

Eyes on Earth-Current Events Paper

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Article 1

Possible Algal Bloom Off Erie, Pa., Raises Fears of What's to Come

The Buffalo News

T. J. Pignataro

July 11, 2019

This article is an alert to the people of Buffalo, New York, that a patch of suspected toxic algae was “found on the surface of open lake Erie water less than 10 miles off the shore of Erie, PA” (Pignataro, 2019). The concern for Buffalo is that this would be the closest documented occurrence, being just 70 miles away. Scientists are vigilant in locating, testing, and verifying the toxicity of the algal blooms in order to prevent harm to animals and humans who rely on water from the lake. This particular discovery was made by “George Bullerjahn, a Bowling Green State University biology professor who serves as the director of the national Institute of environmental health sciences” (Pignataro, 2019). However, NASA’s Landsat mission has been instrumental in warning communities of harmful algal blooms for years. In Kate Ramsayer’s article, “NASA Helps Warn of Harmful Algal Blooms in Lakes, Reservoirs,” Jeremy Werdell, The NASA Goddard Space Flight Center lead for CyAN, states, “resources are limited, and it’s not possible for everyone on the ground to be monitoring all inland water bodies all of the time” (Ramsayer, 2019). He also states, “satellites are providing a tool to help inform how and when to expand resources to go and collect water samples” (2019). Ramsayer explains how harmless algae become toxic, “under the right conditions – warm water, sunlight, plus nutrients that often wash off agricultural fields – cyanobacteria can multiply and form potentially toxic blooms” (2019).

Lessons in our Eyes on Earth course focused on the importance of NASA missions, with specific mention of the Landsat mission, to help students understand the important connection

between the missions and issues involving the Earth's spheres. While the hydrosphere is obviously affected by algal blooms, their toxicity is linked to human impact through the fertilization of fields (lithosphere) and the effect of the toxic algal blooms can be seen in the biosphere, as humans, plants, and animals are affected.

Article 2

Bolsonaro Calls Amazon Deforestation Data 'Lies'

BBC World News

July 20, 2019

Brazil's president, Jair Bolsonaro, who has been described as, "far-right," has "accused his own country's national space institute of lying about the scale of deforestation in the Amazon" (2019). Brazil's National Space Research Institute (Inpe) released satellite data that showed that "more than 1000 km² of the rainforest had been cleared in the first 15 days of July" and maintains its data is "95% accurate" (2019). Inpe and the accuracy of the data has been defended by several scientific institutions. Scientists have declared that since the president took office in January, the Amazon, the "largest rainforest in the world" and a "vital carbon store that slows down the pace of global warming," has suffered losses at an accelerated rate (2019). Officials suggest that areas of the rainforest are being cleared to create pastures for cattle, as this administration favors development over environmental concerns.

Both the human impact on the Earth's spheres and the warming of the planet have been key areas of focus in our Eyes on Earth lessons. The article, "Despite Recovery, Widespread Evidence of Deforestation Remains a Half-Century Later," from NASA's Landsat Science

webpage, details the efforts of the Landsat mission in capturing data from forests to observe trends associated with deforestation. The article concludes, as the title suggests, that deforestation is still a serious concern despite efforts to recover land that was converted for agricultural use. One of the reasons the situation in Brazil is so troubling is that the losses occurring in the Amazon will have a global effect. Hence the need for the United Nations Sustainable Development goals, as referenced in the Landsat Science article. To further illustrate the trends in deforestation, the article from NASA's "Earth Observatory" site, "[World of Change: Amazon Deforestation](#)" can be explored, as it contains the data observed over multiple decades of study. In addition to discussions of the political ties to issues in science, through the study of these resources, students can see the impact to the biosphere in the loss of forest area, the atmosphere in the significant change in amounts of carbon that will result, the eventual consequences of transforming that land for agricultural use (lithosphere and hydrosphere), and again, the human impact that affects all spheres.

Article 3

Wind erosion and dust from US drylands: a review of causes, consequences, and solutions in a changing world

ECOSPHERE: An ESA Open Access Journal

Michael C. Duniway, et al

March 18, 2019

This scientific journal article published in, ECOSPHERE, an ESA Open Access Journal, seeks to share the data related to wind erosion on the drylands of North America. Multiple causes of wind erosion and dust emissions are discussed (natural occurrences such as drought,

vegetation, and wind-driven sediment), however, the focus is on those to which actionable responses are available to policymakers and practitioners. These include “fire, domestic livestock grazing, and off-highway vehicles,” which can “increase horizontal eolian flux by an order of magnitude, in some cases as much as 40 fold” (Duniway, et al, 2019). Consequences of wind erosion and dust emissions are detailed, as are the causes. Dust on snow was highly enlightening, as that is not a cause one would naturally link, yet downwind snow on mountain system is affected as the albedo is changed, which results in an earlier snow melt (2019). Potential solutions for prevention, as well as restoration and reclamation are provided. Authors also indicate the need for continued and constant research, monitoring, and modeling, citing satellite data as a resource. A similar, though less detailed resource can be found on the U.S. Geological Survey site, “[Wind Erosion and Dust Emissions on the Colorado Plateau](#)” and lists some of the same researchers as contributors. This resource may be better suited to younger students.

The Eyes on Earth course materials included ways satellite data can provide insight into weather and other natural occurrences that are “out of the hands” or control of humans, but can be useful in understanding patterns and implementing warnings. Additionally, the course contained helpful resources to address the issues within our control as humans--issues that can be resolved through prevention, restoration, and reclamation. This article, though a bit dense for middle school students, embodied the kind of scientific research where multiple methods of study can result in prescribed actions to enact positive change on the environment. The lithosphere, atmosphere, biosphere, and hydrosphere are all at play here. An additional article that details the specific use of satellite data, “Wind Erosion Vulnerability and Rainfall Mapping in the Southwestern United States,” would also be very helpful to students. When working through and making sense of this study (Chavez, et al, 2016).

Resources

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