Islanders vs lightning game 7

Katrina Virts was looking at data from the World Wide Lightning Location Network, a network of sensors that tracks global rays, and noticed it almost immediately: a peculiar line of lightning that stretched almost directly across the Indian Ocean. Testing a theory, she and her colleagues at NASA's Marshall Space Flight Center in Huntsville, Alabama, compared the ray map to maps of the exhaust feathers of a global ship emissions database, and found a striking correlation: Thunderstorms above two of the world's busiest sea routes seemed significantly more powerful than storms in other areas of the ocean. In a new article that tries to understand how this works, Virts and a team of other atmospheric scientists looked closer. They studied the locations of 1.5 billion rays between 2005 and 2016, and found nearly twice as many attacks on average on major routes ships take across the northern Indian Ocean, across the Strait of Malacca and in the South China Sea, compared to adjacent areas of the ocean with similar climates. The top map shows the average annual lightning density at a resolution of about 10 kilometers, as recorded by the WWLLN, from 2005 to 2016. The map below shows aerosol emissions from ships crossing routes in the Indian Ocean and South China Sea from 2010. [Image: Thornton et al/Geophysical Research Letters/AGU] Because the areas of lightning augmentation are much wider than the sea routes themselves, the researchers say the effect is probably not due to bolts hitting the ships directly. Increased rays also cannot be explained by weather factors, such as winds or the temperature structure of the atmosphere, they write. Instead, they argue, the likely culprit is ship emissions. The team presumes that soot and nitrogen and sulfur aerosol particles emitted at the ship's engine exhaust act as the nuclei in which cloud droplets form, and can change the vertical development of storms, allowing more cloud water to be transported at high altitudes, where the storm electrification occurs to produce lightning. As one published statement explains along with the study: Where the atmosphere has few aerosol particles, over the ocean, for example- water molecules have fewer particles to condense around, so cloud droplets are large. When more aerosols are added to the air, such as ship escape, water molecules have more particles to accumulate around. More cloud droplets form, but are smaller. Being lighter, these smaller drops travel higher in the atmosphere and more of them reach the freezing line, creating more ice, creating more lightning. Storm clouds are electrified when ice particles collide with each other and with unfreezed droplets in the cloud. Lightning is the form of neutralization of the atmosphere that accumulates the electrical charge. [Photo: svedoliver/iStock] Joel Thornton, an atmospheric scientist at the University of Washington and lead author of the study, said that it was one of the clearest examples of how humans are actually changing the intensity of storm processes on Earth through the emission of particles from combustion. It's the first time we've literally got a smoking gun, showing about the unspoiled areas of the ocean that the amount of lightning is more than double, said Daniel Rosenfeld, an atmospheric scientist at the Hebrew University of Jerusalem, who was not connected to the study. The study shows, very unequivocally, the relationship between anthropogenic emissions, in this case diesel engines, in deep convective clouds. A map of ships crossing the Indian Ocean and surrounding seas during June 2012. Aerosol particulate emissions in these shipping lanes are 10 times or higher than on other sea routes in the region, and are among the largest in the world. Credit: Shipmap.org/Kiln for the University College London Energy Institute.Thornton notes that ships burn dirtier fuels in the open ocean away from the port, throwing more aerosols and creating even more lightning. An advantage of this near-continuous trail of shipping escape: Scientists hoping to better understand how aerosols affect cloud formation now have another place to focus their attention (not to mention more fodder to understand and discuss the impact of humans on the climate). Related: Free shipping is a lieIt is believed that the global shipping industry sends more than $5 trillion of merchandise across the South China Sea each year, and that nearly 100,000 ships pass through the Strait of Malacca alone. Most ships crossing the northern Indian Ocean follow a narrow, almost straight road between Sri Lanka and the island of Sumatra. East of Sumatra, ships travel southeast across the Strait of Malacca, around Singapore and northeast across the South China Sea.Humans, naturally, have been raining for a while. One of the first ancestors of geoengineering technologies that some are pushing as a way to counteract the effects of climate change, rain making was developed in part by Kurt Vonnegut's brother Bernard in the 1940s to help farmers with drought-plagued farmland. The technique is still used to sow clouds, especially in China, where the government apparently spends hundreds of millions on billions of tons of artificial rain a year (the blue skies following a government-ordered storm are often spectacular). And researchers in places like NASA use large lightning rods to trigger lightning and protect rocket launches, for example. The new shipping study is another reminder that we are also able to change the by accident, in ways we don't fully and often understand without even realizing it. It's also a reminder that you start realizing that it can be as simple as comparing a couple of maps and asking some questions. Lightning is one of nature's most beautiful screens. It is also one of the deadliest natural phenomena known to man. With the temperatures of the bolts warmer than the surface of the sun and radiant in all directions, lightning is a lesson in physical science and humility. Beyond its powerful beauty, lightning presents science with one of its greatest local mysteries: How does it work? It is common knowledge that lightning is generated in electrically charged storm systems, but the cloud charging method remains elusive. In this article, we'll see lightning from the inside out so you can understand this phenomenon. Lightning Announcement begins with a process that is less mysterious: the water cycle. To fully understand how the water cycle works, we must first understand the principles of evaporation and condensation. Evaporation is the process by which a liquid absorbs heat and changes to a vapor. A good example is a puddle of water after a rain. Why does the puddle dry? The water in the puddle absorbs heat from the sun and the environment and escapes like a steam. Escape is a good term to use when talking about evaporation. When the liquid is heated, its molecules move faster. Some of the molecules can move fast enough to break off the surface of the liquid and transport heat in the form of steam or gas. Once free from the limitations of the liquid, the steam begins to rise to the atmosphere. Condensation is the process by which a vapor or gas loses heat and becomes a liquid. Each time heat is transferred, it moves from a higher temperature to a lower temperature. A refrigerator uses this concept to cool your food and beverages. It provides a low-temperature environment that absorbs heat from your beverages and food and takes that heat away in what's known as the cooling cycle. In this sense, the atmosphere acts as a huge gas and steam cooler. As vapours or gases rise, temperatures in the surrounding air drop more and more. Soon, the steam, which has taken heat away from its mother liquid, begins to lose heat to the atmosphere. As it rises to higher altitudes and lower temperatures, over time enough heat is lost to cause steam to condense and return to a liquid state. Water or moisture in the earth absorbs heat from the sun and environment. When enough heat has been absorbed, some of the molecules in the liquid may have enough energy to escape the liquid and begin to rise into the atmosphere like a vapor. As the steam rises more and more, the temperature of the surrounding air becomes lower and lower. Eventually, the steam loses enough heat to the surrounding air to allow it to become a liquid again. Earth's gravitational pull then causes the liquid to fall back into the earth, thus completing the cycle. It should be noted that if the temperatures in the surrounding air are low enough, the steam can condense and then in the snow or sleet. Once again, gravity will claim the frozen forms and return to earth. In the next section, section, causing thunderstorms. Storms.

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