

SNOWFALL

Daniel Grayvold

Composer, Sound Designer, Musician.

daniel@dgrayvold.com

1. INTRODUCTION

Snowfall is a meditation on the interpretation of winter weather as a depressive event. A hybrid musical composition/audio installation, its purpose is to sonify the snowfall of a winter season in the Keweenaw county of Michigan, portraying the sadness, isolation, and loneliness that can accompany the season for its residents.

2. FOUNDATION

The season of winter is often portrayed in a joyful or celebratory manner. Popular culture is rife with stories of Christmastime merriment when friends and family come together, of children playing in the snow, and of the landscape being made beautiful by a white blanket of precipitation. This is easily seen in such works as Claude Monet's painting *The Magpie*, Bing Crosby's song *White Christmas*, and classic films such as *A Christmas Story* and *National Lampoon's Christmas Vacation*. For many, this is the feeling that they most commonly associate with that time of year.

For many, however, the season of winter feels completely different. Inclement weather can cause accidents and close roadways, leaving stranded many who have limited means of transportation. The lack of sunlight can harm those with Seasonal Affective Disorder, suffered by many who live in climates—such as Michigan's Keweenaw county—where winter stays longer than it is welcome. The arrival of weather that brings snowfall is therefore frequently seen negatively, an occasion for anything but celebration.

I wanted to create a work that exemplifies the distinct feeling of dread that can come with the falling of snow in the winter. The goal was to give those who may

have never felt this desperate loneliness a sense of what it can feel like.

3. CREATION

The composition of *Snowfall* began with the decision to create an installation that used snowfall data from the Keweenaw county of Michigan—a location that receives a heavy amount of winter precipitation every year and my home for a number of years.

County officials record the staggering amount of accumulated snow every year and make it available online. I was able to gather an up-to-date dataset of snowfall from the 2017-2018 season to form the first version of the piece. This data included daily snowfall, ground accumulation, and to-date information from October of 2017 to April of 2018.

With a good sample of data to work with, I created a patch in Pure Data, a multimedia visual programming application. The first step I took was to create the base scale that the song would be played on. I intended for the piece to cause listeners to feel two emotions: a sense of isolating loneliness and a constant desire to get to the end of this somber feeling. The first emotion would be created by selecting notes from a minor scale - F melodic minor in my case. To achieve the second feeling, I started the scale on the dominant note (C4) and only allowed for the tonic note (a note which gives a feeling of stability because of its nature as the base of a scale) to be randomly chosen 20% of the time.

From there, I needed to create a way to choose notes from this scale randomly. This part was relatively straightforward; I used the built-in random object to choose a number up to 10—the number of notes in the used scale. This would select a value from a list of the ten MIDI note values and



3. The scale that *Snowfall* uses to attain a depressing, always-unresolved timbre. The tonic (F) appears only twice out of a possible ten notes.

trigger a MIDI note at velocity 30 and that value.

Next came the incorporation of the snowfall data. I created an array and populated it with the snowfall data I had gathered for a total of 174 data points. This involved converting HTML information into a CSV file (accomplished by using a standard text editor) and feeding it into Pure Data through its textfile object. This method allows for future expansion with more data as it becomes available.

With the data imported, the last step on the technical side of the composition was to determine how the data would be converted into music. As mentioned earlier, this piece needed to be depressing, giving one the feeling of isolation. There also needed to be contrast between days in which no snowfall was recorded (usually indicating better weather) and days in which snowfall was recorded. After some experimenting, I found that using a slow tempo and using the daily snowfall count in inches as the number of notes played worked well. I split each day into measures of 4/4 time lasting 4000 milliseconds, or 1 second per beat—translating into 60 beats per minute. The 4000ms were then divided by the snowfall accrual in inches rounded

up. This would give the time needed for that amount of notes to be played in a single measure. As an example, a data point of 2 inches of snow would mean that two notes would be played during that measure with a 2000-millisecond delay between the notes. If there was no snowfall during that day, there would be no notes played.

With that set up, it was a simple matter of using a metro (metronome) object to trigger the random note player whenever needed. I also added a single note to be triggered at the beginning of each new measure; this enabled the audience hear the transition to each new day. The triggered MIDI notes were routed out of Pure Data and into Logic Pro X, where the final step of the composition was to take place.

The last part of the puzzle was to create the sounds that the composition would use for the played notes. I decided to use a sampled harp played with a flageolet technique since its hollow, haunting timbre perfectly fit the emotion that I was aiming for. It needed a little more to it, so I also created a drum-like hollow bell synth sound that would play along with the harp. These together created a sound that was eerie and desolate, giving the impression that it was being played from a great distance.

Date	Snowfall	On Ground	Month	Season
2017-12-30	6	22	81	120
2017-12-31	7	24	88	127
2018-01-01	3	24	3	130
2018-01-02	1	22	4	131

2. A sample of snowfall data from the 2017-2018 season in the Keweenaw county of Michigan. This data includes the snow fallen on that day, how much was on the ground, and the running total for the month and entire season. [1]

Going forward, this piece could be expanded in a few different ways. For one, more snowfall data can be added as it is recorded. New instruments could be incorporated to increase the emotive impact of the piece; a visual element could even be added to aid the aural experience.

4. CONCLUSION

Snowfall is a composition that is simple but extremely effective. Its sonification of actual snowfall data allows the listener to get a sense of the depressive feeling that can often accompany winter weather. Its ability to be presented as an installation that passerby can listen to or as a musical piece performed by a solo harpist or keyboardist gives it flexibility in reaching new audiences. This flexibility allows audiences to get a new perspective of the season of winter that they may not have otherwise ever experienced.

4.1. Media

A sample recording of *Snowfall* can be found at dgrayvold.com/features/snowfall.

5. REFERENCES

1. Keweenaw County. "Keweenaw County Snowfall Amounts." Keweenaw County Online. Accessed 20 April 2018. <http://keweenawcountyonline.com/snowfall2.php>.