

### Wetland A Water Budget Analysis and Discussion

**Discussion:**

Wetland A is a ground water slope wetland connected to a stream. However, Wetland A is partially flooded by the Decker Pond dam. The open water portion of Wetland A has a surface water elevation that is the same as Decker Pond. Wetland A has surface water outflow via Decker Pond and Chippewa Creek. It also has surface water inflow via a stream and seeps. Based on monitoring well data and observations by a Professional Wetland Scientist, the shallow ground water aquifer creates saturated soil conditions throughout the portion of Wetland A that does not contain open water. Absent the Decker Pond dam, Wetland A would not have appreciable surface water storage volume. As is, it stores water at a maximum depth of approximately 3 feet. Water discharges from Wetland A at an elevation of approximately 1,079 feet - the elevation of the dam. The open water area of Wetland A has an estimated storage volume of 1.8 acre-ft, based on a surface area of 1.8 acres and estimated average depth of 1 foot.

Water Budget Equation:  $\Delta\text{Storage} = [\text{P} + \text{GI} + \text{SRO} + \text{SI}] - [\text{E} + \text{ET} + \text{GO} + \text{SO}]$

Inputs: Precipitation (P), Ground Water Inflow (GI), Surface Runoff (SRO), Stream & Seep Inflow (SI)

Outputs: Evaporation [E], Evapotranspiration (ET), Ground Water Outflow (GO), and Stream Outflow

Due to high infiltration rates in its watershed, surface runoff is a negligible component of the Wetland A water budget. The soil hydrological class is A and the runoff curve number is ~35. A rainfall of greater than 4 inches would be required to generate appreciable runoff. Furthermore, evaporation is negligible because there is very little exposed open water in the drainage basin of Wetland A. Therefore, the water budget equation becomes:

$\Delta\text{Storage} = [\text{P} + \text{GI} + \text{SI}] - [\text{ET} + \text{GO} + \text{SO}]$ .

**Wetland A Morphological Data:**

Area	7.5 acres
Surface Storage Max Depth	3 ft
Surface Storage Volume	1.8 ac-ft

**Annual Water Budget:**

	2007 - Normal Year		2004 - Wet Year		2003 - Dry Year	
	No Pumping	Pumping 400 gpm	No Pumping	Pumping 400 gpm	No Pumping	Pumping 400 gpm
Precipitation (P, gpm)	14	14	17	17	13	13
Groundwater Inflow (GI, gpm)	82	77	88	83	77	71
Stream and Seep Inflow (SI, gpm)	112	83	128	99	96	67
Evapotranspiration (ET, gpm)	12	12	12	12	12	12
Groundwater Outflow (GO, gpm)	1	1	1	1	1	1
Stream Outflow (SO, gpm)	195	161	220	186	173	139
$\Delta\text{Storage}$ (acre-ft)	0.0	0.0	0.1	0.1	-0.1	-0.1
$\Delta\text{Storage Depth}$ (ft)	0.00	0.00	0.01	0.01	-0.01	-0.01

**Wetland A Water Budget**

**Monthly Water Budget, Normal Year (2007), No Pumping**

Month	Days	Precip (inches)	ET (inches)	Precip (gpm)	ET (gpm)	GW Inflow (gpm)	Stream & Seep Inflow (gpm)	GW Outflow (gpm)	Stream outflow (gpm)	Change In Storage (acre-ft)	Change In Storage (ft)	Relative Level (ft)
Jan	31	1.49	0.54	6.8	2.5	74	93	0.4	171	-0.1	-0.01	-0.01
Feb	28	1.24	0.72	6.3	3.4	76	96	0.5	175	0.0	0.00	-0.01
Mar	31	4.46	1.43	20.3	6.7	86	119	1.0	215	0.3	0.04	0.03
Apr	30	5.20	2.60	24.5	12.3	92	132	1.1	235	0.0	-0.01	0.03
May	31	1.63	4.34	7.4	20.5	93	135	1.2	214	0.0	0.00	0.03
Jun	30	3.22	5.00	15.2	23.6	91	131	1.0	213	-0.1	-0.01	0.01
Jul	31	3.94	5.21	18.0	24.6	84	116	0.7	195	-0.2	-0.03	-0.01
Aug	31	4.35	4.10	19.8	19.3	81	110	0.6	194	-0.3	-0.04	-0.05
Sep	30	1.23	3.10	5.8	14.6	80	106	0.5	177	-0.1	-0.01	-0.07
Oct	31	3.36	1.68	15.3	7.9	80	106	0.6	192	0.2	0.02	-0.05
Nov	30	1.43	1.02	6.7	4.8	77	100	0.5	176	0.3	0.05	0.00
Dec	31	4.49	0.56	20.5	2.6	75	96	0.4	189	0.0	0.00	0.00

**Monthly Water Budget, Normal Year (2007), 400 gpm Pumping**

Month	Days	Precip (inches)	ET (inches)	Precip (gpm)	ET (gpm)	GW Inflow (gpm)	Stream & Seep Inflow (gpm)	GW Outflow (gpm)	Stream outflow (gpm)	Change In Storage (acre-ft)	Change In Storage (ft)	Relative Level (ft)
Jan	31	1.49	0.54	6.8	2.5	69	64	0.4	137	-0.1	-0.01	-0.01
Feb	28	1.24	0.72	6.3	3.4	70	68	0.5	140	0.0	0.00	-0.01
Mar	31	4.46	1.43	20.3	6.7	80	90	1.0	180	0.3	0.04	0.03
Apr	30	5.20	2.60	24.5	12.3	86	103	1.1	201	0.0	-0.01	0.03
May	31	1.63	4.34	7.4	20.5	87	106	1.2	179	0.0	0.00	0.03
Jun	30	3.22	5.00	15.2	23.6	85	103	1.0	179	-0.1	-0.01	0.01
Jul	31	3.94	5.21	18.0	24.6	79	88	0.7	160	-0.2	-0.03	-0.01
Aug	31	4.35	4.10	19.8	19.3	76	82	0.6	160	-0.3	-0.04	-0.05
Sep	30	1.23	3.10	5.8	14.6	74	77	0.5	143	-0.1	-0.01	-0.07
Oct	31	3.36	1.68	15.3	7.9	74	78	0.6	158	0.2	0.02	-0.05
Nov	30	1.43	1.02	6.7	4.8	72	71	0.5	142	0.3	0.05	0.00
Dec	31	4.49	0.56	20.5	2.6	70	67	0.4	154	0.0	0.00	0.00

**Wetland A Water Budget Analysis and Discussion**

**Monthly Water Budget, Wet Year (2004), No Pumping**

Month	Days	Precip (inches)	ET (inches)	Precip (gpm)	ET (gpm)	GW Inflow (gpm)	Stream & Seep Inflow (gpm)	GW Outflow (gpm)	Stream outflow (gpm)	Change In Storage (acre-ft)	Change In Storage (ft)	Relative Level (ft)
Jan	31	3.15	0.54	14.4	2.5	77	100	0.4	188	0.0	-0.01	-0.01
Feb	28	1.32	0.72	6.7	3.4	79	105	0.6	187	0.0	0.00	-0.01
Mar	31	4.64	1.43	21.2	6.7	93	136	1.1	241	0.2	0.03	0.02
Apr	30	2.67	2.60	12.6	12.3	101	155	1.5	255	0.0	0.00	0.02
May	31	8.65	4.34	39.5	20.5	102	159	1.6	279	0.0	0.00	0.02
Jun	30	4.31	5.00	20.3	23.6	100	154	1.4	250	0.0	-0.01	0.02
Jul	31	2.01	5.21	9.2	24.6	91	134	0.9	209	-0.1	-0.02	0.00
Aug	31	3.95	4.10	18.0	19.3	87	126	0.7	213	-0.2	-0.03	-0.03
Sep	30	0.57	3.10	2.7	14.6	85	121	0.6	194	-0.1	-0.01	-0.04
Oct	31	4.76	1.68	21.7	7.9	85	122	0.7	219	0.1	0.02	-0.03
Nov	30	3.20	1.02	15.1	4.8	82	114	0.5	203	0.2	0.03	0.01
Dec	31	3.68	0.56	16.8	2.6	80	108	0.5	202	0.0	0.00	0.01

**Monthly Water Budget, Wet Year (2004), 400 gpm Pumping**

Month	Days	Precip (inches)	ET (inches)	Precip (gpm)	ET (gpm)	GW Inflow (gpm)	Stream & Seep Inflow (gpm)	GW Outflow (gpm)	Stream outflow (gpm)	Change In Storage (acre-ft)	Change In Storage (ft)	Relative Level (ft)
Jan	31	3.15	0.54	14.4	2.5	71	71	0.4	154	0.0	-0.01	-0.01
Feb	28	1.32	0.72	6.7	3.4	73	77	0.6	153	0.0	0.00	-0.01
Mar	31	4.64	1.43	21.2	6.7	87	108	1.1	206	0.2	0.03	0.02
Apr	30	2.67	2.60	12.6	12.3	96	126	1.5	221	0.0	0.00	0.02
May	31	8.65	4.34	39.5	20.5	97	131	1.6	245	0.0	0.00	0.02
Jun	30	4.31	5.00	20.3	23.6	94	126	1.4	216	0.0	-0.01	0.02
Jul	31	2.01	5.21	9.2	24.6	85	105	0.9	175	-0.1	-0.02	0.00
Aug	31	3.95	4.10	18.0	19.3	81	98	0.7	179	-0.2	-0.03	-0.03
Sep	30	0.57	3.10	2.7	14.6	79	92	0.6	159	-0.1	-0.01	-0.04
Oct	31	4.76	1.68	21.7	7.9	80	93	0.7	185	0.1	0.02	-0.03
Nov	30	3.20	1.02	15.1	4.8	76	85	0.5	169	0.2	0.03	0.01
Dec	31	3.68	0.56	16.8	2.6	74	80	0.5	167	0.0	0.00	0.01

**Wetland A Water Budget Analysis and Discussion**

**Monthly Water Budget, Dry Year (2003), No Pumping**

Month	Days	Precip (inches)	ET (inches)	Precip (gpm)	ET (gpm)	GW Inflow (gpm)	Stream & Seep Inflow (gpm)	GW Outflow (gpm)	Stream outflow (gpm)	Change In Storage (acre-ft)	Change In Storage (ft)	Relative Level (ft)
Jan	31	0.84	0.54	3.8	2.5	72	85	0.4	158	-0.1	-0.01	-0.01
Feb	28	0.72	0.72	3.6	3.4	73	87	0.4	160	0.0	0.00	-0.01
Mar	31	1.79	1.43	8.2	6.7	79	102	0.8	180	0.2	0.03	0.02
Apr	30	3.01	2.60	14.2	12.3	83	110	0.9	195	0.0	0.00	0.01
May	31	2.79	4.34	12.7	20.5	84	112	0.9	187	0.0	0.00	0.01
Jun	30	2.99	5.00	14.1	23.6	82	109	0.8	181	-0.1	-0.01	0.00
Jul	31	4.40	5.21	20.1	24.6	78	99	0.5	173	-0.2	-0.02	-0.02
Aug	31	3.75	4.10	17.1	19.3	76	95	0.5	169	-0.2	-0.03	-0.05
Sep	30	2.08	3.10	9.8	14.6	74	91	0.4	161	-0.1	-0.01	-0.06
Oct	31	3.01	1.68	13.7	7.9	74	91	0.5	170	0.1	0.01	-0.04
Nov	30	7.12	1.02	33.6	4.8	72	86	0.4	186	0.2	0.03	-0.01
Dec	31	1.58	0.56	7.2	2.6	71	83	0.4	159	0.0	0.00	-0.01

**Monthly Water Budget, Dry Year (2003), 400 gpm Pumping**

Month	Days	Precip (inches)	ET (inches)	Precip (gpm)	ET (gpm)	GW Inflow (gpm)	Stream & Seep Inflow (gpm)	GW Outflow (gpm)	Stream outflow (gpm)	Change In Storage (acre-ft)	Change In Storage (ft)	Relative Level (ft)
Jan	31	0.84	0.54	3.8	2.5	66	57	0.4	124	-0.1	-0.01	-0.01
Feb	28	0.72	0.72	3.6	3.4	67	59	0.4	126	0.0	0.00	-0.01
Mar	31	1.79	1.43	8.2	6.7	73	73	0.8	146	0.2	0.03	0.02
Apr	30	3.01	2.60	14.2	12.3	77	82	0.9	160	0.0	0.00	0.01
May	31	2.79	4.34	12.7	20.5	78	83	0.9	152	0.0	0.00	0.01
Jun	30	2.99	5.00	14.1	23.6	77	80	0.8	147	-0.1	-0.01	0.00
Jul	31	4.40	5.21	20.1	24.6	72	70	0.5	138	-0.2	-0.02	-0.02
Aug	31	3.75	4.10	17.1	19.3	70	66	0.5	135	-0.2	-0.03	-0.05
Sep	30	2.08	3.10	9.8	14.6	69	63	0.4	127	-0.1	-0.01	-0.06
Oct	31	3.01	1.68	13.7	7.9	69	62	0.5	136	0.1	0.01	-0.04
Nov	30	7.12	1.02	33.6	4.8	67	58	0.4	151	0.2	0.03	-0.01
Dec	31	1.58	0.56	7.2	2.6	65	55	0.4	124	0.0	0.00	-0.01

### Wetland CC Water Budget Analysis and Discussion

**Discussion:**

Wetland CC is a ground water slope wetland and open basin wetland. However, the downstream extent of Wetland CC is hydrologically altered by the Decker Pond dam. Wetland CC does not contain an open water area or appreciable surface water storage - water flows into and out of Wetland CC, similar to Wetland R. Based on monitoring well data and observations by a Professional Wetland Scientist, the shallow ground water aquifer creates saturated soil conditions throughout Wetland CC, but ground water gain results in surface water flow at times. Wetland CC is part of the headwaters of Chippewa Creek.

Water Budget Equation:  $\Delta\text{Storage} = [\text{P} + \text{GI} + \text{SRO} + \text{SI}] - [\text{E} + \text{ET} + \text{GO} + \text{SO}]$

Inputs: Precipitation (P), Ground Water Inflow (GI), Surface Runoff (SRO), Stream & Seep Inflow (SI)

Outputs: Evaporation [E], Evapotranspiration (ET), Ground Water Outflow (GO), and Stream Outflow

Due to high infiltration rates in its watershed, surface runoff is a negligible component of the Wetland CC water budget. The soil hydrological class is A and the runoff curve number is ~35. A rainfall of greater than 4 inches would be required to generate appreciable runoff. Furthermore, evaporation is zero because there is no open water in the drainage basin of Wetland CC. Therefore, the water budget equation becomes:

$\Delta\text{Storage} = [\text{P} + \text{GI} + \text{SI}] - [\text{ET} + \text{GO} + \text{SO}]$ .

**Wetland CC Morphological Data:**

Area 1.2 acres  
 Surface Storage Max Depth 3 ft  
 Surface Storage Volume 1.8 ac-ft

**Annual Water Budget:**

	2007 - Normal Year		2004 - Wet Year		2003 - Dry Year	
	No Pumping	Pumping 400 gpm	No Pumping	Pumping 400 gpm	No Pumping	Pumping 400 gpm
Precipitation (P, gpm)	2	2	3	3	2	2
Groundwater Inflow (GI, gpm)	51	45	55	49	46	40
Stream & Seep Inflow (SI, gpm)	90	67	106	84	74	52
Evapotranspiration (ET, gpm)	2	2	2	2	2	2
Groundwater Outflow (GO, gpm)	1	1	1	1	1	1
Stream Outflow (SO, gpm)	139	111	160	132	119	91
$\Delta\text{Storage}$ (acre-ft)	0.0	0.0	0.0	0.0	0.0	0.0
$\Delta\text{Storage}$ Depth (ft)	0.0	0.0	0.0	0.0	0.0	0.0

**Wetland CC Water Budget Analysis and Discussion**

**Monthly Water Budget, Normal Year (2007), No Pumping**

Month	Days	Precip (inches)	ET (inches)	Precip (gpm)	GW Inflow (gpm)	Stream & Seep Inflow (gpm)	ET (gpm)	GW Outflow (gpm)	Stream outflow (gpm)	Change In Storage (acre-ft)	Change In Storage (ft)	Relative Level (ft)
Jan	31	1.49	0.54	1.1	45	73	0.4	1.3	117	-0.01	-0.01	-0.01
Feb	28	1.24	0.72	1.0	46	75	0.5	1.3	120	-0.01	0.00	-0.01
Mar	31	4.46	1.43	3.3	52	93	1.1	1.2	145	0.05	0.04	0.03
Apr	30	5.20	2.60	3.9	56	106	2.0	1.2	162	-0.01	-0.01	0.03
May	31	1.63	4.34	1.2	57	110	3.3	1.2	163	0.00	0.00	0.03
Jun	30	3.22	5.00	2.4	56	108	3.8	1.2	161	-0.01	-0.01	0.01
Jul	31	3.94	5.21	2.9	52	95	3.9	1.2	145	-0.04	-0.03	-0.01
Aug	31	4.35	4.10	3.2	51	90	3.1	1.2	139	-0.05	-0.04	-0.05
Sep	30	1.23	3.10	0.9	49	86	2.3	1.3	132	-0.02	-0.01	-0.07
Oct	31	3.36	1.68	2.5	49	85	1.3	1.3	134	0.02	0.02	-0.05
Nov	30	1.43	1.02	1.1	48	80	0.8	1.3	126	0.05	0.05	0.00
Dec	31	4.49	0.56	3.3	46	76	0.4	1.3	124	0.00	0.00	0.00

**Monthly Water Budget, Normal Year (2007), 400 gpm Pumping**

Month	Days	Precip (inches)	ET (inches)	Precip (gpm)	GW Inflow (gpm)	Stream & Seep Inflow (gpm)	ET (gpm)	GW Outflow (gpm)	Stream outflow (gpm)	Change In Storage (acre-ft)	Change In Storage (ft)	Relative Level (ft)
Jan	31	1.49	0.54	1.1	39	50	0.4	1.3	89	-0.01	-0.01	-0.01
Feb	28	1.24	0.72	1.0	40	53	0.5	1.3	92	-0.01	0.00	-0.01
Mar	31	4.46	1.43	3.3	46	71	1.1	1.2	117	0.05	0.04	0.03
Apr	30	5.20	2.60	3.9	50	84	2.0	1.2	134	-0.01	-0.01	0.03
May	31	1.63	4.34	1.2	51	87	3.3	1.2	135	0.00	0.00	0.03
Jun	30	3.22	5.00	2.4	50	85	3.8	1.2	133	-0.01	-0.01	0.01
Jul	31	3.94	5.21	2.9	46	73	3.9	1.2	117	-0.04	-0.03	-0.01
Aug	31	4.35	4.10	3.2	45	67	3.1	1.2	111	-0.05	-0.04	-0.05
Sep	30	1.23	3.10	0.9	43	63	2.3	1.3	104	-0.02	-0.01	-0.07
Oct	31	3.36	1.68	2.5	43	63	1.3	1.3	106	0.02	0.02	-0.05
Nov	30	1.43	1.02	1.1	42	58	0.8	1.3	98	0.05	0.05	0.00
Dec	31	4.49	0.56	3.3	40	54	0.4	1.3	96	0.00	0.00	0.00

Wetland CC Water Budget Analysis and Discussion

Monthly Water Budget, Wet Year (2004), No Pumping

Month	Days	Precip (inches)	ET (inches)	Precip (gpm)	GW Inflow (gpm)	Stream & Seep Inflow (gpm)	ET (gpm)	GW Outflow (gpm)	Stream outflow (gpm)	Change In Storage (acre-ft)	Change In Storage (ft)	Relative Level (ft)
Jan	31	3.15	0.54	2.3	48	80	0.4	1.3	128	0.0	-0.01	-0.01
Feb	28	1.32	0.72	1.1	49	84	0.5	1.3	132	0.0	-0.01	-0.02
Mar	31	4.64	1.43	3.4	57	110	1.1	1.2	167	0.1	0.06	0.04
Apr	30	2.67	2.60	2.0	62	127	2.0	1.2	188	0.0	-0.01	0.04
May	31	8.65	4.34	6.3	63	132	3.3	1.2	197	0.0	0.00	0.04
Jun	30	4.31	5.00	3.3	62	130	3.8	1.2	190	0.0	-0.01	0.03
Jul	31	2.01	5.21	1.5	57	114	3.9	1.2	168	0.0	-0.04	-0.01
Aug	31	3.95	4.10	2.9	55	107	3.1	1.2	161	-0.1	-0.05	-0.06
Sep	30	0.57	3.10	0.4	54	101	2.3	1.2	152	0.0	-0.02	-0.08
Oct	31	4.76	1.68	3.5	54	102	1.3	1.2	156	0.0	0.03	-0.05
Nov	30	3.20	1.02	2.4	52	94	0.8	1.2	146	0.1	0.06	0.01
Dec	31	3.68	0.56	2.7	50	89	0.4	1.2	140	0.0	0.00	0.01

Monthly Water Budget, Wet Year (2004), 400 gpm Pumping

Month	Days	Precip (inches)	ET (inches)	Precip (gpm)	GW Inflow (gpm)	Stream & Seep Inflow (gpm)	ET (gpm)	GW Outflow (gpm)	Stream outflow (gpm)	Change In Storage (acre-ft)	Change In Storage (ft)	Relative Level (ft)
Jan	31	3.15	0.54	2.3	42	58	0.4	1.3	100	0.0	-0.01	-0.01
Feb	28	1.32	0.72	1.1	43	62	0.5	1.3	104	0.0	-0.01	-0.02
Mar	31	4.64	1.43	3.4	51	87	1.1	1.2	139	0.1	0.06	0.04
Apr	30	2.67	2.60	2.0	56	105	2.0	1.2	159	0.0	-0.01	0.04
May	31	8.65	4.34	6.3	57	110	3.3	1.2	169	0.0	0.00	0.04
Jun	30	4.31	5.00	3.3	56	107	3.8	1.2	162	0.0	-0.01	0.03
Jul	31	2.01	5.21	1.5	51	91	3.9	1.2	139	0.0	-0.04	-0.01
Aug	31	3.95	4.10	2.9	49	84	3.1	1.2	133	-0.1	-0.05	-0.06
Sep	30	0.57	3.10	0.4	48	79	2.3	1.2	124	0.0	-0.02	-0.08
Oct	31	4.76	1.68	3.5	48	79	1.3	1.2	128	0.0	0.03	-0.05
Nov	30	3.20	1.02	2.4	46	72	0.8	1.2	118	0.1	0.06	0.01
Dec	31	3.68	0.56	2.7	44	67	0.4	1.2	112	0.0	0.00	0.01

**Wetland CC Water Budget Analysis and Discussion**

**Monthly Water Budget, Dry Year (2003), No Pumping**

Month	Days	Precip (inches)	ET (inches)	Precip (gpm)	ET (gpm)	GW Inflow (gpm)	Stream & Seep Inflow (gpm)	GW Outflow (gpm)	Stream outflow (gpm)	Change In Storage (acre-ft)	Change In Storage (ft)	Relative Level (ft)
Jan	31	0.84	0.54	0.6	0.4	43	65	1.3	107	0.0	-0.01	-0.01
Feb	28	0.72	0.72	0.6	0.5	43	66	1.3	108	0.0	0.00	-0.01
Mar	31	1.79	1.43	1.3	1.1	47	78	1.3	123	0.0	0.03	0.02
Apr	30	3.01	2.60	2.3	2.0	50	85	1.3	134	0.0	-0.01	0.01
May	31	2.79	4.34	2.0	3.3	50	87	1.3	135	0.0	0.00	0.01
Jun	30	2.99	5.00	2.3	3.8	50	86	1.3	132	0.0	-0.01	0.00
Jul	31	4.40	5.21	3.2	3.9	47	78	1.3	123	0.0	-0.02	-0.02
Aug	31	3.75	4.10	2.7	3.1	46	74	1.3	118	0.0	-0.03	-0.05
Sep	30	2.08	3.10	1.6	2.3	45	70	1.3	113	0.0	-0.01	-0.06
Oct	31	3.01	1.68	2.2	1.3	45	70	1.3	114	0.0	0.01	-0.05
Nov	30	7.12	1.02	5.4	0.8	43	66	1.3	112	0.0	0.03	-0.02
Dec	31	1.58	0.56	1.2	0.4	42	63	1.3	105	0.0	0.00	-0.02

**Monthly Water Budget, Dry Year (2003), 400 gpm Pumping**

Month	Days	Precip (inches)	ET (inches)	Precip (gpm)	ET (gpm)	GW Inflow (gpm)	Stream & Seep Inflow (gpm)	GW Outflow (gpm)	Stream outflow (gpm)	Change In Storage (acre-ft)	Change In Storage (ft)	Relative Level (ft)
Jan	31	0.84	0.54	1	0	37	43	1.3	79	0.0	-0.01	-0.01
Feb	28	0.72	0.72	1	1	37	44	1.3	80	0.0	0.00	-0.01
Mar	31	1.79	1.43	1	1	41	55	1.3	95	0.0	0.03	0.02
Apr	30	3.01	2.60	2	2	44	63	1.3	106	0.0	-0.01	0.01
May	31	2.79	4.34	2	3	44	65	1.3	107	0.0	0.00	0.01
Jun	30	2.99	5.00	2	4	44	63	1.3	104	0.0	-0.01	0.00
Jul	31	4.40	5.21	3	4	41	55	1.3	95	0.0	-0.02	-0.02
Aug	31	3.75	4.10	3	3	40	51	1.3	90	0.0	-0.03	-0.05
Sep	30	2.08	3.10	2	2	39	48	1.3	85	0.0	-0.01	-0.06
Oct	31	3.01	1.68	2	1	39	48	1.3	86	0.0	0.01	-0.05
Nov	30	7.12	1.02	5	1	37	44	1.3	84	0.0	0.03	-0.02
Dec	31	1.58	0.56	1	0	36	41	1.3	76	0.0	0.00	-0.02



### Wetland G Water Budget Analysis and Discussion

**Discussion:**

Wetland G is a depressionnal, closed basin wetland. Based on topography at the west end of Wetland G, it appears possible Wetland G could outflow to Wetland R during very wet years. However, surface outflow has not been observed or recorded. The primary water inputs are ground water inflow and precipitation. The primary outputs are evapotranspiration and ground water outflow. Wetland G is a small wetland, so direct precipaiton and ET result in small inputs and outputs. The primary inputs and uptputs are ground water inflow and outflow. Based on monitoring well data and observations by a Professional Wetland Scientist, the shallow ground water aquifer creates inundated to saturated soil conditions throughout Wetland G. However, monitoring wells were not installed in Wetland G prior to 2017. The closest monitoring wells are DP-1, DP-2, and DP-3 located along the upgradient (north) edge of Wetland G. Estimated avergae depth is 0.5 feet, and the surface area is 0.34 acres, resulting in a surface storage volume of 0.17 acre-feet.

Water Budget Equation:  $\Delta\text{Storage} = [\text{P} + \text{GI} + \text{SRO} + \text{SI}] - [\text{E} + \text{ET} + \text{GO} + \text{SO}]$

Inputs: Precipitation (P), Ground Water Inflow (GI), Surface Runoff (SRO), Stream & Seep Inflow (SI)

Outputs: Evaporation [E], Evapotranspiration (ET), Ground Water Outflow (GO), and Stream Outflow

Due to high infiltration rates in its watershed, surface runoff is a negligible component of the Wetland G water budget. The soil hydrological class is A and the runoff curve number is ~35. A rainfall of greater than 4 inches would be required to generate appreciable runoff. Furthermore, evaporation is zero because there is little open water area in Wetland G. Lastly, there are no streams or seeps draining to or from Wetland G. Therefore, the water budget equation becomes:  $\Delta\text{Storage} = [\text{P} + \text{GI}] - [\text{ET} + \text{GO}]$ .

**Wetland G Morphological Data:**

Area 0.34 acres  
 Surface Storage Max Depth 2 ft  
 Surface Storage Volume 0.17 ac-ft

**Annual Water Budget:**

	2007 - Normal Year		2004 - Wet Year		2003 - Dry Year	
	No Pumping	Pumping 400 gpm	No Pumping	Pumping 400 gpm	No Pumping	Pumping 400 gpm
Precipitation (P, gpm)	0.6	0.6	0.7	0.7	0.6	0.6
Groundwater Inflow (GI, gpm)	7.5	7.1	8.1	7.7	7.1	6.7
Evapotranspiration (ET, gpm)	0.5	0.5	0.5	0.5	0.5	0.5
Groundwater Outflow (GO, gpm)	7.6	7.2	8.4	8.0	7.2	6.8
$\Delta\text{Storage}$ (acre-ft)	0.0	0.0	0.0	0.0	0.0	0.0
$\Delta\text{storage Depth}$ (ft)	0.00	0.00	-0.14	-0.14	-0.14	-0.14

**Wetland G Water Budget Analysis and Discussion**

**Monthly Water Budget, Normal Year (2007), No Pumping**

Month	Days	Precip (inches)	ET (inches)	Precip (gpm)	ET (gpm)	GW Inflow (gpm)	GW Outflow (gpm)	Change In Storage (acre-ft)	Change In Storage (ft)	Relative Level (ft)
Jan	31	1.49	0.54	0.3	0.1	7.1	7.1	0.0	0.09	0.09
Feb	28	1.24	0.72	0.3	0.2	7.2	7.2	0.0	0.05	0.14
Mar	31	4.46	1.43	0.9	0.3	7.5	9.2	-0.2	-0.45	-0.31
Apr	30	5.20	2.60	1.1	0.6	7.8	8.2	0.0	0.06	-0.25
May	31	1.63	4.34	0.3	0.9	7.9	7.3	0.0	0.00	-0.25
Jun	30	3.22	5.00	0.7	1.1	7.9	7.2	0.0	0.10	-0.15
Jul	31	3.94	5.21	0.8	1.1	7.7	6.6	0.1	0.29	0.14
Aug	31	4.35	4.10	0.9	0.9	7.6	6.6	0.1	0.40	0.54
Sep	30	1.23	3.10	0.3	0.7	7.5	6.7	0.1	0.15	0.69
Oct	31	3.36	1.68	0.7	0.4	7.5	8.3	-0.1	-0.21	0.49
Nov	30	1.43	1.02	0.3	0.2	7.3	8.6	-0.2	-0.46	0.03
Dec	31	4.49	0.56	0.9	0.1	7.2	8.1	0.0	-0.03	0.00

**Monthly Water Budget, Normal Year (2007), 400 gpm Pumping**

Month	Days	Precip (inches)	ET (inches)	Precip (gpm)	ET (gpm)	GW Inflow (gpm)	GW Outflow (gpm)	Change In Storage (acre-ft)	Change In Storage (ft)	Relative Level (ft)
Jan	31	1.49	0.54	0.3	0.1	6.7	6.7	0.0	0.09	0.09
Feb	28	1.24	0.72	0.3	0.2	6.8	6.8	0.0	0.05	0.14
Mar	31	4.46	1.43	0.9	0.3	7.1	8.8	-0.2	-0.45	-0.31
Apr	30	5.20	2.60	1.1	0.6	7.4	7.8	0.0	0.06	-0.25
May	31	1.63	4.34	0.3	0.9	7.5	6.9	0.0	0.00	-0.25
Jun	30	3.22	5.00	0.7	1.1	7.5	6.8	0.0	0.10	-0.15
Jul	31	3.94	5.21	0.8	1.1	7.3	6.2	0.1	0.29	0.14
Aug	31	4.35	4.10	0.9	0.9	7.2	6.2	0.1	0.40	0.54
Sep	30	1.23	3.10	0.3	0.7	7.1	6.3	0.1	0.15	0.69
Oct	31	3.36	1.68	0.7	0.4	7.1	7.9	-0.1	-0.21	0.49
Nov	30	1.43	1.02	0.3	0.2	6.9	8.2	-0.2	-0.46	0.03
Dec	31	4.49	0.56	0.9	0.1	6.8	7.7	0.0	-0.03	0.00

**Wetland G Water Budget Analysis and Discussion**

**Monthly Water Budget, Wet Year (2004), No Pumping**

Month	Days	Precip (inches)	ET (inches)	Precip (gpm)	ET (gpm)	GW Inflow (gpm)	GW Outflow (gpm)	Change In Storage (acre-ft)	Change In Storage (ft)	Relative Level (ft)
Jan	31	3.15	0.54	0.7	0.1	7.4	7.7	0.0	0.08	0.08
Feb	28	1.32	0.72	0.3	0.2	7.4	7.5	0.0	0.04	0.12
Mar	31	4.64	1.43	1.0	0.3	8.3	10.1	-0.2	-0.46	-0.34
Apr	30	2.67	2.60	0.6	0.6	9.3	9.2	0.0	0.04	-0.30
May	31	8.65	4.34	1.8	0.9	9.3	10.2	0.0	-0.01	-0.31
Jun	30	4.31	5.00	0.9	1.1	8.8	8.4	0.0	0.09	-0.22
Jul	31	2.01	5.21	0.4	1.1	8.1	6.7	0.1	0.28	0.06
Aug	31	3.95	4.10	0.8	0.9	8.0	6.9	0.1	0.39	0.45
Sep	30	0.57	3.10	0.1	0.7	7.8	6.9	0.0	0.14	0.59
Oct	31	4.76	1.68	1.0	0.4	7.8	9.0	-0.1	-0.22	0.37
Nov	30	3.20	1.02	0.7	0.2	7.7	9.4	-0.2	-0.47	-0.10
Dec	31	3.68	0.56	0.8	0.1	7.6	8.3	0.0	-0.04	-0.14

**Monthly Water Budget, Wet Year (2004), 400 gpm Pumping**

Month	Days	Precip (inches)	ET (inches)	Precip (gpm)	ET (gpm)	GW Inflow (gpm)	GW Outflow (gpm)	Change In Storage (acre-ft)	Change In Storage (ft)	Relative Level (ft)
Jan	31	3.15	0.54	0.7	0.1	7.0	7.3	0.0	0.08	0.08
Feb	28	1.32	0.72	0.3	0.2	7.0	7.1	0.0	0.04	0.12
Mar	31	4.64	1.43	1.0	0.3	7.9	9.7	-0.2	-0.46	-0.34
Apr	30	2.67	2.60	0.6	0.6	8.9	8.8	0.0	0.04	-0.30
May	31	8.65	4.34	1.8	0.9	8.9	9.8	0.0	-0.01	-0.31
Jun	30	4.31	5.00	0.9	1.1	8.4	8.0	0.0	0.09	-0.22
Jul	31	2.01	5.21	0.4	1.1	7.7	6.3	0.1	0.28	0.06
Aug	31	3.95	4.10	0.8	0.9	7.6	6.5	0.1	0.39	0.45
Sep	30	0.57	3.10	0.1	0.7	7.4	6.5	0.0	0.14	0.59
Oct	31	4.76	1.68	1.0	0.4	7.4	8.6	-0.1	-0.22	0.37
Nov	30	3.20	1.02	0.7	0.2	7.3	9.0	-0.2	-0.47	-0.10
Dec	31	3.68	0.56	0.8	0.1	7.2	7.9	0.0	-0.04	-0.14

**Wetland G Water Budget Analysis and Discussion**

**Monthly Water Budget, Dry Year (2003), No Pumping**

Month	Days	Precip (inches)	ET (inches)	Precip (gpm)	ET (gpm)	GW Inflow (gpm)	GW Outflow (gpm)	Change In Storage (acre-ft)	Change In Storage (ft)	Relative Level (ft)
Jan	31	0.84	0.54	0.2	0.1	6.9	6.8	0.0	0.08	0.08
Feb	28	0.72	0.72	0.2	0.2	6.9	6.9	0.0	0.04	0.12
Mar	31	1.79	1.43	0.4	0.3	7.2	8.4	-0.2	-0.46	-0.34
Apr	30	3.01	2.60	0.6	0.6	7.3	7.3	0.0	0.04	-0.30
May	31	2.79	4.34	0.6	0.9	7.4	7.1	0.0	-0.01	-0.31
Jun	30	2.99	5.00	0.6	1.1	7.4	6.7	0.0	0.09	-0.22
Jul	31	4.40	5.21	0.9	1.1	7.2	6.3	0.1	0.28	0.06
Aug	31	3.75	4.10	0.8	0.9	7.1	6.1	0.1	0.39	0.45
Sep	30	2.08	3.10	0.4	0.7	7.1	6.5	0.0	0.14	0.59
Oct	31	3.01	1.68	0.6	0.4	7.0	7.8	-0.1	-0.22	0.37
Nov	30	7.12	1.02	1.5	0.2	6.9	9.4	-0.2	-0.47	-0.10
Dec	31	1.58	0.56	0.3	0.1	6.8	7.1	0.0	-0.04	-0.14

**Monthly Water Budget, Dry Year (2003), 400 gpm Pumping**

Month	Days	Precip (inches)	ET (inches)	Precip (gpm)	ET (gpm)	GW Inflow (gpm)	GW Outflow (gpm)	Change In Storage (acre-ft)	Change In Storage (ft)	Relative Level (ft)
Jan	31	0.84	0.54	0.2	0.1	6.5	6.4	0.0	0.08	0.08
Feb	28	0.72	0.72	0.2	0.2	6.5	6.5	0.0	0.04	0.12
Mar	31	1.79	1.43	0.4	0.3	6.8	8.0	-0.2	-0.46	-0.34
Apr	30	3.01	2.60	0.6	0.6	6.9	6.9	0.0	0.04	-0.30
May	31	2.79	4.34	0.6	0.9	7.0	6.7	0.0	-0.01	-0.31
Jun	30	2.99	5.00	0.6	1.1	7.0	6.3	0.0	0.09	-0.22
Jul	31	4.40	5.21	0.9	1.1	6.8	5.9	0.1	0.28	0.06
Aug	31	3.75	4.10	0.8	0.9	6.7	5.7	0.1	0.39	0.45
Sep	30	2.08	3.10	0.4	0.7	6.7	6.1	0.0	0.14	0.59
Oct	31	3.01	1.68	0.6	0.4	6.6	7.4	-0.1	-0.22	0.37
Nov	30	7.12	1.02	1.5	0.2	6.5	9.0	-0.2	-0.47	-0.10
Dec	31	1.58	0.56	0.3	0.1	6.4	6.7	0.0	-0.04	-0.14

### Wetland R Water Budget Analysis and Discussion

**Discussion:**

Wetland R is a ground water slope wetland and open basin wetland. Wetland R has zero or negligible surface storage capacity because it is drained by several tributaries, primarily Twin Creek, and those tributaries have base elevations below the surface of the wetland. The sub-surface storage capacity is represented by the shallow ground water aquifer, which has been modeled using a ground water model. Based on monitoring well data and observations by a Professional Wetland Scientist, the shallow ground water aquifer creates saturated soil conditions throughout the surface of Wetland R. Ground water flowing into Wetland R also feeds the tributaries and Twin Creek draining it. That is, flow into Wetland R roughly equals flow out of Wetland R, minus water loss due to evapotranspiration within Wetland R. Therefore, the ground water storage does not change as inputs increase or decrease.

Water Budget Equation:  $\Delta\text{Storage} = [\text{P} + \text{GI} + \text{SRO} + \text{SI}] - [\text{E} + \text{ET} + \text{GO} + \text{SO}]$

Inputs: Precipitation (P), Ground Water Inflow (GI), Surface Runoff (SRO), Stream & Seep Inflow (SI)

Outputs: Evaporation [E], Evapotranspiration (ET), Ground Water Outflow (GO), and Stream Outflow

Due to high infiltration rates in its watershed, surface runoff is a negligible component of the Wetland R water budget. The soil hydrological class is A and the runoff curve number is ~35. A rainfall of greater than 4 inches would be required to generate appreciable runoff. Furthermore, evaporation is negligible because there is very little exposed open water in the drainage basin of Wetland R.

Therefore, the water budget equation becomes:  $\Delta\text{Storage} = [\text{P} + \text{GI} + \text{SI}] - [\text{ET} + \text{GO} + \text{SO}]$ .

**Wetland R Morphological Data:**

Area 174 acres  
 Surface Storage Max Depth 0 ft  
 Surface Storage Volume 0 ac-ft

**Annual Water Budget:**

	2007 - Normal Year		2004 - Wet Year		2003 - Dry Year	
	No Pumping	Pumping 400 gpm	No Pumping	Pumping 400 gpm	No Pumping	Pumping 400 gpm
Precipitation (P, gpm)	322	322	383	383	306	306
Groundwater Inflow (GI, gpm)	2,053	1,951	2,281	2,179	1,826	1,724
Stream & Seep Inflow (SI, gpm)	858	822	996	960	715	679
Evapotranspiration (ET, gpm)	276	276	276	276	271	271
Groundwater Outflow (GO, gpm)	17	17	17	17	18	18
Stream Outflow (SO, gpm)	2,939	2,801	3,365	3,227	2,559	2,421
$\Delta\text{Storage}$ (acre-ft)	0.0	0.3	3.2	3.5	-3.2	-2.9
$\Delta\text{Storage Depth}$ (ft)	0.00	0.00	0.02	0.02	-0.02	-0.02

**Wetland R Water Budget Analysis and Discussion**

**Monthly Water Budget, Normal Year (2007), No Pumping**

Month	Days	Precip (inches)	ET (inches)	Precip (gpm)	ET (gpm)	GW Inflow (gpm)	Stream & Seep Inflow (gpm)	GW Outflow (gpm)	Stream outflow (gpm)	Change In Storage (acre-ft)	Change In Storage (ft)	Relative Level (ft)
Jan	31	1.49	0.54	158	59	1826	662	16	2582	-1.63	-0.01	-0.01
Feb	28	1.24	0.72	145	79	1859	737	18	2652	-0.81	0.00	-0.01
Mar	31	4.46	1.43	472	156	2112	1053	22	3402	7.81	0.04	0.03
Apr	30	5.20	2.60	569	284	2269	1138	21	3678	-0.98	-0.01	0.03
May	31	1.63	4.34	173	475	2309	1097	19	3085	0.00	0.00	0.03
Jun	30	3.22	5.00	352	547	2278	1018	17	3098	-1.79	-0.01	0.01
Jul	31	3.94	5.21	417	570	2118	817	15	2804	-5.12	-0.03	-0.01
Aug	31	4.35	4.10	460	448	2055	798	16	2899	-6.91	-0.04	-0.05
Sep	30	1.23	3.10	135	339	2004	771	16	2574	-2.60	-0.01	-0.07
Oct	31	3.36	1.68	356	184	2003	803	17	2936	3.58	0.02	-0.05
Nov	30	1.43	1.02	156	112	1926	715	16	2610	7.97	0.05	0.00
Dec	31	4.49	0.56	475	61	1872	686	16	2953	0.49	0.00	0.00

**Monthly Water Budget, Normal Year (2007), 400 gpm Pumping**

Month	Days	Precip (inches)	ET (inches)	Precip (gpm)	ET (gpm)	GW Inflow (gpm)	Stream & Seep Inflow (gpm)	GW Outflow (gpm)	Stream outflow (gpm)	Change In Storage (acre-ft)	Change In Storage (ft)	Relative Level (ft)
Jan	31	1.49	0.54	158	59	1724	626	16	2444	-1.60	-0.01	-0.01
Feb	28	1.24	0.72	145	79	1758	701	18	2514	-0.79	0.00	-0.01
Mar	31	4.46	1.43	472	156	2010	1017	22	3264	7.83	0.05	0.03
Apr	30	5.20	2.60	569	284	2167	1102	21	3540	-0.95	-0.01	0.03
May	31	1.63	4.34	173	475	2207	1061	19	2947	0.03	0.00	0.03
Jun	30	3.22	5.00	352	547	2176	982	17	2960	-1.76	-0.01	0.02
Jul	31	3.94	5.21	417	570	2016	780	15	2666	-5.09	-0.03	-0.01
Aug	31	4.35	4.10	460	448	1953	761	16	2761	-6.88	-0.04	-0.05
Sep	30	1.23	3.10	135	339	1902	735	16	2436	-2.58	-0.01	-0.07
Oct	31	3.36	1.68	356	184	1902	767	17	2798	3.60	0.02	-0.05
Nov	30	1.43	1.02	156	112	1824	678	16	2472	7.99	0.05	0.00
Dec	31	4.49	0.56	475	61	1770	650	16	2815	0.52	0.00	0.00

**Wetland R Water Budget Analysis and Discussion**

**Monthly Water Budget, Wet Year (2004), No Pumping**

Month	Days	Precip (inches)	ET (inches)	Precip (gpm)	ET (gpm)	GW Inflow (gpm)	Stream & Seep Inflow (gpm)	GW Outflow (gpm)	Stream outflow (gpm)	Change In Storage (acre-ft)	Change In Storage (ft)	Relative Level (ft)
Jan	31	3.15	0.54	333	59	1940	719	16	2931	-1.84	-0.01	-0.01
Feb	28	1.32	0.72	155	79	1995	825	18	2885	-0.81	0.00	-0.02
Mar	31	4.64	1.43	491	156	2348	1247	22	3831	10.42	0.06	0.04
Apr	30	2.67	2.60	292	284	2557	1358	21	3910	-1.00	-0.01	0.04
May	31	8.65	4.34	916	475	2612	1303	18	4335	0.27	0.00	0.04
Jun	30	4.31	5.00	471	547	2575	1200	16	3699	-2.06	-0.01	0.03
Jul	31	2.01	5.21	213	570	2367	941	13	2984	-6.38	-0.04	-0.01
Aug	31	3.95	4.10	418	448	2291	922	14	3232	-8.71	-0.05	-0.06
Sep	30	0.57	3.10	62	339	2231	890	14	2853	-3.12	-0.02	-0.08
Oct	31	4.76	1.68	504	184	2239	938	16	3446	4.92	0.03	-0.05
Nov	30	3.20	1.02	350	112	2139	821	15	3105	10.62	0.06	0.01
Dec	31	3.68	0.56	390	61	2074	786	15	3166	0.91	0.01	0.02

**Monthly Water Budget, Wet Year (2004), 400 gpm Pumping**

Month	Days	Precip (inches)	ET (inches)	Precip (gpm)	ET (gpm)	GW Inflow (gpm)	Stream & Seep Inflow (gpm)	GW Outflow (gpm)	Stream outflow (gpm)	Change In Storage (acre-ft)	Change In Storage (ft)	Relative Level (ft)
Jan	31	3.15	0.54	333	59	1839	683	16	2793	-1.81	-0.01	-0.01
Feb	28	1.32	0.72	155	79	1894	789	18	2747	-0.78	0.00	-0.01
Mar	31	4.64	1.43	491	156	2247	1210	22	3693	10.45	0.06	0.05
Apr	30	2.67	2.60	292	284	2456	1322	21	3772	-0.98	-0.01	0.04
May	31	8.65	4.34	916	475	2510	1266	18	4197	0.30	0.00	0.04
Jun	30	4.31	5.00	471	547	2474	1164	16	3561	-2.03	-0.01	0.03
Jul	31	2.01	5.21	213	570	2265	905	13	2846	-6.36	-0.04	-0.01
Aug	31	3.95	4.10	418	448	2190	885	14	3094	-8.68	-0.05	-0.06
Sep	30	0.57	3.10	62	339	2129	854	14	2715	-3.09	-0.02	-0.07
Oct	31	4.76	1.68	504	184	2137	902	16	3308	4.95	0.03	-0.05
Nov	30	3.20	1.02	350	112	2038	785	15	2967	10.65	0.06	0.02
Dec	31	3.68	0.56	390	61	1972	750	15	3028	0.94	0.01	0.02

**Wetland R Water Budget Analysis and Discussion**

**Monthly Water Budget, Dry Year (2003), No Pumping**

Month	Days	Precip (inches)	ET (inches)	Precip (gpm)	ET (gpm)	GW Inflow (gpm)	Stream & Seep Inflow (gpm)	GW Outflow (gpm)	Stream outflow (gpm)	Change In Storage (acre-ft)	Change In Storage (ft)	Relative Level (ft)
Jan	31	0.84	0.54	89	57	1713	601	17	2340	-1.41	-0.01	-0.01
Feb	28	0.72	0.72	84	84	1728	649	18	2365	-0.82	0.00	-0.01
Mar	31	1.79	1.43	189	151	1883	852	21	2714	5.19	0.03	0.02
Apr	30	3.01	2.60	329	284	1981	911	21	2923	-0.95	-0.01	0.01
May	31	2.79	4.34	295	459	2003	882	19	2703	-0.27	0.00	0.01
Jun	30	2.99	5.00	327	547	1978	826	18	2577	-1.52	-0.01	0.00
Jul	31	4.40	5.21	466	551	1868	689	16	2483	-3.86	-0.02	-0.02
Aug	31	3.75	4.10	397	434	1818	672	17	2474	-5.11	-0.03	-0.05
Sep	30	2.08	3.10	227	339	1777	650	17	2314	-2.09	-0.01	-0.06
Oct	31	3.01	1.68	319	178	1770	667	18	2544	2.23	0.01	-0.05
Nov	30	7.12	1.02	779	112	1715	604	17	2929	5.31	0.03	-0.02
Dec	31	1.58	0.56	167	59	1675	580	17	2345	0.07	0.00	-0.02

**Monthly Water Budget, Dry Year (2003), 400 gpm Pumping**

Month	Days	Precip (inches)	ET (inches)	Precip (gpm)	ET (gpm)	GW Inflow (gpm)	Stream & Seep Inflow (gpm)	GW Outflow (gpm)	Stream outflow (gpm)	Change In Storage (acre-ft)	Change In Storage (ft)	Relative Level (ft)
Jan	31	0.84	0.54	89	57	1612	565	17	2202	-1.38	-0.01	-0.01
Feb	28	0.72	0.72	84	84	1626	613	18	2227	-0.79	0.00	-0.01
Mar	31	1.79	1.43	189	151	1782	816	21	2576	5.22	0.03	0.02
Apr	30	3.01	2.60	329	284	1879	875	21	2785	-0.92	-0.01	0.01
May	31	2.79	4.34	295	459	1901	845	19	2565	-0.25	0.00	0.01
Jun	30	2.99	5.00	327	547	1876	790	18	2439	-1.49	-0.01	0.00
Jul	31	4.40	5.21	466	551	1766	653	16	2345	-3.83	-0.02	-0.02
Aug	31	3.75	4.10	397	434	1717	636	17	2336	-5.08	-0.03	-0.05
Sep	30	2.08	3.10	227	339	1676	613	17	2176	-2.06	-0.01	-0.06
Oct	31	3.01	1.68	319	178	1669	631	18	2406	2.26	0.01	-0.05
Nov	30	7.12	1.02	779	112	1614	567	17	2791	5.34	0.03	-0.02
Dec	31	1.58	0.56	167	59	1573	544	17	2207	0.09	0.00	-0.02