_warun, Catch. Area: 1909 sq. km



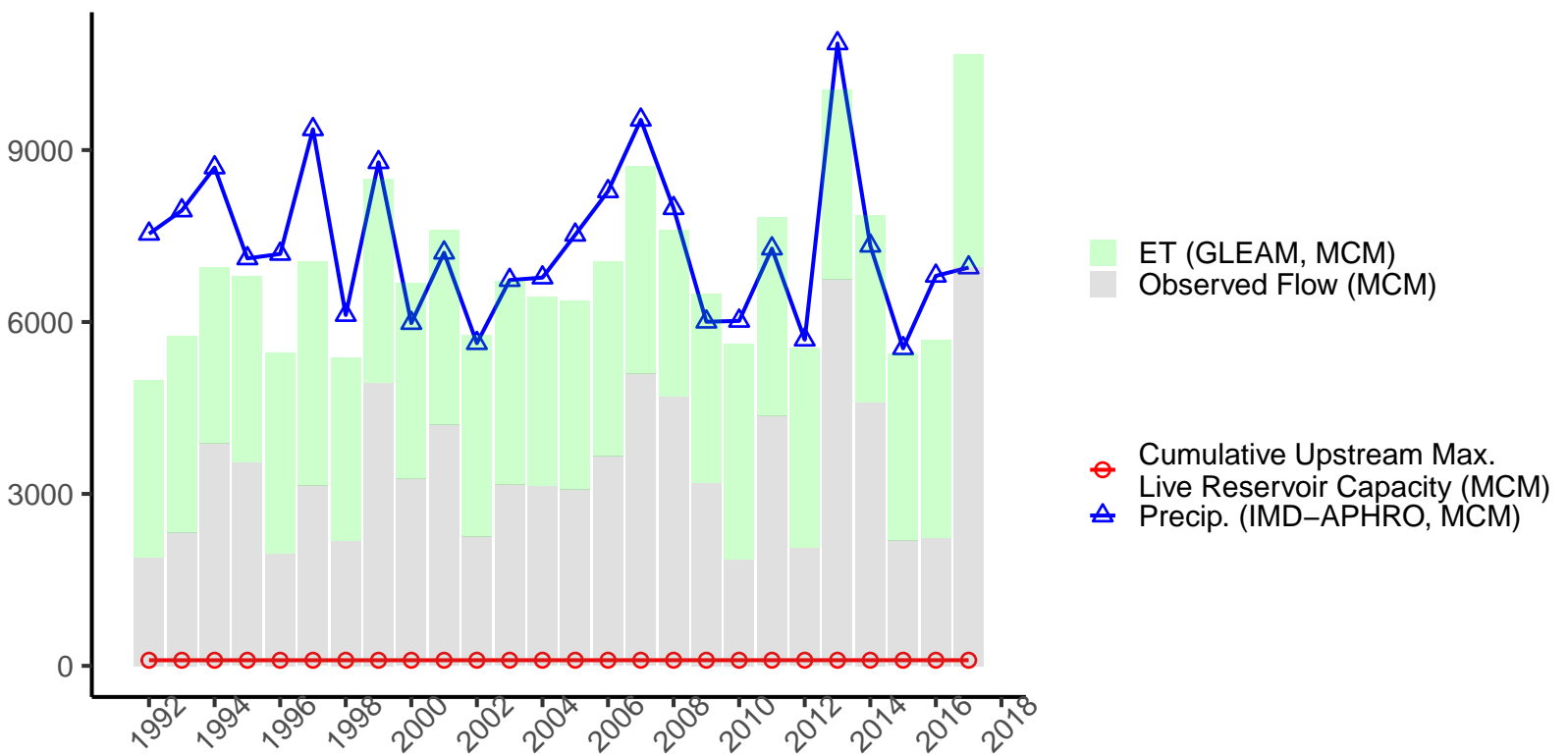
Station: Chakaliya, River: Mahi/Anas
GHI ID: mahi_chaka, Catch. Area: 3608 sq. km



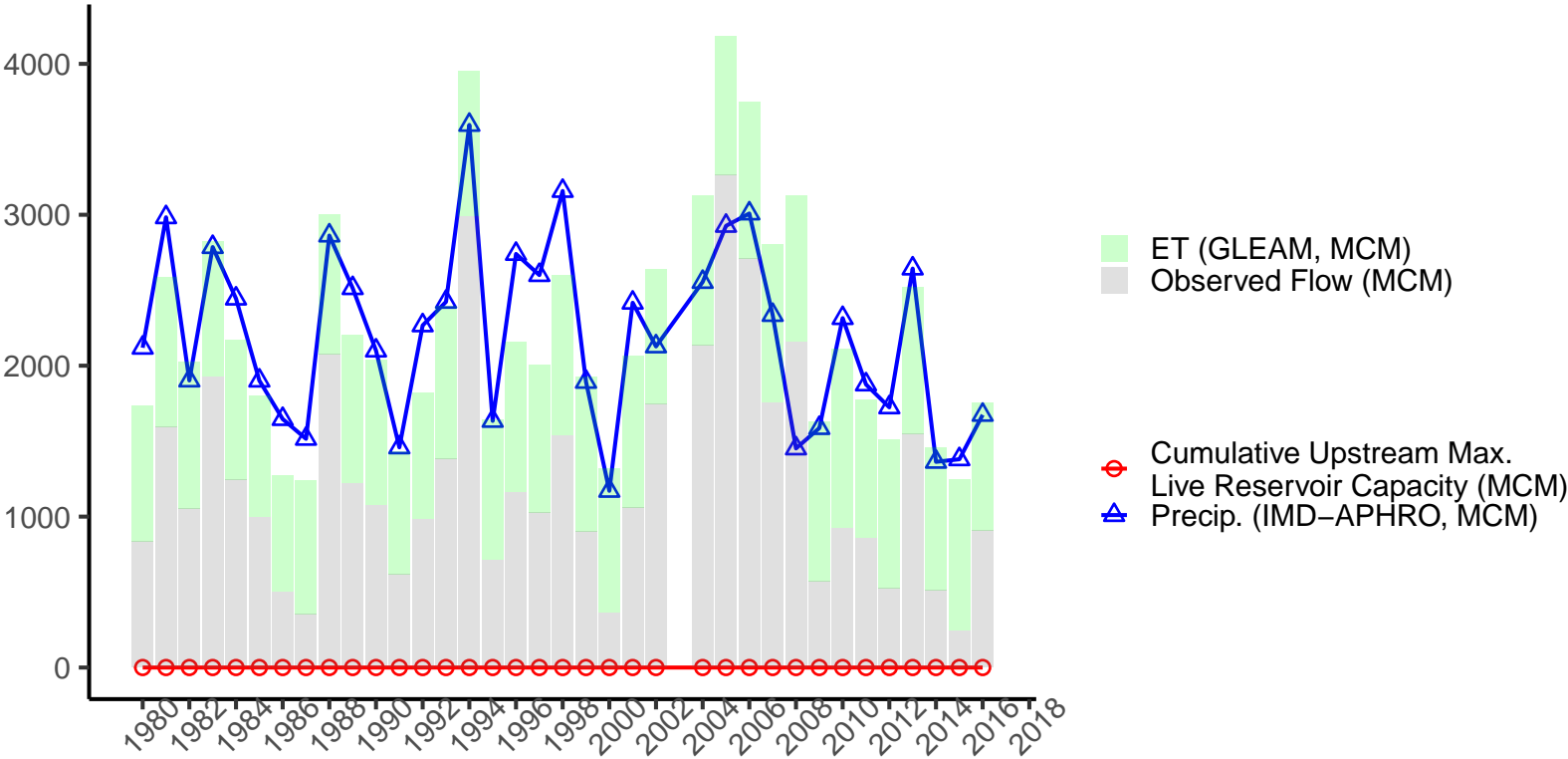
Station: Gadarwara, River: Narmada/Sakkar
GHI ID: narm_gadar, Catch. Area: 2232 sq. km



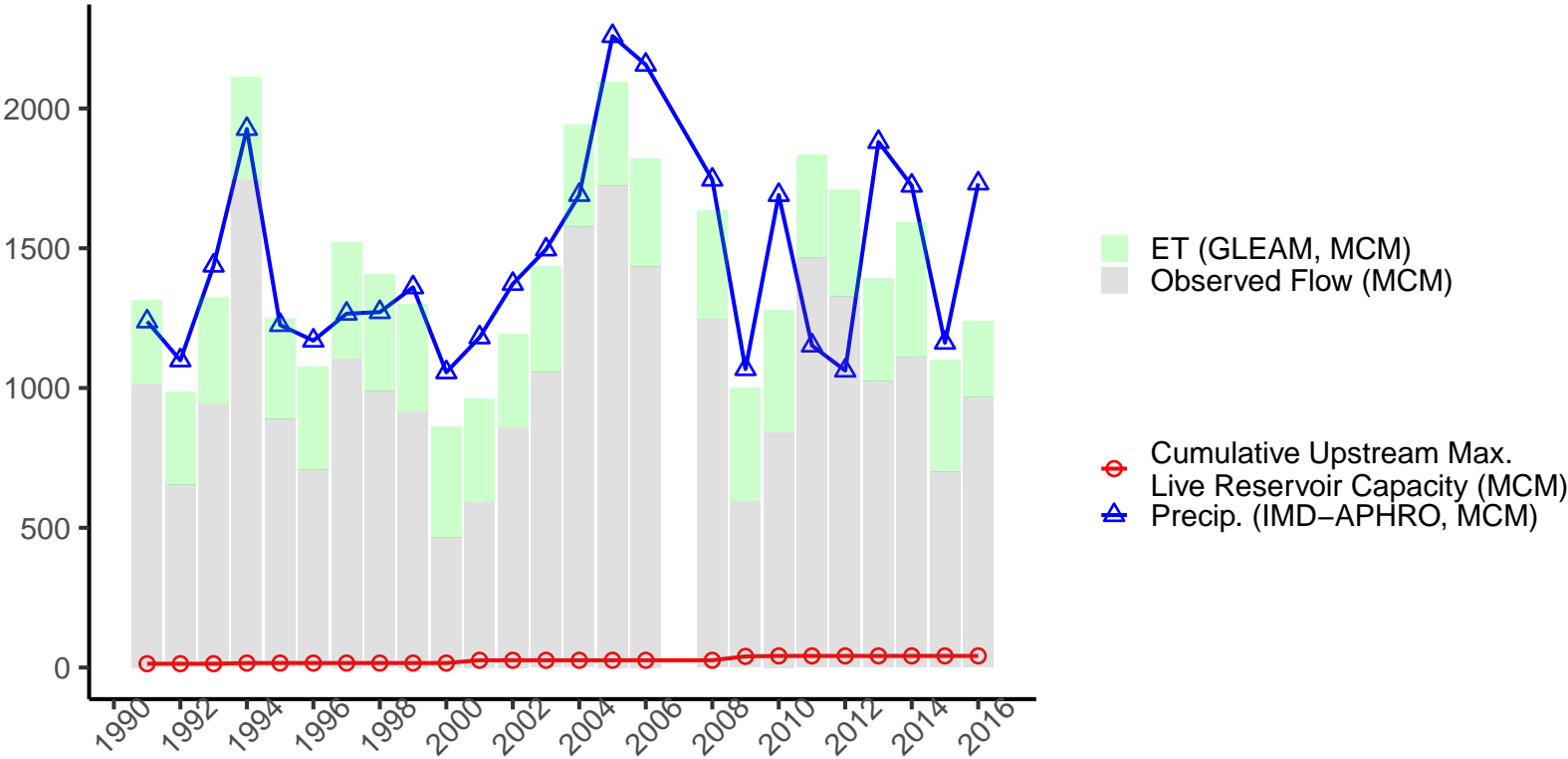
Station: Govindapur, River: Burhabalang
GHI ID: sube_govin, Catch. Area: 4450 sq. km



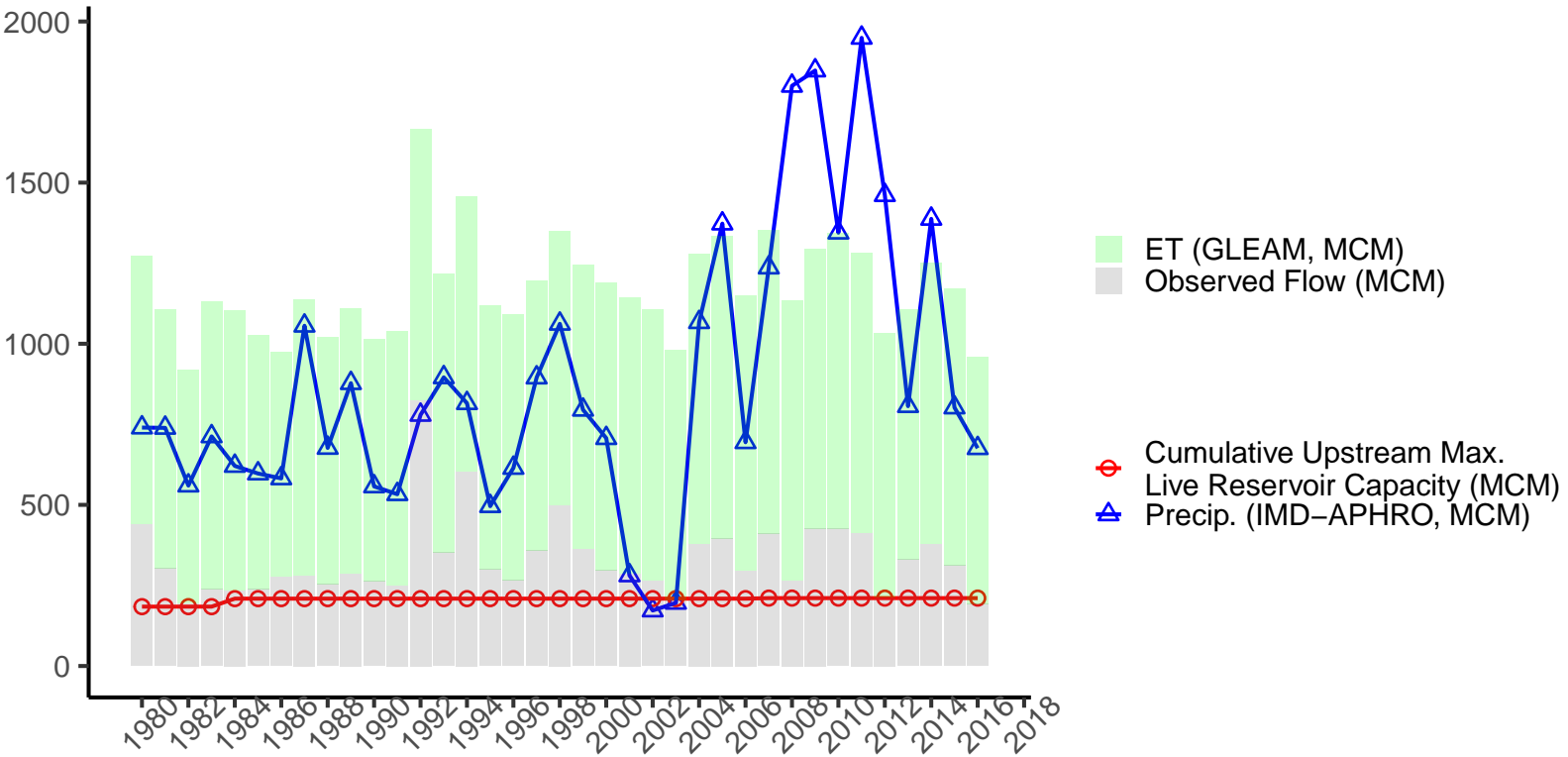
Station: Mahuwa, River: Purna
GHI ID: wfrn_mahuw, Catch. Area: 1750 sq. km



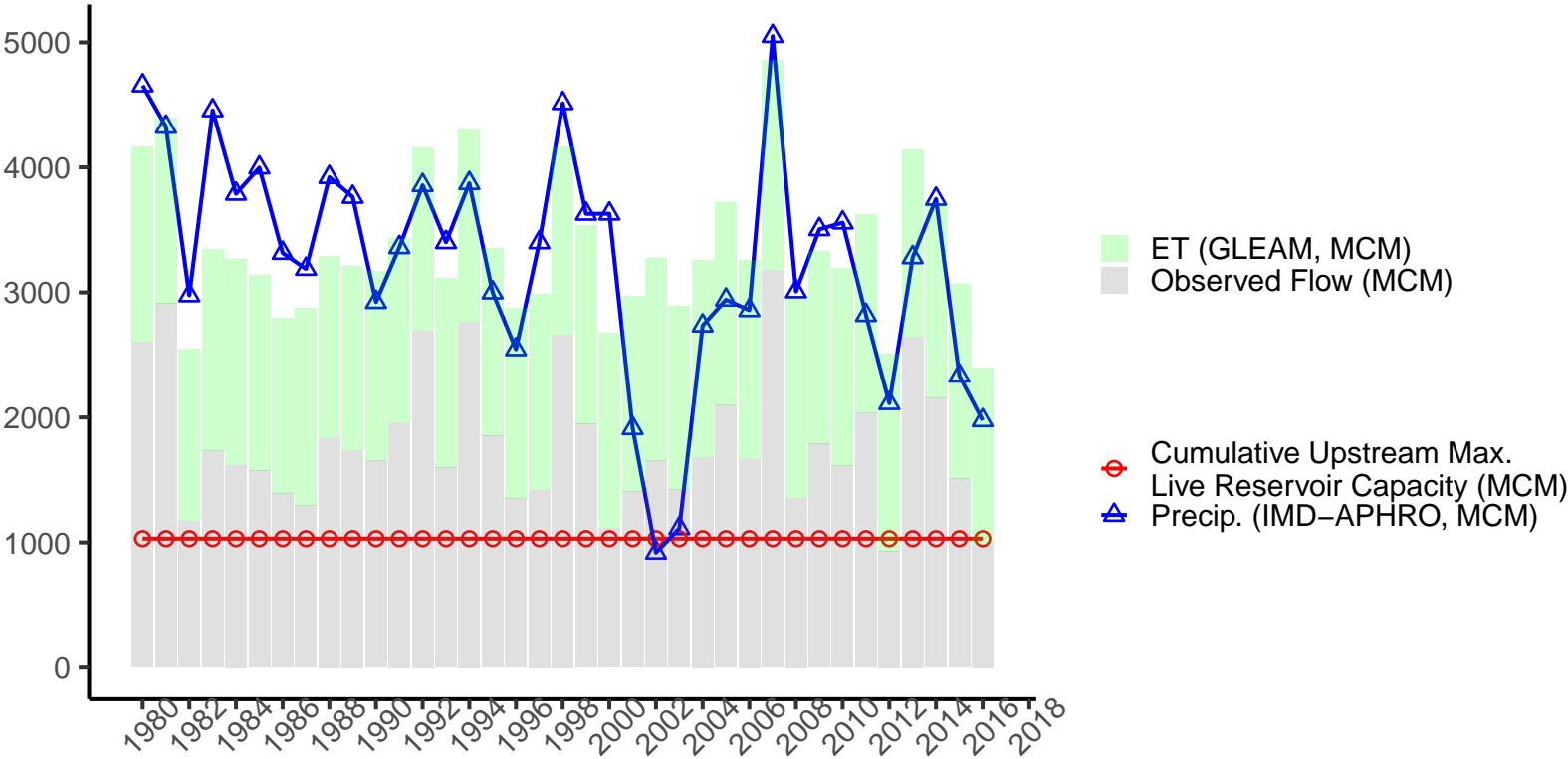
Station: Ozerkheda, River: Wagh/Damanganga
GHI ID: wfrn_ozerk, Catch. Area: 678 sq. km



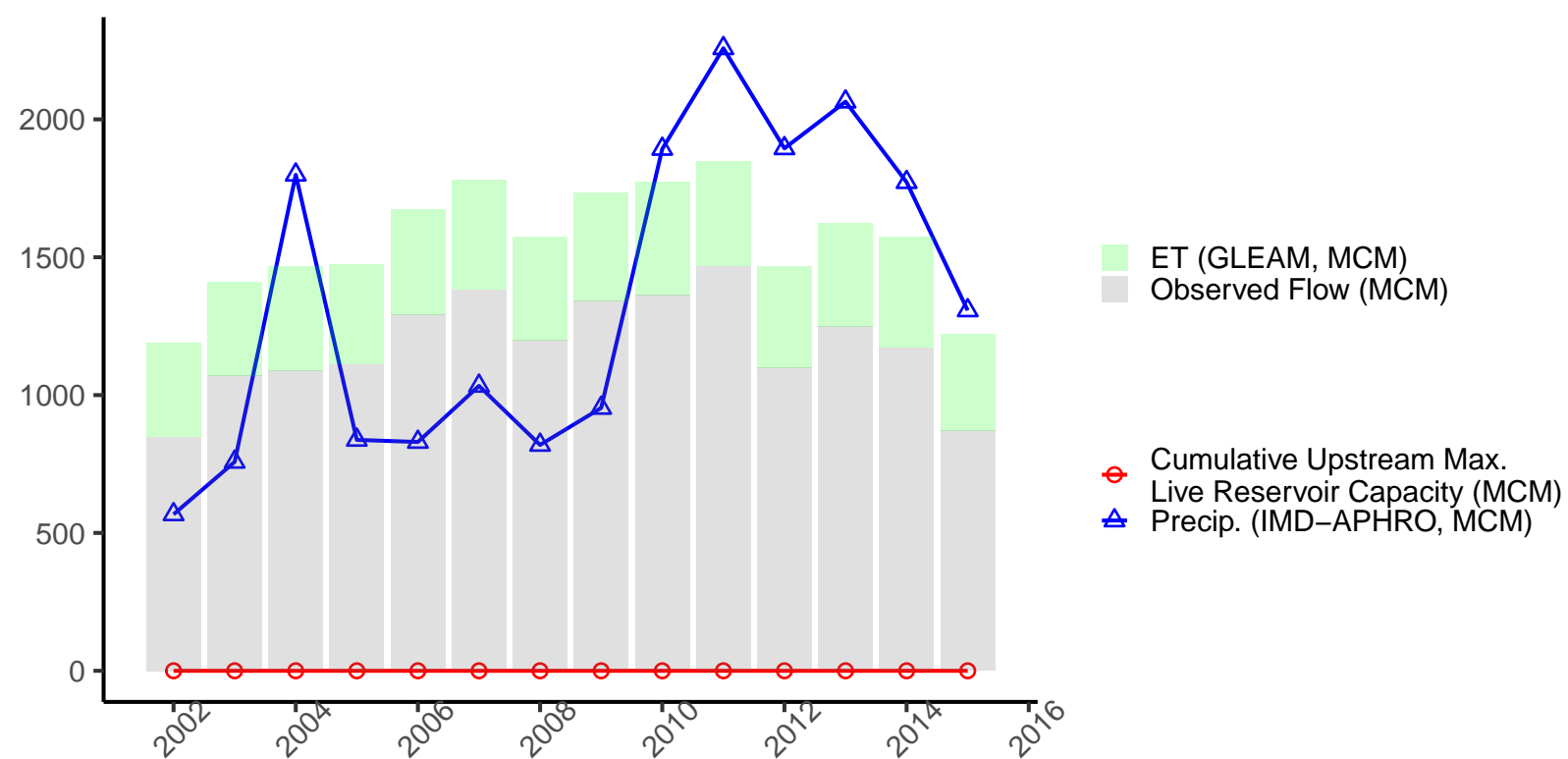
Station: Ambarampalayam, River: Bharathapuzha/Kannadipuzha/Aliyar
GHI ID: wfrs_ambar, Catch. Area: 950 sq. km



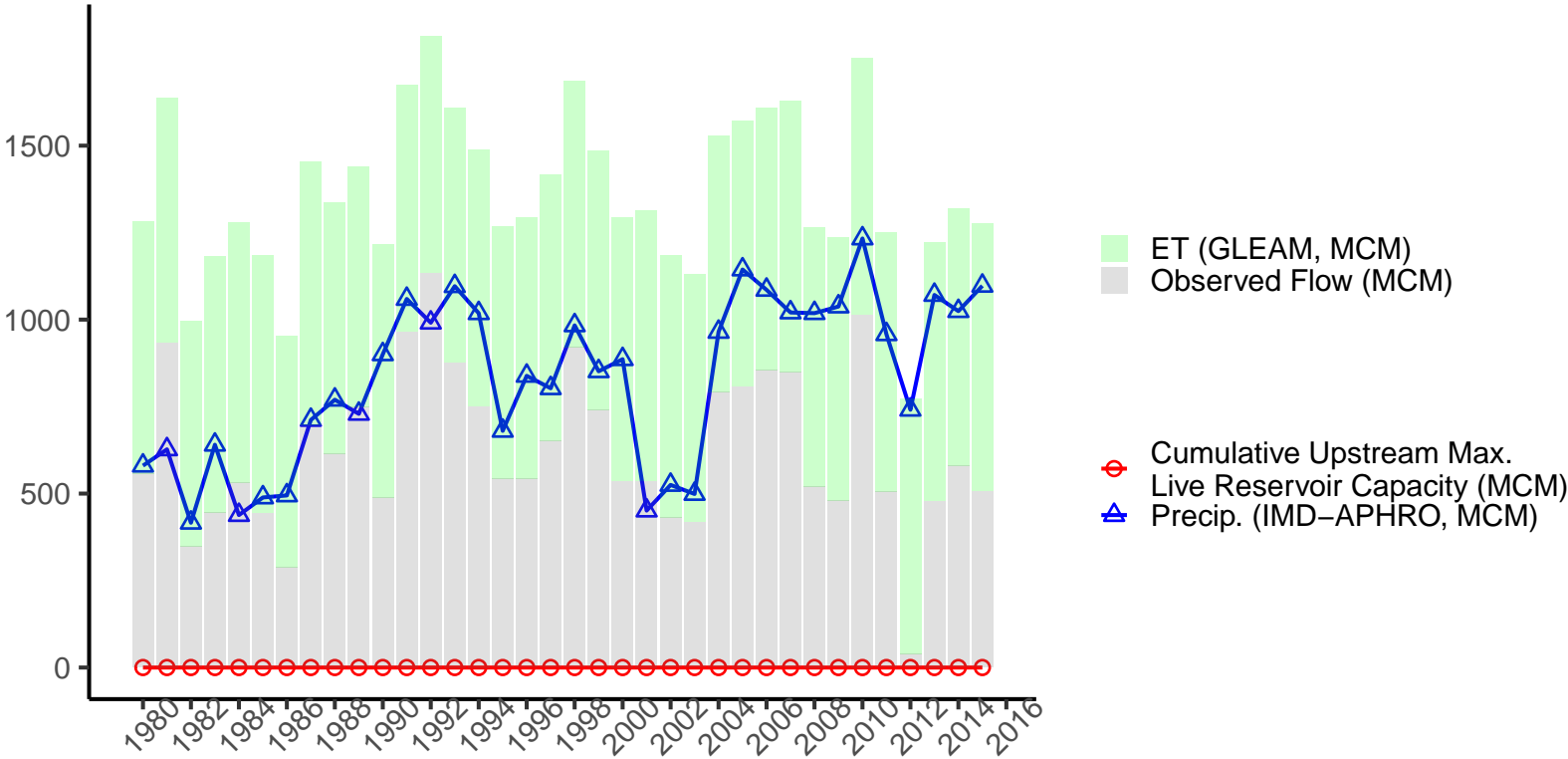
Station: Arangaly, River: Periyar/Chalaky
GHI ID: wfrs_arang, Catch. Area: 1342 sq. km



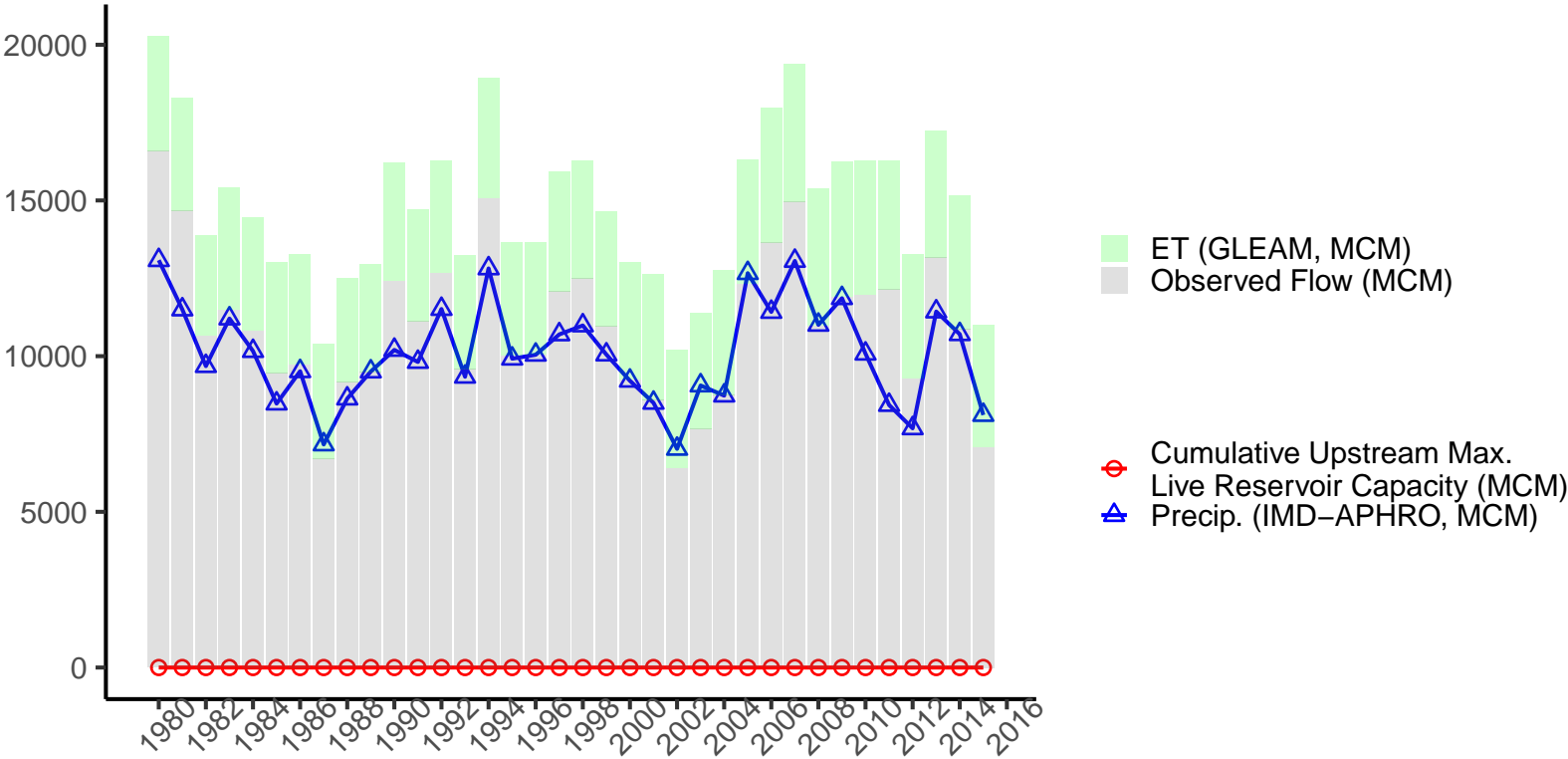
Station: Avershe, River: Seetha
GHI ID: wfrrs_avers, Catch. Area: 300 sq. km



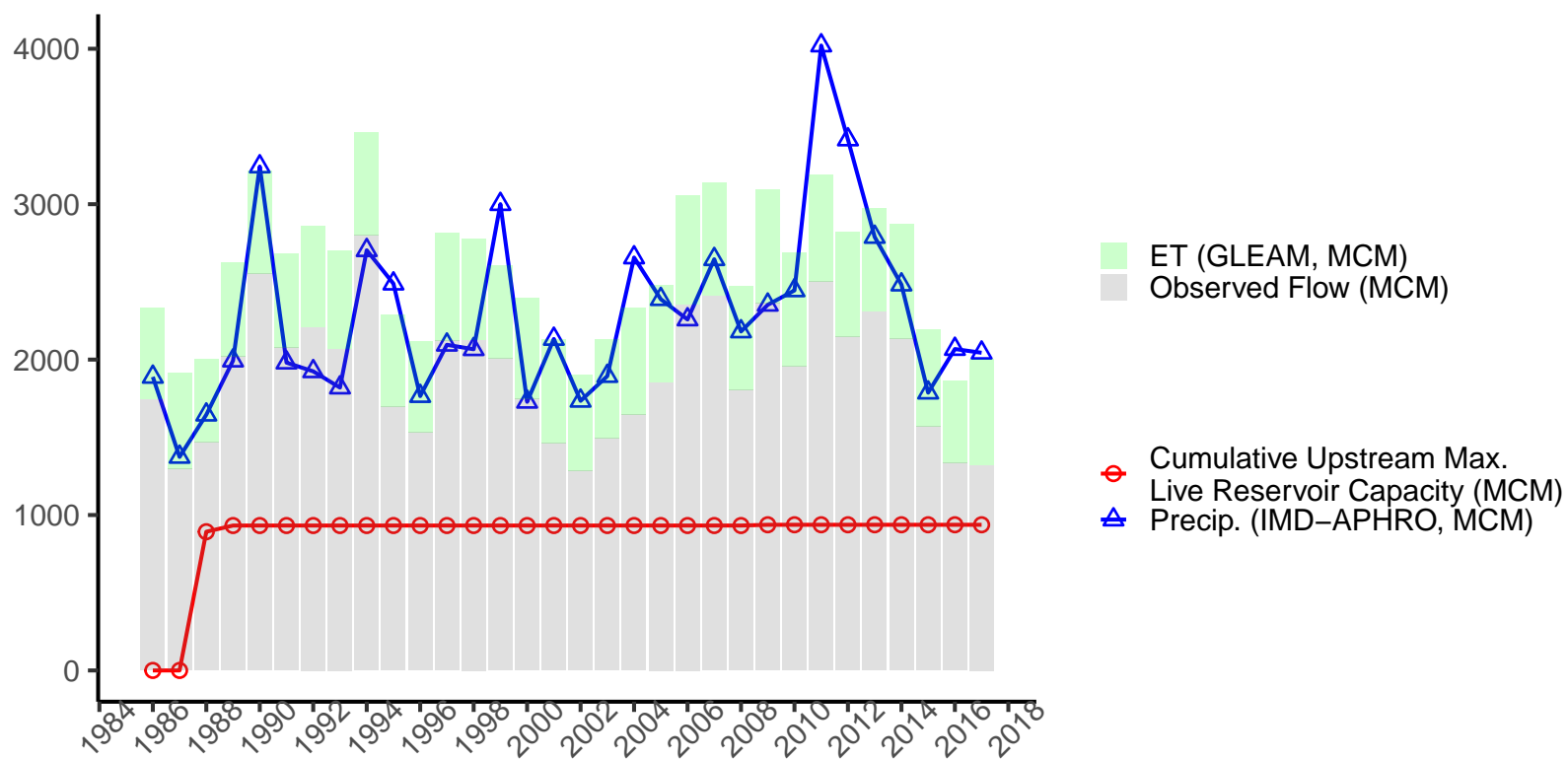
Station: Ayilam, River: Vamanapuram
GHI ID: wfrs_ayila, Catch. Area: 556 sq. km



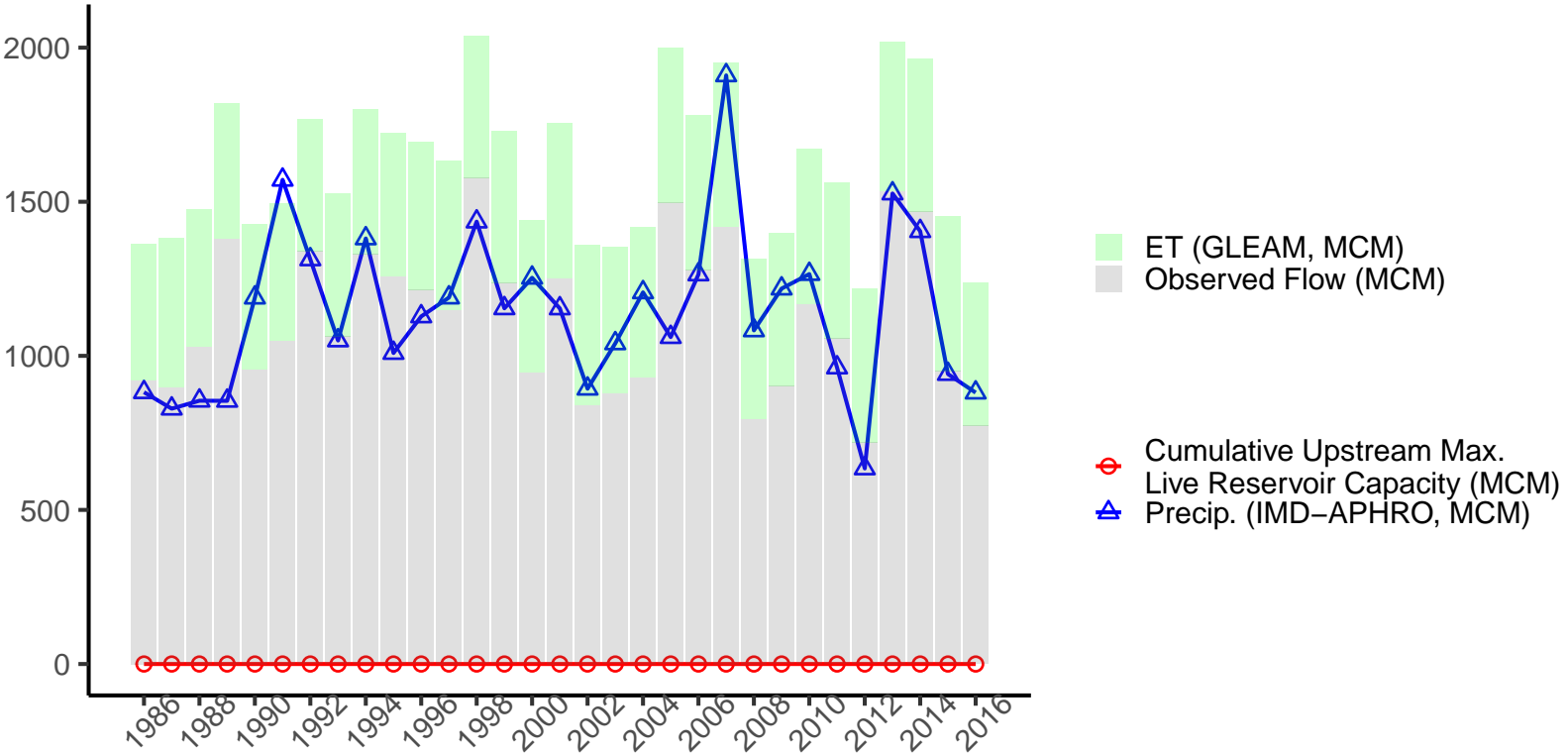
Station: Bantwal, River: Nethravathi
GHI ID: wfrrs_bantw, Catch. Area: 3295 sq. km



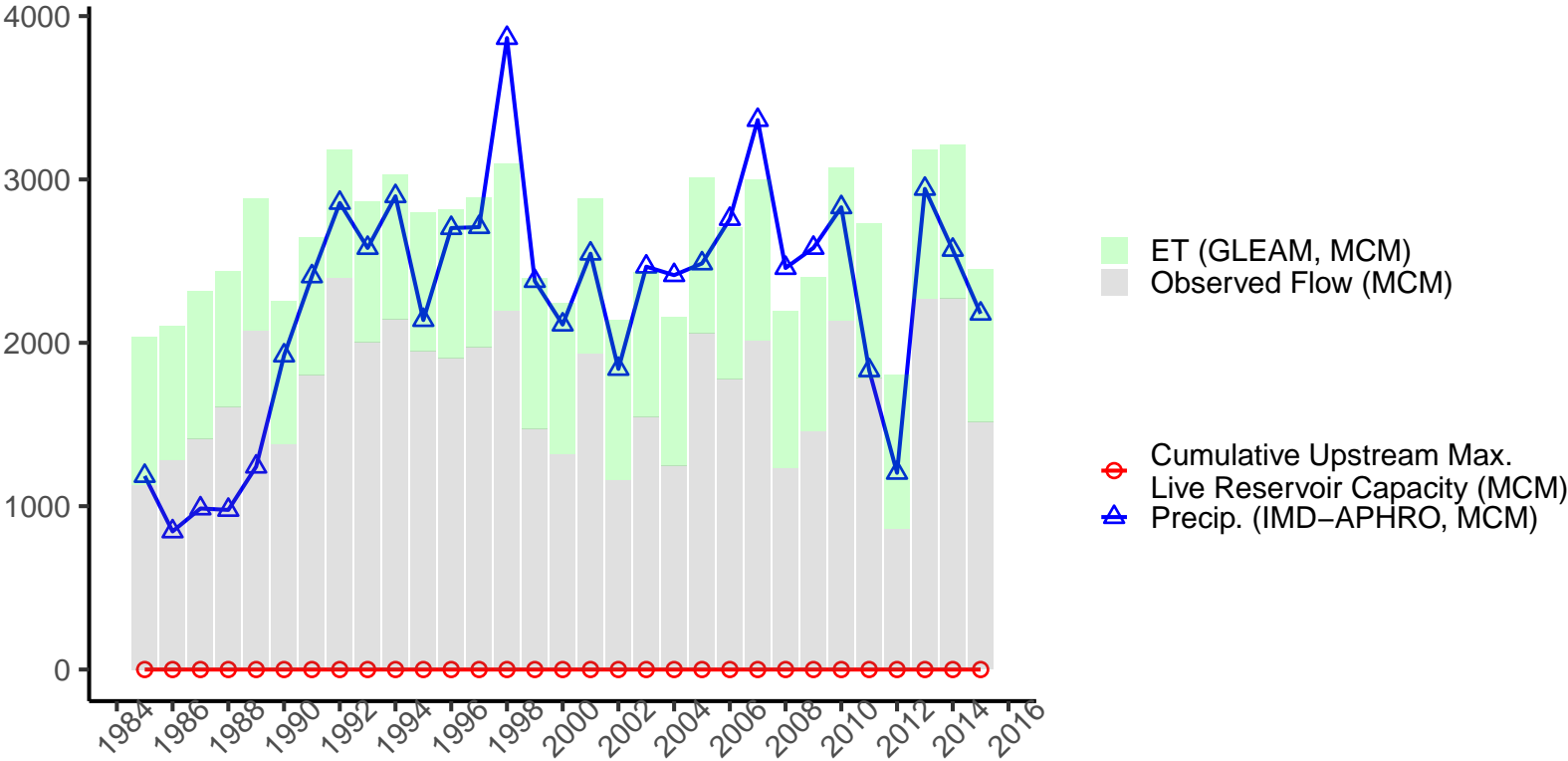
Station: Halady, River: Halady
GHI ID: wfrs_halad, Catch. Area: 566 sq. km



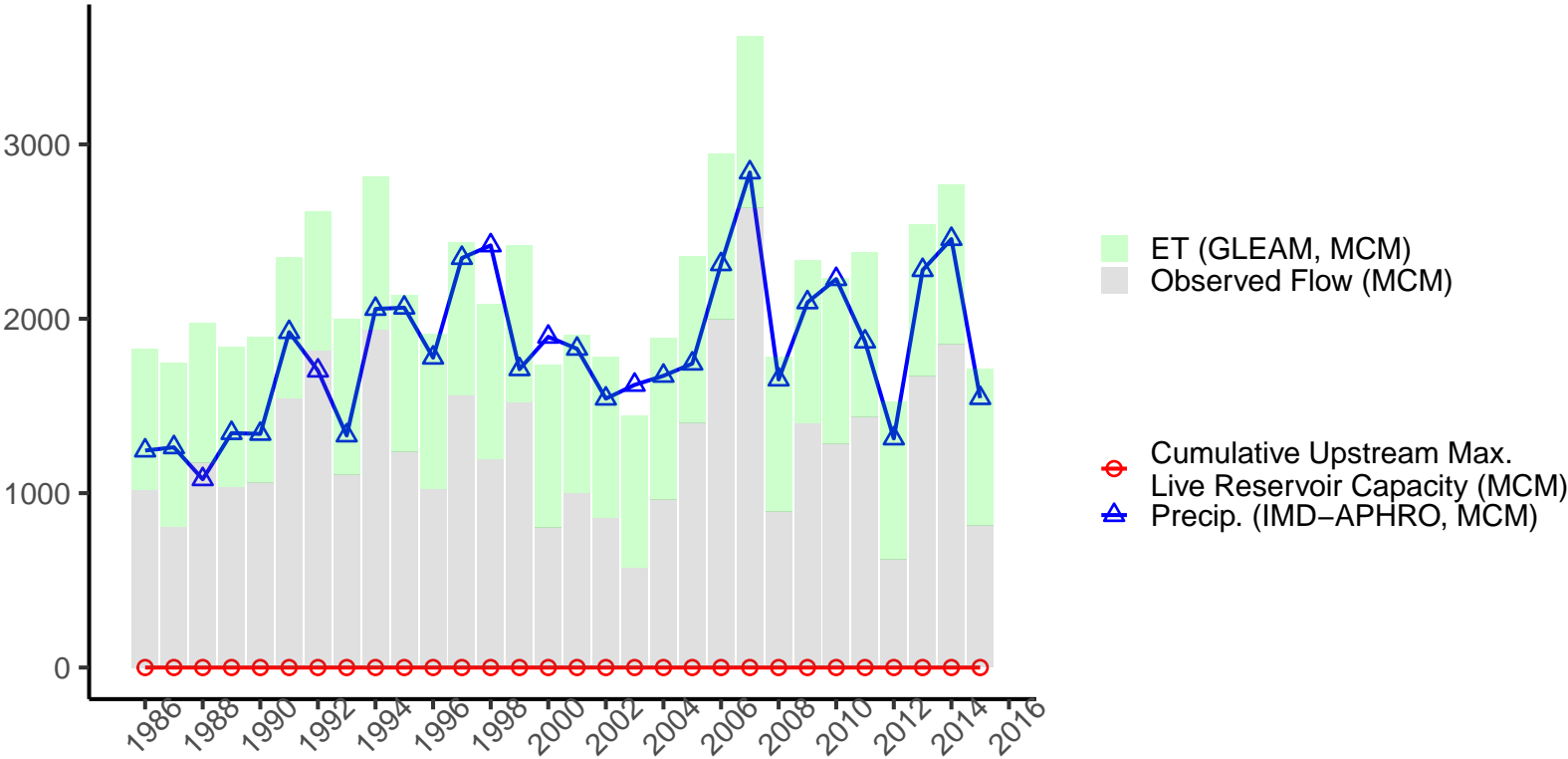
Station: Kalampur, River: Muvattupuzha/Kaliyar
GHI ID: wfrs_kalam, Catch. Area: 386 sq. km



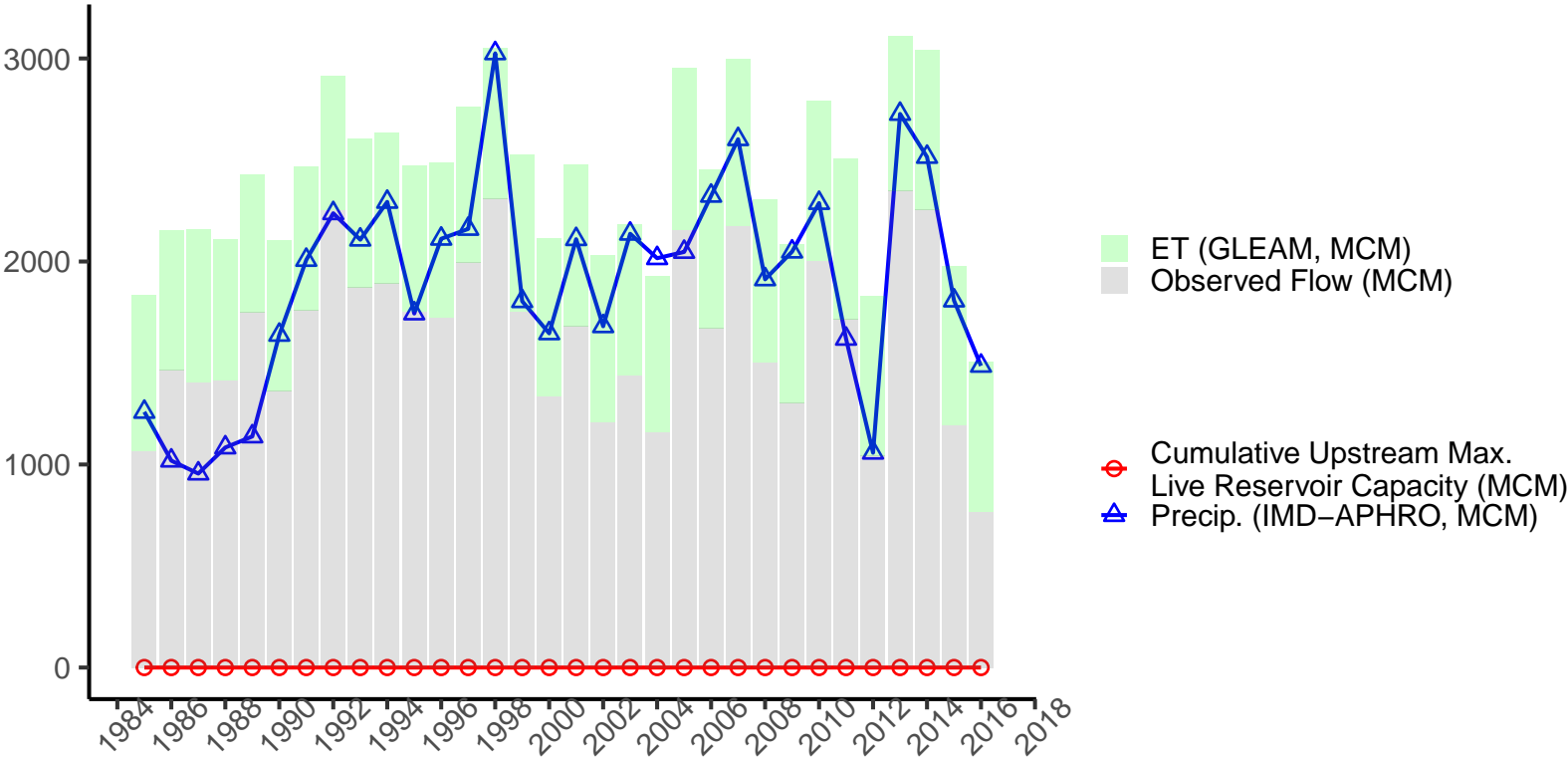
Station: Kallooppara, River: Pampa/Manimala
GHI ID: wfrs_kallo, Catch. Area: 733 sq. km



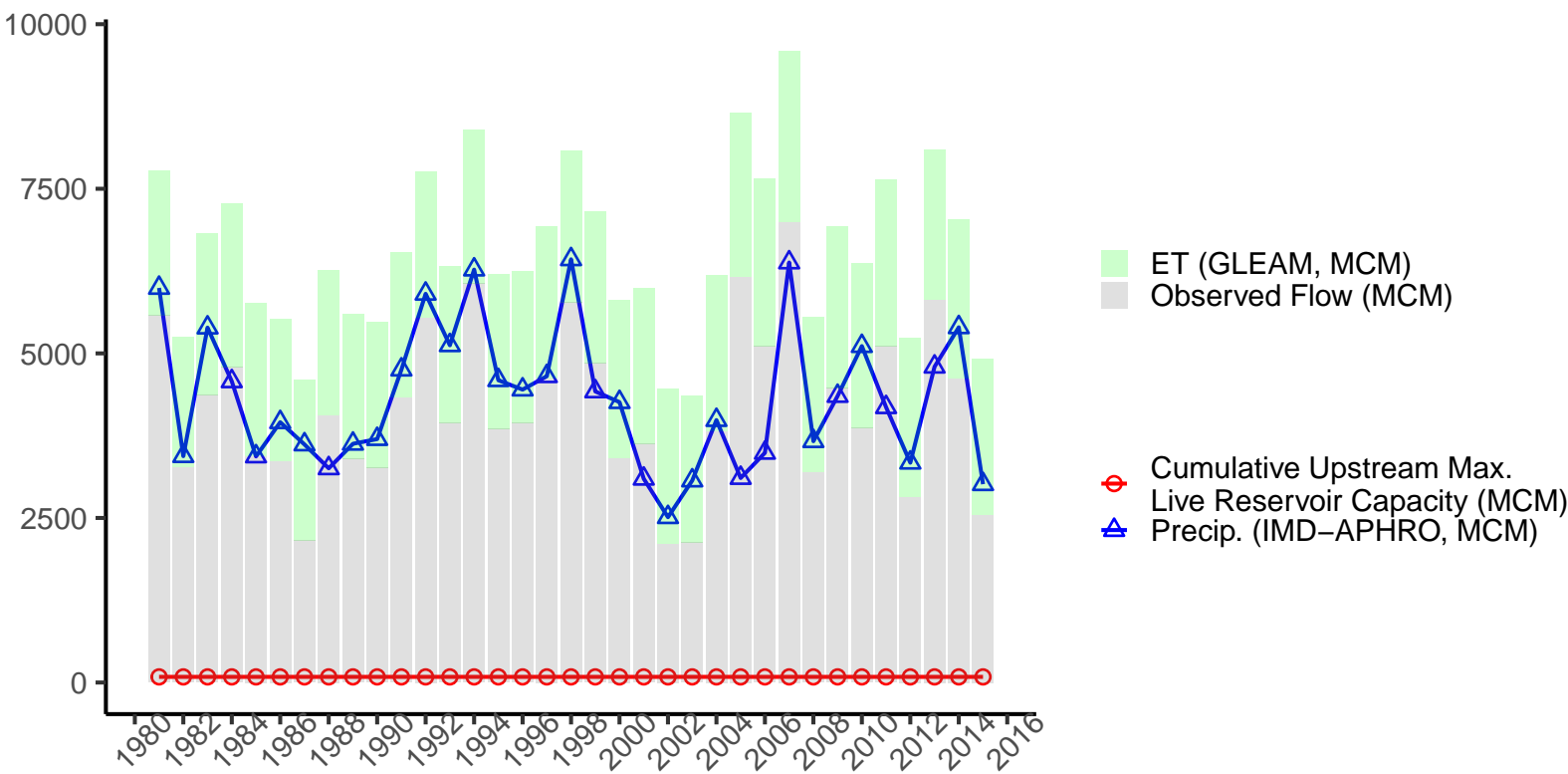
Station: Karathodu, River: Kadalundi
GHI ID: wfrs_karat, Catch. Area: 794 sq. km



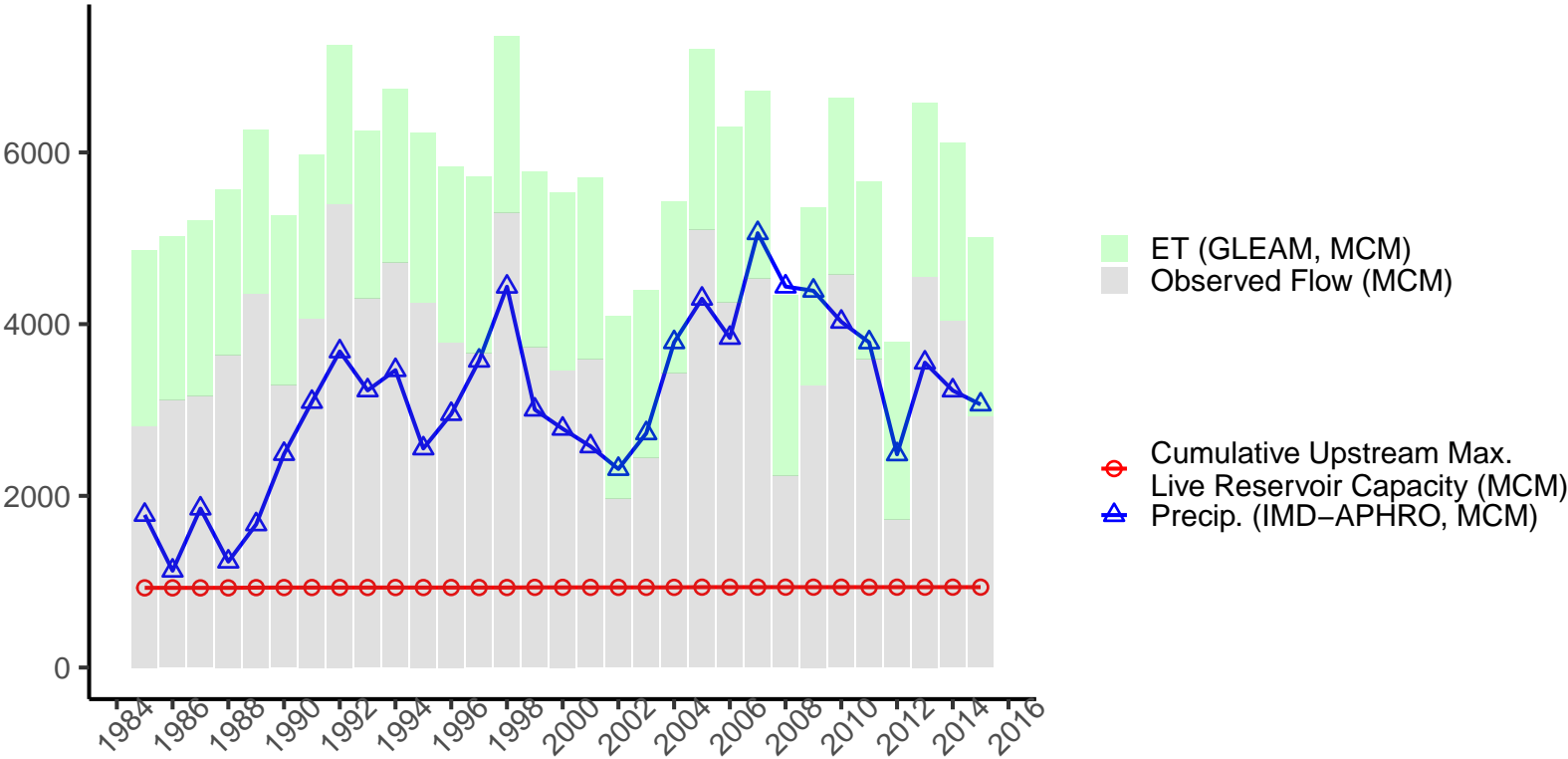
Station: Kidangoor, River: Meenachil
GHI ID: wfrs_kidan, Catch. Area: 618 sq. km



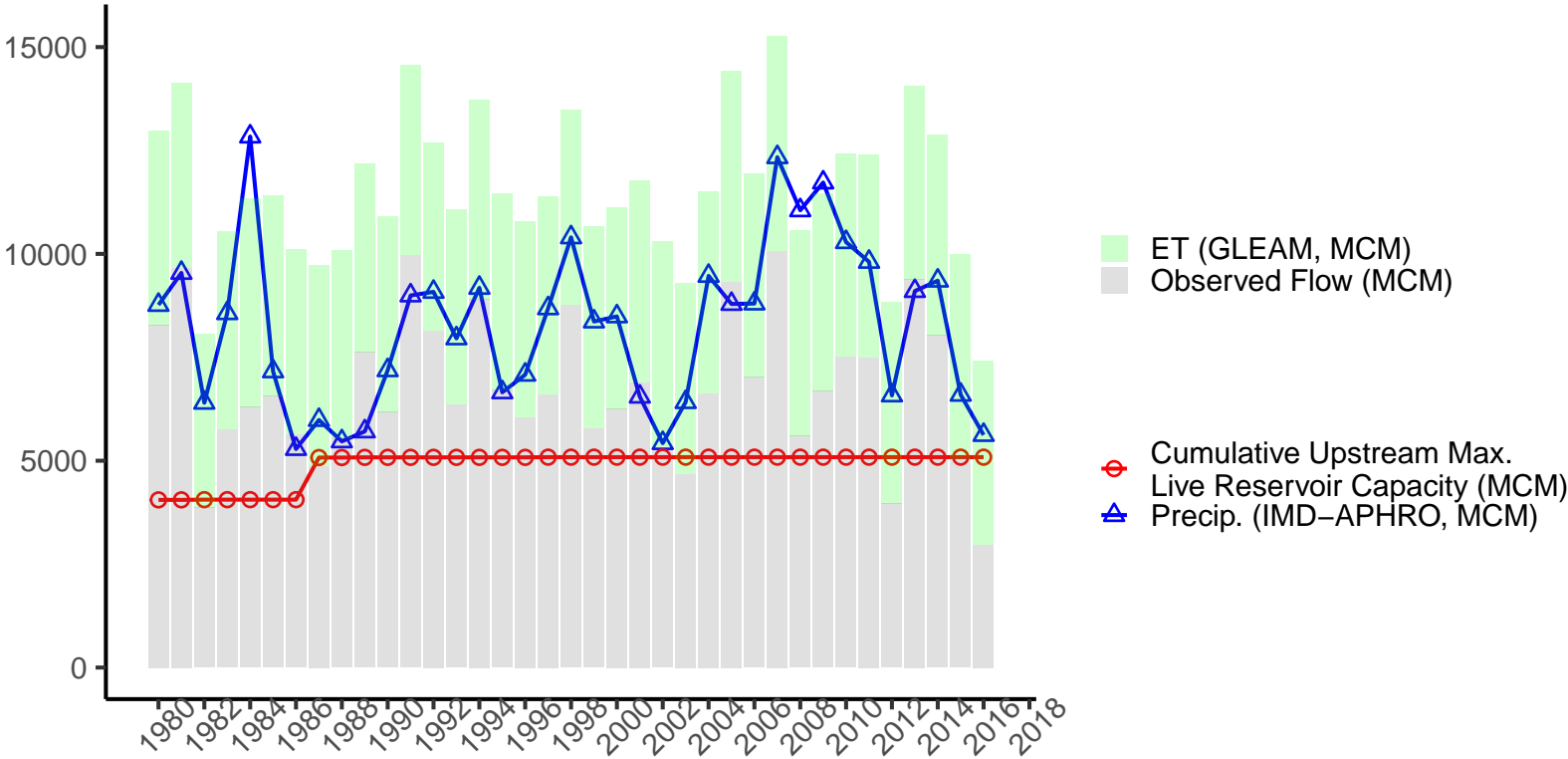
Station: Kuniyil, River: Chaliyar
GHI ID: wfrs_kuniy, Catch. Area: 2038 sq. km



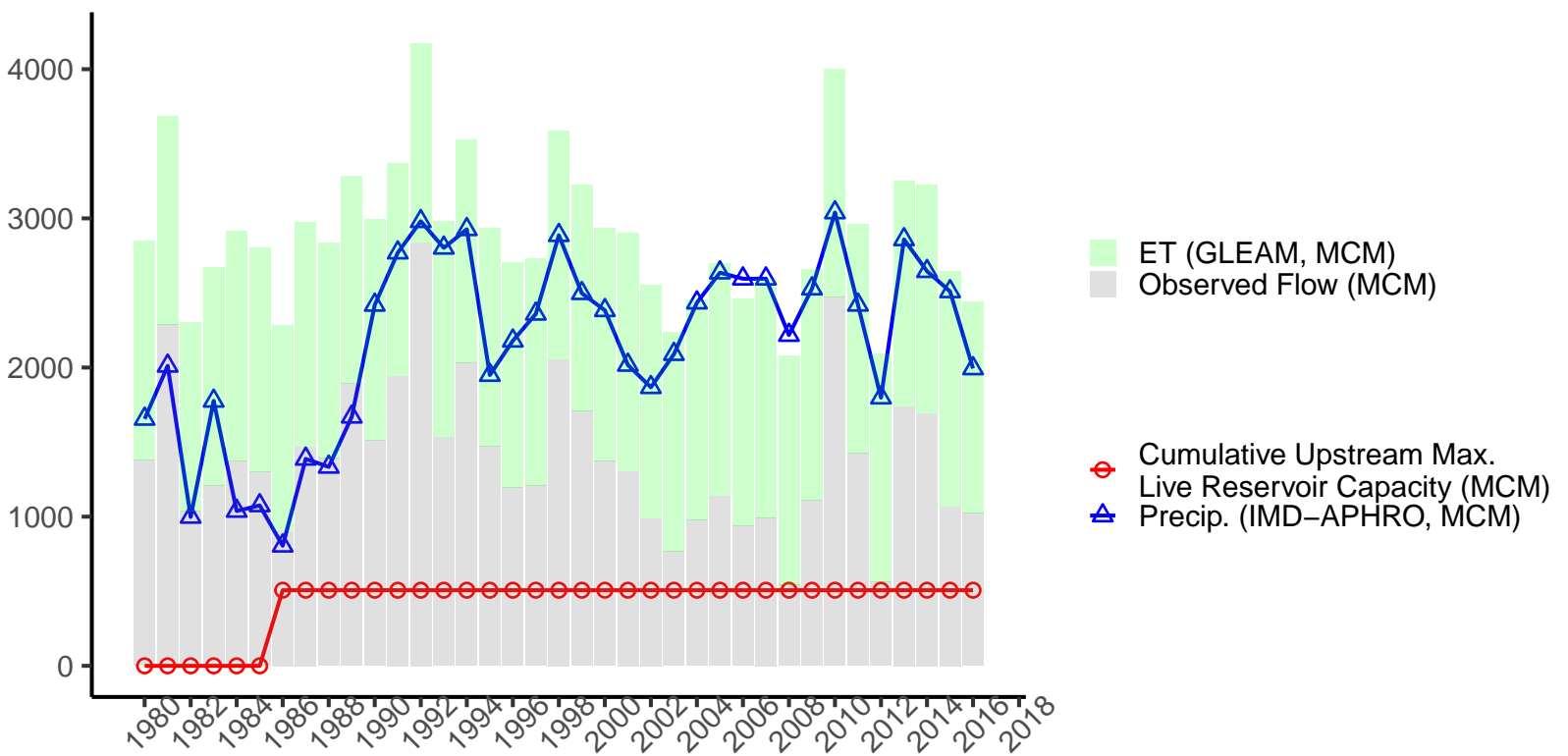
Station: Malakkara, River: Pampa
GHI ID: wfrs_malak, Catch. Area: 1650 sq. km



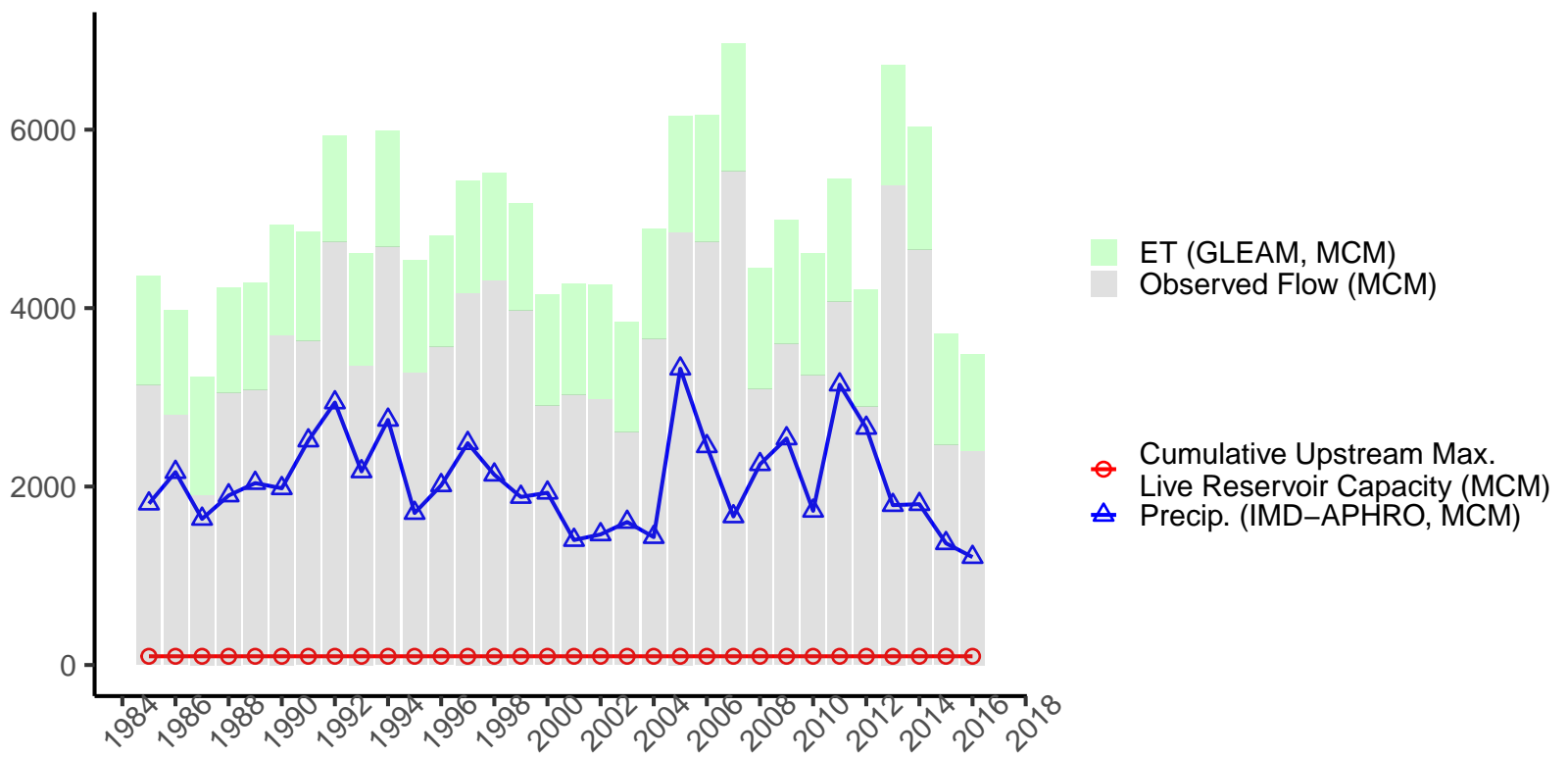
Station: Neeleswaram, River: Periyar
GHI ID: wfrrs_neele, Catch. Area: 4150 sq. km



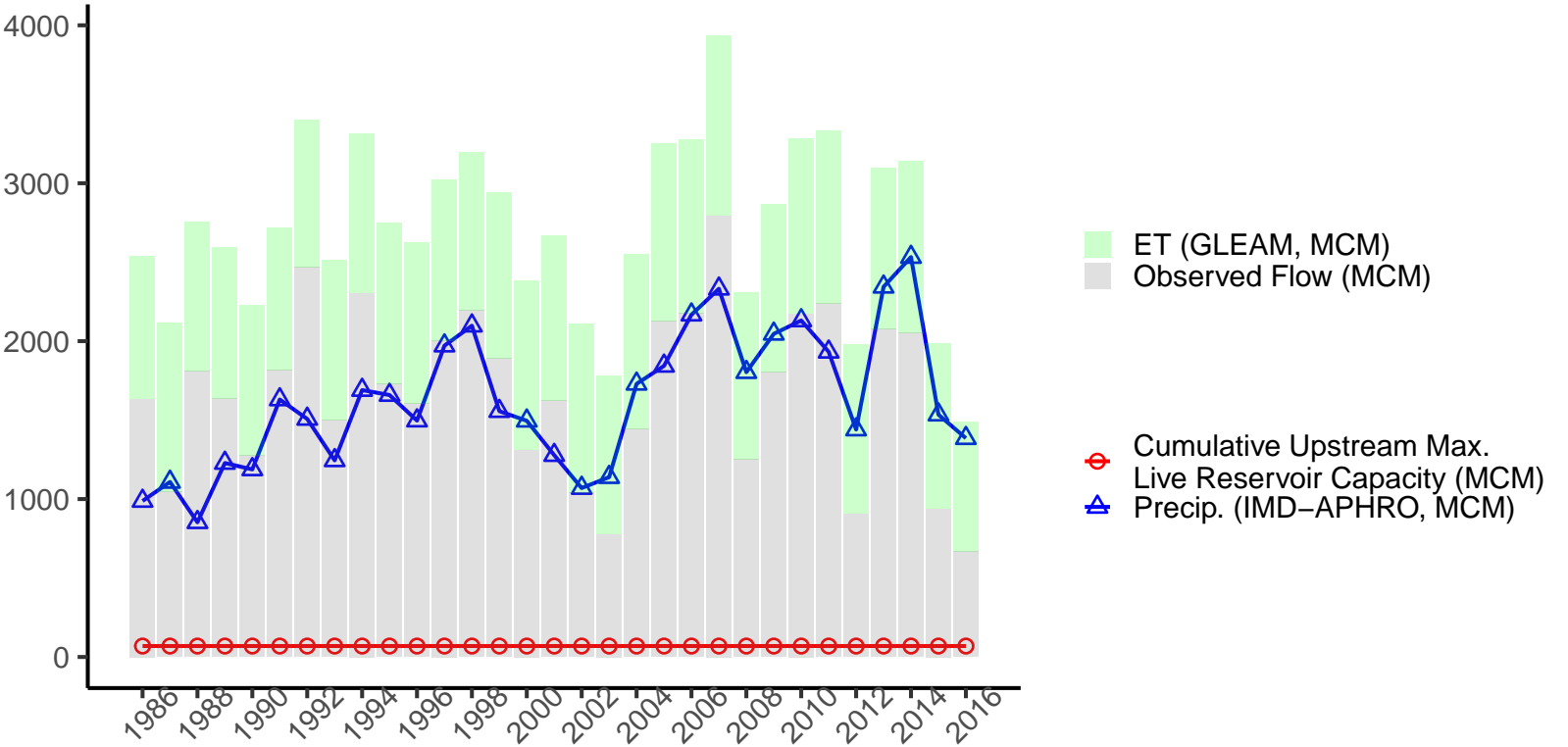
Station: Pattazhy, River: Kallada
GHI ID: wfrs_patta, Catch. Area: 1221 sq. km



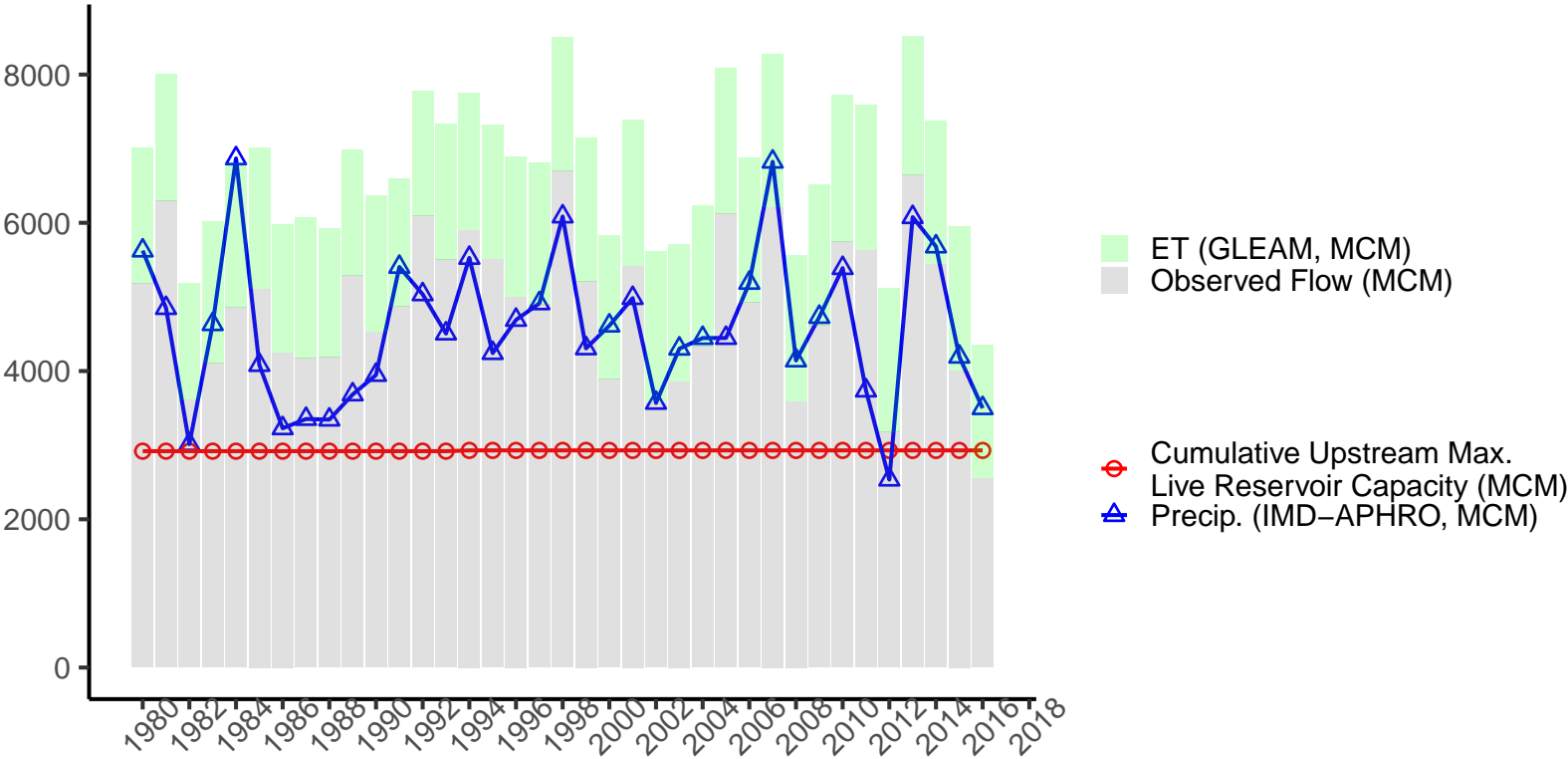
Station: Perumannu, River: Valapatnam
GHI ID: wfrs_perum, Catch. Area: 1069 sq. km



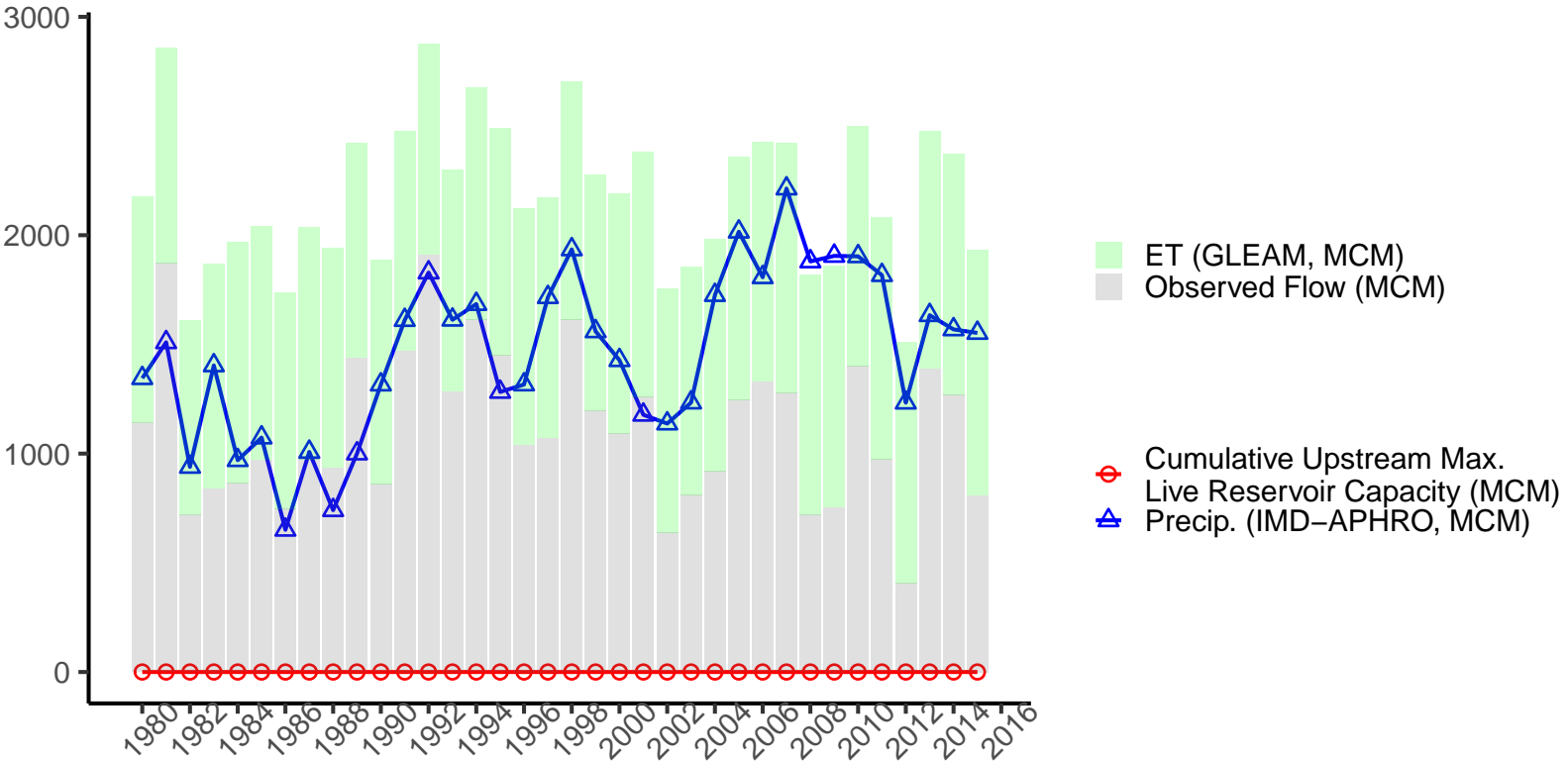
Station: Pulamanthole, River: Bharathapuzha/Pulanthodu
GHI ID: wfrs_pulam, Catch. Area: 923 sq. km



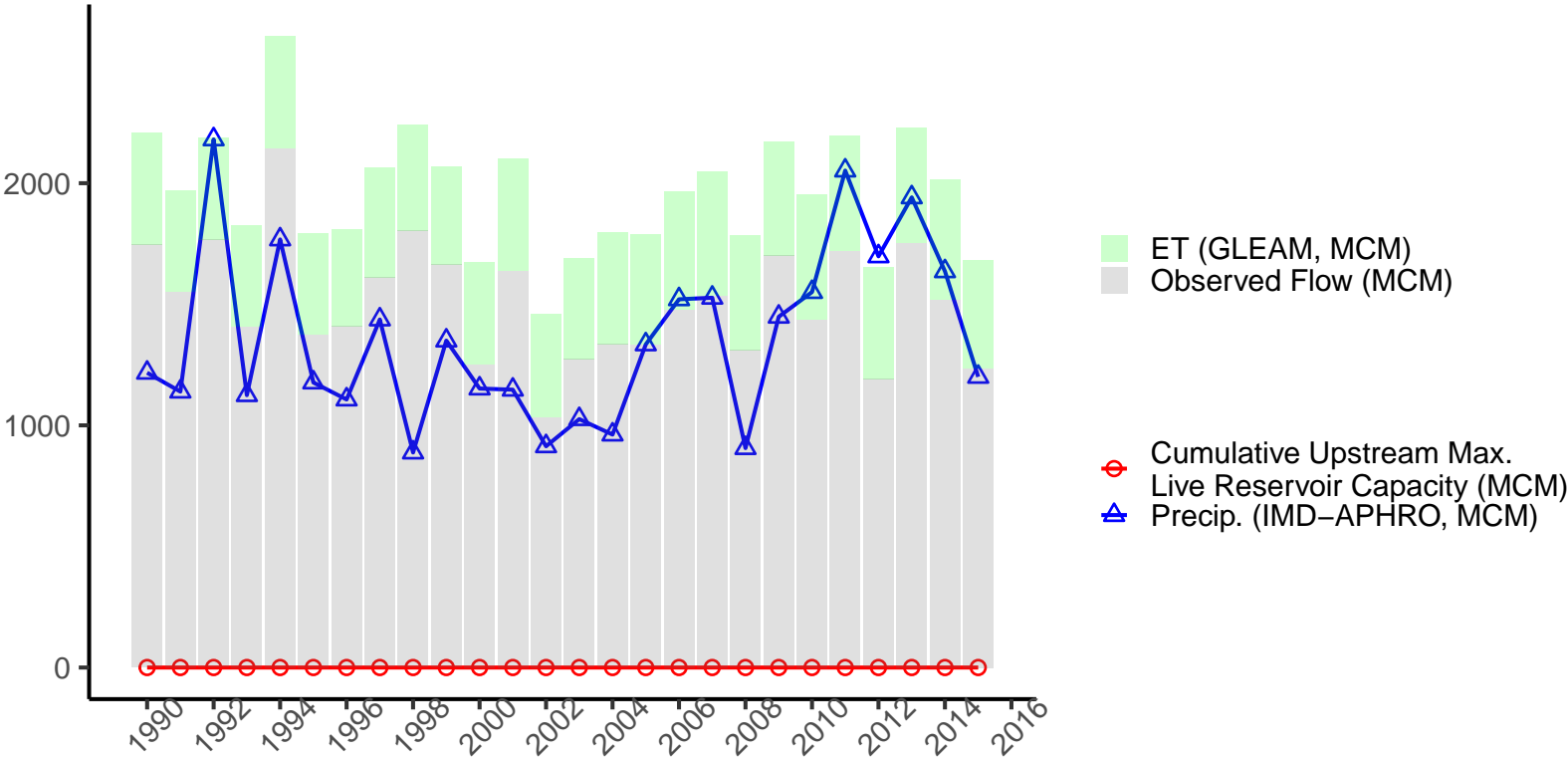
Station: Ramamangalam, River: Muvattupuzha
GHI ID: wfrs_ramam, Catch. Area: 1482 sq. km



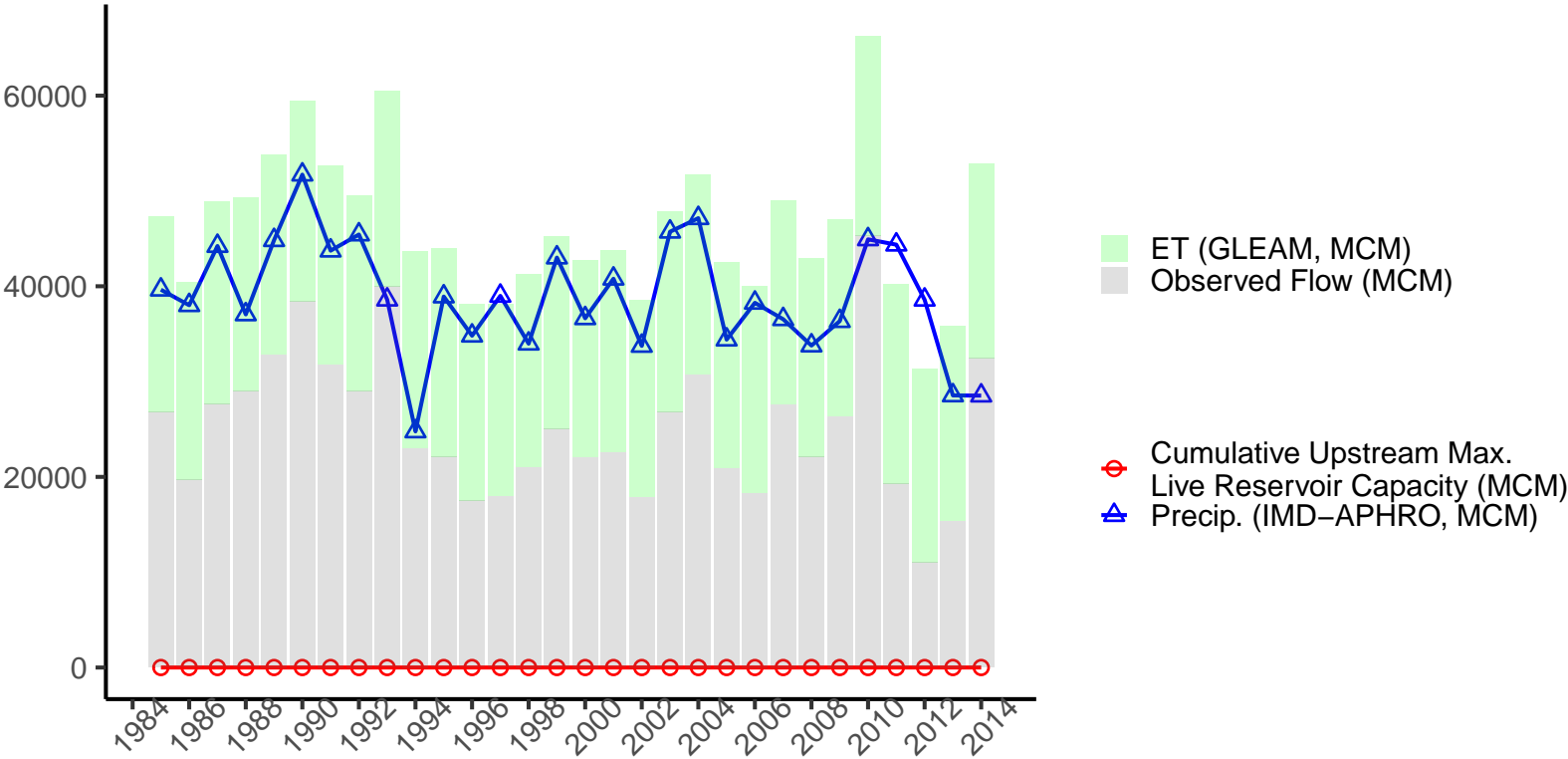
Station: Thumpamon, River: Pamba/Achankovil
GHI ID: wfrs_thump, Catch. Area: 839 sq. km



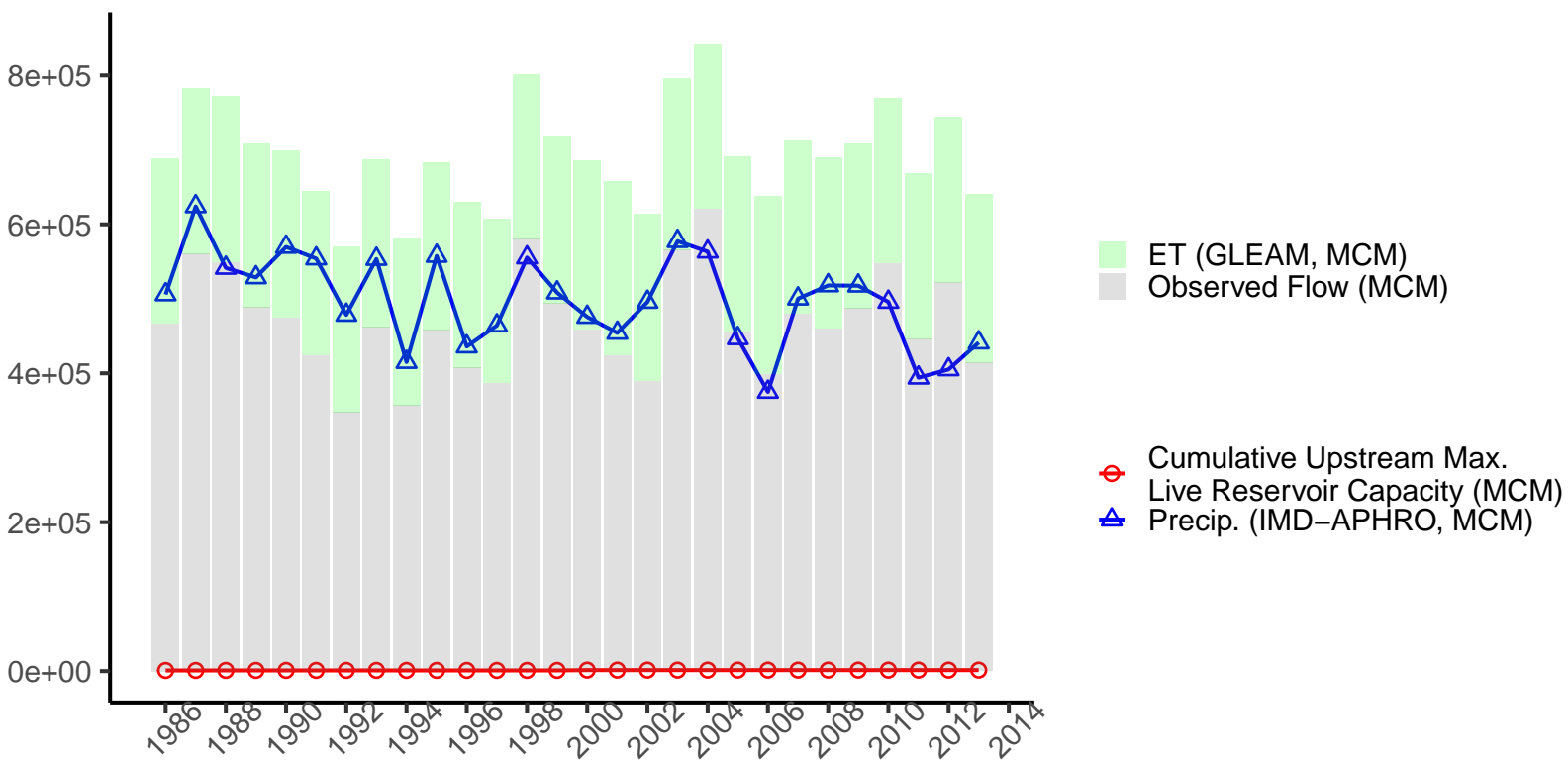
Station: Yennehole, River: Swarna
GHI ID: wfrs_yenne, Catch. Area: 357 sq. km



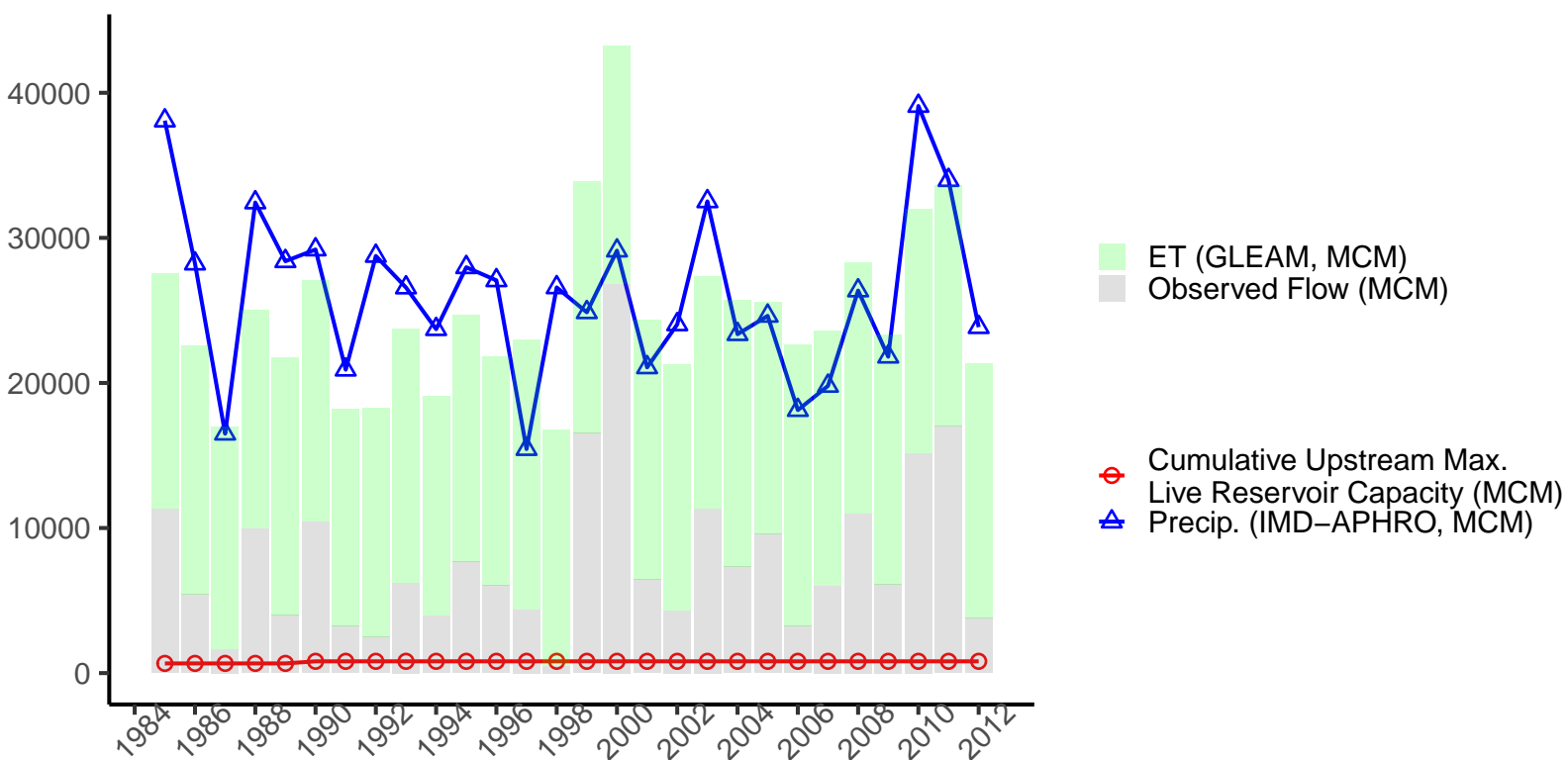
Station: Anna Purna Ghat, River: Barak
GHI ID: gbm_x_anna, Catch. Area: 19235 sq. km



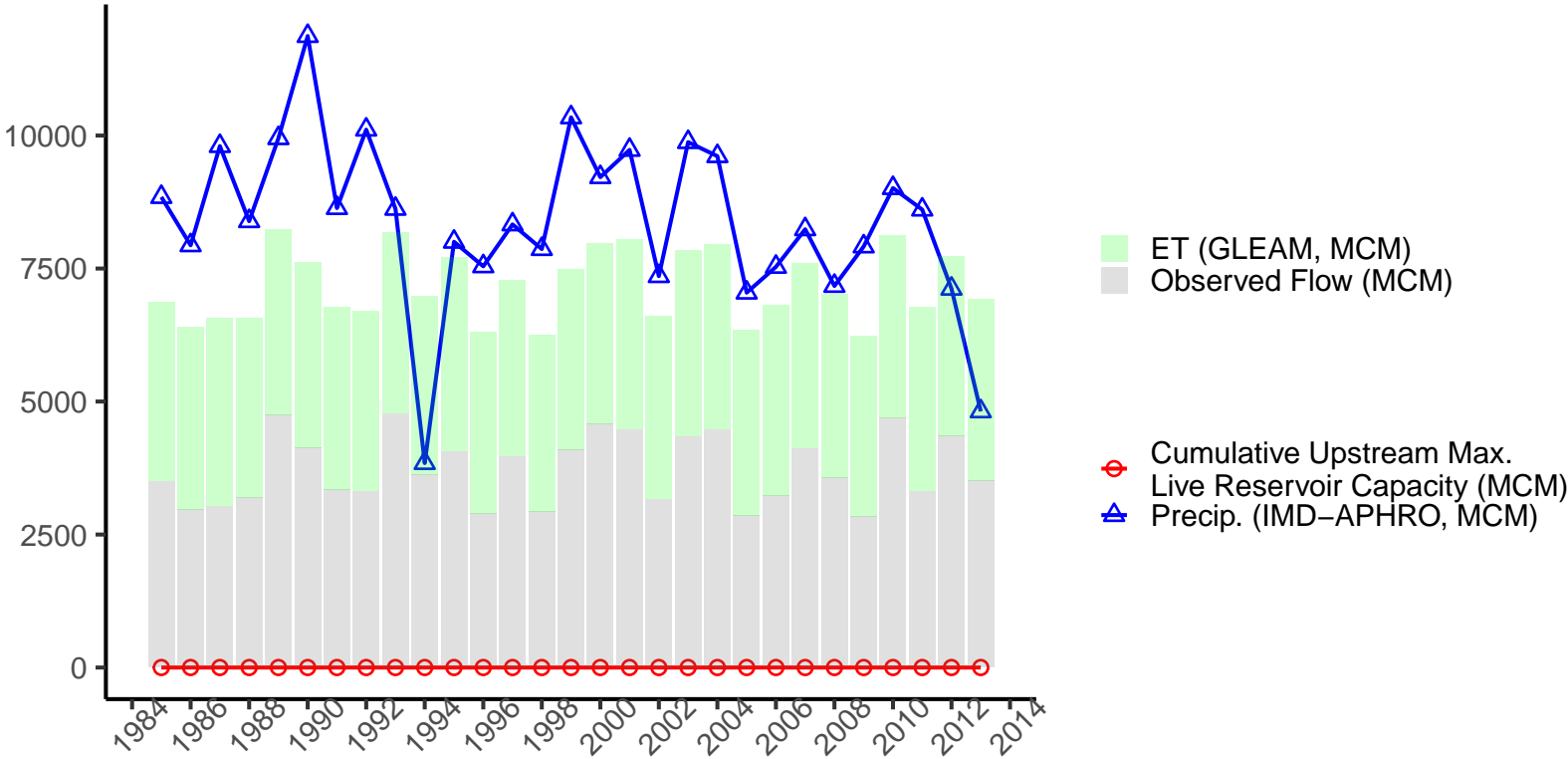
Station: Pancharatna, River: Brahmaputra
GHI ID: gbm_x_panch, Catch. Area: 458992 sq. km



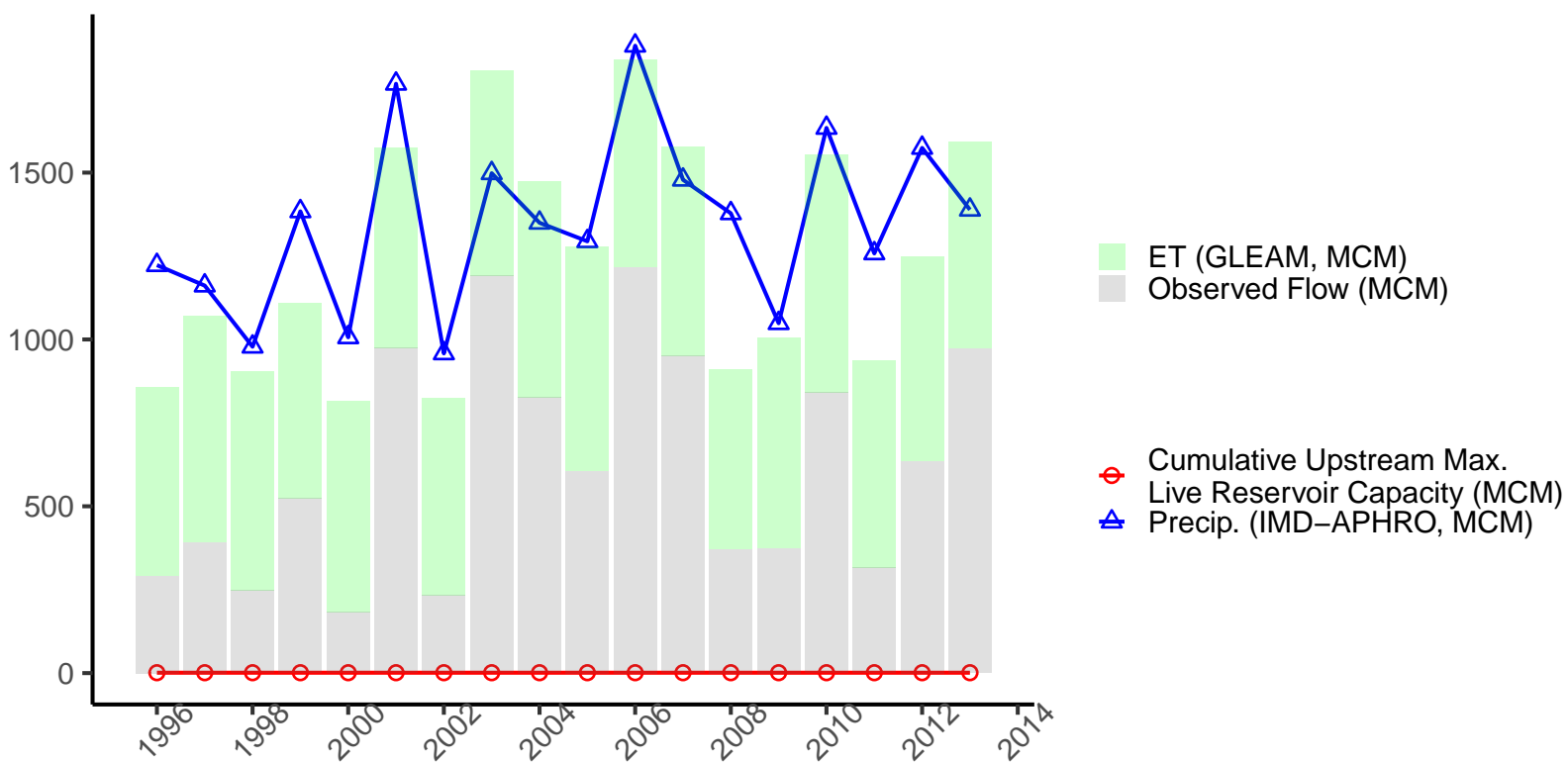
Station: Dabri, River: Ganga/Ramganga
GHI ID: gbm_x_dabri, Catch. Area: 24606 sq. km



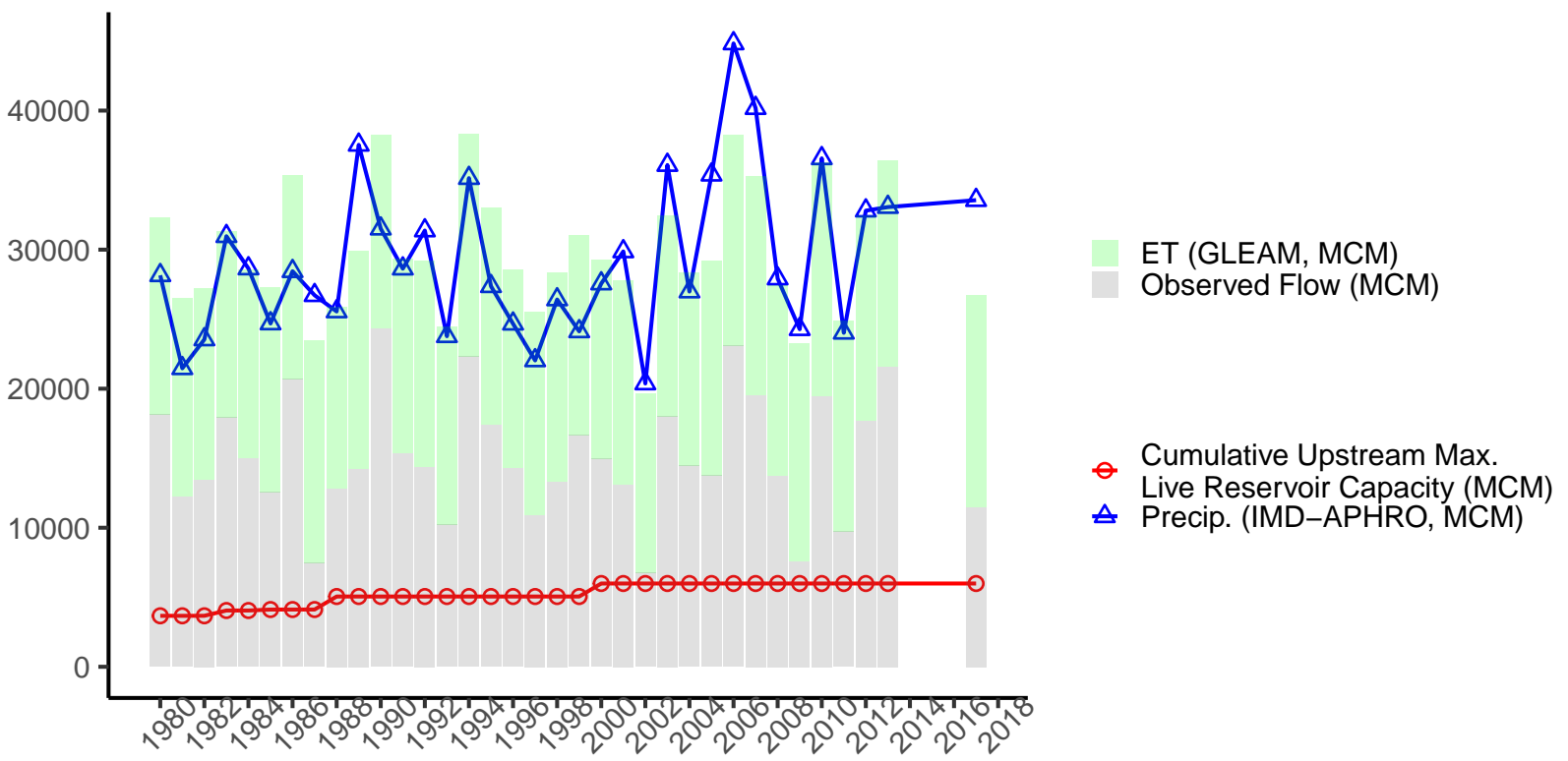
Station: Tulargram, River: Sonai
GHI ID: gbm_x_tular, Catch. Area: 3182 sq. km



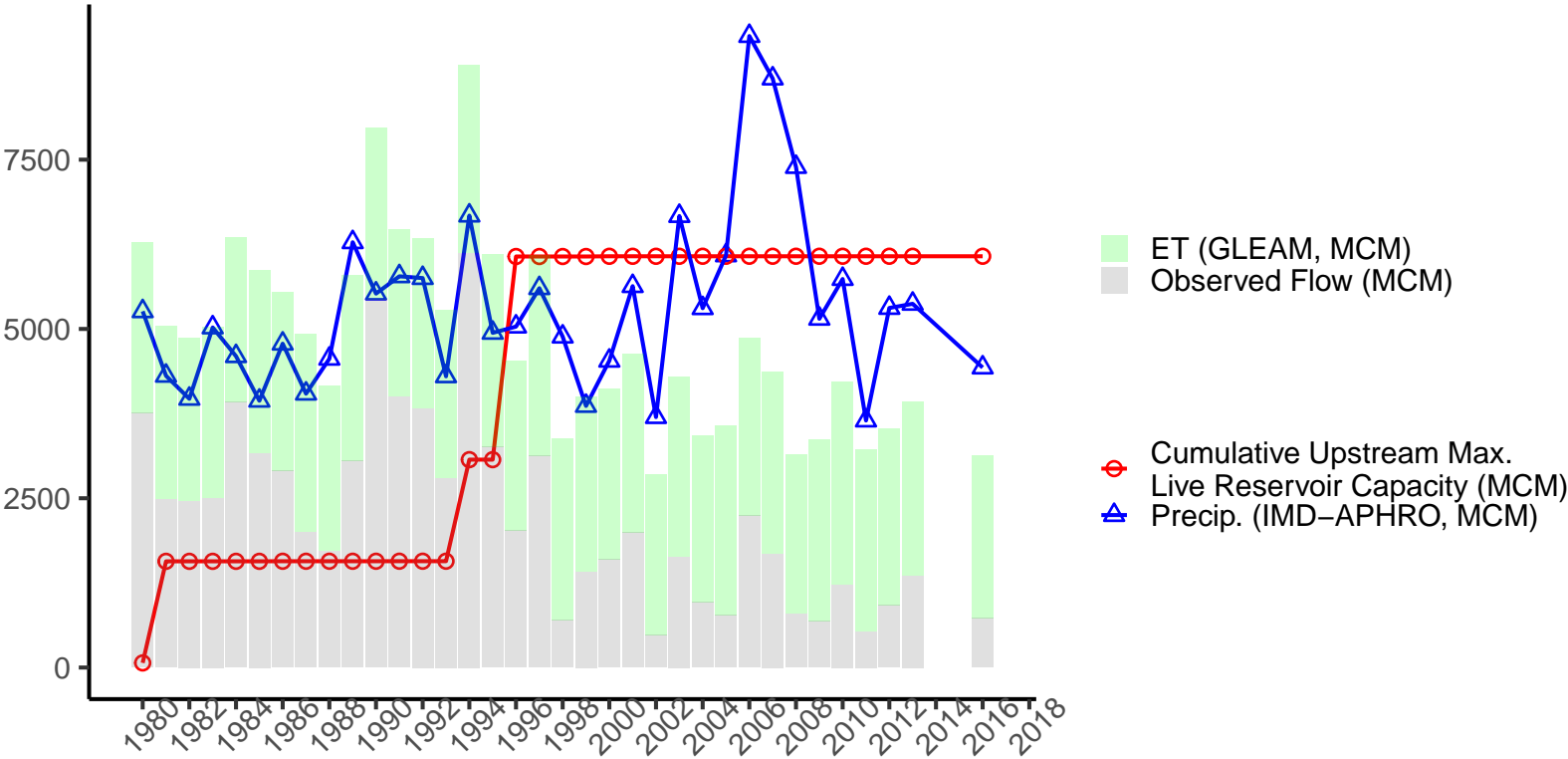
Station: Cherribeda, River: Godavari/Indravati/Bardha
GHI ID: goda_cherr, Catch. Area: 1026 sq. km



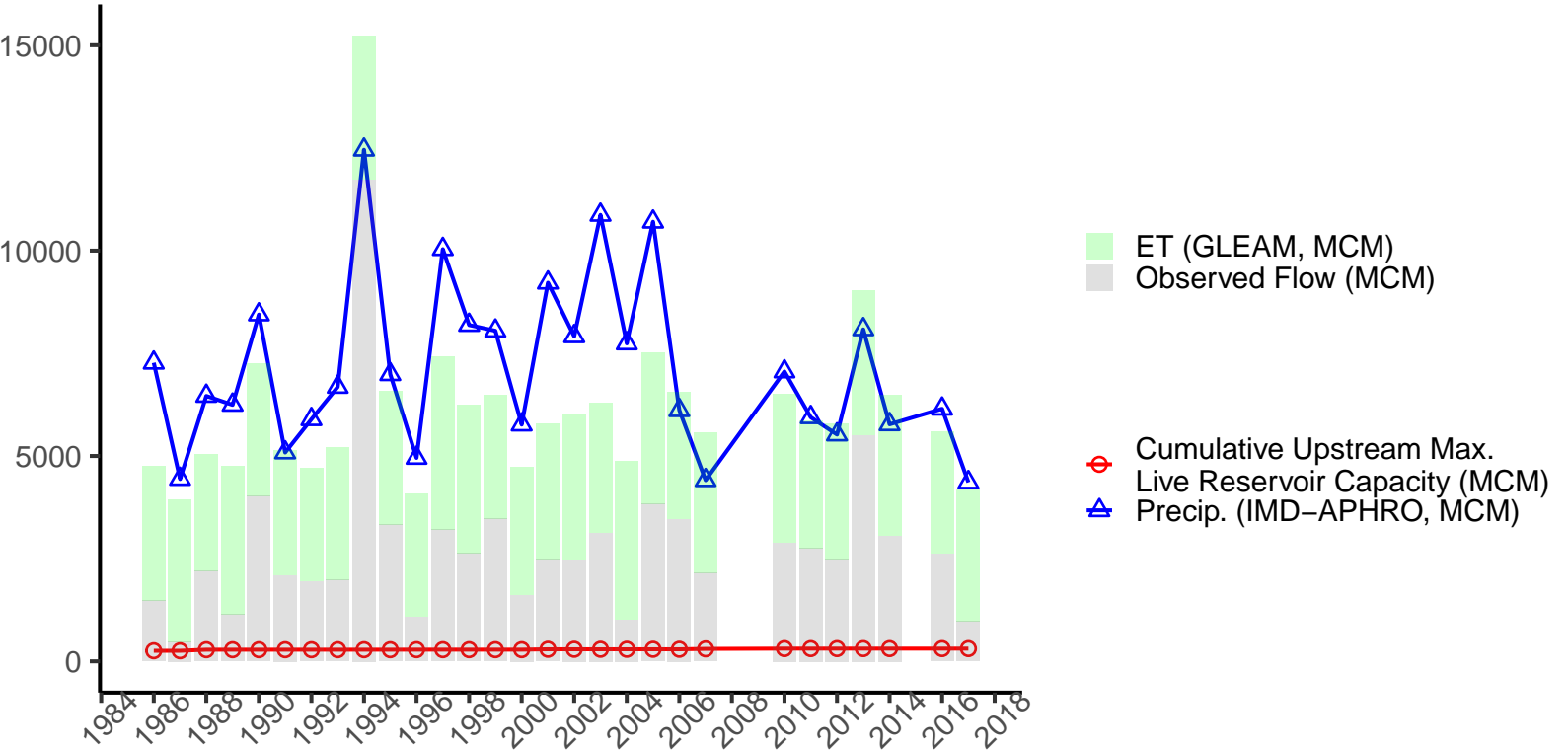
Station: Konta, River: Godavari/Sabari
GHI ID: goda_konta, Catch. Area: 20334 sq. km



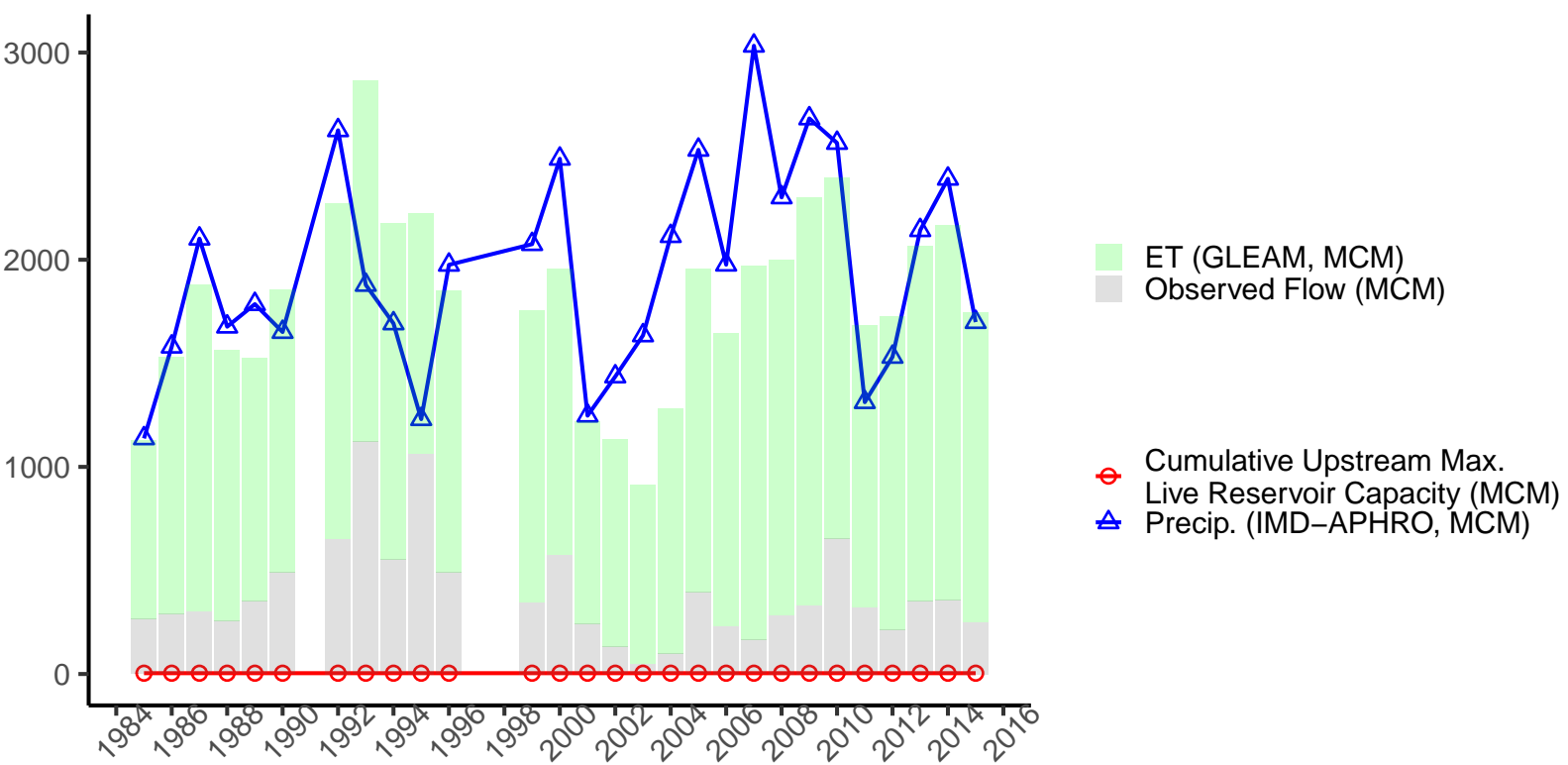
Station: Nowrangpur, River: Godavari/Indravati
GHI ID: goda_nowra, Catch. Area: 3661 sq. km



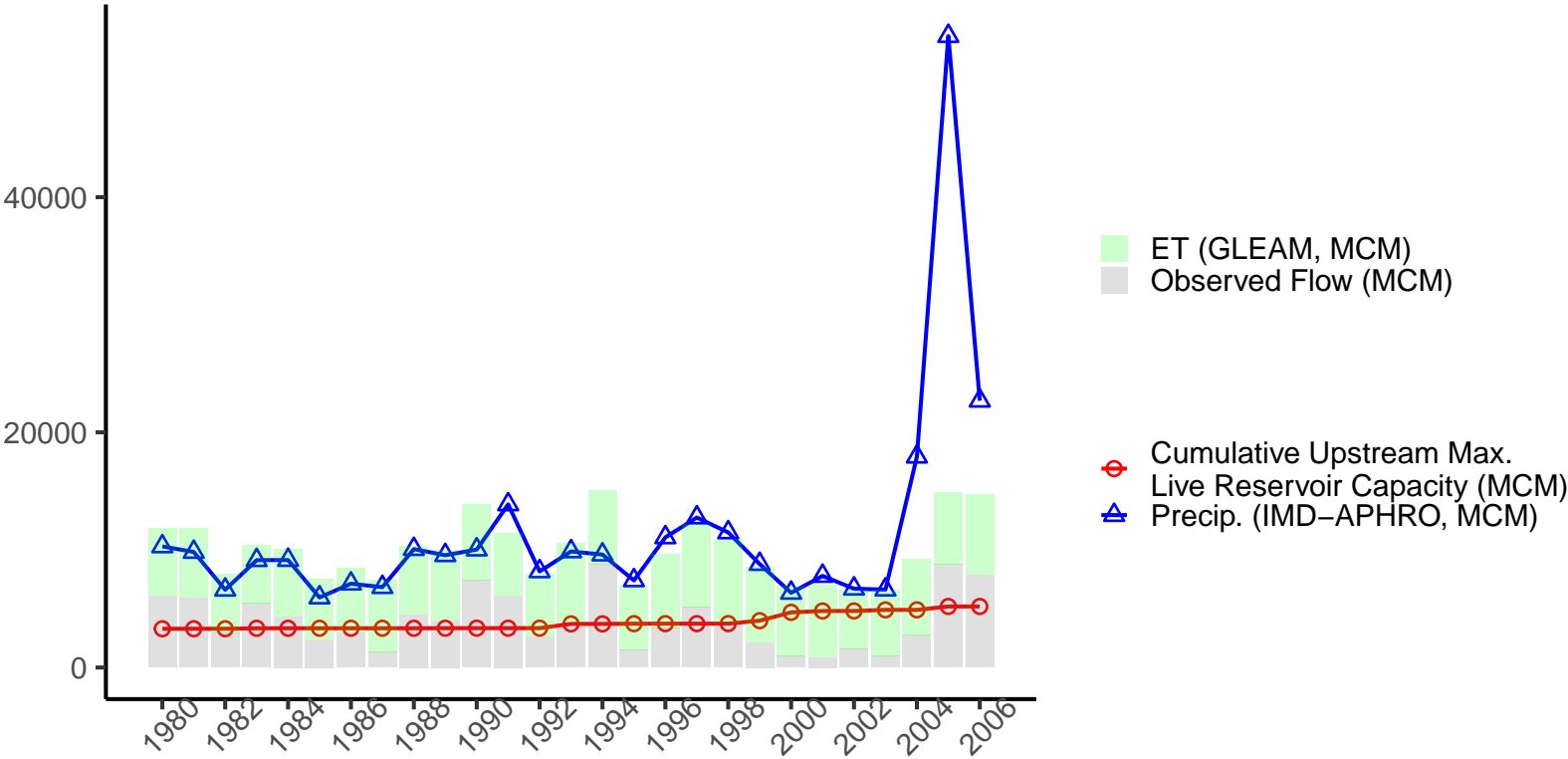
Station: Rajegaon, River: Godavari/Pranhita/Bagh
GHI ID: goda_rajeg, Catch. Area: 5403 sq. km



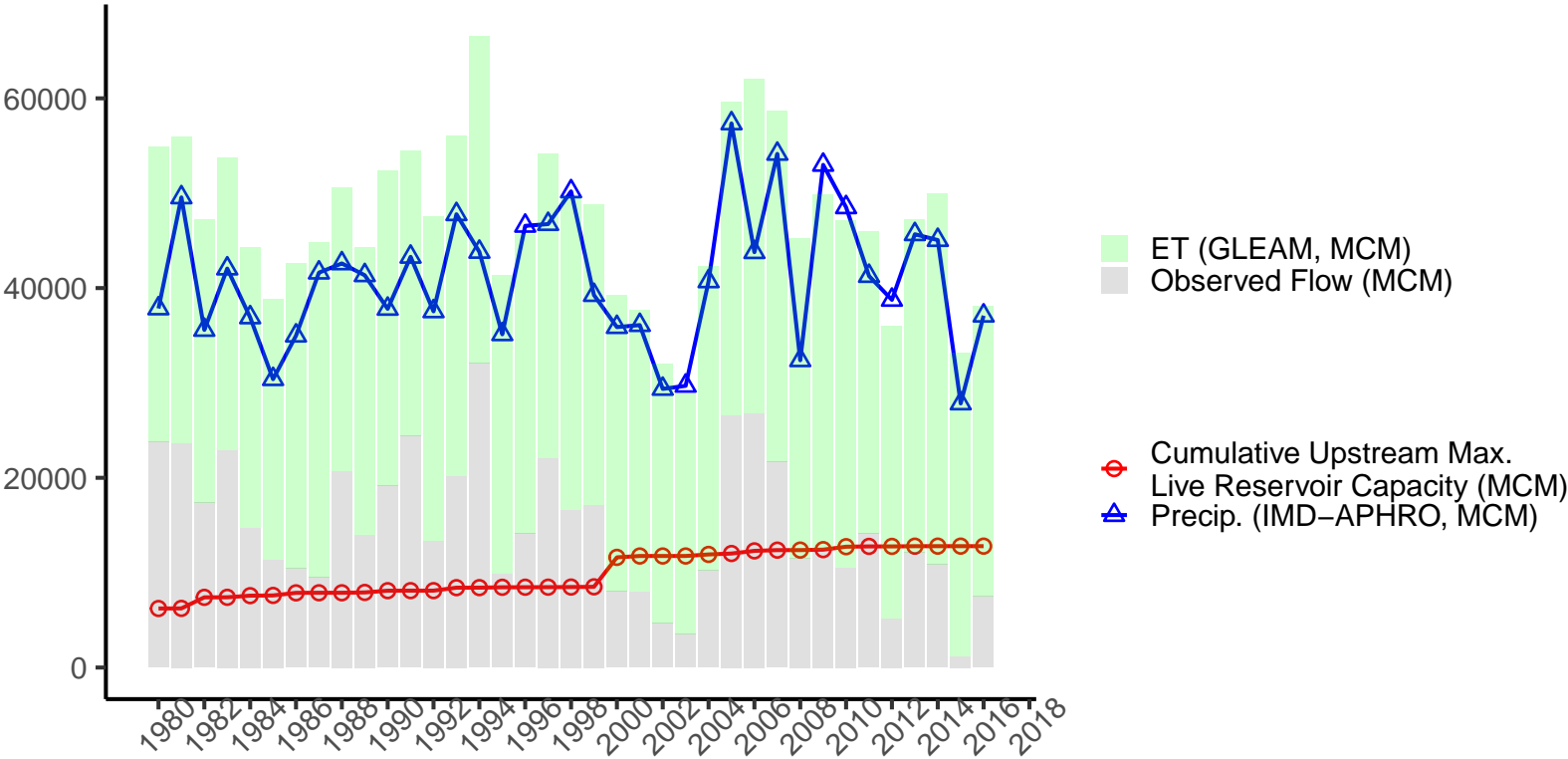
Station: Byaladahalli, River: Krishna/Tungabhadra/Tunga
GHI ID: kris_byala, Catch. Area: 2508 sq. km



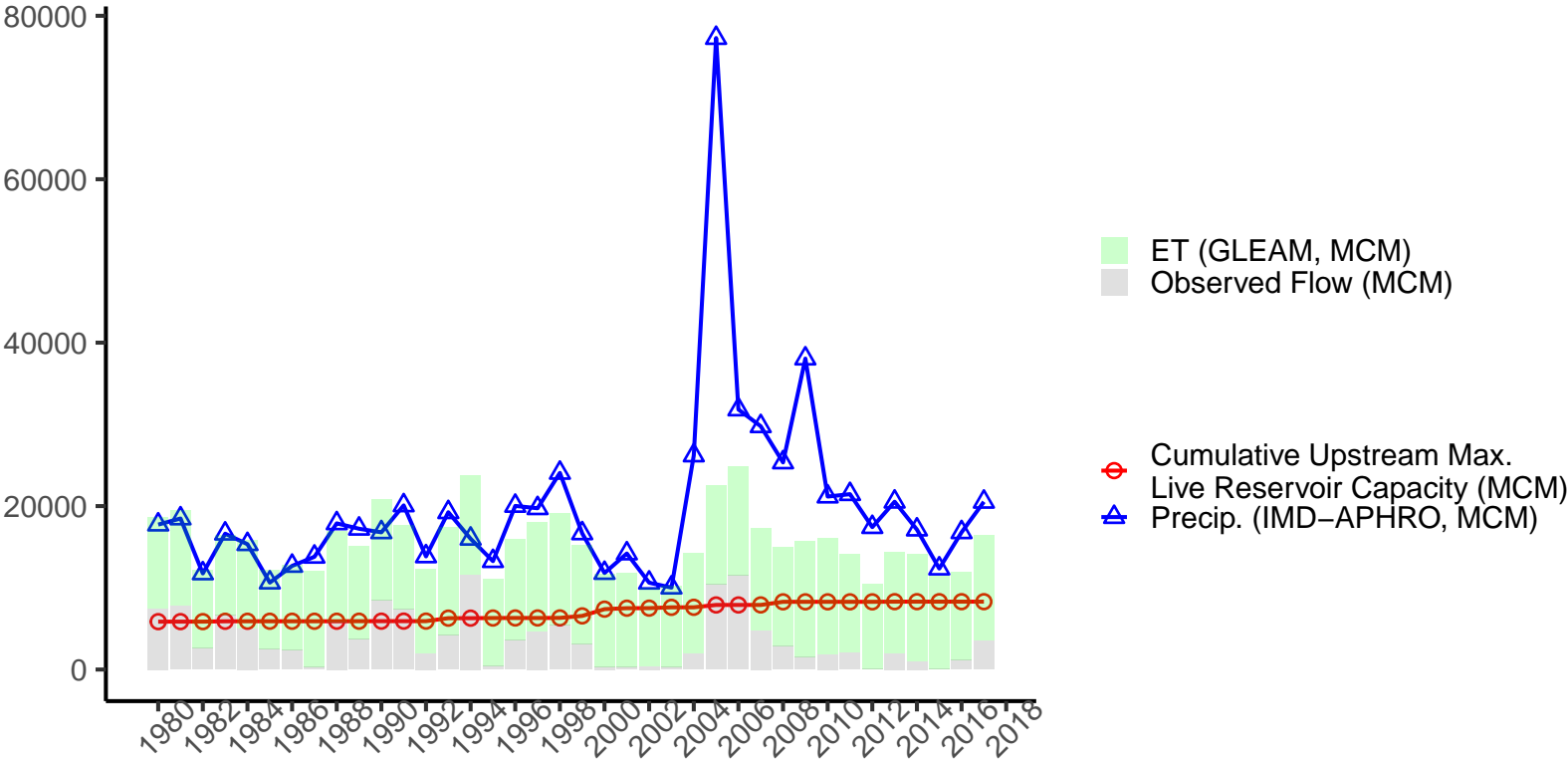
Station: Daund, River: Krishna/Bhima
GHI ID: kris_daund, Catch. Area: 11439 sq. km



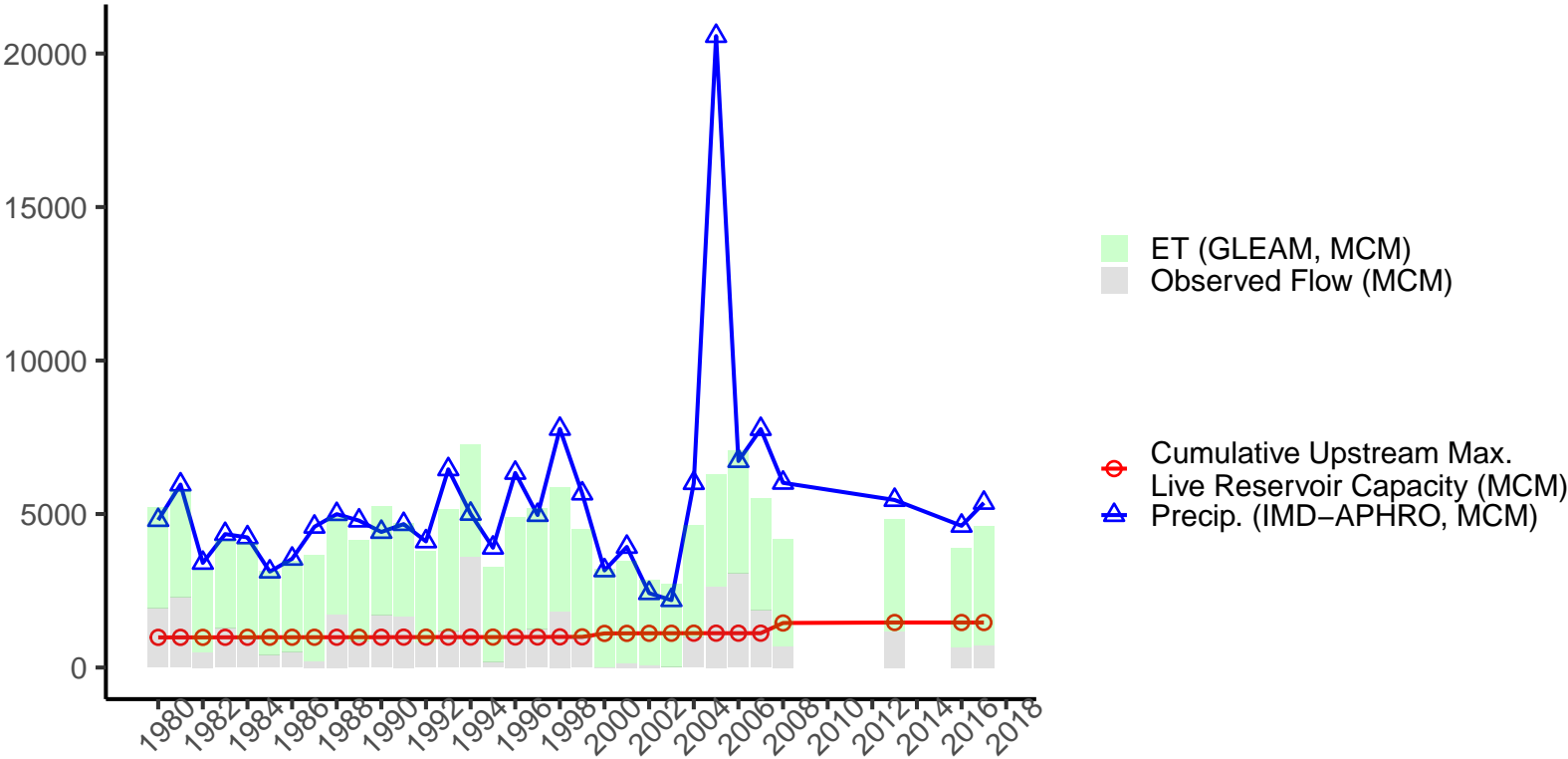
Station: Huvinhedigi, River: Krishna
GHI ID: kris_huvin, Catch. Area: 54166 sq. km



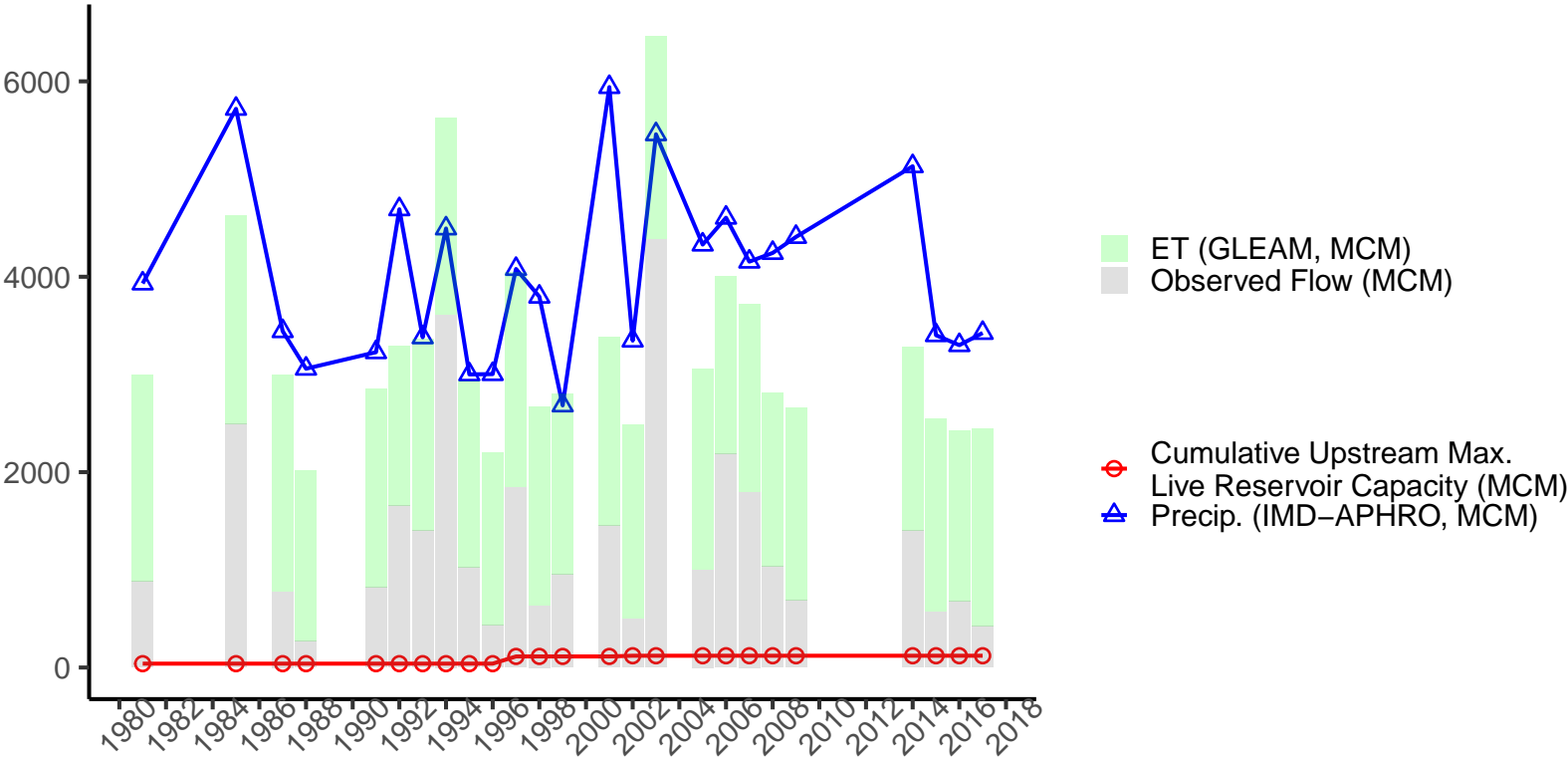
Station: Narsingpur, River: Krishna/Bhima
GHI ID: kris_narsi, Catch. Area: 22326 sq. km



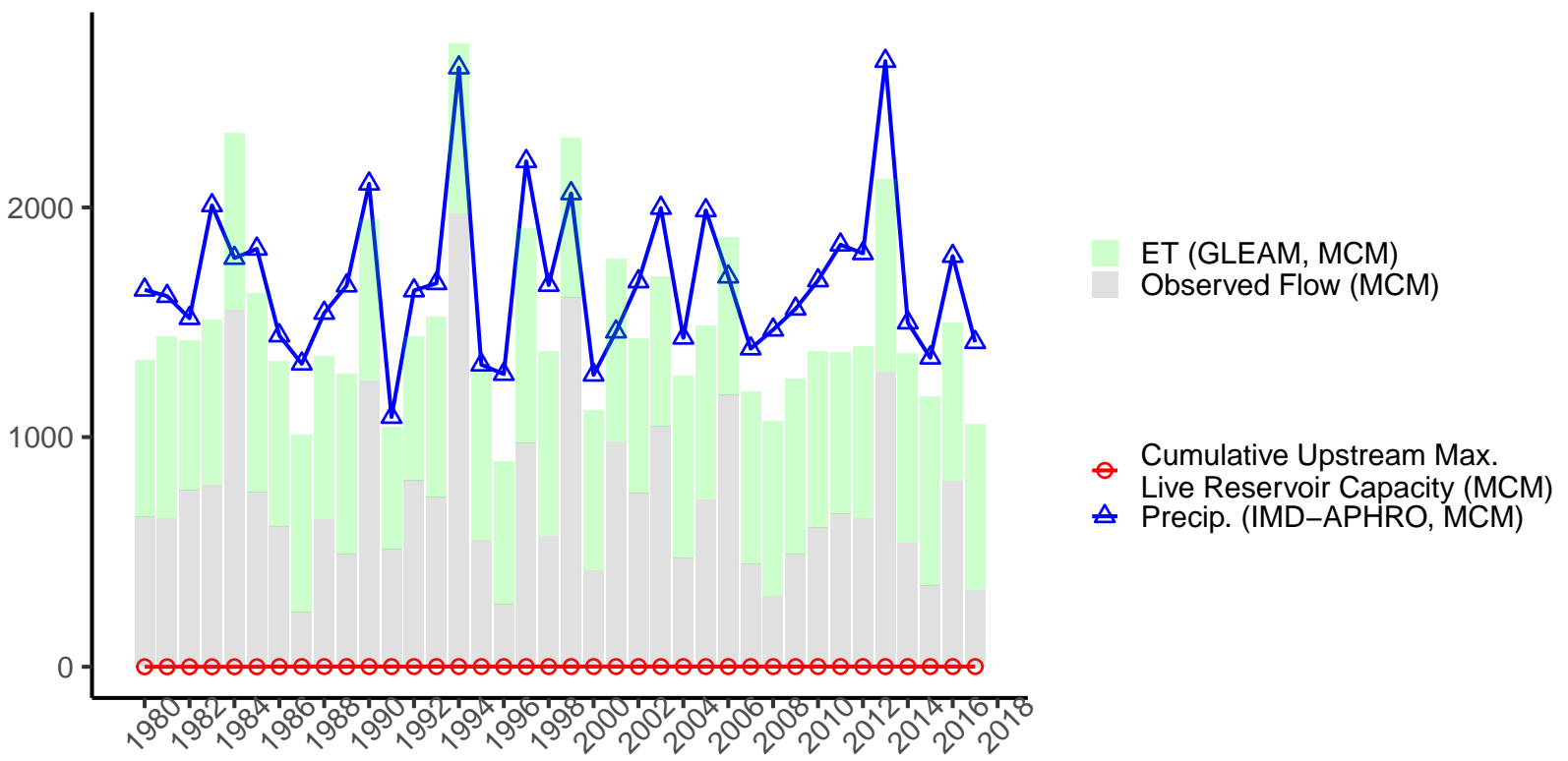
Station: Sarati, River: Krishna/Bhima/Nira
GHI ID: kris_sarat, Catch. Area: 6807 sq. km



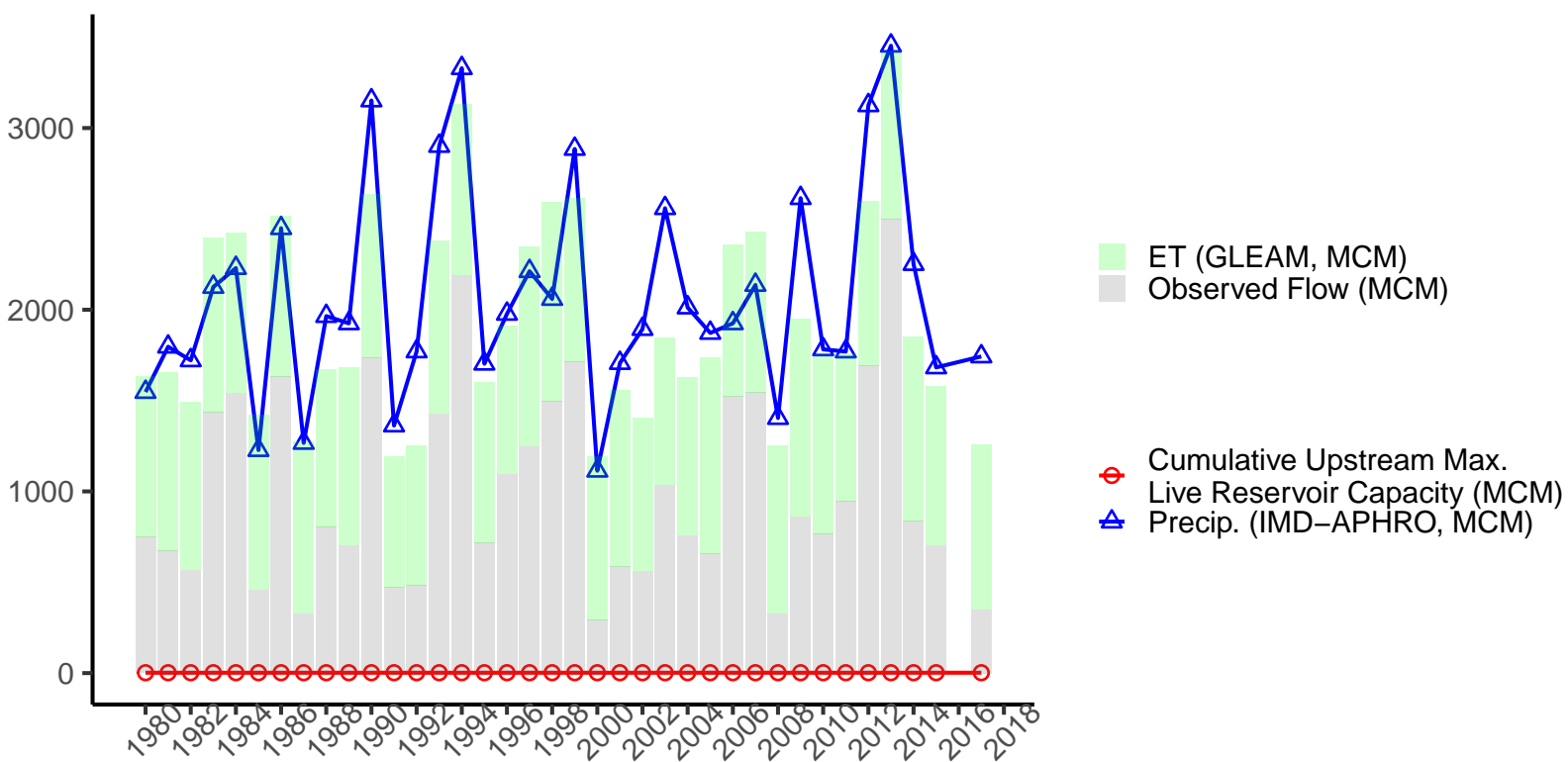
Station: Rampur, River: Mahanadi/Jonk
GHI ID: maha_rampu, Catch. Area: 3451 sq. km



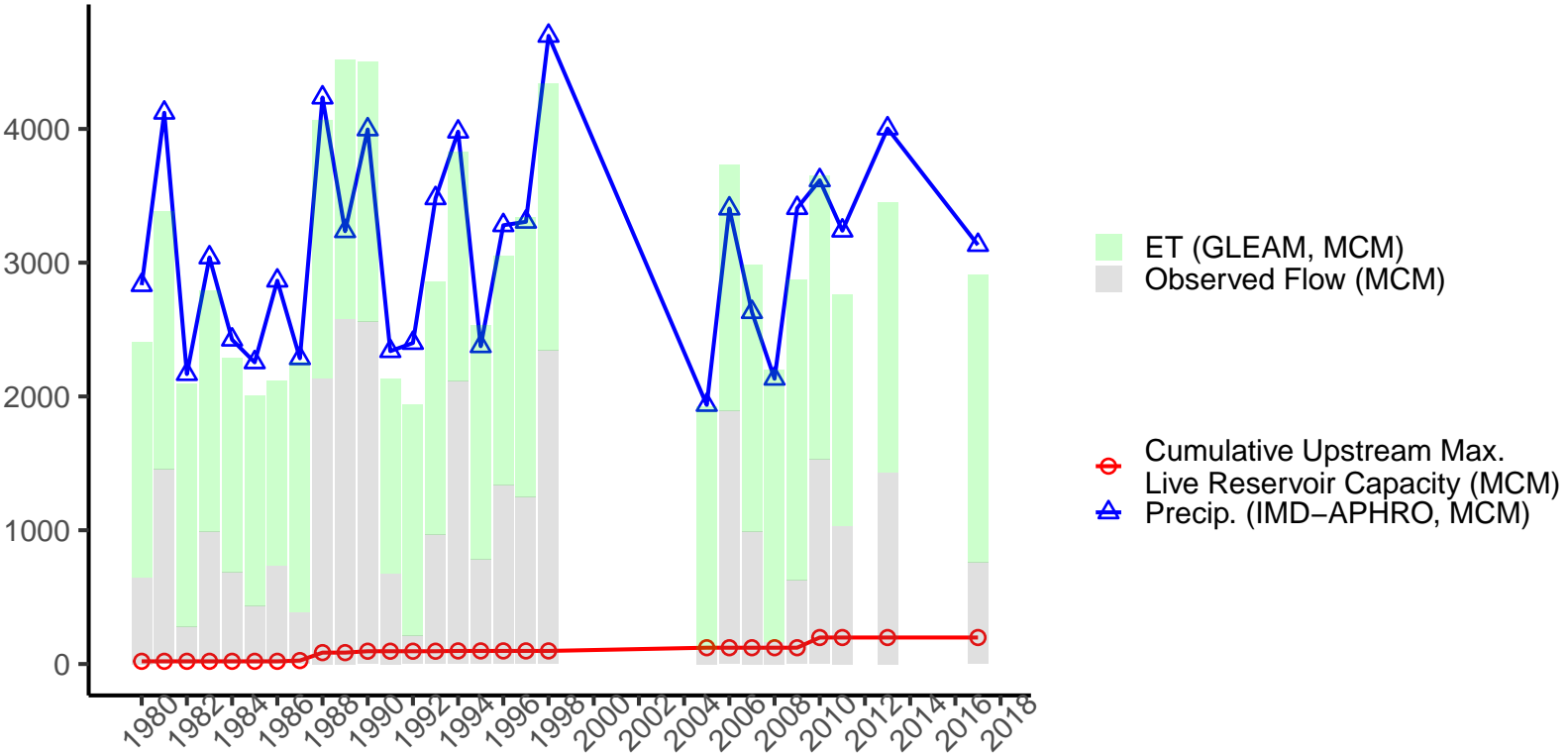
Station: Belkheri, River: Narmada/Sher
GHI ID: narm_belkh, Catch. Area: 1490 sq. km



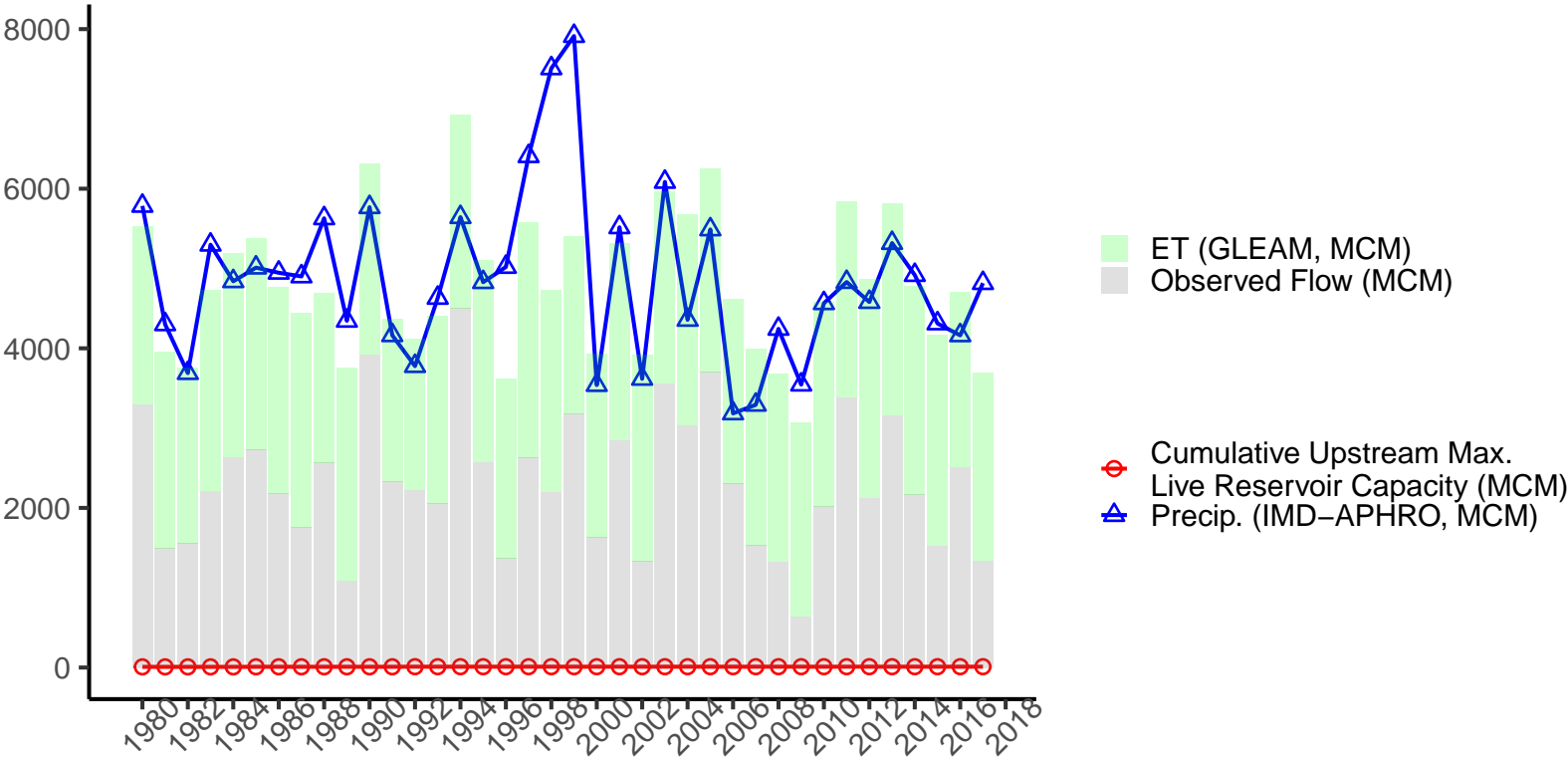
Station: Chhidgaon, River: Narmada/Ganjal
GHI ID: narm_chhid, Catch. Area: 1765 sq. km



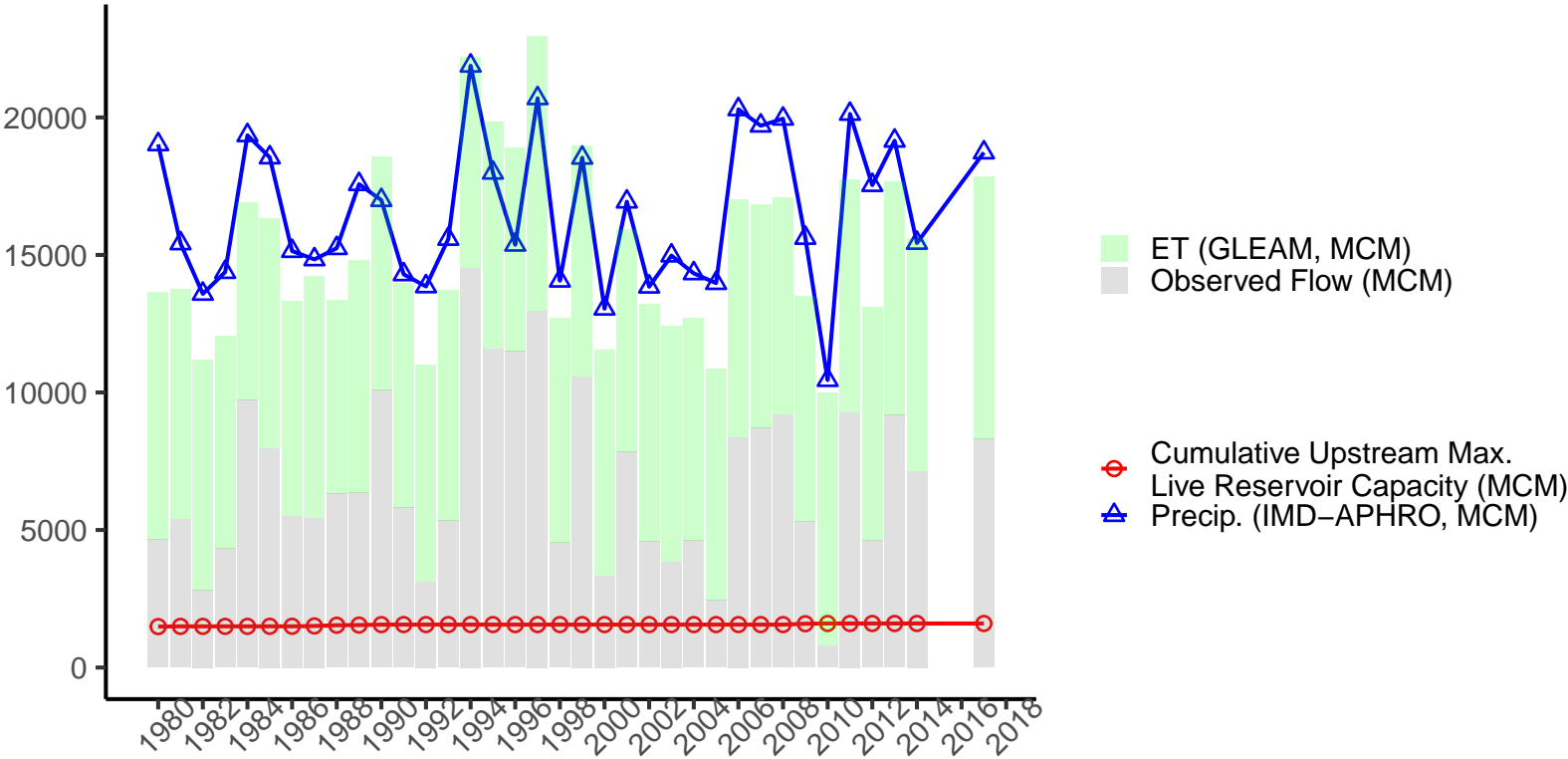
Station: Kogaon, River: Narmada/Kundi
GHI ID: narm_kogao, Catch. Area: 3934 sq. km



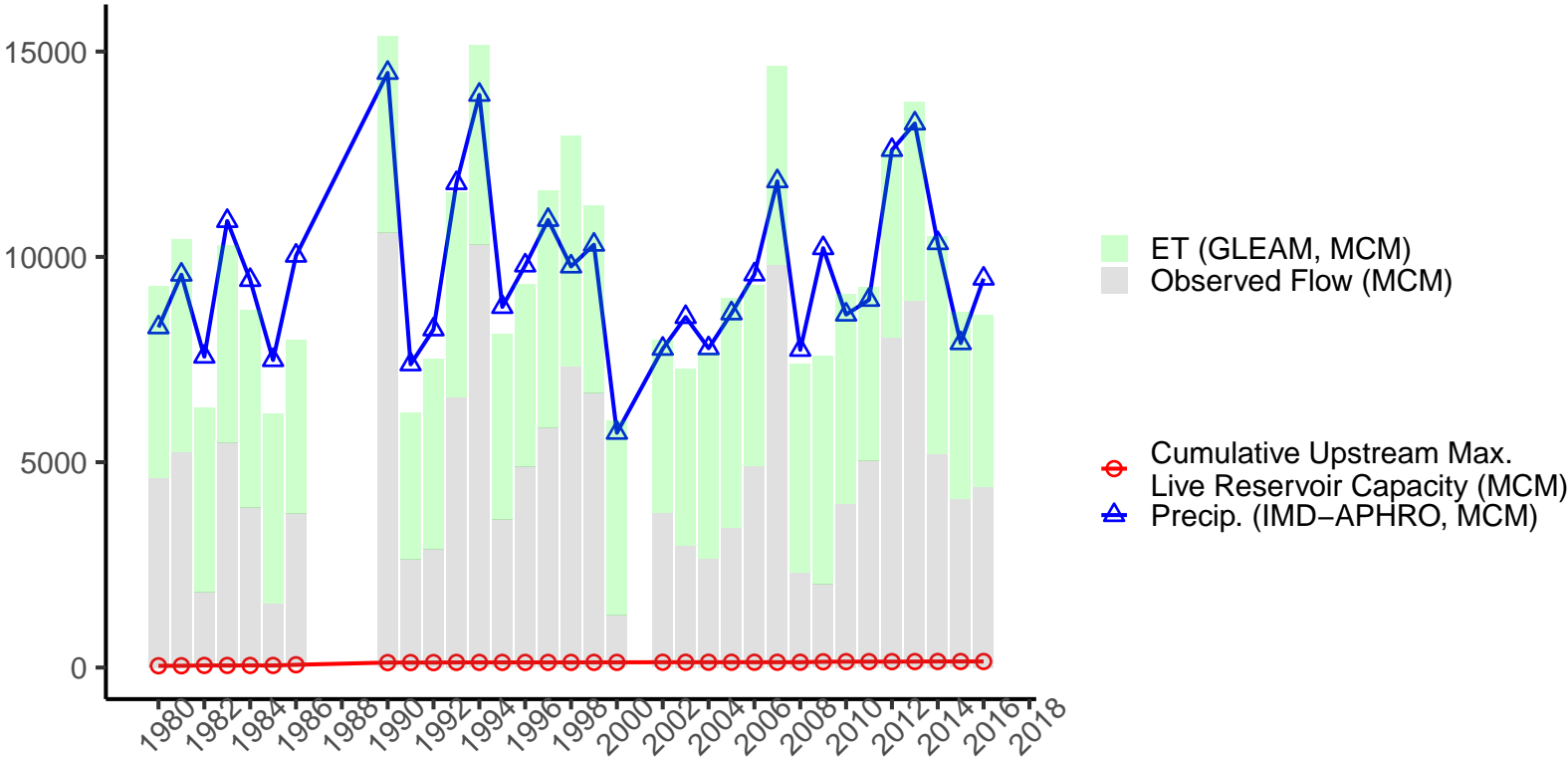
Station: Mohgaoan, River: Narmada/Burhner
GHI ID: narm_mohga, Catch. Area: 3998 sq. km



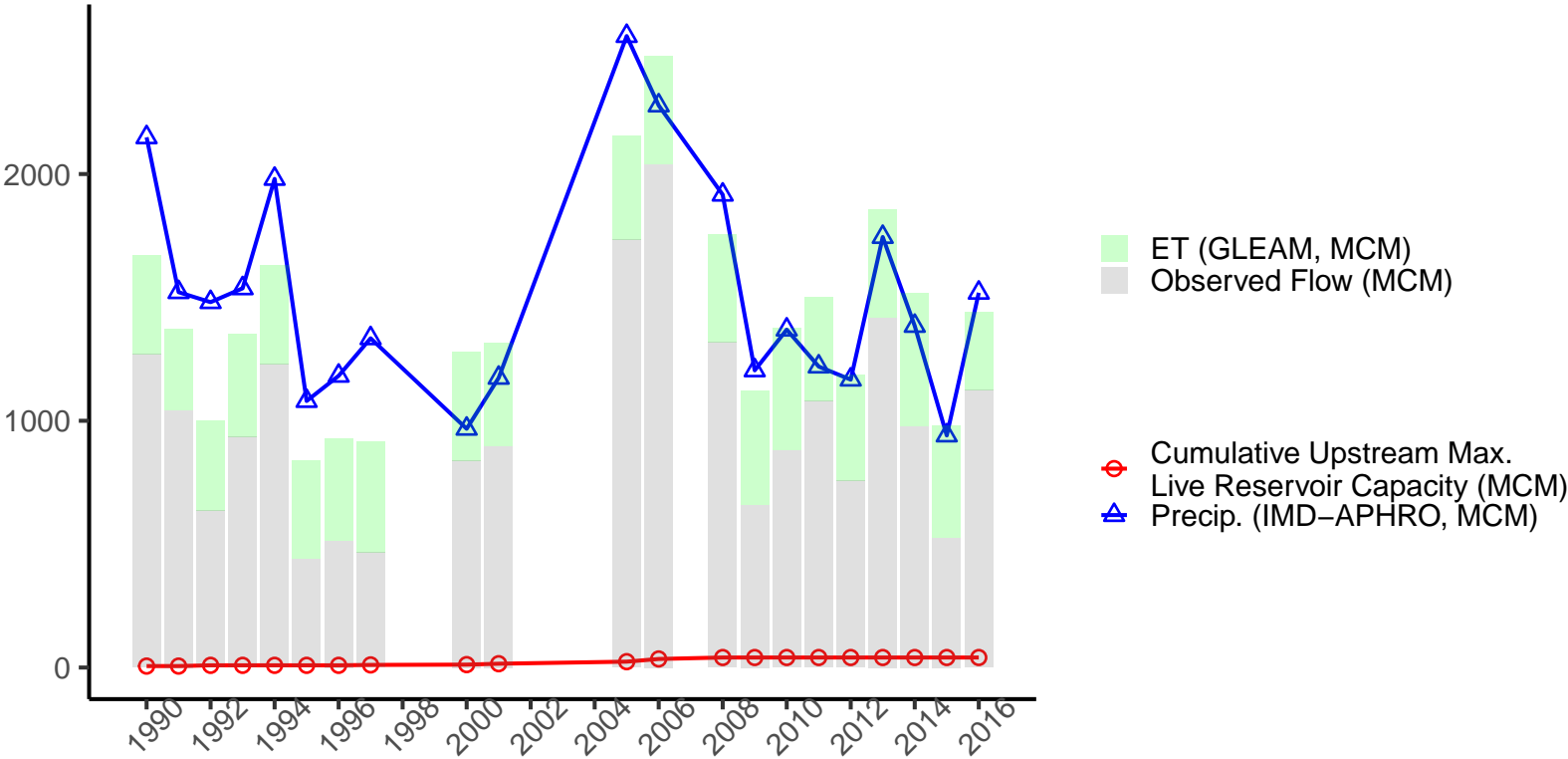
Station: Jamshedpur, River: Subarnarekha
GHI ID: sube_jams1, Catch. Area: 12785 sq. km



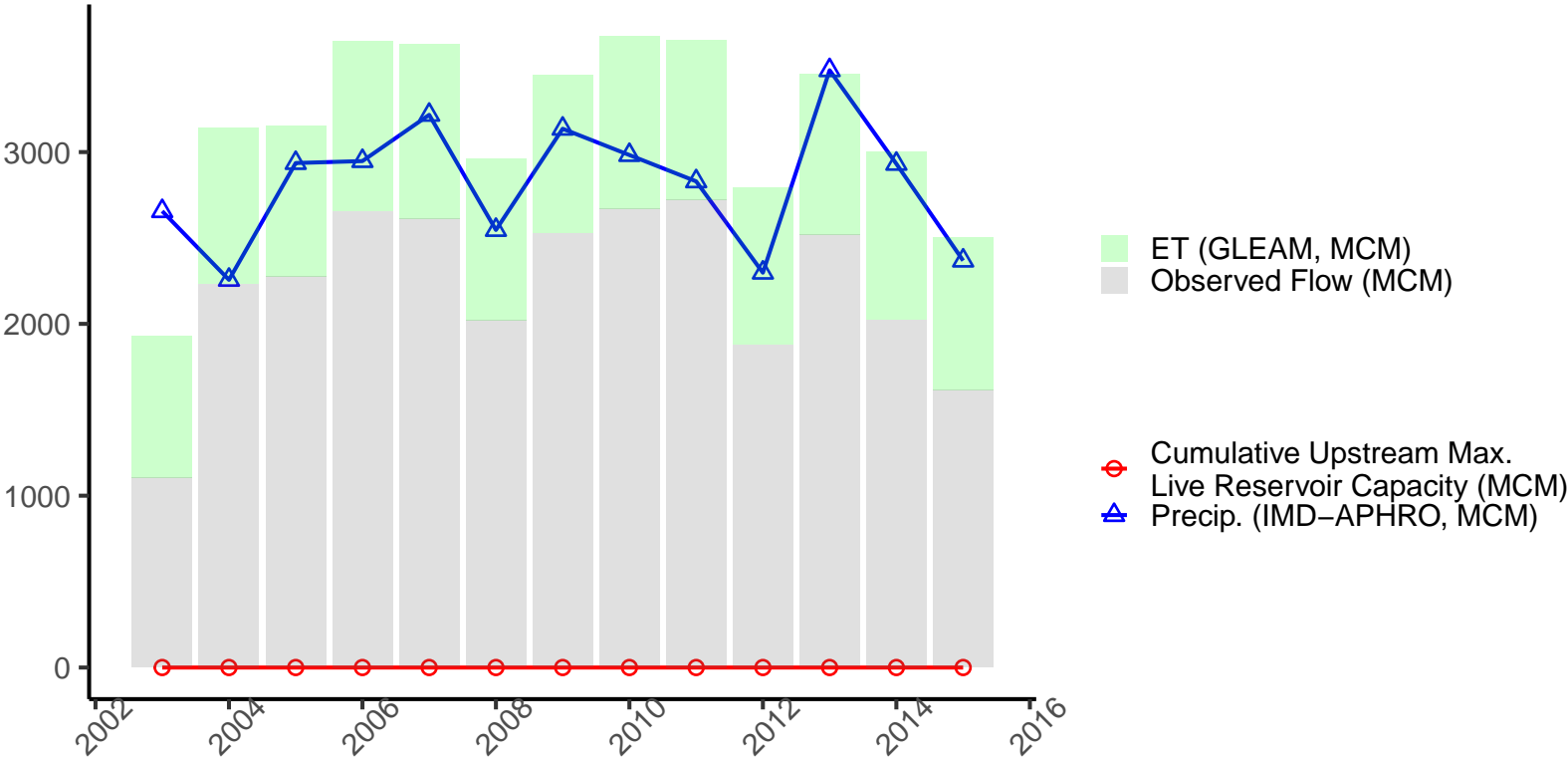
Station: Burhanpur, River: Tapi
GHI ID: tapi_burha, Catch. Area: 9070 sq. km



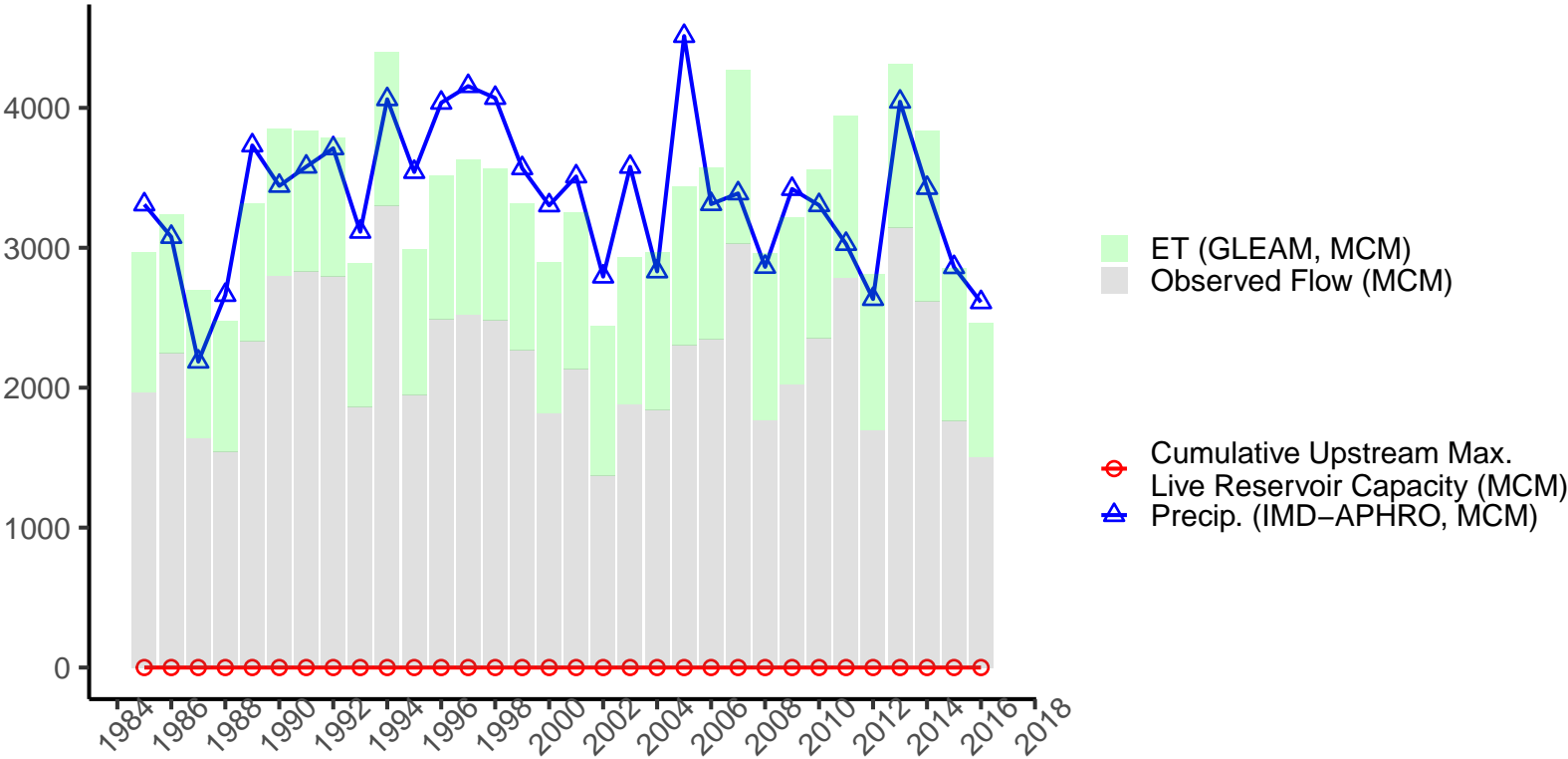
Station: Nanipalson, River: Damanganga
GHI ID: wfrn_nanip, Catch. Area: 763 sq. km



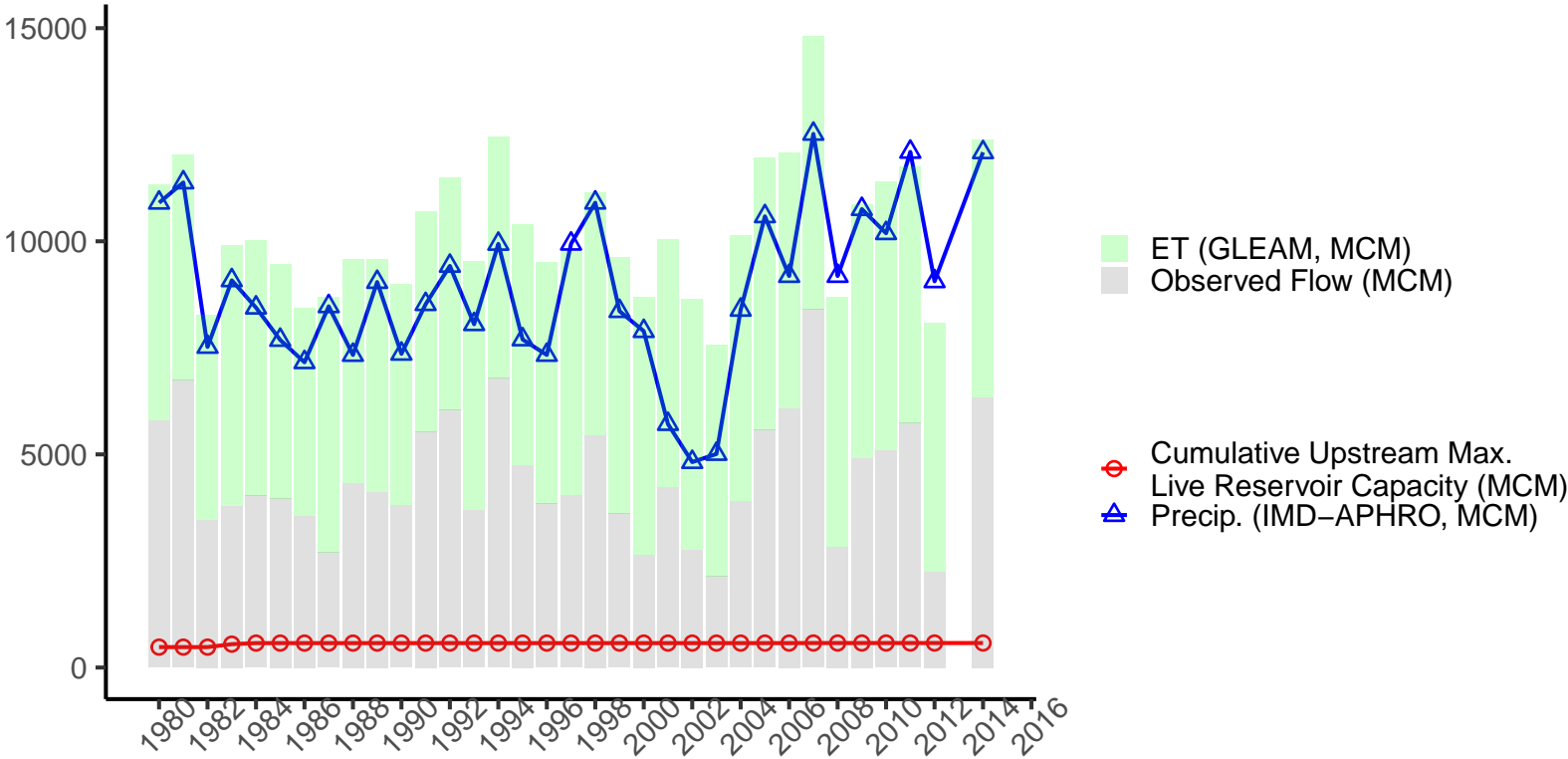
Station: Addoor, River: Gurupur
GHI ID: wfrs_addoo, Catch. Area: 719 sq. km



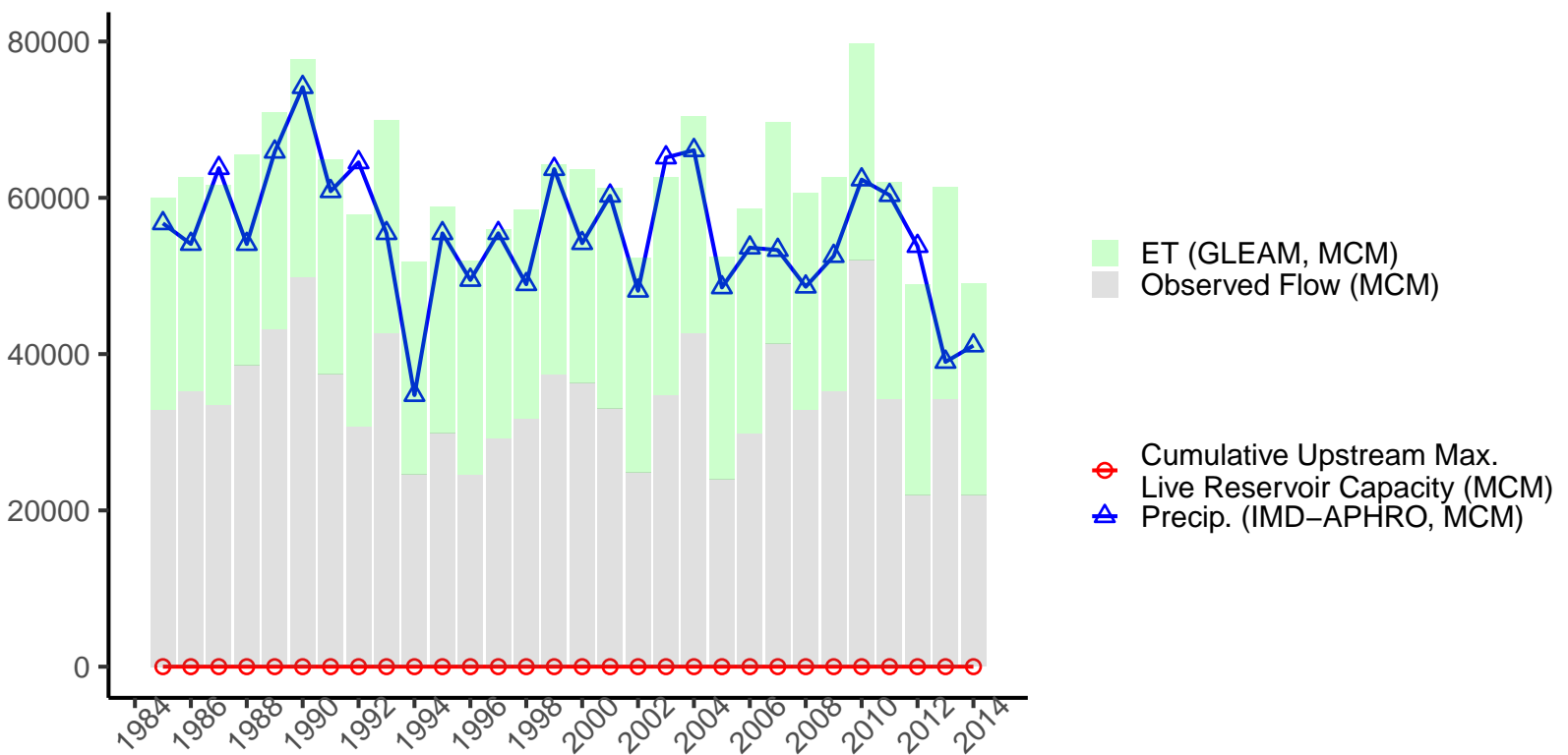
Station: Erinjipuzha, River: Payaswani
GHI ID: wfrs_erinj, Catch. Area: 912 sq. km



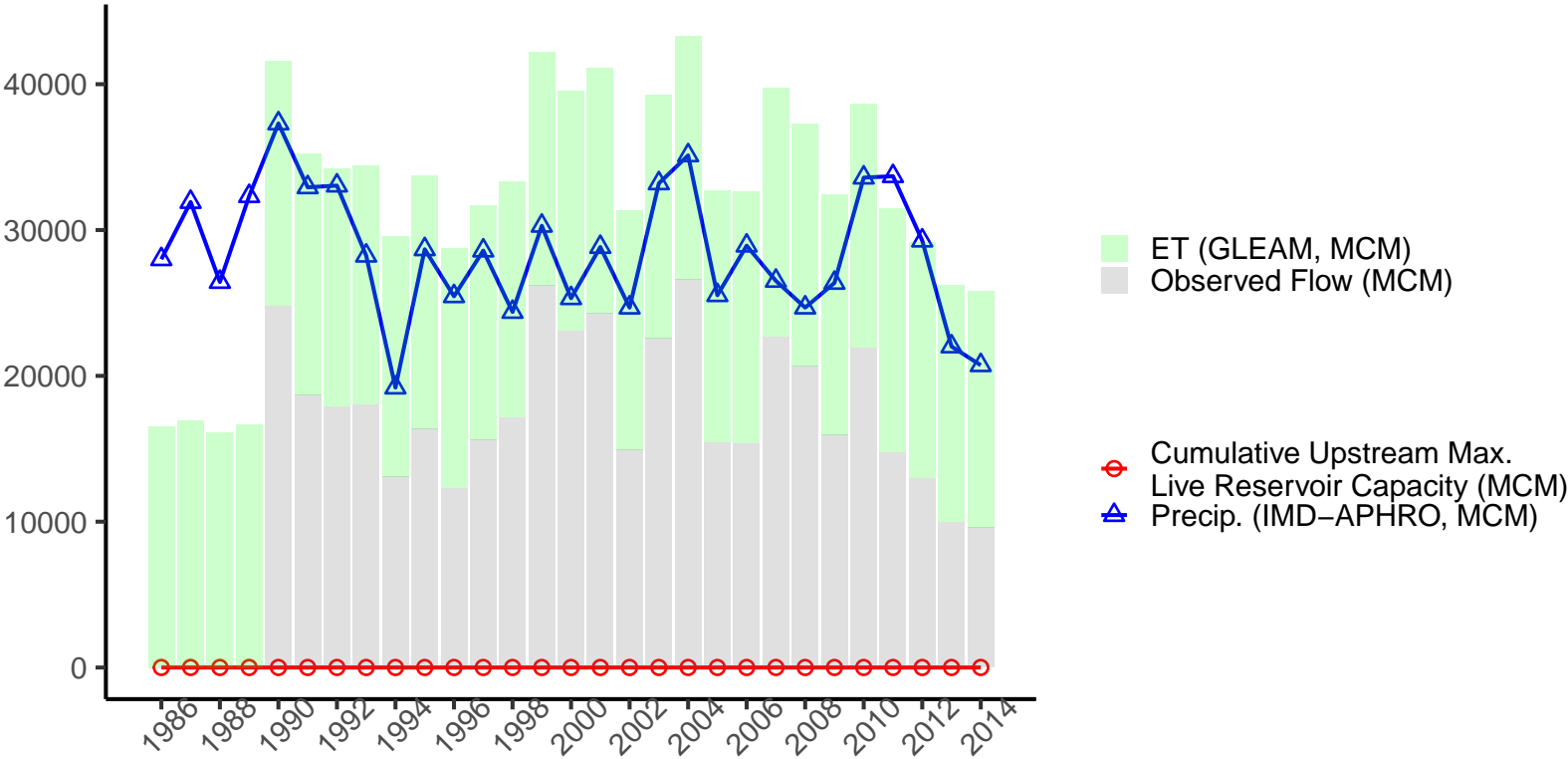
Station: Kumbidi, River: Bharathapuzha
GHI ID: wfrs_kumbi, Catch. Area: 5867 sq. km



Station: Badar Pur Ghat, River: Barak
GHI ID: gbmxbadar, Catch. Area: 25629 sq. km



Station: Fulertal, River: Barak
GHI ID: gbmxf_fuler, Catch. Area: 15249 sq. km



Station: Kailashahar, River: Manu
GHI ID: gbm_x_kaila, Catch. Area: 2188 sq. km

