

What do penguins, grapes and magnolias have in common?

Jean Chemnick, E&E reporter Published: Friday, August 30, 2013

Experts warn that climate change will usher in a host of nasty events, from rising sea levels at the beach to less snow at your favorite ski resort. Rising temperatures from human activity have been linked to more asthma attacks, hurricanes and bark beetles, and less maple syrup.

But while the overall effects of climate change may be dismal, there will also be some global warming winners -- things and people who will find that higher temperatures usher in a host of new opportunities. Here are a few examples:

A toast to winemaking in Sussex

Britain is known for its royal family, Bentley Roadsters and Beefeater gin, but rarely for wine -- at least not since the medieval warming period ended in 1250, leading to a slow decline in English viticulture.

But Old Blighty has been experiencing a winemaking renaissance in recent decades and especially in the last few years, as sparkling white wines from the southern counties have overtaken labels from more traditional winemaking regions -- including Champagne, France.

Antonio Busalacchi, who is both the director of the University of Maryland's Earth Systems Science Interdisciplinary Center and a prominent wine expert, said in a recent interview that only a few decades ago, the nascent British wine industry was largely confined to growing hybrids and hearty Germanic grape varieties -- like Müller-Thurgau and riesling crossed with silvaner -- that could survive in a cold, wet climate.

But in recent years, average temperatures have warmed enough in counties like Sussex and Surrey to allow vintners to grow chardonnay, pinot noir and pinot meunier, the grapes needed to make sparkling wine.

Harvests are also occurring earlier in the autumn, said Busalacchi, allowing for a warmer growing period that makes for better wine. Winemakers that have been operating in southern England since the 1970s have seen the harvest move up one to two weeks in that time; it now falls between late September and late October of each year.

And while vintners once had to pick and choose their acreage to ensure that vines would be protected from harsh weather, a gentler climate has allowed them to expand, allowing English winemakers to offer a wider array of wines at different price points.

"It does not make you as susceptible to weather disasters that would wipe out your harvest," said Busalacchi. "It gives you more to play with."

One of the beneficiaries of this shift is Nyetimber, a West Sussex winemaker that has been in business since the mid-1980s. The company's website declares an intention to "rival the best in the world, including Champagne." It recently began exporting its product to Japan, Nyetimber's first foreign market.

Julie Carolan, a spokeswoman for the label, said climate change has been only one factor in the rise and fall of British winemaking. The industry's flameout had more to do with the British Reformation than with temperature, she said.

"Winemaking essentially stopped in Britain after Henry VIII dissolved the monasteries during the 16th century," she said in an email. "If one looks across the Channel, many of the great wines of the world have roots in

monasteries: Dom Pérignon, Dom Ruinart, etc."

But Carolan's colleague Cherie Spriggs, the head winemaker at Nyetimber, said the harvest had shifted somewhat in recent years.

"We have seen our fruit more recently harvested starting at the beginning of October, but that is not a clear trend," she said.

Last year was an example of "a year that doesn't fit the global warming/earlier harvest trend," Spriggs added. Nyetimber decided to cancel its harvest altogether after poor weather conditions compromised the quality of the grapes, she added.

Britain has several natural advantages that make it ripe for growing sparkling wine grapes, Busalacchi said. It shares the same chalky soil as Champagne, but because the land has not been cultivated for grapes for millennia, acreage in Britain goes for a fraction of the cost: about \$30,000 an acre rather than \$600,000 an acre.

And although sparkling wine from Champagne will always be in demand, said Busalacchi, French wine country has been hit with more hailstorms and other events in recent years that might be a harbinger of things to come in a world affected by climate change.

March of the (moderately sized) penguins

Climate change is not generally good for polar creatures. The Arctic is warming at twice the global average, causing polar bears to lose the sea ice they rely on to hunt. Changes to the South Pole region are more complex: A recent report by the National Oceanic and Atmospheric Administration found that Antarctic sea ice is actually growing in many areas as a result of increased winds linked to climate change. But wind and higher temperatures are causing a decrease in so-called fast ice, thick sea ice that is frozen along the continental shelf, extending into the sea.

Emperor penguins need fast ice in order to breed and have suffered from the loss of it. But smaller Adélie penguins, which weigh in at an average of 10 pounds each, compared with the emperors' 50 pounds, rear their young on rocky soil. The loss of ice along coastlines has allowed them to colonize new areas and expand their numbers somewhat in recent years.

"These two species have very different requirements," penguin scientist David Ainley said in a recent interview. Both emperor and Adélie penguins need to be near a so-called polynya, open water surrounded by sea ice, in order to hunt. But emperors are willing to travel a distance over land to get to one. Adélies are not -- "they don't like to walk," Ainley said -- and when a polynya disappears, they have to move their colonies to be closer to another one.

But warmer, windier weather is keeping polynyas more open and stable, reducing the number of times Adélie colonies have to pull up stakes and move on, he said. All of this should have had a positive effect on Adélie populations.

"I'd guess that there are more Adélie penguins now, given that there have been increases in colonies noted for East Antarctica," Ainley said, adding that reliable estimates for the penguins are hard to come by.

The Ross Sea, which is home to nearly 40 percent of Adélie penguins, has also seen an uptick in their numbers, he said. The sea has experienced more offshore winds in recent years, "extending the sea ice season, increasing the size and persistence of coastal polynyas, and decreasing the sea ice thickness," according to a 2010 report published by the Ecological Society of America, of which Ainley was head author.

All of those factors should make Adélie's very happy.

Sweet blossom come on

There will be climate change winners and losers in the plant world, as well. Sugar maples, which produce maple syrup, are projected to be among the biggest losers, as rising temperatures push them slowly out of the northeastern United States and into Canada ([Greenwire](#), Jan. 10, 2012).

But the same trend seems to be allowing warm-weather plants -- like the Southern magnolia -- to expand their territory. The state flower of Mississippi and Louisiana was once found only in areas of southeastern North Carolina with a hot, humid climate that mirrors the Deep South. But in recent decades, the plant has been found elsewhere in North Carolina, hundreds of miles outside its historical habitat.

Peter White, a plant biologist at the University of North Carolina, Chapel Hill, noted that plant migration is nothing new.

"Plants have migrated freely over time -- including the great migrations that happened after the last ice age," he said via email.

It is still unclear what is causing the Southern magnolia to spread north, White said. "There are multiple possible explanations, of which climate is one," he said.

But a 2011 report by NASA found that if man-made carbon dioxide emissions cause warming of between 2 and 4 degrees Celsius by 2100, that shift could be responsible for changes in the plant life covering nearly half the Earth's surface by century's end. Researchers from NASA's Jet Propulsion Laboratory and the California Institute of Technology in Pasadena, Calif., found that plants and animals would migrate to new habitats, where they would face competition for resources from different species.

This century's migration due to climate change will happen more quickly than in past centuries and will place greater stress on plant ecosystems, NASA concluded.

"While Earth's plants and animals have evolved to migrate in response to seasonal environmental changes and to even larger transitions, such as the end of the last ice age, they often are not equipped to keep up with the rapidity of modern climate changes that are currently taking place," NASA said in its press release accompanying the 2011 report. This is in part because other factors, like urbanization, further constrict plant habitat, limiting their ability to adapt, it said.