SUPPLEMENTARY MATERIAL TO: CHASE-PL - FUTURE HYDROLOGY DATA SET: PROJECTIONS OF WATER BALANCE AND STREAMFLOW FOR THE VISTULA AND ODRA BASINS, POLAND

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Table 1: List of raw model output files

ID	File name	Input type	Time span	Time step	RCP	Climate model
1a	calibration_1954-2013_subbasin.csv	Obs	1954-2013	m	-	-
1b	calibration_1954-2013_reach.csv	Obs	1954-2013	d	-	-
2a	ref_cm01_1974-2000_subbasin.csv	Proj	1974-2000	m	-	01
2b	ref_cm01_1974-2000_reach.csv	Proj	1974-2000	d	-	01
3a	ref_cm02_1974-2000_subbasin.csv	Proj	1974-2000	m	-	02
3b	ref_cm02_1974-2000_reach.csv	Proj	1974-2000	d	-	02
4a	ref_cm03_1974-2000_subbasin.csv	Proj	1974-2000	m	-	03
4b	ref_cm03_1974-2000_reach.csv	Proj	1974-2000	d	-	03
5a	ref_cm04_1974-2000_subbasin.csv	Proj	1974-2000	m	-	04
5b	ref_cm04_1974-2000_reach.csv	Proj	1974-2000	d	-	04
6a	ref_cm05_1974-2000_subbasin.csv	Proj	1974-2000	m	-	05
6b	ref_cm05_1974-2000_reach.csv	Proj	1974-2000	d	-	05
7a	ref_cm06_1974-2000_subbasin.csv	Proj	1974-2000	m	-	06
7b	ref_cm06_1974-2000_reach.csv	Proj	1974-2000	d	-	06
8a	ref_cm07_1974-2000_subbasin.csv	Proj	1974-2000	m	-	07
8b	ref_cm07_1974-2000_reach.csv	Proj	1974-2000	d	-	07
9a	ref_cm08_1974-2000_subbasin.csv	Proj	1974-2000	m	-	08
9b	ref_cm08_1974-2000_reach.csv	Proj	1974-2000	d	-	08
10a	ref_cm09_1974-2000_subbasin.csv	Proj	1974-2000	m	-	09
10b	ref_cm09_1974-2000_reach.csv	Proj	1974-2000	d	-	09
11a	rcp45_cm01_2024-2074_subbasin.csv	Proj	2024-2074	m	4.5	01
11b	rcp45_cm01_2024-2074_reach.csv	Proj	2024-2074	d	4.5	01
12a	rcp45_cm02_2024-2074_subbasin.csv	Proj	2024-2074	m	4.5	02
12b	rcp45_cm02_2024-2074_reach.csv	Proj	2024-2074	d	4.5	02
13a	rcp45_cm03_2024-2074_subbasin.csv	Proj	2024-2074	m	4.5	03
13b	rcp45_cm03_2024-2074_reach.csv	Proj	2024-2074	d	4.5	03
14a	rcp45_cm04_2024-2074_subbasin.csv	Proj	2024-2074	m	4.5	04
14b	rcp45_cm04_2024-2074_reach.csv	Proj	2024-2074	d	4.5	04
15a	rcp45_cm05_2024-2074_subbasin.csv	Proj	2024-2074	m	4.5	05
15b	rcp45_cm05_2024-2074_reach.csv	Proj	2024-2074	d	4.5	05
16a	rcp45_cm06_2024-2074_subbasin.csv	Proj	2024-2074	m	4.5	06
16b	rcp45_cm06_2024-2074_reach.csv	Proj	2024-2074	d	4.5	06
17a	rcp45_cm07_2024-2074_subbasin.csv	Proj	2024-2074	m	4.5	07
17b	rcp45_cm07_2024-2074_reach.csv	Proj	2024-2074	d	4.5	07
18a	rcp45_cm08_2024-2074_subbasin.csv	Proj	2024-2074	m	4.5	08
18b	rcp45_cm08_2024-2074_reach.csv	Proj	2024-2074	d	4.5	08
19a	rcp45_cm09_2024-2074_subbasin.csv	Proj	2024-2074	m	4.5	09

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ID	File name	Input type	Time span	Time step	RCP	Climate model
19b	rcp45_cm09_2024-2074_reach.csv	Proj	2024-2074	d	4.5	09
20a	rcp45_cm01_2074-2100_subbasin.csv	Proj	2074-2100	m	4.5	01
20b	rcp45_cm01_2074-2100_reach.csv	Proj	2074-2100	d	4.5	01
21a	rcp45_cm02_2074-2100_subbasin.csv	Proj	2074-2100	m	4.5	02
21b	rcp45_cm02_2074-2100_reach.csv	Proj	2074-2100	d	4.5	02
22a	rcp45_cm03_2074-2100_subbasin.csv	Proj	2074-2100	m	4.5	03
22b	rcp45_cm03_2074-2100_reach.csv	Proj	2074-2100	d	4.5	03
23a	rcp45_cm04_2074-2100_subbasin.csv	Proj	2074-2100	m	4.5	04
23b	rcp45_cm04_2074-2100_reach.csv	Proj	2074-2100	d	4.5	04
24a	rcp45_cm05_2074-2100_subbasin.csv	Proj	2074-2100	m	4.5	05
24b	rcp45_cm05_2074-2100_reach.csv	Proj	2074-2100	d	4.5	05
25a	rcp45_cm06_2074-2100_subbasin.csv	Proj	2074-2100	m	4.5	06
25b	rcp45_cm06_2074-2100_reach.csv	Proj	2074-2100	d	4.5	06
26a	rcp45_cm07_2074-2100_subbasin.csv	Proj	2074-2100	m	4.5	07
26b	rcp45_cm07_2074-2100_reach.csv	Proj	2074-2100	d	4.5	07
27a	rcp45_cm08_2074-2100_subbasin.csv	Proj	2074-2100	m	4.5	08
27b	rcp45_cm08_2074-2100_reach.csv	Proj	2074-2100	d	4.5	08
28a	rcp45_cm09_2074-2100_subbasin.csv	Proj	2074-2100	m	4.5	09
28b	rcp45_cm09_2074-2100_reach.csv	Proj	2074-2100	d	4.5	09
29a	rcp85_cm01_2024-2074_subbasin.csv	Proj	2024-2074	m	8.5	01
29b	rcp85_cm01_2024-2074_reach.csv	Proj	2024-2074	d	8.5	01
30a	rcp85_cm02_2024-2074_subbasin.csv	Proj	2024-2074	m	8.5	02
30b	rcp85_cm02_2024-2074_reach.csv	Proj	2024-2074	d	8.5	02
31a	rcp85_cm03_2024-2074_subbasin.csv	Proj	2024-2074	m	8.5	03
31b	rcp85_cm03_2024-2074_reach.csv	Proj	2024-2074	d	8.5	03
32a	rcp85_cm04_2024-2074_subbasin.csv	Proj	2024-2074	m	8.5	04
32b	rcp85_cm04_2024-2074_reach.csv	Proj	2024-2074	d	8.5	04
33a	rcp85_cm05_2024-2074_subbasin.csv	Proj	2024-2074	m	8.5	05
33b	rcp85_cm05_2024-2074_reach.csv	Proj	2024-2074	d	8.5	05
34a	rcp85_cm06_2024-2074_subbasin.csv	Proj	2024-2074	m	8.5	06
34b	rcp85_cm06_2024-2074_reach.csv	Proj	2024-2074	d	8.5	06
35a	rcp85_cm07_2024-2074_subbasin.csv	Proj	2024-2074	m	8.5	07
35b	rcp85_cm07_2024-2074_reach.csv	Proj	2024-2074	d	8.5	07
36a	rcp85_cm08_2024-2074_subbasin.csv	Proj	2024-2074	m	8.5	08
36b	rcp85_cm08_2024-2074_reach.csv	Proj	2024-2074	d	8.5	08
37a	rcp85_cm09_2024-2074_subbasin.csv	Proj	2024-2074	m	8.5	09
37b	rcp85_cm09_2024-2074_reach.csv	Proj	2024-2074	d	8.5	09
38a	rcp85_cm01_2074-2100_subbasin.csv	Proj	2074-2100	m	8.5	01
38b	rcp85_cm01_2074-2100_reach.csv	Proj	2074-2100	d	8.5	01
39a	rcp85_cm02_2074-2100_subbasin.csv	Proj	2074-2100	m	8.5	02
39b	rcp85_cm02_2074-2100_reach.csv	Proj	2074-2100	d	8.5	02
40a	rcp85_cm03_2074-2100_subbasin.csv	Proj	2074-2100	m	8.5	03
40b	rcp85_cm03_2074-2100_reach.csv	Proj	2074-2100	d	8.5	03
41a	rcp85_cm04_2074-2100_subbasin.csv	Proj	2074-2100	m	8.5	04
41b	rcp85_cm04_2074-2100_reach.csv	Proj	2074-2100	d	8.5	04
42a	rcp85_cm05_2074-2100_subbasin.csv	Proj	2074-2100	m	8.5	05
42b	rcp85_cm05_2074-2100_reach.csv	Proj	2074-2100	d	8.5	05
43a	rcp85_cm06_2074-2100_subbasin.csv	Proj	2074-2100	m	8.5	06
43b	rcp85_cm06_2074-2100_reach.csv	Proj	2074-2100	d	8.5	06

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ID	File name	Input type	Time span	Time step	RCP	Climate model
44a	rcp85_cm07_2074-2100_subbasin.csv	Proj	2074-2100	m	8.5	07
44b	rcp85_cm07_2074-2100_reach.csv	Proj	2074-2100	d	8.5	07
45a	rcp85_cm08_2074-2100_subbasin.csv	Proj	2074-2100	m	8.5	08
45b	rcp85_cm08_2074-2100_reach.csv	Proj	2074-2100	d	8.5	08
46a	rcp85_cm09_2074-2100_subbasin.csv	Proj	2074-2100	m	8.5	09
46b	rcp85_cm09_2074-2100_reach.csv	Proj	2074-2100	d	8.5	09

Table 2: The list of calibration parameters, their definition and optimal (opt) values and 95PPU parameter ranges (min, max) obtained in calibration of eight flow regime clusters. The symbols a__, r__ and v__ refer to three different methods of parameter change: additive change, multiplication and replacement, respectively.

Parameter	Definition	Value type	C1	C2	C3	C4	C5	C6	C7	C8
a__EPCO	Plant uptake compensation factor	min	-0.4	-0.1	-0.1	-0.25	0.05	-0.18	-0.1	0
		max	0	0.25	0.25	0.25	0.45	0.25	0.5	0.5
		opt	-0.11	0.19	0.12	-0.13	0.07	0.09	-0.06	0.38
a__ESCO	Soil evaporation compensation factor	min	-0.05	-0.12	-0.05	-0.05	-0.05	-0.12	-0.1	-0.13
		max	0.1	0.05	0.07	0.05	0.08	0.02	0.05	0.07
		opt	-0.01	-0.11	-0.04	-0.04	0.07	-0.09	-0.08	0.03
a__GWQMN	Treshold depth of water in the shallow aquifer required for return flow to occur	min	150	0	-200	150	250	-200	-	-300
		max	400	400	200	250	450	200	-	100
		opt	175.32	187.18	-66.1	-128.9	282.05	185.13	-	-282.67
r__CN2	Initial SCS curve number for moisture condition	min	-0.16	0	-0.01	-0.1	-0.16	-0.04	0.03	-0.02
		max	-0.07	0.15	0.13	0	-0.09	0.09	0.18	0.1
		opt	-0.15	0.11	0.11	-0.04	-0.13	0.02	0.14	0.05
r__HRU_SLP	Average slope steepness (m/m)	min	-	0	-	-	-	-	-	-
		max	-	0.4	-	-	-	-	-	-
		opt	-	0.14	-	-	-	-	-	-
r__SOL_AWC()	Available water capacity of the soil layer (mm H2O/ mm soil)	min	-	0	-0.15	-0.15	0.05	-	-0.2	0.05
		max	-	0.45	0.1	0.35	0.3	-	0.35	0.4
		opt	-	0.29	-0.03	0.1	0.12	-	0.01	0.37
r__SOL_BD()	Moist bulk density (g/cm3)	min	0.2	-0.2	-0.15	-0.4	0	-0.1	-0.3	-
		max	0.4	0.2	0.22	0.2	0.35	0.4	0.3	-
		opt	0.37	0.11	0.14	-0.01	0.3	0.09	-0.16	-
r__SOL_K()	Saturated hydraulic conductivity (mm/hr)	min	-	0.3	-	-0.7	-	-	-	-
		max	-	1.8	-	1	-	-	-	-
		opt	-	0.33	-	0.05	-	-	-	-
r__SOL_Z()	Depth from soil Surface to bottom of layer (mm)	min	-0.3	0	-	-0.35	-0.3	-	-0.3	0.1
		max	0	0.3	-	0.2	0	-	0.35	0.35
		opt	-0.09	0.27	-	0.17	-0.11	-	0.03	0.1
v__ALPHA_BF	Baseflow alpha factor (days)	min	0.08	0.04	0.1	0.05	0.08	0.08	0.05	0.05
		max	0.15	0.11	0.17	0.15	0.15	0.15	0.16	0.12
		opt	0.12	0.11	0.14	0.07	0.1	0.09	0.06	0.08
v__CH_N1	Mannings n value for the tributary channels	min	-	0.07	0.07	-	0.06	0.06	0.07	0.07
		max	-	0.14	0.12	-	0.12	0.12	0.2	0.12
		opt	-	0.1	0.12	-	0.11	0.07	0.17	0.08
v__CH_N2	Mannings n value for the main channel	min	0.05	0.03	0.02	0.03	0.02	0.03	-	0.04
		max	0.1	0.06	0.07	0.09	0.09	0.09	-	0.12
		opt	0.1	0.04	0.07	0.06	0.03	0.09	-	0.48
v__DEP_IMP	Depth to impervious layer in soil profile (mm)	min	-	-	-	-	-	1050	-	1050
______FESC										
		max	-	-	-	-	-	1400	-	1400
		opt	-	-	-	-	-	1174.29	-	1118.83
v__GW_DELAY	Groundwater delay time (days)	min	330	20	65	100	80	75	15	40
		max	450	110	140	240	130	150	150	110
		opt	424.31	46.65	137.6	203.92	118.4	82.79	26.25	101.37
v__GW_REVAP	Groundwater revap coefficient	min	0.02	-	0.15	0.02	0.03	0.02	-	0.02

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Table 2 – *Continued from previous page*

Parameter	Definition	Value type	C1	C2	C3	C4	C5	C6	C7	C8
		max	0.07	-	0.2	0.09	0.07	0.1	-	0.1
		opt	0.05	-	0.17	0.05	0.06	0.04	-	0.06
v__NDTARGR	Number of days to reach target storage from current reservoir storage	min	50	-	35	-	15	-	-	-
		max	75	-	55	-	35	-	-	-
		opt	57.4	-	41.74	-	15.18	-	-	-
v__RCHRG_DP	Deep aquifer percolation fraction	min	0.02	-	0.15	0.1	0.11	0	-	-
		max	0.1	-	0.28	0.3	0.23	0.17	-	-
		opt	0.02	-	0.23	0.14	0.12	0.14	-	-
v__REVAPMN	Threshold depth of water in the shallow aquifer for revap or percolation to the deep aquifer to occur (mm H2O)	min	250	-	-	-	-	-	-	-
		max	500	-	-	-	-	-	-	-
		opt	259.94	-	-	-	-	-	-	-
v__SUB_SMTMP	Snow melt base temperature (C)	min	-	-1	-	-	-	-	0	-
		max	-	1.5	-	-	-	-	2.5	-
		opt	-	0.52	-	-	-	-	2.45	-
v__SUB_TIMP	Snow pack temperature lag factor	min	0.4	0.05	0.4	-	0.3	0.1	0.05	0.05
		max	0.9	0.5	0.8	-	0.85	0.7	0.8	0.55
		opt	0.89	0.14	0.69	-	0.82	0.2	0.31	0.26
v__SURLAG	Surface runoff lag coefficient	min	0.5	0.1	0.05	0.09	0.4	0.15	0.35	0.11
		max	0.9	0.25	0.35	0.3	1	0.4	0.95	0.4
		opt	0.74	0.21	0.21	0.09	0.56	0.23	0.51	0.31
v__SLSOIL	Slope length for lateral subsurface flow (m)	min	50	45	30	25	40	30	6	50
		max	120	105	80	80	80	110	50	150
		opt	75.22	69.54	39.68	64.28	61.8	92.46	14.29	60.33