



Caught in a Snow Daze

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[stag_intro]Percy Bysshe Shelley famously asked, “If winter comes, can spring be far behind?”. But as the spring equinox approaches in one week, that long anticipated date in March when the Northern Hemisphere welcomes the end of winter, an unusual thing has happened in an unexpected place. [/stag_intro]

The quiet little Italian village of Capracotta in the Molise region of southern Italy is claiming to be one of the snowiest places in the world after it was smothered under more than eight feet of snow in less than 24 hours earlier last week.

The intense storm left the 1400 villagers climbing out of first floor windows or digging tunnels from their front doors to make a way out of their homes, and using snowshoes and skis to traverse the village. It is the largest amount of snow to have fallen there since 1956, and it is making a few people question what caused this unexpected snowstorm.

But the Italians are not the only ones scratching their heads and resorting to extreme measures to deal with intense snowfall. Across the pond, the people of New England, United States dealt with five feet of snow falling in just over two weeks last month, and the mayor of Boston noted that they were running out of space to put all the snow they have had to clear away, plows having already removed enough to fill 90 football stadiums from the previous two storms that hit the area.

At the time, the city was deploying more than 350 snowplows to try and control massive drifts spilling into the streets, burying cars and making it impossible to park. Moreover, snow melters, which can turn 400 tonnes of snow powder into water in an hour, were utilised.

While children in snow covered areas may feel their dreams have come true with the promise of a “snow day”, (and Boston has had to cancel eight days of school this year, the highest amount in 20 years), what are the economic consequences due to such inclement weather? As climate change exacerbates weather volatility, this is an increasingly important question for municipalities.

In fact, after three winter storms battered New England between the end of January and mid-February, Boston officials admit that the city had already exhausted its \$18 million dollar snow removal budget. It was the same story across Massachusetts. In Westwood, the constant onslaught of winter storms has resulted in the town exceeding its \$250,000 snow and ice removal budget by the beginning of February, as meteorologists warned of the snow not letting up any time soon. The town of Harvard, meanwhile, called a meeting of the Finance Committee in order to authorize deficit spending for snow removal for the rest of the season. New Bedford, Connecticut exceeded its \$350,000 budget for snow removal by \$150,000, and Groton by \$43,000.

These budgetary overruns are not confined to the United States, of course. Even the hardy and well-

prepared Canadians to the North have been having a tough time of it. The small town of Timmins, Canada announced that it was approximately \$1 million over budget by the end of December alone. Meanwhile, snow clearing costs across Nova Scotia could be as much as \$9 million over its \$58 million budget by the end of the winter. As of February 27, the city of Halifax had exceeded its \$20 million budget for 2014-15, and the city admits that expenditures have consistency exceeded the budget for five years running. Similarly, in the nation's capital of Ottawa, thanks to 33 snowfall days in January and February (up from 24 during that time last year), by March the city is \$11 million ahead of its annual budget of \$56,7 million which was to take the city to the end of 2015.

What exactly drives up the costs of snow removal? The city of Toronto, Canada reports that it costs the city around \$5 million whenever enough snow falls to require a full plowing operation. To break down what is involved in a snow removal operation, in Montreal, Canada, an average of 140,000 tonnes of salt and abrasives are used each winter, and 180 vehicles are used for roads and 190 for sidewalks. Plowing begins as soon as there is 2,5cm of snow on the ground and continues as long as a storm lasts, ending several hours after the snow stops falling. Snow is loaded from the sides of the road, and then trucks take it to one of 28 disposal sites, the average volume removed per year being 300,000 truckloads. Meltwater from such disposal sites is recovered and treated according to environmental standards. In total, the average cost of a snowstorm with ground accumulations of 20 cm is \$17 million, with \$1 million for plowing, \$14 million for loading and \$2 million for disposal, totalling \$155 million.

For cities less prepared than Montreal, private-sector contractors raise costs considerably, as well as overtime for city employees involved in the snow removal process. The town of Westwood, Massachusetts estimates that employees work at least 23 hours of overtime during each snowstorm, with plow workers working more than 16 hours straight during a storm and the days that follow. Municipalities can also expect bills for removing fallen trees, and repairing potholes as well as damaged property following snowstorms.

Where does a municipality go when they exceed their snow removal budget? For Ottawa, the city council approved a motion to put an extra \$2 million in property tax revenue into the city's winter maintenance reserve fund. The Massachusetts House approved this week a \$50 million increase to its snow removal budget. Both Washington DC, Maryland and Virginia have asked for funding from the federal government to help them cope with the unusually high snowfall. The township of Berkeley, New Jersey in exhausting its snow removal budget plans to shift money from other line items or dip into surplus funds should further snow come their way.

At the same time, the Mayor of Berkeley announced, "We have to hope that Mother Nature is kind to us in the next couple weeks and also in December". It is a sentiment that echoes the thoughts of too many municipalities in dealing with unexpected adverse weather conditions brought on by climate change. And it begs the question: have we really evolved that far in our risk management practices from the days human sacrifices were made to the sun, rituals were performed to bring rain, and the seasons personified as deities to be worshipped? In other words, are we all just one storm away from evoking a sky deity- Horus, Zeus, or perhaps the snow goddess herself, Chione, daughter of Boreas- to step in and get the blasted snow to stop so we can just balance our budgets?

That is to say, now that all scientific bodies of national or international standing agree that climate change is a reality are municipalities moving forward to make sober, fact-based assessments of the consequences of climate change and increased weather volatility, incorporating risk assessment into capital expenditures and balance, and engaging risk management practices, or are they simply carrying on "business as usual"?

In Halifax, it has been noted that many city councillors are wondering if future budgets should be modified, with one Councillor, Wayne Mason, who represents Halifax South Downtown saying, "I can't imagine a circumstance under which council would not talk about changing the way we approach snow removal." Similarly, a complete review of the city's snow clearing policy and spending is underway in

Ottawa, with operations general manager Kevin Wylie already in the process of reviewing the city's winter maintenance system to avoid deficit situations in the future.

Thankfully, there exist innovative, new operational and financial strategies to mitigate the risk of adverse weather conditions, including the snow. Meteo Protect, headquartered in Paris but with clients worldwide, provides index-based weather insurance, a type of insurance that is triggered when the index (an amount of snow, a temperature threshold, precipitation level, sunshine duration, wind speed, or any other weather variable) exceeds a predefined value. Thus, an insured municipality can be compensated partially or fully for every centimetre of snow accumulated above an average number of centimetres accumulated during a winter season.

A municipality builds weather insurance coverage into its budget and never again has to suffer from "unexpected expenses" related to the removal of snow, eliminating the need to pull funds from other important budget streams, nor request emergency assistance from the federal government. Whatever was budgeted for snow removal will never then be exceeded, and rather than blaming Mother Nature as a reason to increase taxes or divert taxes destined for other important public services, the insurer picks up the extra cost caused by a severe winter. The municipality can now plan for the "unexpected".

Moreover, Meteo Protect provides weather risk management consultancy services to businesses and municipalities, including weather risk assessments, financial communication and reporting of weather risk, weather-driven commodity price risk management, weather sensitivity portfolio analysis and management, and the creation of innovative marketing campaigns with weather hedging. Therefore, one can know the risks threatening a company or municipality including the links between financial performance and weather conditions, progressively adjusting the forecast to avoid unpleasant surprises.

Whilst for many years, municipalities had no other option than to hope Mother Nature is kind, today innovative insurance products are there to direct taxes to where they are most needed. It's the end of our snow daze.