Discuss news articles related to **GLOBAL CLIMATE CHANGE.** Submit your writing to the instructor by the beginning of class on the date designated in the syllabus.

**Use electronic versions of news articles (but they MUST be from valid news!), and provide the website location for the article.** Again, use web-based articles, but **they must originate from legitimate news organizations**. All articles should be **published within the last year.**

For each article, write a **three-paragraph response** (a 1-2 pages). The first paragraph should summarize the article (use in-text citations are fine for the article). The second paragraph should summarize additional knowledge you had to find in order to understand/interpret the science from the article (journal and book sources should have in-text citations). The third paragraph should voice your response to the article. Your response should focus on the scientific perspective and/or the social/political action involved with the issue. *Your response should not focus on your feelings nor on negative qualities of the writing/reporting.* Realize that you need to pick a detailed article to receive full credit (in other words, **if the article is so simple that involves no underlying science, you can only receive 66% credit for the article—the then, only if you have written an exceptional response**).

Remember:

1. Your first paragraph should summarize the article (use in-text citations are fine for the article). See the rubric to have a better sense of a good summary.
2. Your second paragraph should provide additional knowledge you bring into your response—use literature that builds your perspective; news, journal, and book sources should have in-text citations and complete citations in the bibliography.
3. Your third paragraph should voice your response to the article. Your response should focus on the scientific perspective and/or the social/political action involved with the issue. *Don’t waste your writing and my time by focusing on your feelings nor on negative qualities of the writing/reporting.*

## Consider the following two student writing examples as you develop your summary responses.

**Deep Aquatic Pollution**

Recent, alarming findings suggest that pollution is now reaching parts of the ocean previously thought to be safe from pollution (Green 2017). Polychlorinated biphenyls were found in the Mariana and Kermadec trenches, both of which are some of the deepest ocean trenches on the planet. Polychlorinated biphenyls (PCBs) were utilized as coolants in various transformers and other electrical devices. Even though these chemicals were banned in the 1970s, 35% of the 1.3 million tons produced can be found in these deep trenches. These chemicals are not water soluble, so rather than simply dissolving in the ocean and becoming inert, they chemically bond to ocean debris, allowing them to reach locations as deep as these remote trenches. These chemicals were discovered in crustaceans’ fat tissue residing at the bottom of these trenches. PCBs can interfere with these crustacean’s regular body processes, and these effects are even more obvious as one moves up the trophic pyramid.

The concentration of PCBs increases as it moves along the trophic pyramid. Although the effects of these PCBs may not be detrimental to the small crustaceans living at the bottom of these remote trenches, they may be harmful to larger organisms and possibly destroy intricate aquatic ecosystems. This is described as the biological process of biomagnification. Biomagnification involves the movement of organic molecules such as PCBs from one food source to another (Zenker 2014). Each time this moves up a trophic level, the concentration of the organic molecule stored in the organism’s biomass increases tenfold. Because these chemicals become so much more concentrated in the animal’s biomass as it is passed along, it can become much more harmful to top predators than they previously were to primary consumers or even autotrophs. This result can even lead to the complete removal of certain keystone species from aquatic environments, possibly having profound impacts on the environment as a whole. The removal of keystone species, leading to the disruption of an ecosystem is called trophic downgrading (Estes 2011). This outcome is especially concerning, as one cannot always predict the outcome of the removal of these species before it occurs, so the removal of one species may lead to the breakdown of interactions between many species in the ecosystem.

As discussed, biomagnification and the removal of keystone species is a large concern with the discovery of PCBs in remote areas of the ocean. Solutions to preventing biomagnification from disrupting aquatic ecosystems *after* harmful chemicals are already introduced to the ecosystem are not common, but preventative measures can be taken to ensure chemicals are not introduced in the future. For example, the government could enforce policies encouraging companies to use to chemicals that are biodegradable. Companies utilizing products that are environmentally friendly could receive financial incentives, which could reduce the risk of harmful chemicals such as PCBs entering aquatic ecosystems. In addition, greater funds should be allocated to increase research in developing biodegradable chemicals. This would lead to the creation of jobs, stimulating economic growth. The more biodegradable chemicals available for the use of companies, the more likely they would be to utilize these chemicals rather than using traditional harmful chemicals. Furthermore, the more often companies use and purchase these chemicals, the cheaper these biodegradable chemicals would become. A variety of environmental and economic benefits to encouraging companies to use biodegradable chemicals should be implemented instead of encouraging toxic chemicals. Moreover, because the effect of many chemicals to organisms are unknown, more research on these effects must be performed so that certain chemicals can be banned for use by companies.

### Literature Cited

Estes, JA, J Terborgh, JS Brashares, ME Power, J Berger, WJ Bond, SR Carpenter, TE Essington, RD Holt, JBC Jackson, RJ Marquis, L Oksanen, T Oksanen, RT Paine, EK Pikitch, WJ Ripple, SA Sandin, M Scheffer, TW Schoener, JB Shurin, ARE Sinclair, ME Soule, R Virtainen, DA Wardle. 2011. Trophic Downgrading of the Planet Earth. *Science* 333:301-306.

Greene, S. 2017. Feb 15. Extraordinary levels' of pollution have contaminated even the deepest parts of the Pacific Ocean. *Los Angeles Times*. [Internet] <http://www.latimes.com/science/sciencenow/la-sci-sn-deep-sea-> pollution-20170215-story.html

Zenker, A, MR Cicero, F Prestinaci, P Bottoni, and M Carere. 2014. Bioaccumulation and biomagnification potential of pharmaceuticals with a focus to the aquatic environment. *Journal of Environmental Management* 133:378-87.

# Air Pollution

Simon Denyer from the *Washington Post* discusses the devastating levels of air pollution in the world. According to research done by the World Health Organization, seven million people were killed from polluted air either outside or inside their homes in 2012 (Denyer 2016). Many of the deaths that were recorded were from individuals residing in developing countries. One air pollutant that is particularly concerning is PM2.5. This refers to any air pollutant below 2.5 micrometers in diameter making it permeable to the lungs and bloodstream. These pollutants can cause health concerns such as heart disease and asthma. The 3-D map of the world’s air pollution levels shows that over 90% of the air that is breathed in is below the national standard of clean air. Currently, the standard is 10 micrograms per cubic meter or less is considered clean air according to the Global Health Agency.

Most of the world has levels around 12 micrograms per cubic meter, thus failing the standard of clean air and leading to deaths.

A wide variety of substances factor into air pollution. Many PM2.5 pollutants are caused by combustion, burning, and other human industrial processes (Airnow 2017). These particles include organic solvents, combustion particles, and some metals. These particles can cause negative effects in all humans and could be potentially lethal. These effects typically only happen when one is exposed to high concentrations of pollutants, but as said in Denyer’s article most of the world has air concentrations that would be considered unsafe. The environment also experiences negative effects due to air pollutants such as haziness causing a reduction in visibility and damage buildings. More serious effects to the environment include depleting soil nutrients, damaging crops and forests, increase water acidity, and potentially change the nutrient flow in water thus disrupting the natural balance.

Air pollution, in my opinion, is the worst one of all because everything is affected by it either directly or indirectly. Because seven million people are dying from air pollution, it is obviously an important issue. Since most of the world is failing to meet these standards, laws are not strict enough regarding air pollution. Time and time again laws have allowed humans to do too much damage. Laws can allow waste to be dumped into bodies of water as long as it is below a certain amount, and due to these loose laws, we continue harming the entire earth, ourselves included. The amount of damage we have already done is nearly impossible to reverse, but stricter laws could help prevent further damage. If these laws are not put in place, then the concentrations of PM2.5 and other air pollutant particles will only worsen leading to more fatalities all around the globe.

### Literature Cited

Denyer, S. 2016. Nov 17. This stunning world map shows the awful state of air pollution. The Washington Post [Internet]. https://[www.washingtonpost.com/news/worldviews/wp/ 2016/11/17/this-stunning-world-map-](http://www.washingtonpost.com/news/worldviews/wp/2016/11/17/this-stunning-world-map-) shows-the-awful-state-of-air-pollution/?utm\_term=.bd2256e19118

Airnow. 2017. Particle Pollution (PM). [Internet]. [cited 10 Feb. 2017]. https://airnow.gov/index.cfm?action=aqibasics.particle

**Name:**

**F-level: Evidence of plagiarism**

**via Turnitin. Results in**

**zero score for entire paper**.

1. **Summary of Article: Environmental issues associated with GCC.**

\_ \_ \_ \_ \_ D-level: Summary is short, lacks information, or is missing

\_ \_ \_ \_ \_ C-level: Summary is vague or repetitious

\_ \_ \_ \_ \_ B-level: Summary is complete, detailed, specific

\_ \_ \_ \_ \_ A-level: Summary is complete, detailed, specific, **and particularly well-written**

# Incorporation of other literature:

## \_ \_ \_ \_ \_ D/F-level: Other literature is lacking or is missing

\_ \_ \_ \_ \_ C-level: Use of other literature is limited

\_ \_ \_ \_ \_ B-level: Use of other literature is complete, detailed, specific

\_ \_ \_ \_ \_ A-level: Use of other literature is complete, detailed, specific, & **particularly well- written**

# Response:

## \_ \_ \_ \_ \_ D-level Not supported with concrete, relevant detail

\_ \_ \_ \_ \_ C-level Support concrete, only occasionally vague or irrelevant

\_ \_ \_ \_ \_ B-level Paragraph unified, well-supported with relevant detail

\_ \_ \_ \_ \_ A-level Paragraphs unified/well-supported/**demonstrating high-level thinking/insight**

# Sentences:

## \_ \_ \_ \_ \_ D-level: language/sentences confused, full of misspellings, fragments or run-ons.

\_ \_ \_ \_ \_ C-level: language/sentences clear, but occasionally vague or containing grammatical errors

\_ \_ \_ \_ \_ B-level: clear/effective language with standard grammar, punctuation, spelling

\_ \_ \_ \_ \_ A-level: clear/effective language, **varied and interesting sentence structure; transitions clear and effective.**

# Final grade:

**F or D-level: Essay does not answer assignment. F FOR ASSIGNMENT**

## C-level: Essay is slightly short, answers assignment generally B-level: Essay answers assignments specifically

A-level: Essay answers assignments specifically; exhibits professional appearance

**Summary comments:**