

# ANALYSIS OF FLOOD ON OCTOBER 1, 2010

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Rainfall totals for the storm of October 1, 2010 for the drainage basin of the Schoharie Reservoir upstream of the Gilboa Dam; information provided by NOAA and Steve DiRienzo, Service Hydrologist NOAA.

Tannersville, NY-9.00"

Maple Crest, NY-8.50"

"On average, the upper part of the basin south of Prattsville had 6-9 inches. North of Prattsville less with averages in the 4-6 inch range." Steve DiRienzo

The Daily Mean Discharge for Prattsville, NY, USGS gauge station #01350000 for October 1, 2010 is 18,700 cubic feet per second, (cfs). This is the third highest daily average recorded at this site since records began being kept. The daily mean discharge of Oct. 1, 2010 at Prattsville has only been exceeded by the flood of October 16, 1955, which had a whopping daily mean discharge of 26,200 cfs and the flood of January 19, 1996 that produced a daily mean discharge of 22,000 cfs. Both of these floods caused major property damage downstream of the Gilboa Dam, as well as in areas above or upstream of the Schoharie Reservoir. The flood of Jan. 19, 1996 caused death by hypothermia and subsequent drowning of two people in Schoharie, NY. It is only because of the fact that the water level of the Schoharie Reservoir was at 1096.57', 7:00 pm Thursday, Sept. 30, 2010 and of the presence of the 220' long x 5.5' deep "notch" in the 1324' long Gilboa Dam spillway, that a major flood downstream of the Schoharie Reservoir was averted.

The Schoharie Reservoir was roughly half full at the onset of the storm of Oct. 1, 2010, which was in reality, the residue of tropical storm "Nicole". The presence of the "void" as storage space in the reservoir coupled with the "notch" served to attenuate or lengthen the time it took the Schoharie Reservoir to "fill and spill" across the entire length of its 1324' spillway. By the time this occurred around 7 pm, Friday, Oct. 1, 2010, the water level and stream flow upstream of Prattsville had already begun to drop as this remnant of tropical storm Nicole made its exit from the Catskills. The "void" in the Schoharie Reservoir prior to the onset of this storm was the

result of a prolonged drought in the area. The month of September 2010 was "on its way" to becoming one of the driest Septembers on record, when the rains arrived on Sept. 29<sup>th</sup>. By Sept. 30<sup>th</sup>, the precipitation, in the watershed in particular, and area in general, ended up being above average.

This is a strikingly similar scenario to the flood of Sept. 11, 1960 that had a daily mean of 12,900 cfs as measured at Prattsville, NY, USGS gauge state 0135000. The pool elevation of the Schoharie Reservoir at the onset of this flood, caused by rains from Hurricane Donna was 1097' above sea level. At this water level the reservoir is more than half empty and is 33' down from the top of the spillway. **A 220' long x 5.5' deep "notch" did not exist in the 1324' masonry spillway in 1960.** When the Schoharie Reservoir filled 18.5 hours after the onset of the storm, it immediately ran over the entire 1324' long spillway causing much higher water levels downstream of the Gilboa Dam than did the spillage from the floodwaters of tropical storm Nicole, October 1, 2010.

A comparison of the daily means discharge, expressed in cfs for Prattsville and Burtonsville in the floods of Sept. 11, 1960 and Oct. 1, 2010, amply demonstrates the "peak shaving" powers of the 220'x5.5' "notch" in the Gilboa Dam. The peak daily means for these two floods are shown in Table 1.

Table 1: Comparison of the daily mean discharge for Prattsville and Burtonsville

Prattsville, NY USGS 0135000		Burtonsville, NY USGS 01251500	
12,900 cfs	Sept. 12, 1960	17,000 cfs	Sept. 13, 1960
18,700 cfs	Oct. 1, 2010	14,900 cfs	Oct. 2, 2010

It is interesting to notice the "rolling" crest that takes place on the Schoharie Creek in times of flood, in terms of apogee between Prattsville and Burtonsville, a distance of about 40 miles.

The conclusions that can be drawn from the data above are important.

1. A void of approximately 50% in the Schoharie Reservoir, when used in concert with an unobstructed “notch” in the spillway of the Gilboa Dam, can greatly attenuate spillage and thereby reduce the impact of flooding downstream of the Gilboa Dam. By its own reckoning, NYCDEP recommended a Schoharie Reservoir pool elevation of 1093’ for a snowpack of 40” coupled with a rainfall of 4.5”. This is a probably worst-case scenario.

2. The impact of the flood of Oct. 1, 2010 would have been much worse had the level of the Schoharie Reservoir been higher and/or the “notch” not been in place.

3. A protocol should be firmly in place regarding the lowering of the Obermeyer Gate System, soon to be installed in the 220’x5.5’ “notch”, in advance of a flood so as to use its maximum capacity for flood mitigating and spill attenuating potential.

The flood of Oct. 1, 2010 can be compared as well as contrasted to the flood of Sept. 11, 1960. **Similarities:** 1. Both floods occurred after a prolonged drought; 2. Starting elevations at the beginning of each event for the Schoharie Reservoir were virtually identical; 3. Rainfall totals for both storms were somewhat similar with the edge going to the storm of Oct. 1, 2010. **Differences:** 1. Daily means was roughly 30% greater at Prattsville, NY-USGS 0135000 in the Oct. 1, 2010 flood than that of Sept. 12, 1960; 2.

Daily mean at Burtonsville, NY-USGS 01351500 was 2100 cfs less in Oct. 1, 2010 than that of Sept. 12, 1960. 3. Most Important is the fact that no one died as a result of drowning, Oct. 1, 2010.

Due to the flood mitigating influence of the half empty Schoharie Reservoir in both of the aforementioned floods and the enhancement of the mitigation exercised by the “notch” in the 2010 flood, the full, devastating impact of these floods upstream of the Gilboa Dam is hard to appreciate, unless on actually experienced one or both of them or visited the areas affected shortly after they took place.

The bridge over the Battaviakill, just south of Prattsville, at the junction of rts 23 & 23A was washed out in the 1960 flood and Paul Alle, Chief of the Ashland Hose Company drowned when a portion of Rt. 23A washed out.

In conclusion, it is safe to say that a void of + or – 50% in the Schoharie Reservoir, whether created intentionally for the purpose of flood mitigation downstream of the Gilboa Dam or simply by drought, can be a significant factor in reducing flooding in the Schoharie Valley north of the Schoharie Reservoir. This is especially true if the “notch” if allowed to function to its full capacity, when the proposed Obermeyer Gate System is in place. **Having an intelligent protocol for the operations of these gates and the proposed new Low Level Outlet that takes into consideration the best interest of all parties involved is imperative!**