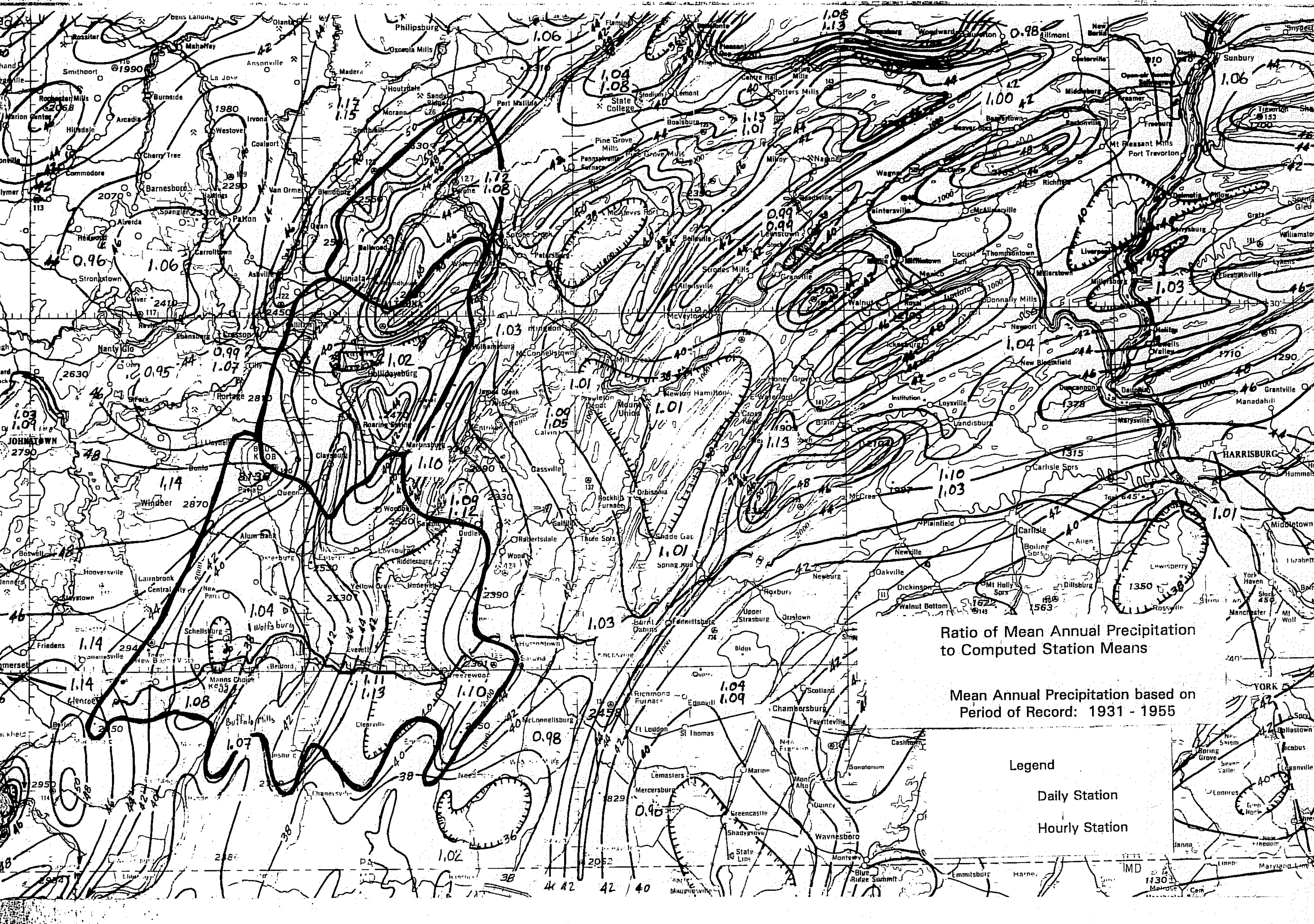
Analysis of Precipitation in Mountainous Areas

Juniata River in Pennsylvania

Juniata River Watershed MARFC



Calibration Workshop
Station Mean Precip. Estimates vs Isohyetal Map Values
Juniata River Watershed

	Daily Station	STATION MEAN PRECIP. 1 Isohyetal Map	2 PXPP Computed	Ratio 1/2
1	Altoona-Martinsburg	40	36.32	1.10
2	Beavertown	42.5	42.53	1.00
3	Bloserville	43.7	39.86	1.10
4	Buffalo Mills	41.0	38.18	1.07
5	Burnt Cabins	41.0	39.78	1.03
6	Carrolltown	45.5	42.80	1.06
7	Chambersburg	41.5	39.87	1.04
8	Cresson	43.5	43.80	0.99
9	Ebensburg	45.2	47.57	0.95
10	Everett	40.0	36.13	1.11
11	Hunt-Rays	38.7	35.52	1.09
12	Johnstown	47.5	46.26	1.03
13	Kegg	38.7	35.85	1.08
14	Lewistown	38	38.49	0.99
15	Madera	45.7	38.90	1.17
16	Mapleton Depot	37.7	37.29	1.01
17	McConnellsburg	38.9	39.81	0.98
18	Mercersberg	39.9	40.83	0.98
19	Millheim	45	41.53	1.08
20	Milroy	44	38.84	1.13
21	Newport	41.8	40.02	1.04
22	Saxton	41.0	37.51	1.09
23	State College	39.0	37.34	1.04
24	Tyrone DLY MGED	43.5	39.89	1.12
25	Williamsburg	41.5	40.10	1.03
26	Wolfsburg	39.0	37.58	1.04
27	Breezewood	41.5	37.63	1.10

Calibration Workshop
Station Mean Precip. Estimates VS Isohyetal Map Values
Juniata River Watershed

Hourly Station	STATION MEAN PRECIP. 1 Isohyetal Map	2 PXPP Computed	Ratio 1/2
28 Hancock	37	36.45	1.02
29 Blain	45	39.83	1.13
30 Bloserville	43.8	42.51	1.03
31 Buckstown	45.0	39.40	1.14
32 Chambersburg	41.5	38.21	1.09
33 Cresson	43.5	40.50	1.07
34 Dunlo	48.2	42.35	1.14
35 Everett	40.0	35.51	1.13
36 Glencoe	43.5	38.23	1.14
37 Harrisburg	39.0	38.58	1.01
38 Holidaysburg	37.5	36.69	1.02
39 Johnstown	47.5	43.75	1.09
40 Laurelton St. Village	41.0	41.80	0.98
41 Lewistown	38.0	38.33	0.99
42 Madera	45.7	39.75	1.15
43 Millersburg	39.5	38.43	1.03
44 Millheim	45.0	39.9	1.13
45 Millroy	44.0	43.51	1.01
46 Mt. Union	37.9	37.45	1.01
47 Philipsburg	45.0	42.56	1.06
48 Raystown Lake	39.0	36.99	1.05
49 Saxton	41.0	36.46	1.12
50 Shade Gap	38.0	37.55	1.01
51 State College	39.0	36.15	1.08
52 Strongstown	44.8	46.52	0.96
53 Sunbury	42.8	40.37	1.06
54 Tyrone	43.5	40.13	1.08

PPXP and Isohyetal Map Analysis

1. Mean of 54 ratios: 1.059

2. STD of 54 ratios: 0.055

3. Adjustment Factor applied to Iso. Map: 1/1.059 = 0.94

MAP Analysis
Stations and Weightings

Basin: Little Juniata @ Spruce Creek
Adjusted Mean from Isohyetal MAP: 0.94 x 45.8 = 43.05 in.

Station Name		Station Mean $\bar{S}$	Relative Weight R	Final Station Weight W	Thiessen Weight
Madera	d	38.90	0.11	0.118	0.09
Philipsburg	h	42.56	0.10	0.107	0.03
State Coll.	d	37.34	0.08	0.086	
Tyrone	d	39.89	0.40	0.429	0.68
Williamsburg	d	40.10	0.08	0.086	0.03
Holidaysburg	h	36.69	0.08	0.086	0.15
Cresson	d	43.80	0.08	0.086	0.03
Carrolltown	d	42.80	0.07	0.075	
Total			1.00	1.073	1.00

1. $\Sigma (\bar{S} \times R) = 40.121$ in.

2. Adjustment factor = $\frac{43.05}{40.12} = 1.07$

3. $W = R \times 1.07$

Note: Σ (Thiessen Weights x $\bar{S}$) = 39.92 in.

MAP Analysis
Stations and Weightings

Basin: Frankstown Br. @ Williamsburg
Adjusted Mean from Isohyetal MAP: 0.94 x 43.96 = 41.32 in.

Station Name		Station Mean $\bar{S}$	Relative Weight R	Final Station Weight W	Thiessen Weight
Williamsburg	d	40.10	0.20	0.210	0.21
Hollidaysburg	h	36.69	0.25	0.263	0.38
Alt.-Martins.	d	36.32	0.20	0.210	0.17
Tyrone	d	39.89	0.10	0.105	0.04
Dunlo	h	42.35	0.10	0.105	0.02
Cresson	d	43.80	0.15	0.158	0.17
Total			1.00	1.051	0.99

1. $\Sigma (\bar{S} \times R) = 39.25$ in.

2. Adjustment factor = $\frac{41.32}{39.25} = 1.05$

3. $W = R \times 1.05$

Note: Σ (Thiessen Weights x $\bar{S}$) = 38.42 in.

MAP Analysis
Stations and Weightings

Basin: Raystown Branch @ Saxton
Adjusted Mean from Isohyetal MAP: 0.94 x 41.32 = 38.84 in.

Station Name		Station Mean $\bar{S}$	Relative Weight R	Final Station Weight W	Thiessen Weight
Alt.-Martins.	d	36.32	0.10	0.103	0.03
Breezewood	d	37.63	0.12	0.124	0.14
Everett	d	36.13	0.12	0.124	0.19
Wolfsburg	d	37.58	0.12	0.124	0.25
Buffalo Mills	h	38.18	0.11	0.114	0.09
Saxton	d	37.51	0.10	0.103	0.14
Dunlo	h	42.35	0.06	0.062	0.08
Glencoe	h	38.23	0.06	0.062	
Kegg	d	35.85	0.12	0.124	0.08
Buckstown	h	39.40	0.06	0.062	
Hollidaysburg	h	36.69	0.03	0.031	
Total			1.00	1.033	1.00

1. $\Sigma\ (\bar{S} \times R) = 37.54$ in.

2. Adjustment factor = $\frac{38.84}{37.54} = 1.03$

3. $W = R \times 1.03$

Note: Σ (Thiessen Weights x $\bar{S}$) = 37.60 in.