Answer Key for Environmental Geology Lab 1

1. $P = ET + Q$

2. $ET > Q$

3. Highest - August Lowest - December
Yes temperature is correlated with PET because the highest values are recorded during the warm months of the summer and the lowest values during the cool months of winter.

4. 9.2 mm X 30 days = 276 mm per month

5. $P < PET$

6. Since $P < PET$ - $Q = 0$

7. 4 mm X 31 days = 124 mm per month

8. $P > PET$

9. Since $P > PET$
Then, $Q = P - PET$ or
Q = 200 mm per month - 124 mm per month = 76 mm per month

10. No. this is false. PET is greater during late summer versus fall

11. 27 km^2

12. Six

13 (a) $Q (m) = 0.001 \times Q (mm) = 0.001 \times 76$ mm = 0.076 m

13 (b) Area (m^2) = 1,000,000 X Area (km^2) = 1,000,000 X 27 = 27,000,000 m^2

13 (c) $Q (m^3) = Q (m) \times$ Area (m^2) = 0.0476 X 27,000,000 = 2,052,000 m^3

14. Q (liters) = 1,000 X Q (m^3) = 1,000 X 1,285,200 = 2,052,000,000 liters

Bonus 2,052,000,000 / 2 = 1,026,000,000 Two Liter Bottles !

15. Highest – September Tropical Storm Lowest – December Winter-time Event

16. July thunderstorm is the most isolated and this makes sense because the precipitation from thunderstorms tends to be spatially isolated and commonly confined to relative small areas.

17.
July

Sum of rainfall in drainage basin = 352 mm; Total number of grids = 7

Average P = 352 mm / 7 = 50.3 mm

September

Sum of rainfall in drainage basin = 2,388 mm; Total number of grids = 27

Average P = 2,388 mm / 27 = 88.4 mm

December

Sum of rainfall in drainage basin = 60 mm; Total number of grids = 27

Average P = 60 mm / 27 = 2.2 mm

19.
July Daily PET = 12 mm

September Daily PET = 4.5 mm

December Daily PET = 1.7 mm

20.

July Event	P > PET
September Event	P > PET
December Event	P > PET

21.

July Event	Q = P - PET = 50.3 mm - 12 mm = 38.3 mm
September Event	Q = P - PET = 88.4 mm - 4.5 mm = 83.9 mm
December Event	Q = P - PET = 2.2 mm - 1.7 mm = 0.5 mm

22. Again the September event that has much more discharge compared to either the July or December events.

23
July

(a) Q (m) = 0.001 X Q (mm) = 0.001 X 38.3 mm = 0.0383 m

(c) Q (m^3) = Q (m) X Area (m^2) = 0.0383 X 7,000,000 = 268,100 m^3

September

(a) Q (m) = 0.001 X Q (mm) = 0.001 X 83.9 mm = 0.0839 m

(c) Q (m^3) = Q (m) X Area (m^2) = 0.0839 X 27,000,000 = 2,265,300 m^3

December

(a) Q (m) = 0.001 X Q (mm) = 0.001 X 0.5 mm = 0.0005 m

(c) Q (m^3) = Q (m) X Area (m^2) = 0.0005 X 27,000,000 = 13,500 m^3