

Copake Lake

and its level



Copake Lake and its watershed

Lake area = 400 acres

Watershed area = 950 acres

TOTAL = 1350 acres

Maximum depth = 31 feet

Volume about 2,000,000,000 Gallons

**The top one inch contains about 10,000,000 Gallons
and weighs about 45,000 tons**

Average flow rate through the lake about 1,300 GPM

Longest fetch about 7,500 feet

Average annual rainfall about 42 inches

Average annual snowfall about 48 inches

Copake Lake is a glacially created natural lake whose level has been artificially raised at least three times. Due to shoreline development, we must down draw the lake every winter to its early 1900s level to protect the structures lying close to the lake from ice erosion and damage. However, we do not get enough seasonal water to reliably refill the lake every season, to its current desired level and in a timely manner, while fulfilling the requirements of our weed treatment permit.

How the lake was formed

Why we down draw

How we down draw and refill

Down draw difficulties

How the lake was formed:

Glaciers covered the area and then collapsed

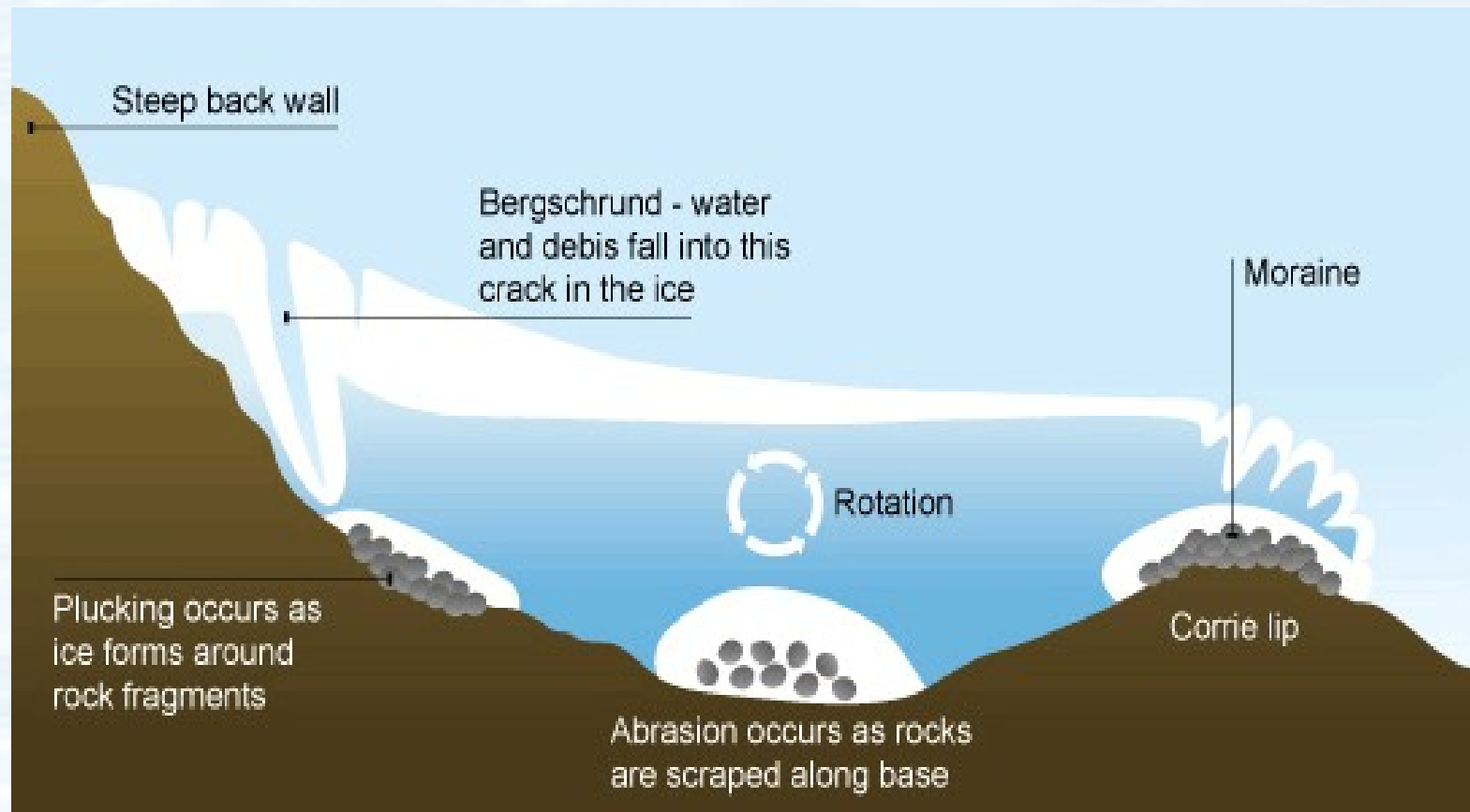
The collapse(s) blocked one end of an amphitheater shaped valley

The collapses also created the islands

The moving glaciers pieces created much of the steep shorelines

At one point water was flowing out over the golf course and Southwest Colony

The bottom of the valley was filled with about 200 feet of debris



Level history

Native Americans found a lake about 6 to 10 feet lower than we see

European settlers raised the lake to the level it was until 1900 or so

They also cut most of the trees to be able to farm

Copake Lake development Corp raised the level in the early 1900s

CBC Corp raised the level in the 1980s



Lake levels in early 1900s



THE WA-WA-NA, COPAKE LAKE.

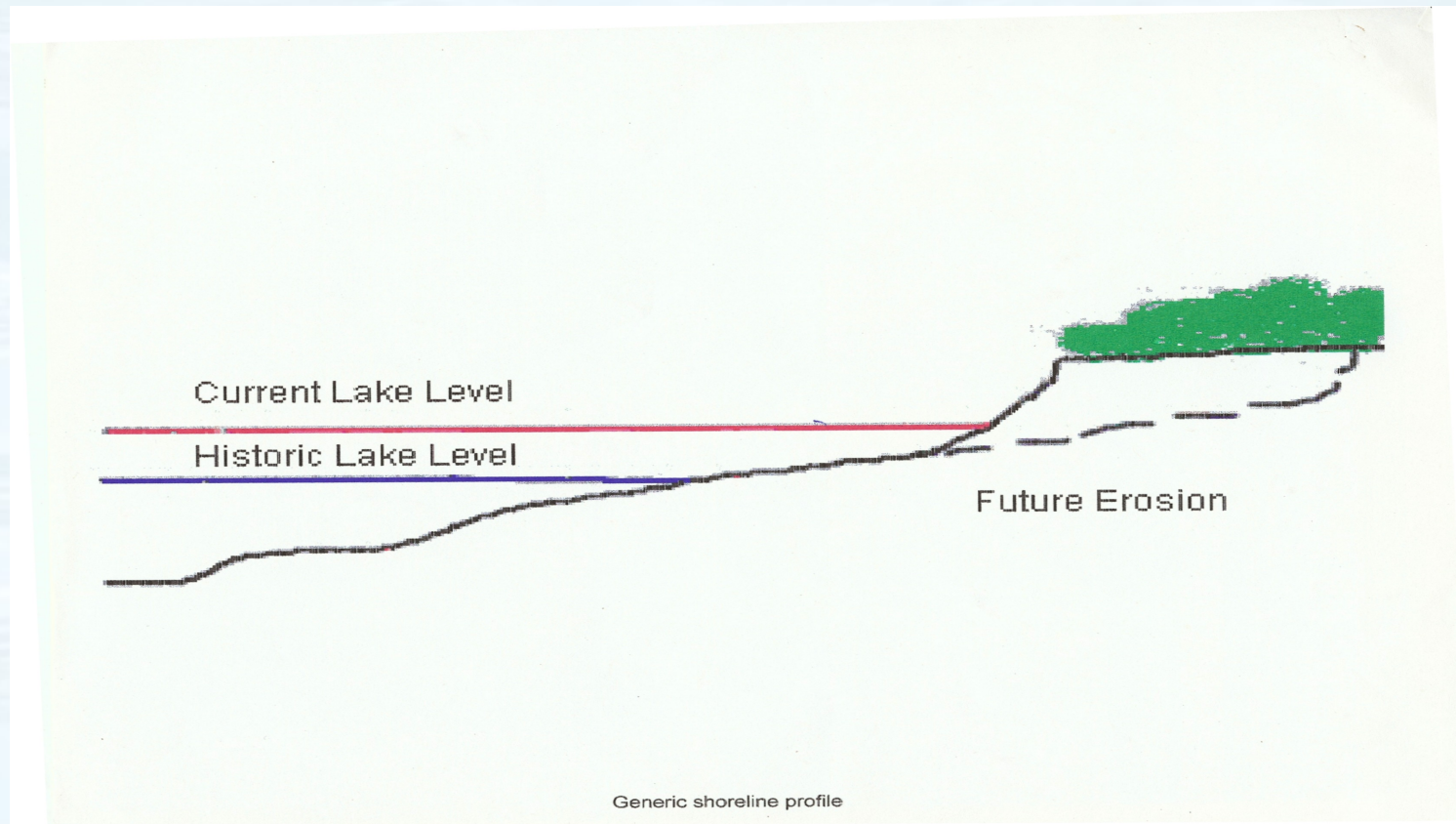


Boat basin 1960s

Why we down draw

Shoreline erosion by ice

Minor impact on shoreline weed growth



And this is the rest of the problem



How we down draw

Open drain valve approximately Columbus Day

We close the drain valve based on:

Accumulated snow and estimated spring rainfall

Whether or not there is ice on the lake

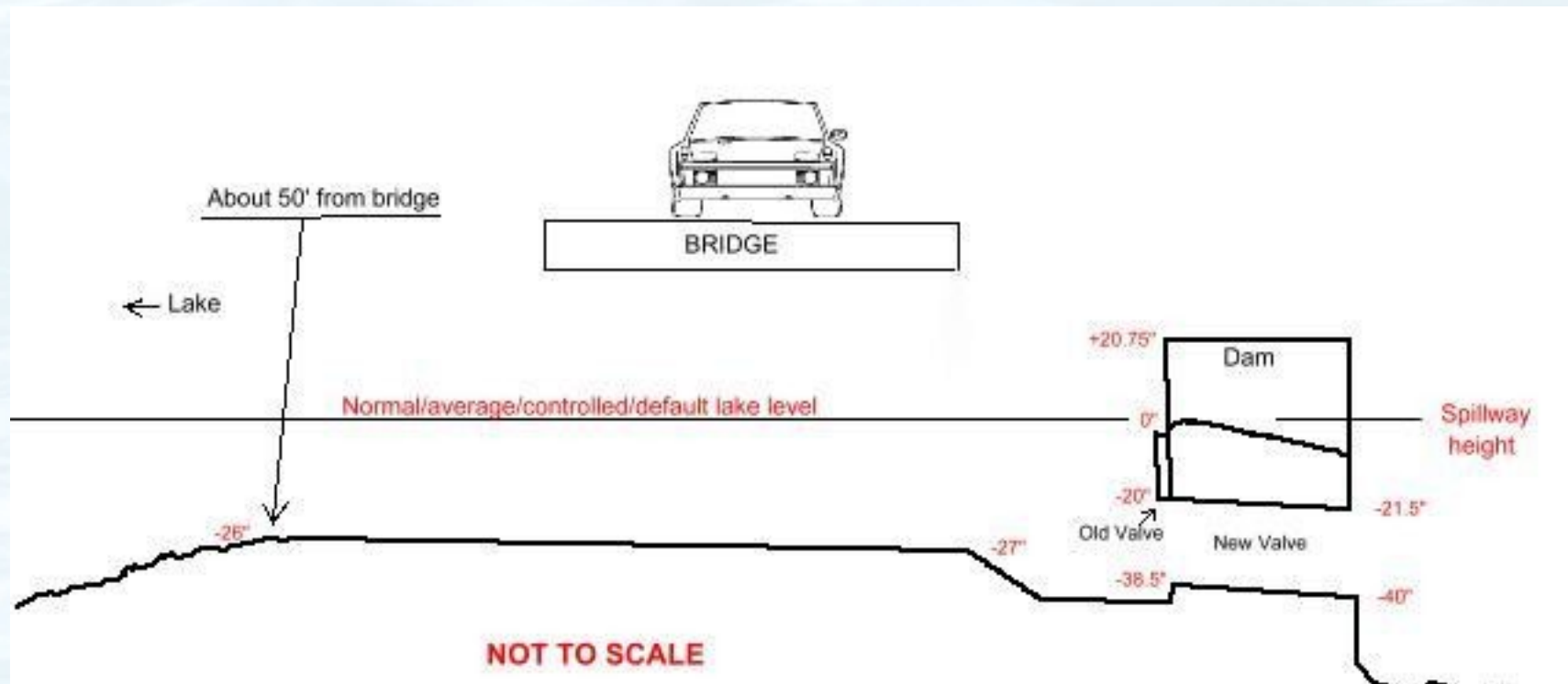
Weed treatment holding period

So, the big question is, “Where does the refill water come from?”

The answer is precipitation. That is snow and rain.

What about springs?

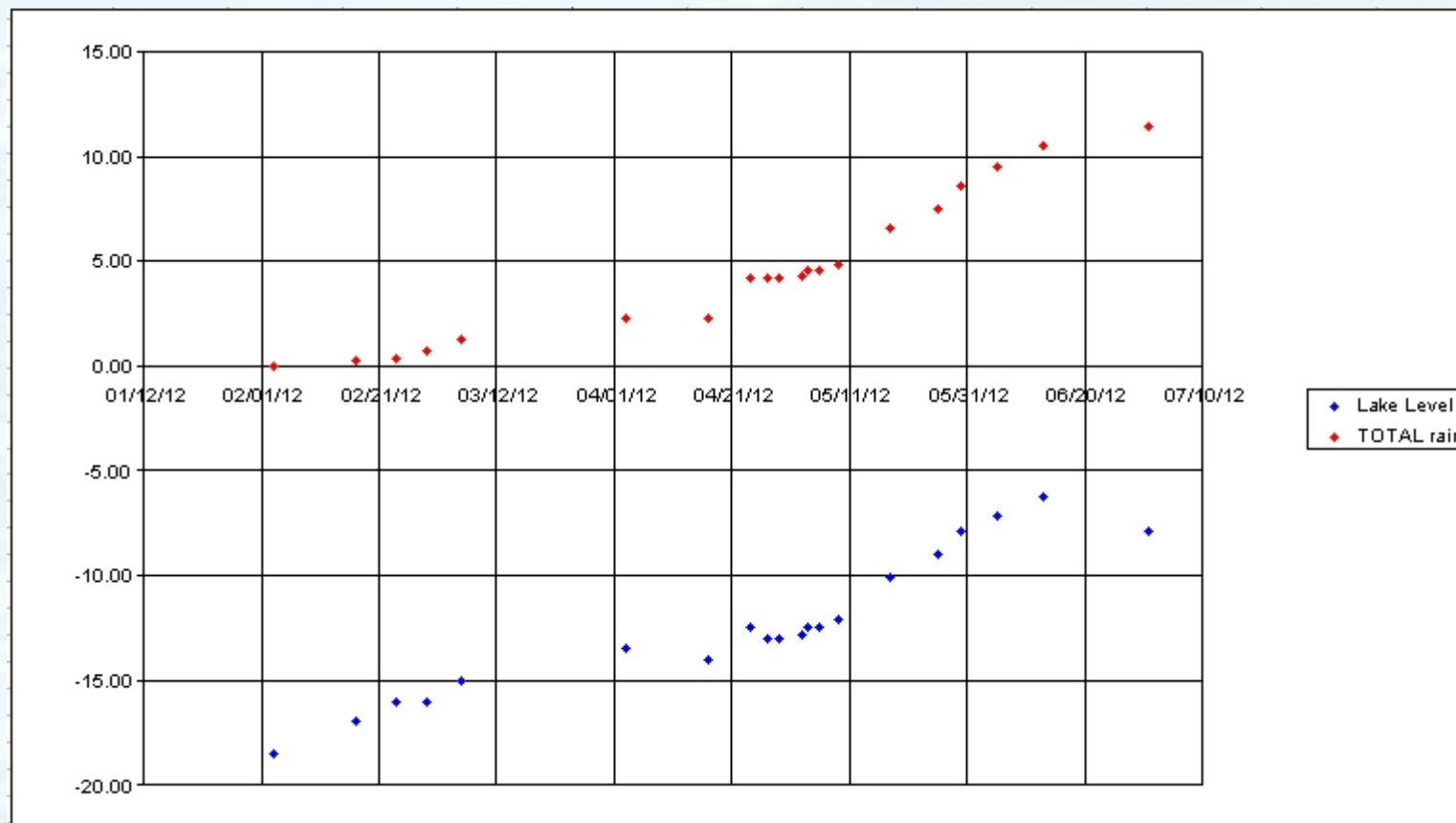
Essentially, there are none, or they have minimal effect.



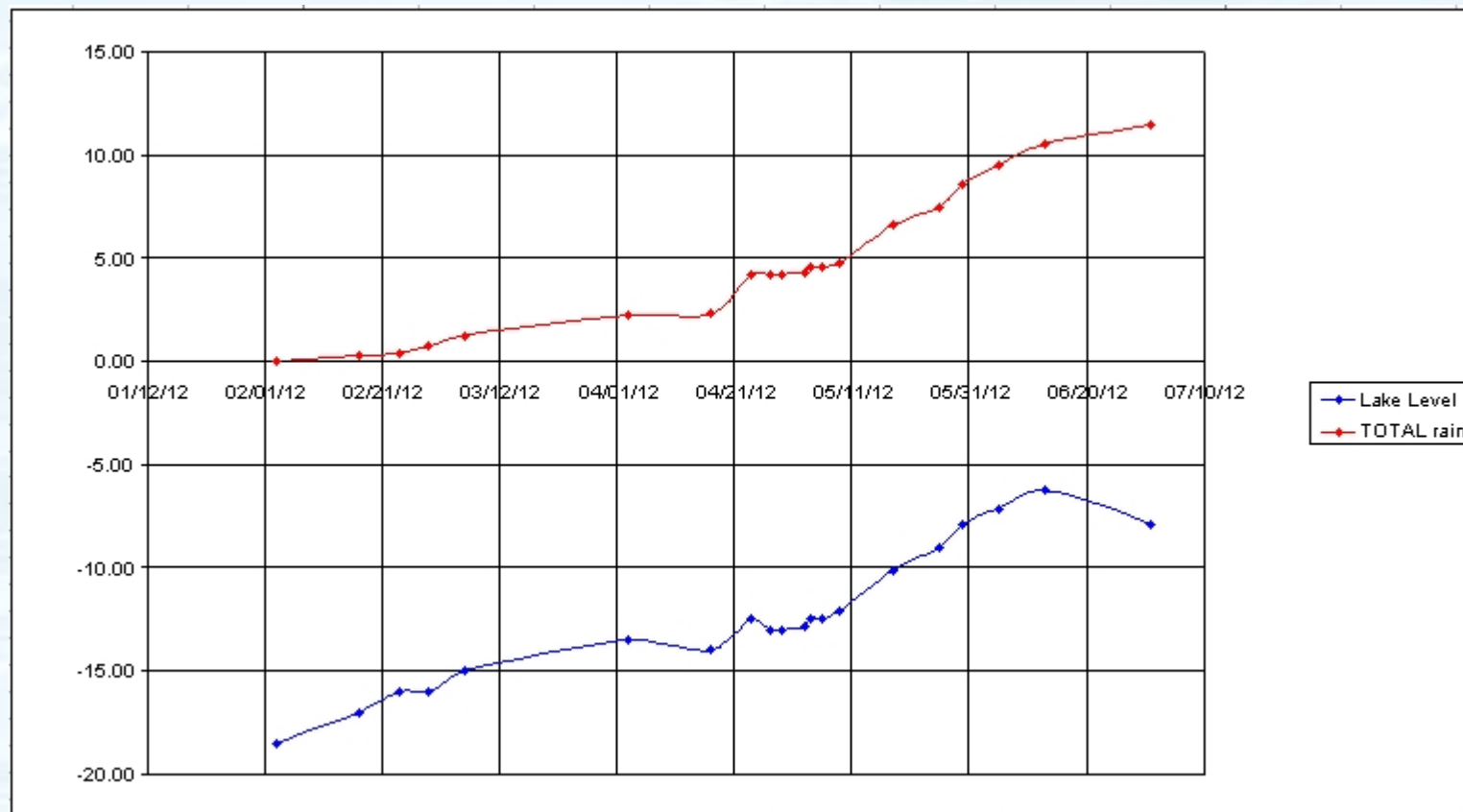
Cross section at dam and bridge



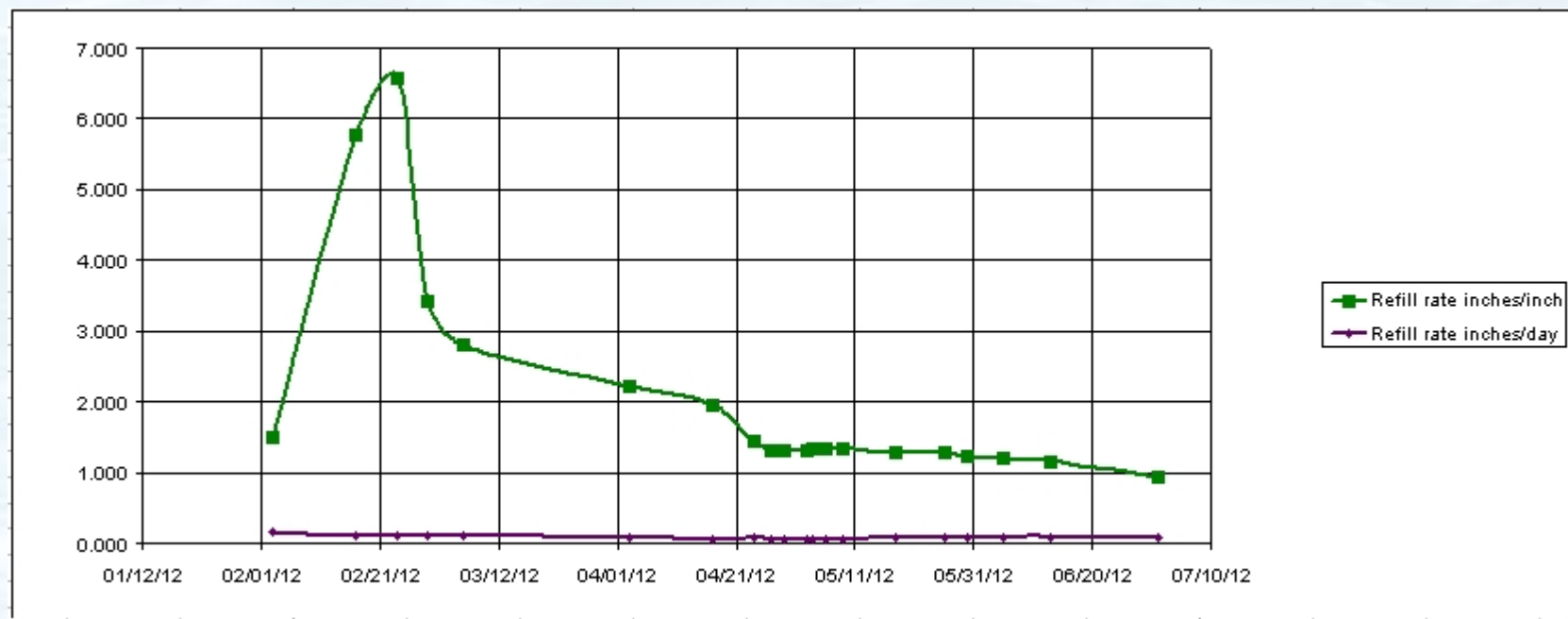
Copake Lake watershed - 3D



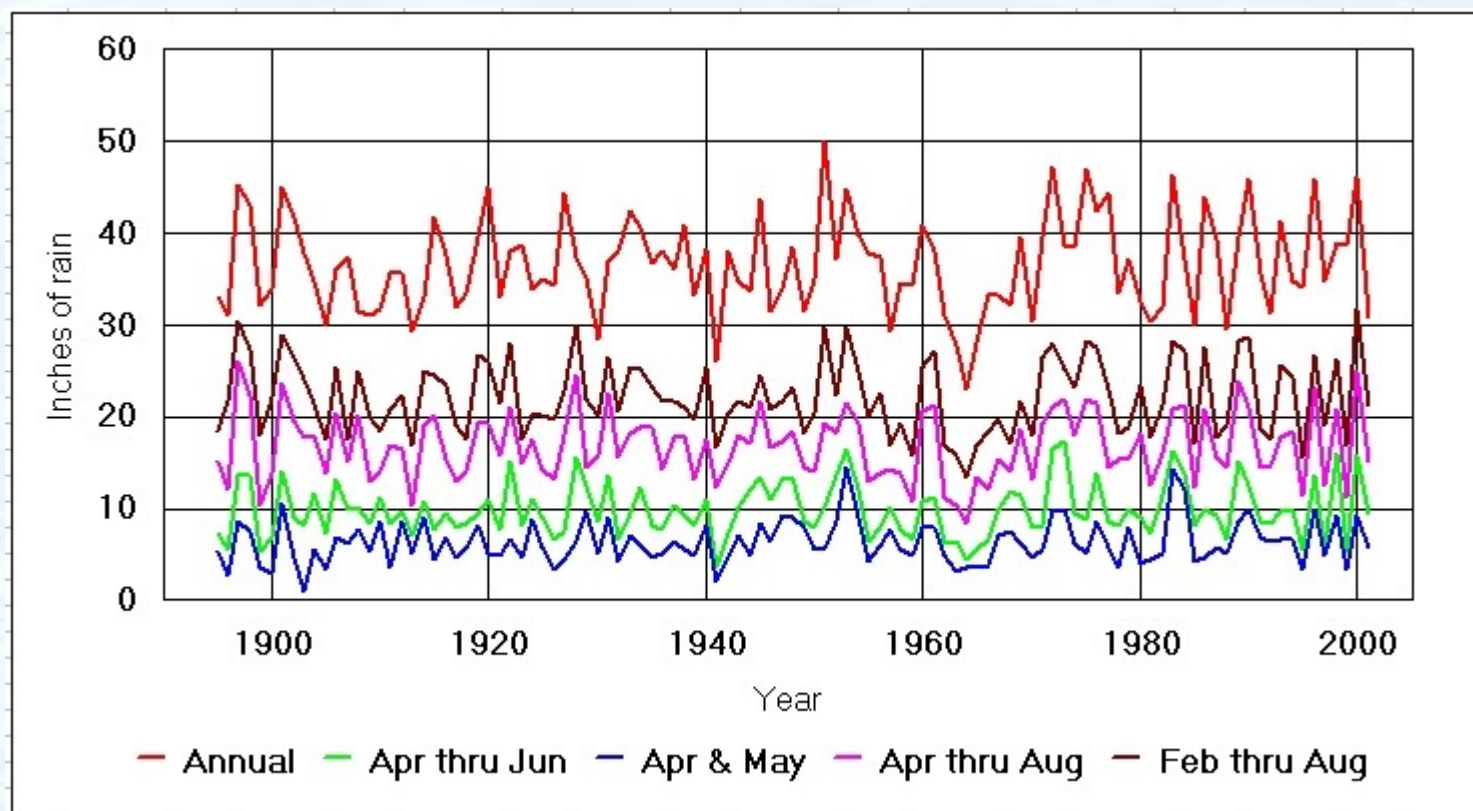
2012 refill data as recorded



Refill data with computer added lines

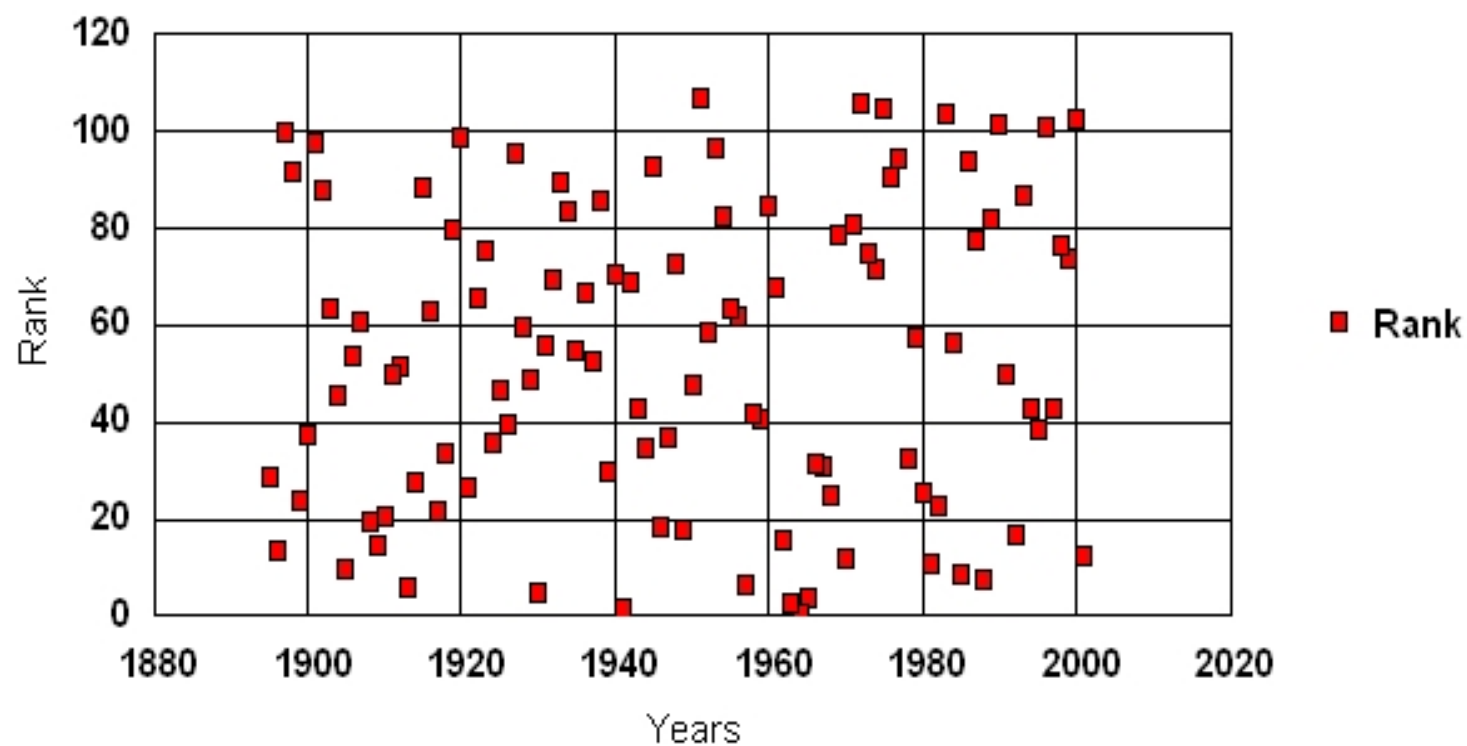


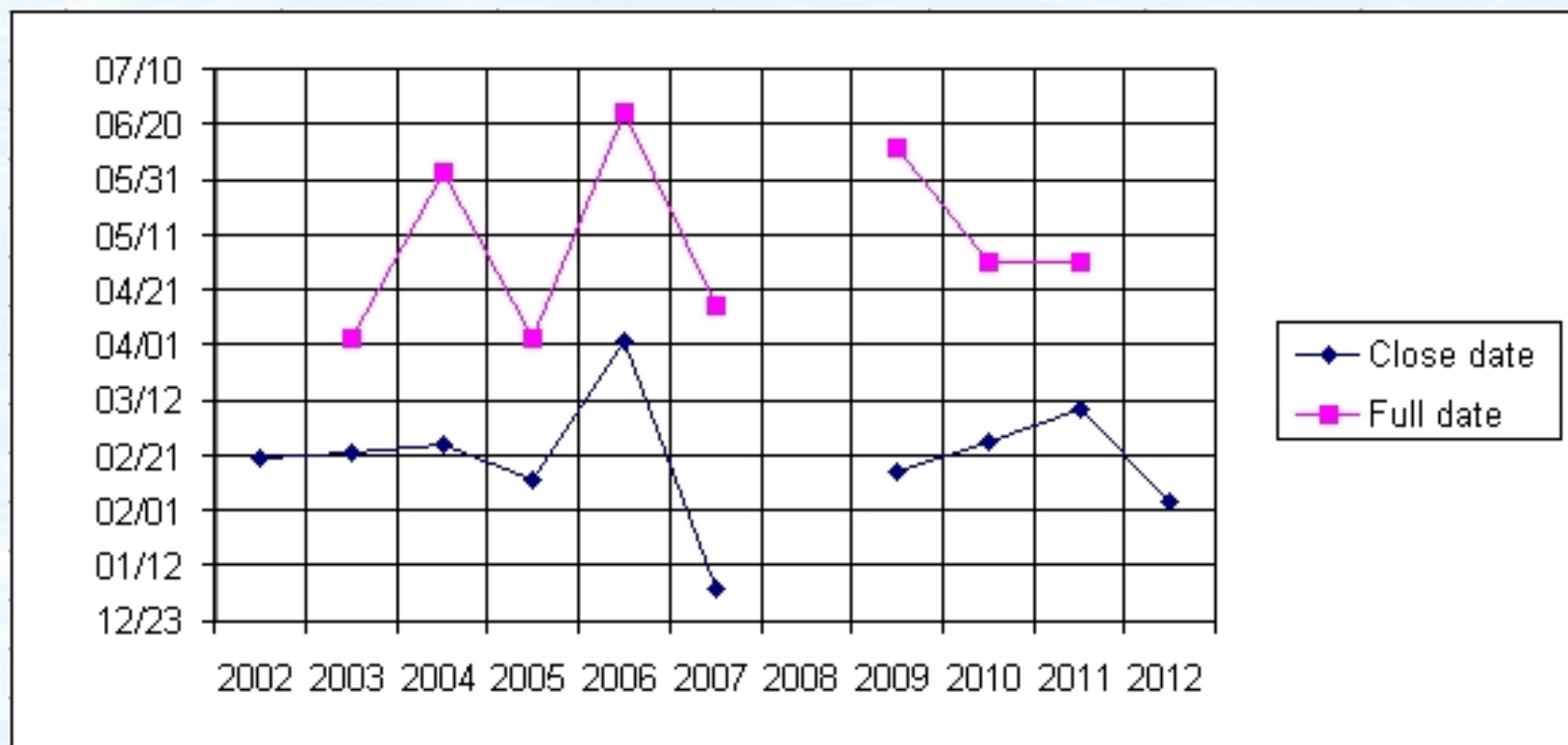
2012 refill rates



Albany Rainfall 1895 - 2002

Annual Precip rank vs year





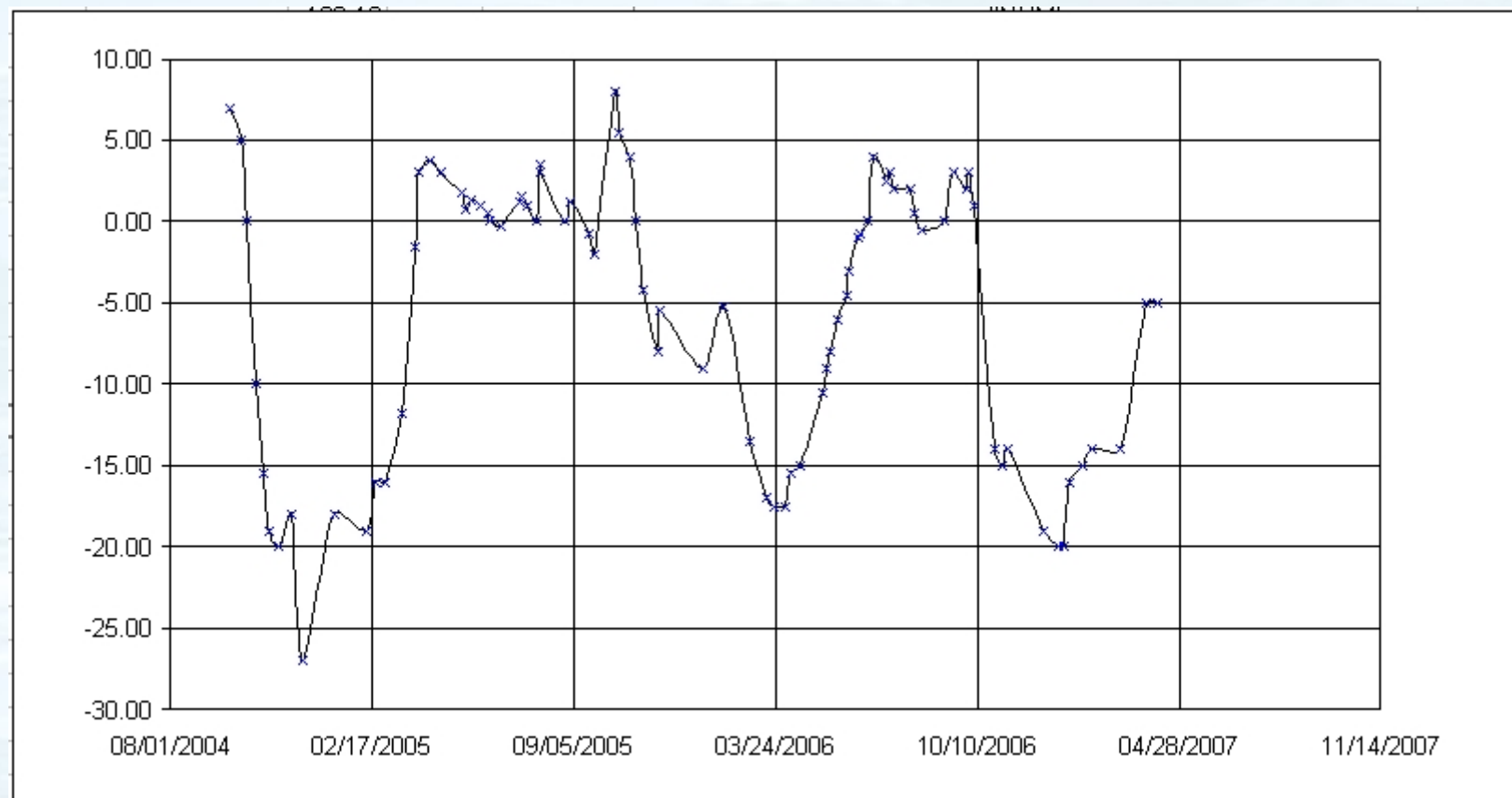
Recent drain valve close and lake full dates

Once we refill the lake it has to continue to rain periodically for the lake to remain full!!!!

We have absolutely no control over rain. And neither does anyone else.

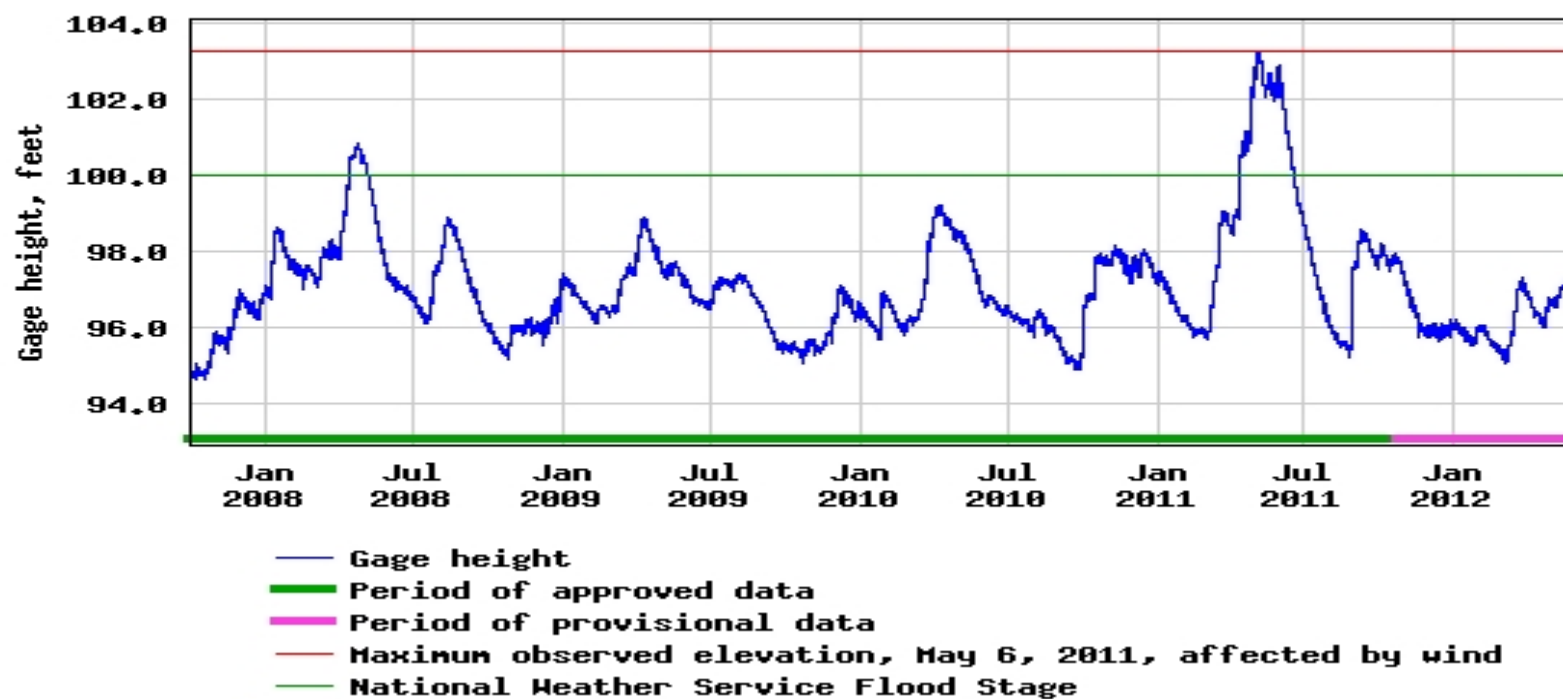
We only capture or release water. We have no way to add water.

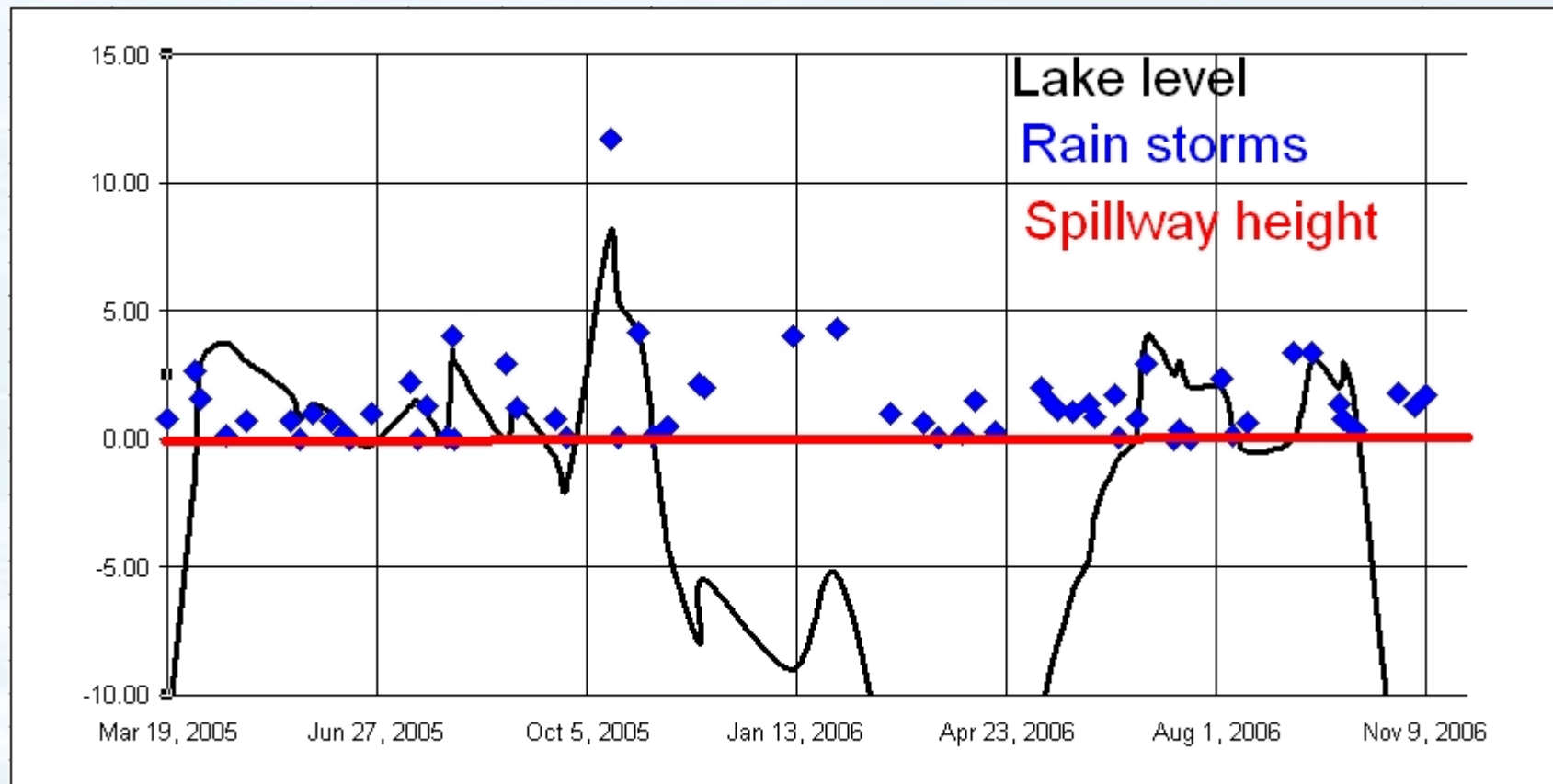
Nature is in charge. We are not. We just like to think that we are





USGS 04294500 LAKE CHAMPLAIN AT BURLINGTON, VT





Detailed lake level vs rain

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Copake Lake is not a swimming pool

It does not have any refill mechanism

There are no inlet valves, pumps or plumbing

The lake is wholly, solely and totally dependent on rain and snow to maintain level

In general, if it is not raining, the level is going down