Summary of the flood frequency analysis for Watersheds 172, 177 and 196 located within the North Appalacian Experimental Watershed Coshocton, Ohio USA

prepared by:

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OVERVIEW

For a long period of time, the USDA-ARS North Appalacian Experimental Watershed collected various hydrologic data on several primarily agricultural watersheds. These data are available to the public. As part of ongoing work to evaluate rainfall temporal distributions, Hydrosphere Engineering utilized the flow data for three of the experimental watersheds, and performed a flood frequency analysis.

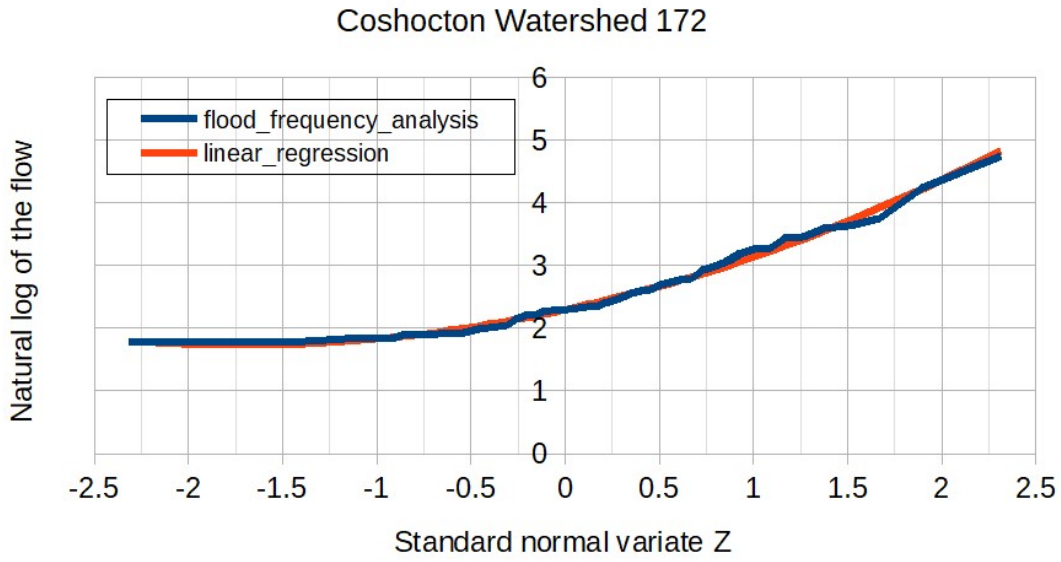
The flood frequency analysis indicated that the relationship between the natural logarithm of the flow rate and the standard normal variate was nonlinear. A second degree polynomial, using linear regression analysis, was fit to the data for each of the three watersheds. The results of the flood frequency analysis are presented in the following pages.

The results of the flood frequency analysis will be used to evaluate how well the NCRS Type 2, 24 hour rainfall temporal distribution predicts peak flow rates for various average return intervals.

Coshocton Watershed 172
Results from flood frequency analysis

Average return interval (years)	Exceedance probability	Peak flow cfs
100	0.01	127.1
50	0.02	84.7
25	0.04	55.8
10	0.10	31.3
5	0.20	19.7
2	0.50	9.9
1.01	0.99	6.1

On June 12, 1957 a severe rainfall event occurred, which had an exceedance probability less than 0.01 (more severe than a storm with an average return interval of 100 years). The flood frequency analysis will overpredict peak flows for the 100 year and 50 year average return intervals.



$$\ln Q = aZ^2 + bZ + c$$

a	0.1902
b	0.6543
c	2.2935
R^2	0.9941
DOF	51

Area 43.6 acres

Coshocton Watershed 177
Results from flood frequency analysis

Average return interval (years)	Exceedance probability	Peak flow cfs
100	0.01	335.9
50	0.02	235.7
25	0.04	163.7
10	0.10	99.1
5	0.20	66.3
2	0.50	36.8
1.01	0.99	25.6

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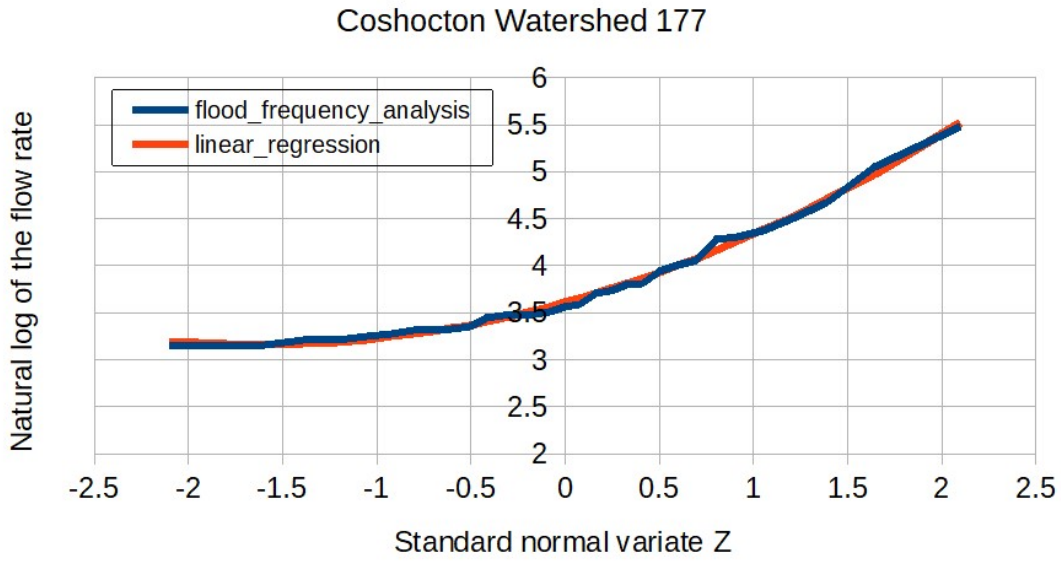

$$\ln Q = aZ^2 + bZ + c$$

a	0.1703
b	0.5538
c	3.6067
R^2	0.9952
DOF	28

Area 75.6 acres

Coshocton Watershed 196
Results from flood frequency analysis

Average return interval (years)	Exceedance probability	Peak flow cfs
100	0.01	1060.9
50	0.02	782.1
25	0.04	570.6
10	0.10	367.7
5	0.20	257.0
2	0.50	149.8
1.01	0.99	91.9

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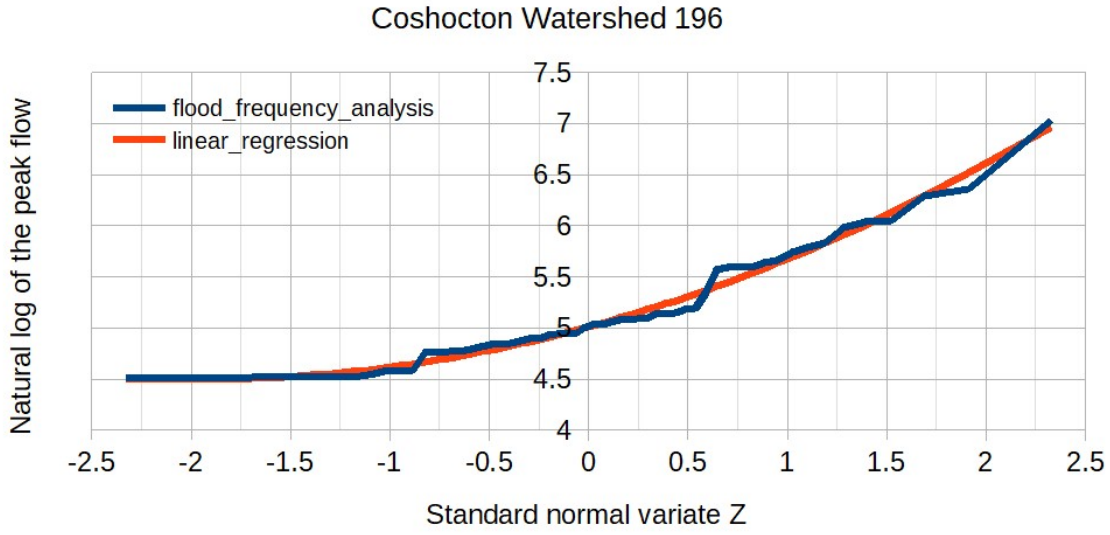

$$\ln Q = aZ^2 + bZ + c$$

a	0.1348
b	0.5278
c	5.0094
R^2	0.9862
DOF	53

Area 303 acres