

Supplement 7 Rainfall, Runoff and Evaporation Data

Rainfall, Runoff and Evaporation Data for Pennsylvania Counties

Prepared by TJM, May 2000, Revised October 2007 by WHL

Use the factors in the following table to determine the contribution of rainfall to total manure production on the farm for any given manure collection period.

Rainfall Directly on the Storage

To estimate rainfall contributions directly on the storage the effects of evaporation must be accounted for in some situations. Follow the guidance below to determine whether to adjust for evaporation or not. Answer the three questions that follow to decide if evaporation should be included in your calculations for cattle manure. Hog manure almost always stays liquid on the surface, so evaporation can always be used. Poultry manure is usually not stored as a liquid, so this is not usually an issue.

1. Does the storage facility contain fibrous organic bedding (Straw bedding or a lot of waste hay)?
NO – Account for evaporation.
YES – Go to 2.

2. Is the manure loaded through a pipe near the bottom of the storage facility?
NO – Go to 3.
YES – Do NOT account for evaporation.

3. Is milking parlor (more than a pipeline milking system) wastewater added at or near the top of the storage facility?
NO – Do NOT account for evaporation.
YES - Account for evaporation.

Rainfall Directed to the Storage

To estimate rainfall contributions directed to the storage from barnyards, loafing areas, barn roofs, etc., the nature of the runoff surface must be accounted for. Runoff to a storage will differ depending on whether the surface where runoff is occurring is paved or not. Use the paved data for all hard compacted surfaces (A simple guide is if an animal does not leave a hoof print when the surface is walked on dry, consider it paved). Also, a roof would be considered a paved surface in this calculation.

Rainfall, Runoff and Evaporation for Pennsylvania counties.

County		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Adams	Directly on Storage - No Evaporation	2.98	2.72	3.22	3.42	3.73	3.53	2.96	3.30	3.60	2.97	3.23	3.15	38.81
	Directly on Storage - With Evaporation	1.99	1.73	1.57	1.11	0.43	0.00	0.00	0.00	0.00	0.00	1.25	2.16	10.24
	Directed to Storage - Paved	1.52	1.44	1.71	1.78	1.94	2.01	1.69	2.08	2.27	1.66	1.81	1.61	21.51
	Directed to Storage - Unpaved	0.60	0.60	0.71	0.72	0.78	0.92	0.77	1.06	1.15	0.74	0.81	0.63	9.48
Allegheny	Directly on Storage - No Evaporation	2.51	2.40	3.26	3.18	3.91	3.78	3.88	3.22	3.03	2.52	3.05	2.94	37.65
	Directly on Storage - With Evaporation	1.64	1.53	1.81	1.15	1.01	0.00	0.00	0.00	0.00	0.00	1.31	2.07	10.52
	Directed to Storage - Paved	1.03	1.08	1.47	1.49	1.84	2.00	2.05	1.74	1.64	1.21	1.46	1.21	18.21
	Directed to Storage - Unpaved	0.25	0.34	0.46	0.51	0.63	0.83	0.85	0.74	0.70	0.43	0.52	0.29	6.54
Armstrong	Directly on Storage - No Evaporation	2.68	2.61	3.47	3.36	4.11	4.36	4.32	4.09	3.70	2.98	3.34	3.14	42.13
	Directly on Storage - With Evaporation	1.84	1.77	2.07	1.40	1.31	0.72	0.12	0.17	0.34	0.46	1.66	2.30	14.13
	Directed to Storage - Paved	1.10	1.17	1.56	1.58	1.93	2.31	2.29	2.21	2.00	1.43	1.60	1.29	20.46
	Directed to Storage - Unpaved	0.27	0.36	0.49	0.54	0.66	0.96	0.95	0.94	0.85	0.51	0.57	0.31	7.40
Beaver	Directly on Storage - No Evaporation	2.32	2.12	3.25	3.16	3.92	3.48	4.08	3.15	3.07	2.37	2.93	2.94	36.79
	Directly on Storage - With Evaporation	1.45	1.25	1.80	1.13	1.02	0.00	0.00	0.00	0.00	0.00	1.19	2.07	9.91
	Directed to Storage - Paved	0.90	0.93	1.43	1.45	1.80	1.81	2.12	1.67	1.63	1.11	1.38	1.15	17.39
	Directed to Storage - Unpaved	0.19	0.28	0.42	0.47	0.59	0.73	0.86	0.69	0.68	0.38	0.47	0.24	5.98
Bedford	Directly on Storage - No Evaporation	2.23	2.45	2.96	3.26	3.50	3.52	3.70	2.85	2.97	2.89	2.91	2.66	35.87
	Directly on Storage - With Evaporation	1.39	1.61	1.56	1.30	0.70	0.00	0.00	0.00	0.00	0.37	1.23	1.82	9.97
	Directed to Storage - Paved	1.05	1.20	1.45	1.63	1.75	1.94	2.03	1.65	1.72	1.50	1.51	1.25	18.68
	Directed to Storage - Unpaved	0.36	0.44	0.53	0.62	0.66	0.84	0.89	0.77	0.80	0.61	0.61	0.43	7.56
Berks	Directly on Storage - No Evaporation	3.11	2.63	3.10	3.62	4.36	3.75	4.34	3.93	3.91	2.89	3.71	3.32	42.67
	Directly on Storage - With Evaporation	2.09	1.61	1.40	1.24	0.96	0.00	0.00	0.00	0.00	0.00	1.67	2.30	11.27
	Directed to Storage - Paved	1.62	1.42	1.68	1.92	2.31	2.18	2.52	2.52	2.50	1.65	2.11	1.72	24.14
	Directed to Storage - Unpaved	0.65	0.60	0.71	0.80	0.96	1.01	1.17	1.30	1.29	0.75	0.96	0.70	10.91

Rainfall, Runoff and Evaporation for Pennsylvania counties.

County		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Blair	Directly on Storage - No Evaporation	2.60	2.43	3.27	3.59	4.63	4.43	4.25	3.67	4.00	3.65	3.61	3.16	43.29
	Directly on Storage - With Evaporation	1.80	1.63	1.87	1.59	1.83	0.83	0.05	0.00	0.70	1.15	1.91	2.36	15.72
	Directed to Storage - Paved	1.20	1.17	1.57	1.76	2.27	2.39	2.30	2.06	2.24	1.86	1.84	1.45	22.10
	Directed to Storage - Unpaved	0.39	0.41	0.56	0.65	0.83	1.02	0.98	0.92	1.00	0.73	0.72	0.47	8.68
Bradford	Directly on Storage - No Evaporation	1.94	2.19	2.40	2.90	3.48	3.52	3.02	2.91	3.14	2.58	3.04	2.40	33.52
	Directly on Storage - With Evaporation	1.14	1.39	1.00	0.90	0.68	0.00	0.00	0.00	0.00	0.08	1.34	1.60	8.13
	Directed to Storage - Paved	0.87	1.03	1.13	1.39	1.67	1.87	1.60	1.60	1.73	1.32	1.55	1.08	16.83
	Directed to Storage - Unpaved	0.27	0.35	0.38	0.49	0.59	0.77	0.66	0.70	0.75	0.52	0.61	0.34	6.44
Bucks	Directly on Storage - No Evaporation	3.43	3.08	3.89	4.02	4.51	4.11	5.59	4.66	4.41	3.20	3.92	3.79	48.61
	Directly on Storage - With Evaporation	2.41	2.06	2.19	1.64	1.11	0.00	0.49	0.00	0.33	0.14	1.88	2.77	15.02
	Directed to Storage - Paved	1.82	1.69	2.14	2.21	2.48	2.47	3.35	3.03	2.87	1.92	2.35	2.01	28.34
	Directed to Storage - Unpaved	0.75	0.74	0.93	0.96	1.08	1.19	1.62	1.58	1.50	0.93	1.14	0.83	13.27
Butler	Directly on Storage - No Evaporation	2.55	2.32	3.30	3.39	4.14	4.47	4.37	3.90	3.71	2.98	3.40	3.22	41.72
	Directly on Storage - With Evaporation	1.71	1.48	1.90	1.43	1.34	0.83	0.17	0.00	0.35	0.46	1.72	2.38	13.74
	Directed to Storage - Paved	1.02	1.02	1.45	1.56	1.90	2.32	2.27	1.95	1.85	1.43	1.63	1.29	19.69
	Directed to Storage - Unpaved	0.23	0.30	0.43	0.51	0.62	0.94	0.92	0.74	0.70	0.51	0.58	0.29	6.76
Cambria	Directly on Storage - No Evaporation	3.74	3.45	4.14	3.98	4.60	4.50	5.03	4.08	3.97	3.31	3.87	3.68	48.31
	Directly on Storage - With Evaporation	2.90	2.61	2.74	2.02	1.80	0.86	0.83	0.16	0.61	0.79	2.19	2.84	20.31
	Directed to Storage - Paved	1.68	1.62	1.94	1.91	2.21	2.43	2.72	2.28	2.22	1.65	1.93	1.65	24.25
	Directed to Storage - Unpaved	0.52	0.55	0.66	0.68	0.78	1.03	1.16	1.02	0.99	0.63	0.73	0.51	9.27
Cameron	Directly on Storage - No Evaporation	2.26	2.52	3.10	2.99	4.12	5.22	4.28	3.86	3.83	3.37	3.51	3.16	42.20
	Directly on Storage - With Evaporation	1.42	1.68	1.70	1.03	1.32	1.58	0.08	0.00	0.47	0.85	1.83	2.32	14.26
	Directed to Storage - Paved	0.90	1.13	1.40	1.37	1.89	2.71	2.23	1.93	1.91	1.58	1.65	1.26	19.98
	Directed to Storage - Unpaved	0.20	0.35	0.43	0.45	0.62	1.10	0.90	0.73	0.73	0.54	0.56	0.28	6.89

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Carbon	Directly on Storage - No Evaporation	2.63	2.33	3.04	3.18	4.01	3.75	3.96	3.48	3.55	2.73	2.92	2.81	38.37
	Directly on Storage - With Evaporation	1.63	1.33	1.44	0.98	0.81	0.00	0.00	0.00	0.00	0.00	1.02	1.81	9.01
	Directed to Storage - Paved	1.32	1.17	1.52	1.59	2.00	2.06	2.18	2.09	2.13	1.50	1.61	1.41	20.55
	Directed to Storage - Unpaved	0.50	0.44	0.58	0.60	0.76	0.90	0.95	1.01	1.03	0.65	0.70	0.53	8.66
Centre	Directly on Storage - No Evaporation	2.31	2.54	3.05	2.92	3.73	4.24	3.83	3.33	3.48	2.93	3.27	2.56	38.17
	Directly on Storage - With Evaporation	1.51	1.74	1.65	0.92	0.93	0.64	0.00	0.00	0.18	0.43	1.57	1.76	11.31
	Directed to Storage - Paved	1.06	1.22	1.46	1.43	1.83	2.29	2.07	1.86	1.95	1.49	1.67	1.18	19.51
	Directed to Storage - Unpaved	0.35	0.43	0.52	0.53	0.67	0.98	0.88	0.83	0.87	0.59	0.65	0.38	7.67
Chester	Directly on Storage - No Evaporation	3.35	2.96	3.52	3.77	4.01	3.94	4.47	3.58	4.09	2.99	3.79	3.62	44.09
	Directly on Storage - With Evaporation	2.30	1.91	1.77	1.32	0.51	0.00	0.00	0.00	0.00	0.00	1.69	2.57	12.06
	Directed to Storage - Paved	1.78	1.66	1.97	2.03	2.17	2.36	2.68	2.36	2.70	1.77	2.24	1.92	25.63
	Directed to Storage - Unpaved	0.74	0.74	0.88	0.87	0.92	1.14	1.30	1.25	1.43	0.84	1.06	0.80	11.97
Clarion	Directly on Storage - No Evaporation	2.77	2.46	3.30	3.67	4.09	5.06	4.55	4.29	4.29	3.31	3.80	3.27	44.86
	Directly on Storage - With Evaporation	1.93	1.62	1.90	1.71	1.29	1.42	0.35	0.37	0.93	0.79	2.12	2.43	16.86
	Directed to Storage - Paved	1.11	1.11	1.49	1.69	1.88	2.63	2.37	2.15	2.15	1.56	1.79	1.31	21.21
	Directed to Storage - Unpaved	0.25	0.34	0.46	0.55	0.61	1.06	0.96	0.82	0.82	0.53	0.61	0.29	7.30
Clearfield	Directly on Storage - No Evaporation	1.80	2.09	2.91	3.12	3.95	4.48	4.37	3.79	3.46	2.63	2.74	2.11	37.45
	Directly on Storage - With Evaporation	0.96	1.25	1.51	1.16	1.15	0.84	0.17	0.00	0.10	0.11	1.06	1.27	9.58
	Directed to Storage - Paved	0.77	0.96	1.34	1.50	1.90	2.37	2.32	2.05	1.87	1.29	1.34	0.91	18.61
	Directed to Storage - Unpaved	0.22	0.31	0.44	0.53	0.67	0.99	0.96	0.87	0.80	0.47	0.49	0.25	7.00
Clinton	Directly on Storage - No Evaporation	1.82	2.53	2.95	3.17	3.66	4.04	3.47	3.34	2.99	2.72	3.41	2.47	36.57
	Directly on Storage - With Evaporation	0.82	1.53	1.25	0.87	0.36	0.00	0.00	0.00	0.00	0.00	1.41	1.47	7.71
	Directed to Storage - Paved	0.82	1.19	1.39	1.52	1.76	2.14	1.84	1.84	1.64	1.36	1.71	1.11	18.31
	Directed to Storage - Unpaved	0.25	0.40	0.47	0.54	0.62	0.89	0.76	0.80	0.72	0.52	0.31	0.35	6.63

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Columbia	Directly on Storage - No Evaporation	2.52	2.42	2.97	3.27	4.03	4.56	3.87	3.51	3.69	3.17	3.40	3.00	40.41
	Directly on Storage - With Evaporation	1.62	1.52	1.47	1.17	1.03	0.66	0.00	0.00	0.09	0.47	1.60	2.10	11.73
	Directed to Storage - Paved	1.21	1.21	1.49	1.67	2.06	2.46	2.09	2.04	2.14	1.68	1.80	1.44	21.28
	Directed to Storage - Unpaved	0.43	0.46	0.56	0.65	0.81	1.05	0.89	0.95	1.00	0.70	0.75	0.51	8.75
Crawford	Directly on Storage - No Evaporation	2.19	2.29	2.87	3.21	4.04	4.62	4.24	4.19	4.16	3.46	3.86	3.26	42.36
	Directly on Storage - With Evaporation	1.35	1.45	1.47	1.25	1.24	0.98	0.04	0.27	0.80	0.94	2.18	2.42	14.36
	Directed to Storage - Paved	0.79	0.94	1.18	1.44	1.82	2.35	2.16	1.97	1.95	1.59	1.77	1.17	19.14
	Directed to Storage - Unpaved	0.11	0.23	0.29	0.45	0.57	0.92	0.85	0.67	0.66	0.52	0.58	0.16	6.01
Cumberland	Directly on Storage - No Evaporation	2.75	2.62	3.14	3.25	3.79	3.80	3.55	3.01	3.57	3.08	3.22	2.92	38.66
	Directly on Storage - With Evaporation	1.85	1.72	1.54	1.05	0.59	0.00	0.00	0.00	0.00	0.28	1.32	2.02	10.34
	Directed to Storage - Paved	1.37	1.36	1.63	1.66	1.93	2.13	1.99	1.83	2.17	1.69	1.77	1.46	20.99
	Directed to Storage - Unpaved	0.52	0.55	0.66	0.65	0.76	0.95	0.89	0.90	1.07	0.74	0.77	0.55	9.01
Dauphin	Directly on Storage - No Evaporation	2.84	2.93	3.28	3.24	4.26	3.85	3.59	3.31	3.51	2.93	3.53	3.24	40.51
	Directly on Storage - With Evaporation	1.88	1.97	1.68	1.00	1.06	0.00	0.00	0.00	0.00	0.05	1.61	2.28	11.53
	Directed to Storage - Paved	1.45	1.52	1.71	1.68	2.22	2.16	2.01	2.05	2.18	1.61	1.94	1.65	22.18
	Directed to Storage - Unpaved	0.57	0.62	0.69	0.68	0.89	0.96	0.90	1.03	1.09	0.70	0.85	0.65	9.62
Delaware	Directly on Storage - No Evaporation	2.88	3.03	3.81	3.63	4.13	3.73	4.14	3.71	3.88	2.86	3.64	3.40	42.84
	Directly on Storage - With Evaporation	1.83	1.98	2.06	1.18	0.63	0.00	0.00	0.00	0.00	0.00	1.54	2.35	11.57
	Directed to Storage - Paved	1.53	1.70	2.13	2.00	2.27	2.28	2.53	2.45	2.56	1.72	2.18	1.80	25.14
	Directed to Storage - Unpaved	0.63	0.76	0.95	0.87	0.99	1.12	1.24	1.30	1.36	0.83	1.06	0.75	11.86
Elk	Directly on Storage - No Evaporation	2.43	2.39	3.30	3.43	4.39	4.69	4.60	3.85	3.63	3.09	3.55	3.05	42.40
	Directly on Storage - With Evaporation	1.59	1.55	1.90	1.47	1.59	1.05	0.40	0.00	0.27	0.57	1.87	2.21	14.47
	Directed to Storage - Paved	1.00	1.05	1.45	1.61	2.06	2.44	2.39	2.00	1.89	1.48	1.70	1.25	20.33
	Directed to Storage - Unpaved	0.24	0.31	0.43	0.55	0.70	0.98	0.97	0.81	0.76	0.53	0.60	0.31	7.19

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Erie	Directly on Storage - No Evaporation	2.68	2.51	3.25	3.45	3.63	4.36	4.05	4.26	4.33	3.82	4.22	3.99	44.53
	Directly on Storage - With Evaporation	1.85	1.68	1.87	1.52	0.88	0.78	0.00	0.41	1.03	1.34	2.57	3.16	17.07
	Directed to Storage - Paved	0.94	1.00	1.30	1.52	1.60	2.18	2.03	1.91	1.95	1.76	1.94	1.40	19.51
	Directed to Storage - Unpaved	0.11	0.23	0.29	0.45	0.47	0.83	0.77	0.60	0.61	0.57	0.63	0.16	5.71
Fayette	Directly on Storage - No Evaporation	2.71	2.58	3.68	3.81	4.25	4.02	4.61	3.76	3.43	2.81	3.37	3.12	42.15
	Directly on Storage - With Evaporation	1.87	1.74	2.28	1.85	1.45	0.38	0.41	0.00	0.07	0.29	1.69	2.28	14.31
	Directed to Storage - Paved	1.22	1.21	1.73	1.83	2.04	2.17	2.49	2.07	1.89	1.41	1.69	1.40	21.14
	Directed to Storage - Unpaved	0.38	0.41	0.59	0.65	0.72	0.92	1.06	0.90	0.82	0.53	0.64	0.44	8.07
Forest	Directly on Storage - No Evaporation	2.49	2.22	3.27	3.51	3.87	4.56	4.52	4.05	3.94	3.33	3.54	3.18	42.48
	Directly on Storage - With Evaporation	1.65	1.38	1.87	1.55	1.07	0.92	0.32	0.13	0.58	0.81	1.86	2.34	14.48
	Directed to Storage - Paved	0.92	0.95	1.41	1.61	1.78	2.33	2.31	1.94	1.89	1.57	1.66	1.18	19.55
	Directed to Storage - Unpaved	0.15	0.27	0.39	0.53	0.58	0.91	0.90	0.69	0.67	0.53	0.57	0.19	6.38
Franklin	Directly on Storage - No Evaporation	2.66	2.71	3.56	3.50	3.91	3.95	3.55	3.46	3.29	3.19	3.39	3.12	40.26
	Directly on Storage - With Evaporation	1.73	1.78	2.01	1.33	0.81	0.00	0.00	0.00	0.00	0.40	1.53	2.19	11.77
	Directed to Storage - Paved	1.33	1.38	1.82	1.82	2.03	2.21	1.99	2.07	1.97	1.75	1.86	1.56	21.79
	Directed to Storage - Unpaved	0.51	0.54	0.71	0.74	0.82	0.99	0.89	1.00	0.95	0.76	0.81	0.59	9.31
Fulton	Directly on Storage - No Evaporation	2.27	2.53	3.15	3.44	3.81	3.72	3.49	3.30	3.32	3.22	3.19	2.83	38.24
	Directly on Storage - With Evaporation	1.37	1.63	1.65	1.34	0.81	0.00	0.00	0.00	0.00	0.52	1.39	1.93	10.62
	Directed to Storage - Paved	1.11	1.27	1.58	1.75	1.94	2.04	1.92	1.94	1.96	1.70	1.69	1.38	20.29
	Directed to Storage - Unpaved	0.41	0.48	0.60	0.69	0.76	0.89	0.84	0.92	0.93	0.71	0.70	0.51	8.43
Greene	Directly on Storage - No Evaporation	2.47	2.23	3.41	3.32	4.00	3.80	4.14	3.62	3.08	2.47	3.13	2.78	38.45
	Directly on Storage - With Evaporation	1.57	1.33	1.91	1.22	1.00	0.00	0.00	0.00	0.00	0.00	1.33	1.88	10.24
	Directed to Storage - Paved	1.06	1.05	1.60	1.59	1.92	2.01	2.19	1.99	1.69	1.21	1.53	1.20	19.06
	Directed to Storage - Unpaved	0.30	0.36	0.55	0.56	0.68	0.84	0.91	0.87	0.74	0.44	0.56	0.33	7.14

Rainfall, Runoff and Evaporation for Pennsylvania counties.

County		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Huntingdon	Directly on Storage - No Evaporation	2.39	2.42	3.13	3.27	4.37	4.17	4.17	3.42	3.64	3.32	3.41	2.98	40.67
	Directly on Storage - With Evaporation	1.59	1.62	1.73	1.27	1.57	0.57	0.00	0.00	0.34	0.82	1.71	2.18	13.38
	Directed to Storage - Paved	1.12	1.19	1.53	1.64	2.18	2.25	2.25	1.98	2.11	1.72	1.77	1.40	21.15
	Directed to Storage - Unpaved	0.38	0.44	0.56	0.62	0.83	0.96	0.96	0.92	0.98	0.70	0.72	0.48	8.54
Indiana	Directly on Storage - No Evaporation	3.22	3.09	4.02	3.88	4.44	4.70	4.91	4.08	4.08	3.08	3.82	3.54	46.83
	Directly on Storage - With Evaporation	2.38	2.25	2.62	1.92	1.64	1.06	0.71	0.16	0.72	0.56	2.14	2.70	18.83
	Directed to Storage - Paved	1.38	1.42	1.85	1.86	2.13	2.49	2.60	2.24	2.24	1.51	1.87	1.52	23.12
	Directed to Storage - Unpaved	0.39	0.46	0.60	0.66	0.75	1.03	1.08	0.98	0.98	0.55	0.69	0.42	8.60
Jefferson	Directly on Storage - No Evaporation	2.73	2.58	3.48	3.31	4.21	4.87	4.28	4.08	3.81	3.03	3.43	3.48	43.25
	Directly on Storage - With Evaporation	1.89	1.74	2.08	1.35	1.41	1.23	0.08	0.16	0.45	0.51	1.75	2.64	15.25
	Directed to Storage - Paved	1.12	1.13	1.53	1.55	1.98	2.53	2.23	2.12	1.98	1.45	1.65	1.42	20.69
	Directed to Storage - Unpaved	0.27	0.33	0.45	0.53	0.67	1.02	0.90	0.86	0.80	0.51	0.58	0.35	7.28
Juniata	Directly on Storage - No Evaporation	2.35	2.53	3.10	3.10	4.12	3.82	3.84	3.35	3.54	3.15	3.37	2.98	39.23
	Directly on Storage - With Evaporation	1.51	1.69	1.70	1.14	1.32	0.18	0.00	0.00	0.18	0.63	1.69	2.14	12.16
	Directed to Storage - Paved	1.13	1.27	1.55	1.55	2.06	2.10	2.11	1.94	2.05	1.67	1.79	1.43	20.64
	Directed to Storage - Unpaved	0.40	0.48	0.59	0.59	0.78	0.92	0.92	0.90	0.96	0.69	0.74	0.51	8.48
Lackawanna	Directly on Storage - No Evaporation	2.58	2.52	2.98	3.57	4.24	4.45	3.91	3.82	3.81	3.36	3.63	3.13	41.99
	Directly on Storage - With Evaporation	1.68	1.62	1.48	1.47	1.24	0.65	0.00	0.00	0.31	0.66	1.83	2.23	13.17
	Directed to Storage - Paved	1.26	1.29	1.52	1.82	2.16	2.45	2.15	2.29	2.29	1.81	1.96	1.53	22.53
	Directed to Storage - Unpaved	0.46	0.50	0.60	0.71	0.85	1.07	0.94	1.11	1.10	0.77	0.83	0.56	9.51
Lancaster	Directly on Storage - No Evaporation	2.79	2.43	2.92	3.66	3.72	4.10	4.20	3.51	3.35	3.14	3.34	3.17	40.32
	Directly on Storage - With Evaporation	1.74	1.38	1.17	1.21	0.22	0.00	0.00	0.00	0.00	0.00	1.24	2.12	9.08
	Directed to Storage - Paved	1.48	1.31	1.58	1.94	1.97	2.38	2.43	2.28	2.18	1.79	1.90	1.68	22.92
	Directed to Storage - Unpaved	0.61	0.56	0.67	0.80	0.82	1.11	1.13	1.19	1.14	0.82	0.87	0.70	10.42

Rainfall, Runoff and Evaporation for Pennsylvania counties.

County		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Lawrence	Directly on Storage - No Evaporation	2.16	2.14	3.08	3.03	3.50	4.08	3.96	3.38	3.40	2.70	3.08	2.80	37.31
	Directly on Storage - With Evaporation	1.32	1.30	1.68	1.07	0.70	0.44	0.00	0.00	0.04	0.18	1.40	1.96	10.09
	Directed to Storage - Paved	0.82	0.92	1.32	1.39	1.61	2.08	2.02	1.69	1.70	1.27	1.45	1.06	17.34
	Directed to Storage - Unpaved	0.15	0.26	0.37	0.45	0.53	0.82	0.79	0.64	0.65	0.43	0.49	0.20	5.77
Lebanon	Directly on Storage - No Evaporation	3.10	2.42	3.01	3.67	4.86	4.23	4.74	3.62	4.13	3.02	3.66	3.34	43.80
	Directly on Storage - With Evaporation	2.11	1.43	1.36	1.36	1.56	0.00	0.00	0.00	0.17	0.05	1.68	2.35	12.07
	Directed to Storage - Paved	1.58	1.28	1.60	1.91	2.53	2.37	2.65	2.28	2.60	1.69	2.05	1.70	24.24
	Directed to Storage - Unpaved	0.62	0.53	0.66	0.77	1.02	1.06	1.19	1.16	1.32	0.76	0.92	0.67	10.67
Lehigh	Directly on Storage - No Evaporation	3.16	2.95	3.28	3.52	4.20	3.75	4.14	4.28	3.93	2.94	3.88	3.49	43.52
	Directly on Storage - With Evaporation	2.14	1.93	1.58	1.14	0.80	0.00	0.00	0.00	0.00	0.00	1.84	2.47	11.90
	Directed to Storage - Paved	1.64	1.59	1.77	1.87	2.23	2.14	2.36	2.74	2.52	1.68	2.21	1.81	24.55
	Directed to Storage - Unpaved	0.66	0.68	0.75	0.77	0.92	0.98	1.08	1.41	1.30	0.76	1.01	0.73	11.06
Luzerne	Directly on Storage - No Evaporation	2.37	2.49	2.79	3.51	4.16	4.46	4.24	4.00	3.95	3.23	3.57	2.91	41.69
	Directly on Storage - With Evaporation	1.47	1.59	1.29	1.41	1.16	0.56	0.00	0.00	0.35	0.53	1.77	2.01	12.15
	Directed to Storage - Paved	1.16	1.27	1.42	1.79	2.12	2.45	2.33	2.40	2.37	1.75	1.93	1.42	22.43
	Directed to Storage - Unpaved	0.43	0.50	0.56	0.70	0.83	1.07	1.02	1.16	1.15	0.74	0.82	0.52	9.50
Lycoming	Directly on Storage - No Evaporation	2.53	2.81	3.28	3.16	3.78	4.30	3.78	3.13	3.33	3.14	3.59	2.96	39.76
	Directly on Storage - With Evaporation	1.73	2.01	1.88	1.16	0.98	0.70	0.00	0.00	0.00	0.64	1.89	2.16	13.13
	Directed to Storage - Paved	1.14	1.35	1.57	1.55	1.85	2.28	2.00	1.75	1.86	1.60	1.83	1.33	20.11
	Directed to Storage - Unpaved	0.35	0.48	0.56	0.57	0.68	0.94	0.83	0.78	0.83	0.63	0.72	0.41	7.79
Mc Kean	Directly on Storage - No Evaporation	2.81	2.62	3.39	3.44	3.99	5.15	4.27	4.11	4.22	3.45	3.87	3.73	45.06
	Directly on Storage - With Evaporation	1.97	1.78	1.99	1.48	1.19	1.51	0.07	0.19	0.86	0.93	2.19	2.89	17.06
	Directed to Storage - Paved	1.04	1.10	1.42	1.55	1.80	2.62	2.18	1.97	2.03	1.62	1.82	1.38	20.53
	Directed to Storage - Unpaved	0.17	0.29	0.37	0.48	0.56	1.03	0.85	0.70	0.72	0.55	0.62	0.22	6.57

Rainfall, Runoff and Evaporation for Pennsylvania counties.

County		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mercer	Directly on Storage - No Evaporation	2.26	2.28	3.20	3.33	3.77	4.47	3.96	3.64	3.87	2.91	3.68	3.03	40.37
	Directly on Storage - With Evaporation	1.42	1.44	1.80	1.37	0.97	0.83	0.00	0.00	0.51	0.39	2.00	2.19	12.90
	Directed to Storage - Paved	0.84	0.96	1.34	1.50	1.69	2.28	2.02	1.74	1.86	1.37	1.73	1.12	18.44
	Directed to Storage - Unpaved	0.14	0.25	0.35	0.47	0.53	0.89	0.79	0.62	0.66	0.47	0.59	0.18	5.93
Mifflin	Directly on Storage - No Evaporation	2.17	2.41	2.99	2.95	4.10	3.91	4.09	3.17	3.28	2.98	3.20	2.80	38.05
	Directly on Storage - With Evaporation	1.37	1.61	1.59	0.95	1.30	0.31	0.00	0.00	0.00	0.48	1.50	2.00	11.11
	Directed to Storage - Paved	1.02	1.18	1.47	1.48	2.05	2.11	2.21	1.71	1.90	1.73	1.66	1.32	19.83
	Directed to Storage - Unpaved	0.35	0.43	0.54	0.56	0.78	0.90	0.94	0.73	0.89	0.80	0.67	0.45	8.04
Monroe	Directly on Storage - No Evaporation	3.41	3.21	3.66	4.03	4.65	4.16	4.24	4.18	4.22	3.60	4.37	3.81	47.51
	Directly on Storage - With Evaporation	2.41	2.21	2.06	1.83	1.45	0.00	0.00	0.00	0.42	0.70	2.47	2.81	16.34
	Directed to Storage - Paved	1.74	1.70	1.94	2.10	2.42	2.33	2.37	2.59	2.61	2.01	2.44	1.94	26.20
	Directed to Storage - Unpaved	0.68	0.71	0.81	0.85	0.98	1.04	1.06	1.30	1.31	0.90	1.09	0.76	11.47
Montgomery	Directly on Storage - No Evaporation	3.20	2.79	3.33	3.72	4.00	3.32	4.28	3.94	3.90	2.79	3.87	3.36	42.46
	Directly on Storage - With Evaporation	2.18	1.77	1.63	1.34	0.60	0.00	0.00	0.00	0.00	0.00	1.83	2.34	11.66
	Directed to Storage - Paved	1.69	1.56	1.86	2.01	2.16	1.99	2.57	2.60	2.57	1.65	2.28	1.78	24.71
	Directed to Storage - Unpaved	0.70	0.70	0.83	0.85	0.92	0.96	1.24	1.38	1.37	0.78	1.08	0.74	11.55
Montour	Directly on Storage - No Evaporation	2.52	2.42	2.97	3.27	4.03	4.56	3.87	3.51	3.69	3.17	3.40	3.00	40.41
	Directly on Storage - With Evaporation	1.62	1.52	1.47	1.17	1.03	0.66	0.00	0.00	0.09	0.47	1.60	2.10	11.73
	Directed to Storage - Paved	1.21	1.21	1.49	1.64	2.02	2.51	2.13	2.04	2.14	1.68	1.80	1.44	21.29
	Directed to Storage - Unpaved	0.43	0.46	0.56	0.62	0.77	1.09	0.93	0.95	1.00	0.70	0.75	0.51	8.76
Northampton	Directly on Storage - No Evaporation	3.42	3.08	3.69	3.94	4.77	4.21	4.23	4.27	4.28	3.48	4.23	3.95	47.55
	Directly on Storage - With Evaporation	2.43	2.09	2.04	1.63	1.47	0.00	0.00	0.00	0.32	0.51	2.25	2.96	15.70
	Directed to Storage - Paved	1.78	1.66	1.99	2.09	2.53	2.40	2.41	2.73	2.74	1.98	2.41	2.05	26.78
	Directed to Storage - Unpaved	0.72	0.71	0.85	0.87	1.05	1.09	1.10	1.41	1.41	0.90	1.10	0.83	12.04

Rainfall, Runoff and Evaporation for Pennsylvania counties.

County		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Northumberland	Directly on Storage - No Evaporation	2.50	2.45	2.83	3.53	4.20	4.26	4.03	3.84	3.39	3.64	3.68	2.81	41.16
	Directly on Storage - With Evaporation	1.60	1.55	1.33	1.43	1.20	0.36	0.00	0.00	0.00	0.94	1.88	1.91	12.20
	Directed to Storage - Paved	1.20	1.23	1.42	1.77	2.10	2.34	2.22	2.23	1.97	1.93	1.95	1.35	21.69
	Directed to Storage - Unpaved	0.43	0.47	0.54	0.67	0.80	1.02	0.97	1.04	0.92	0.80	0.81	0.48	8.93
Perry	Directly on Storage - No Evaporation	2.53	2.65	3.20	3.24	4.13	3.73	3.59	3.52	3.80	3.31	3.54	3.16	40.40
	Directly on Storage - With Evaporation	1.63	1.75	1.70	1.14	1.13	0.00	0.00	0.00	0.20	0.61	1.74	2.26	12.16
	Directed to Storage - Paved	1.24	1.35	1.63	1.65	2.11	2.05	1.97	2.11	2.28	1.79	1.91	1.55	21.65
	Directed to Storage - Unpaved	0.46	0.53	0.64	0.65	0.83	0.90	0.86	1.02	1.10	0.76	0.81	0.57	9.12
Philadelphia	Directly on Storage - No Evaporation	3.21	2.79	3.46	3.62	3.75	3.74	4.28	3.80	3.42	2.62	3.34	3.38	41.41
	Directly on Storage - With Evaporation	2.16	1.74	1.71	1.17	0.25	0.00	0.00	0.00	0.00	0.00	1.24	2.33	10.60
	Directed to Storage - Paved	1.70	1.56	1.94	1.99	2.06	2.28	2.61	2.51	2.26	1.57	2.00	1.79	24.28
	Directed to Storage - Unpaved	0.71	0.70	0.87	0.87	0.90	1.12	1.28	1.33	1.20	0.76	0.97	0.74	11.44
Pike	Directly on Storage - No Evaporation	3.12	2.90	3.42	3.69	4.30	3.80	4.30	3.70	3.87	3.08	3.88	3.35	43.41
	Directly on Storage - With Evaporation	2.22	2.00	1.82	1.49	1.20	0.00	0.00	0.00	0.17	0.28	1.98	2.45	13.61
	Directed to Storage - Paved	1.59	1.51	1.78	1.92	2.24	2.09	2.37	2.26	2.36	1.72	2.17	1.71	23.71
	Directed to Storage - Unpaved	0.62	0.61	0.72	0.77	0.90	0.91	1.03	1.11	1.16	0.77	0.97	0.67	10.25
Potter	Directly on Storage - No Evaporation	2.38	2.40	2.91	3.20	3.69	5.29	3.92	3.69	3.78	3.19	3.79	2.97	41.21
	Directly on Storage - With Evaporation	1.54	1.56	1.51	1.24	0.89	1.65	0.00	0.00	0.42	0.67	2.11	2.13	13.72
	Directed to Storage - Paved	1.00	1.08	1.31	1.50	1.73	2.75	2.04	1.88	1.78	1.50	1.78	1.25	19.60
	Directed to Storage - Unpaved	0.26	0.34	0.41	0.51	0.59	1.11	0.82	0.74	0.60	0.51	0.61	0.33	6.83
Schuylkill	Directly on Storage - No Evaporation	2.71	2.52	2.95	3.61	4.43	4.24	4.43	4.07	4.10	3.20	3.79	3.17	43.23
	Directly on Storage - With Evaporation	1.71	1.52	1.35	1.41	1.23	0.04	0.00	0.00	0.30	0.30	1.89	2.17	11.93
	Directed to Storage - Paved	1.38	1.31	1.53	1.88	2.31	2.38	2.48	2.52	2.54	1.79	2.12	1.62	23.86
	Directed to Storage - Unpaved	0.54	0.53	0.62	0.76	0.93	1.06	1.11	1.26	1.27	0.80	0.95	0.63	10.46

Rainfall, Runoff and Evaporation for Pennsylvania counties.

County		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Snyder	Directly on Storage - No Evaporation	2.50	2.45	2.83	3.53	4.20	4.26	4.03	3.84	3.39	3.64	3.68	2.81	41.16
	Directly on Storage - With Evaporation	1.60	1.55	1.33	1.43	1.20	0.36	0.00	0.00	0.00	0.94	1.88	1.91	12.20
	Directed to Storage - Paved	1.20	1.23	1.42	1.77	2.10	2.34	2.22	2.27	2.00	1.93	1.95	1.35	21.76
	Directed to Storage - Unpaved	0.43	0.47	0.54	0.67	0.80	1.02	0.97	1.08	0.95	0.80	0.81	0.48	9.00
Somerset	Directly on Storage - No Evaporation	3.07	2.72	3.80	3.93	4.30	4.00	5.00	3.67	3.71	3.07	3.46	3.53	44.26
	Directly on Storage - With Evaporation	2.23	1.88	2.40	1.97	1.50	0.36	0.80	0.00	0.35	0.55	1.78	2.69	16.51
	Directed to Storage - Paved	1.41	1.31	1.82	1.93	2.11	2.16	2.70	2.09	2.11	1.57	1.76	1.62	22.60
	Directed to Storage - Unpaved	0.46	0.46	0.65	0.71	0.77	0.92	1.15	0.95	0.96	0.61	0.69	0.53	8.87
Sullivan	Directly on Storage - No Evaporation	2.81	2.85	2.54	3.88	3.71	4.83	4.25	3.67	3.53	3.62	4.22	3.12	43.03
	Directly on Storage - With Evaporation	2.01	2.05	1.14	1.88	0.91	1.23	0.05	0.00	0.13	1.12	2.52	2.32	15.36
	Directed to Storage - Paved	1.32	1.37	1.22	1.90	1.82	2.61	2.30	2.09	2.01	1.88	2.19	1.47	22.18
	Directed to Storage - Unpaved	0.45	0.48	0.43	0.70	0.67	1.11	0.98	0.95	0.92	0.76	0.89	0.50	8.84
Susquehanna	Directly on Storage - No Evaporation	2.90	2.84	3.23	3.62	4.00	4.22	3.88	3.81	3.60	3.41	3.84	3.31	42.66
	Directly on Storage - With Evaporation	2.00	1.94	1.83	1.62	1.10	0.52	0.00	0.00	0.20	0.81	2.14	2.41	14.57
	Directed to Storage - Paved	1.36	1.36	1.55	1.77	1.96	2.24	2.06	2.17	2.05	1.77	2.00	1.56	21.85
	Directed to Storage - Unpaved	0.46	0.48	0.55	0.65	0.72	0.93	0.85	0.99	0.94	0.72	0.81	0.53	8.63
Tioga	Directly on Storage - No Evaporation	1.68	1.78	2.14	2.35	3.33	4.09	3.36	2.82	3.14	2.64	2.62	2.19	32.14
	Directly on Storage - With Evaporation	0.88	0.98	0.74	0.39	0.53	0.45	0.00	0.00	0.00	0.12	0.94	1.35	6.38
	Directed to Storage - Paved	0.72	0.82	0.98	1.13	1.60	2.17	1.78	1.55	1.73	1.32	1.31	0.94	16.05
	Directed to Storage - Unpaved	0.20	0.27	0.32	0.40	0.57	0.90	0.74	0.68	0.75	0.50	0.50	0.26	6.09
Union	Directly on Storage - No Evaporation	2.58	2.88	3.34	3.21	4.39	4.54	4.29	3.41	4.27	3.66	3.82	3.17	43.56
	Directly on Storage - With Evaporation	1.68	1.98	1.84	1.21	1.49	0.74	0.00	0.00	0.77	1.06	2.12	2.27	15.16
	Directed to Storage - Paved	1.21	1.41	1.64	1.61	2.20	2.45	2.32	1.98	2.48	1.90	1.99	1.49	22.66
	Directed to Storage - Unpaved	0.41	0.52	0.60	0.61	0.83	1.04	0.99	0.92	1.15	0.77	0.80	0.51	9.16

Rainfall, Runoff and Evaporation for Pennsylvania counties.

County		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Venango	Directly on Storage - No Evaporation	2.46	2.39	3.25	3.53	3.79	4.69	4.79	4.08	3.88	3.16	3.77	3.25	43.04
	Directly on Storage - With Evaporation	1.62	1.55	1.85	1.57	0.99	1.05	0.59	0.16	0.52	0.64	2.09	2.41	15.04
	Directed to Storage - Paved	0.91	1.03	1.40	1.62	1.74	2.44	2.49	2.04	1.94	1.86	1.77	1.20	28.70
	Directed to Storage - Unpaved	0.15	0.29	0.39	0.53	0.57	0.98	1.01	0.78	0.74	0.51	0.60	0.20	6.73
Warren	Directly on Storage - No Evaporation	2.67	2.40	3.19	3.53	3.97	4.88	4.13	4.26	4.12	3.44	3.92	3.70	44.21
	Directly on Storage - With Evaporation	1.83	1.56	1.79	1.57	1.17	1.24	0.00	0.34	0.76	0.92	2.24	2.86	16.28
	Directed to Storage - Paved	0.99	1.03	1.37	1.62	1.83	2.49	2.11	2.04	1.98	1.62	1.84	1.37	20.29
	Directed to Storage - Unpaved	0.16	0.29	0.38	0.42	0.60	0.98	0.83	0.72	0.70	0.55	0.63	0.22	6.48
Washington	Directly on Storage - No Evaporation	2.37	2.26	3.33	3.24	3.83	3.65	3.87	3.64	3.08	2.63	3.00	2.70	37.58
	Directly on Storage - With Evaporation	1.47	1.36	1.83	1.14	0.83	0.00	0.00	0.00	0.00	0.00	1.20	1.80	9.61
	Directed to Storage - Paved	1.00	1.01	1.50	1.52	1.80	1.93	2.05	1.97	1.66	1.26	1.44	1.13	18.27
	Directed to Storage - Unpaved	0.26	0.32	0.47	0.52	0.61	0.80	0.85	0.84	0.71	0.45	0.51	0.30	6.62
Wayne	Directly on Storage - No Evaporation	2.87	2.77	3.13	3.71	4.33	4.28	3.73	3.95	3.81	3.40	3.85	3.39	43.19
	Directly on Storage - With Evaporation	1.97	1.87	1.63	1.71	1.43	0.48	0.00	0.00	0.31	0.80	2.15	2.49	14.82
	Directed to Storage - Paved	1.38	1.39	1.56	1.86	2.16	2.31	2.01	2.29	2.21	1.84	2.08	1.63	22.70
	Directed to Storage - Unpaved	0.49	0.53	0.59	0.70	0.82	0.98	0.86	1.07	1.03	0.78	0.89	0.58	9.31
Westmoreland	Directly on Storage - No Evaporation	2.81	2.78	3.66	3.96	4.32	4.63	4.65	4.03	3.88	3.03	3.64	3.27	44.66
	Directly on Storage - With Evaporation	1.97	1.94	2.26	2.00	1.52	0.99	0.45	0.11	0.52	0.51	1.96	2.43	16.66
	Directed to Storage - Paved	1.21	1.31	1.72	1.90	2.07	2.45	2.46	2.22	2.13	1.48	1.79	1.40	22.15
	Directed to Storage - Unpaved	0.34	0.45	0.59	0.67	0.73	1.02	1.02	0.97	0.93	0.54	0.66	0.39	8.31
Wyoming	Directly on Storage - No Evaporation	2.28	2.39	2.51	3.28	3.67	4.16	3.69	3.30	3.38	3.01	3.42	2.69	37.78
	Directly on Storage - With Evaporation	1.38	1.49	1.01	1.28	0.77	0.36	0.00	0.00	0.00	0.41	1.72	1.79	10.22
	Directed to Storage - Paved	1.10	1.17	1.23	1.64	1.83	2.25	1.99	1.91	1.96	1.60	1.81	1.29	19.78
	Directed to Storage - Unpaved	0.39	0.43	0.45	0.62	0.70	0.96	0.85	0.89	0.91	0.66	0.75	0.46	8.07

Rainfall, Runoff and Evaporation for Pennsylvania counties.

County		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
York	Directly on Storage - No Evaporation	2.90	2.80	3.21	3.42	3.91	3.88	3.39	3.33	3.48	2.98	3.40	3.20	39.91
	Directly on Storage - With Evaporation	1.91	1.81	1.56	1.11	0.61	0.00	0.00	0.00	0.00	0.01	1.42	2.21	10.64
	Directed to Storage - Paved	1.51	1.48	1.70	1.81	2.07	2.25	1.97	2.13	2.23	1.70	1.94	1.67	22.46
	Directed to Storage - Unpaved	0.61	0.62	0.71	0.75	0.86	1.05	0.92	1.10	1.15	0.77	0.88	0.67	10.09