

GEOFIZZ

Whether Weather Affects Music

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The creative output of composers, writers, and artists is often influenced by their surroundings. To give a literary example, it has been claimed recently that some of the characters in *Oliver Twist* and *A Christmas Carol* were based on real-life people who lived near Charles Dickens in London [Richardson, 2012]. Of course, an important part of what we see and hear is not only the people with whom we interact but also our geophysical surroundings. Of all the geophysical phenomena to influence us, the weather is arguably the most significant because we are exposed to it directly and daily. The weather was a great source of inspiration for artists Claude Monet, John Constable, and William Turner, who are known for their scientifically accurate paintings of the skies [e.g., Baker and Thornes, 2006].

But to what extent does weather inspire composers? As atmospheric scientists by day and amateur classical musicians by night, we have been contemplating this question. We could find almost nothing enlightening about this in the existing literature, so we embarked upon a research project in our spare time by building a systematic musical database that we published last year [Aplin and Williams, 2011]. We were pleasantly surprised to find intense international media interest in our paper [e.g., Clark, 2011]. What we were not expecting, however, was to attract scorn in the climate change blogosphere, where it was incorrectly reported that we had found that “evil trace gas CO₂ is affecting artistic expression” (Add it to the list: Evil trace gas CO₂ is affecting artistic expression, 2011, <http://hockeyschtick.blogspot.com/2011/09/add-it-to-list-evil-trace-gas-co2.html>).

To investigate depictions of weather in music over the longest possible time period, we had to choose a musical genre that had not changed substantially over centuries, limiting us to classical, church, or folk music. We selected classical music, which covers a wide geographical and temporal range encompassing a variety of climates. We limited the study to orchestral music because the concept of an orchestra has not changed substantially with time. We excluded folk and vocal music because of the literal implications of the text, although these genres have inspired others [Robock, 2005]. We also excluded nonmeteorological depictions of purely astronomical phenomena, such as sunrise, sunset, and the seasons. We selected pieces of music as being representative of weather based mainly on clear indications given by the composer. This could be the title of the piece or section, references in accompanying notes, letters to acquaintances, or the use of bespoke

instruments such as the thunder machine and wind machine. In some cases, the meteorological link was made not by the composer but by music commentators and critics, perhaps long after the piece was written.

Our findings showed that storms, wind, and rain were the most popular weather to be represented, presumably because dramatic weather allows for effective depictions of emotional turmoil. Calm, peaceful weather was pictured less frequently. Almost all of the pieces depicting frontal storms were associated with the sea, and there was only one light-hearted storm: the *Thunder and Lightning Polka* by Johann Strauss. We found disproportionately many representations of weather by composers from the United Kingdom, possibly because of inspiration from its famously variable weather systems but also possibly because of selection bias due to the nationality and residence of the authors. Perhaps unsurprisingly, the pieces depicting miserable weather tended to be in

minor keys, and the pieces depicting fair weather tended to be in major keys.

Since the publication of our paper in 2011 we have been expanding our database to reflect the continuing inspiration of the weather for contemporary composers. *Virga* by the British composer Helen Grime evokes evaporation of rain before it reaches the ground [Clements, 2009]. We also continue to unearth pieces by earlier composers, such as Finnish composer Uuno Klami, who wrote a piece entitled *Sea Pictures*, in which two of the six movements feature meteorological phenomena: “3 Bf” (Beaufort Force) and “Foggy Morning.” Felix Mendelssohn’s *Calm Sea and Prosperous Voyage* and Anton Webern’s *In the Summer Wind* were also added to the database. In our updated database, wind is the most commonly represented weather type, overtaking convective storms (Figure 1). The popularity of wind might be because it has a wide range of characters, from a gentle rustling to a howling gale, and because of the scope for effective mimicry offered by the different sections of an orchestra. We welcome reader suggestions of other weather-influenced pieces. The database is available at <http://www2.physics.ox.ac.uk/contacts/people/aplin>, listed under attachments on the right.

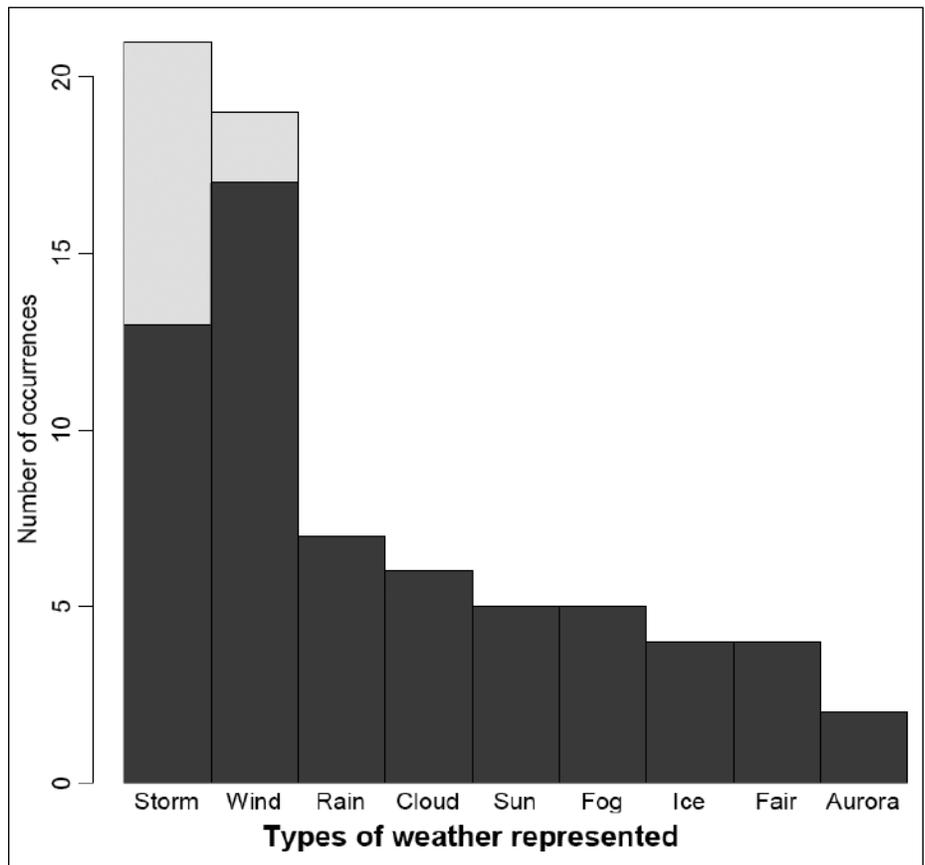


Fig. 1. Histogram of the occurrence of various weather types in our updated database. In the storm category, light shading indicates frontal storms, and dark shading indicates convective storms. In the wind category, light shading indicates calm conditions, and dark shading indicates windy conditions. When a piece of music includes more than one weather type, it is counted in all the relevant columns.

Leaving the possible effects of climate change to one side, we believe that the solar cycle might influence musical portrayals of the aurora. We found two such portrayals by Finns, one being an orchestral fantasy by Klami entitled *Aurora Borealis*. The portrayals were each written during or just after solar maxima (1908 and 1938), when the aurora is more frequently visible. Therefore, it is possible that the composers were influenced by personal sightings. If future climate change does indeed influence artistic expression, interdisciplinary studies like ours will be needed to unravel in which ways and by how much.

References

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