



# the weekly anthropocene



dispatches from the wild, weird world of humanity and its biosphere  
by Sam Matey

**Gabon.** Oxford Ph.D. Candidate Anabelle Cardoso is studying forest elephants in the Central African country of Gabon, in an attempt to learn more about the secretive animals in order to better understand how to conserve them. However, she needs help—her team's forty camera traps have already taken about 750,000 photos, far more than they can analyze! So she's enlisting the help of the general public, setting up a page on the citizen science website Zooniverse. On the Elephant Expedition page, anyone can try their hand at identifying camera trap photos. Most of them are of vegetation blowing in the wind, but some are of animals, ranging from the elephants that are the target of the survey to gorillas, leopards, and pangolins. This writer tried Elephant Expedition for about ten minutes and identified a mandrill and a buffalo (in addition to many images of grass). Try it—it's free, for science, and as addictive as any video game. Start at the link below.

<https://www.zooniverse.org/projects/anabellecardoso/elephant-expedition>



**Alaska.** On November 8<sup>th</sup>, Senator Lisa Murkowski (R-AK) introduced a bill that would open the coastal plain area of the Arctic National Wildlife Refuge to oil drilling. This region is home to grizzly bears, polar bears, and wolverines, and, according to a group of 37 Arctic researchers opposing the bill, hosts "the greatest wildlife diversity of any protected area above the Arctic Circle." It is to be hoped that this bill will not pass. More news as it develops.

**Vladivostok, Russia.** The Vladivostok Zoo has matched a critically endangered Amur leopard cub with a golden retriever foster mother, creating an interspecies family that also includes a lion cub and a tiger cub. Amur leopards are a critically endangered subspecies: as of 2015, there were only 57 left in Russia. The zookeepers were forced to find the leopard cub a new family as its biological mother had a habit of attacking her litters. You can find an adorable video of the cub at

<https://news.nationalgeographic.com/2017/11/how-dog-protects-russian-leopard-cub-from-cannibalism-spd/>

**Earth (1).** From 2014 to 2016, global carbon dioxide emissions rose by only about a quarter of a percent per year, raising hopes that they would eventually peak and decline. However, several new studies released on November 13<sup>th</sup> have found that in 2017, emissions are on track to increase by 2%, dashing those hopes. "What's driving this trend, really, the global trend is this pick-up in China," said climatologist Corinne Le Quéré, lead author of one of the reports. Last summer, China suffered a drought that limited its hydropower capacity, forcing more burning of coal. Higher natural gas prices also meant more coal burned in the United States. It is unclear what this means for the future of climate change. "It's hard to say whether 2017 is a hiccup on the way to a trajectory that eventually peaks and goes downward—or if it's about returning to high growth," Le Quéré said.



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**Earth (2).** A new study by a team of atmospheric scientists has found that human-caused pollution may cause more lightning strikes. The study, published in *Geophysical Research Letters*, analyzed years of data and found that lightning was much more common over crowded shipping lanes than open oceans, occurring nearly twice as often. The researchers hypothesize that this is due to the aerosols (tiny floating particles of many types) in the ship's exhaust: the increased levels of aerosols provide more sites for condensation, so the water in the area is divided into more, smaller droplets.



It is the motion of these droplets (which become electrically charged in ways still unclear to science) that forms lightning. (Google Scientific American's "Bolt from the Brown" article for more info.) This is another example of how humans are changing the world in new, unpredictable ways.

**Cetaceans, 1: Gulf of California.** In sad news, the VaquitaCPR team has decided to end their campaign to capture and safeguard the last remaining vaquitas, after one of the critically endangered porpoises died in captivity. They have determined that the vaquita are simply too fragile for the captive-breeding plan to work, and urge that the resources devoted to their program now be focused on enforcing the ban on gillnets, a fishing method that is the primary cause of the vaquita's rapid population decline. There are now under 30 vaquitas left in the world. More news as it develops.

**Cetaceans, 2: Thailand.** In the polluted Gulf of Thailand, eutrophication (google it) due to sewage discharges has driven most marine life to the surface layer, with anything deeper being uninhabitable. Now, a species of baleen whale known as Bryde's whale (*Balaenoptera edeni*) has adapted to this by developing a new feeding technique. A team of Japanese and Thai scientists found that Bryde's whales in the Gulf are using a new, passive, type of feeding, which they have named "tread-water feeding," to minimize their energy use while maximizing their catch. In tread-water feeding, the whales point their heads upward and tread water with their body, keeping their head stationary and allowing water (and prey) to drain into their mouth. This method of feeding is unique among baleen whales, and may be a cultural behavior, with calves learning the behavior by imitating older whales.

**Cetaceans, 3: The North Atlantic.** The North Atlantic right whale (*Eubalaena glacialis*) was once at risk of extinction from whaling, but rebounded in the late 20<sup>th</sup> century, until it seemed out of danger. Now, it is at risk again, this time from ship strikes and deadly entanglements with fishing nets. Now, populations are declining again: scientists report that there are only about 100 mature females left.

**Cetaceans, 4: Summary.** The cases of the right whale, the Bryde's whale, and the vaquita are excellent proxies for the different effects of the Anthropocene Epoch on different species. The vaquita is on the verge of extinction, unable to coexist with human fishers, while the Bryde's whale has adapted to built-up, polluted waters by developing a new behavior. The North Atlantic right whale stands poised between the two: seemingly recovering, but now on the brink once more. Food for thought, and study.



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## Effects of Climate Change and Other Anthropogenic Change on Atlantic salmon

Guest Writer Submission

By Matthew Allen McBean.  
Environmental Science Student, University of Southern Maine.



Sea-Run Atlantic Salmon, *Salmo salar*  
Adult Female in Spawning Colors

### The Problem.

The issue of salmon populations is local and personal to me, as fishing for sport is such a part of my life. Every recreational moment of time that I have is spent adventuring to new areas, exploring different habitats such as lakes, streams and ponds. Fishing these water bodies for me is my time to be with nature and enjoy the fisheries that the state of Maine has to offer. However, fishing for Atlantic salmon (*Salmo salar*) is something that I have not yet experienced as there has been significant declines in Atlantic salmon populations in the United States as well locally in Maine. This prompted an endangered listing of the species under the Endangered Species Act November 17, 2000 (NOAA, 2006). On a local scale the conservation of salmon is critically essential to keep salmon populations returning back to Maine's coastlines and rivers. The number of wild Atlantic salmon in Maine Rivers is at an all-time low, placing them in danger of extinction (NOAA, Retrieved May 4, 2015).

### Climate Change.

There are several ways salmon have been impacted globally, including several climate change-related factors such as loss of snowpack, warmer waters, forest fires, severe storms and floods, ocean acidification and sea level rise. Current research in the survival of Atlantic salmon has been done by



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NASCO, the North Atlantic Salmon Conservation Organization. This organization states that “The current period of low abundance of Atlantic salmon appears to be related to poor survival of salmon at sea. For some monitored stocks, marine mortality is currently twice as high as in the 1970s and this has been linked to climate change.” (NASCO, 2015). To understand one way Atlantic salmon are being impacted by climate change's effects, consider the loss of snowpack. Losing snowpack reduces stream flows in summer, and in the fall makes it difficult for returning salmon to reach spawning grounds and for juvenile fish to reach the ocean. Lower stream volumes would also mean warmer waters. “The water temperature range for most salmonids is 55-64 degrees Fahrenheit (12.8-17.8 degrees Celsius). Massive fish kills have occurred at or above 71.6 degrees Fahrenheit (22 degrees Celsius)” (National Wildlife Federation, 2015).

## Solutions.

There are many groups working hard towards bringing the Atlantic salmon population levels back in this state. Many institutions involved in this effort are on a State of Maine level, private level, as well as non-profit organizations and volunteers supporting this cause. An example of one of these supporting groups is the Saco River Salmon Hatchery Club (check them out at <https://www.sacosalmon.com/>) which is dedicated to restoring the Atlantic salmon runs to the Saco River watershed. This hatchery club manages populations of salmon in the Saco river watershed in hopes to bring populations up to a level where this species has a chance to sustain growth in this area. I recently attended a meeting with the Saco River Salmon Hatchery Club which was the stem of my interest in the current status of Atlantic salmon in Maine; and at this meeting I was given a chance to see the passion of this club to bring salmon back to Maine waters. The club was very excited about the new techniques that they are working on in hatching salmon eggs. The idea was to raise the eggs in the natural environment and place them in waters in the Saco river watershed; where previously they were raising these eggs only in the hatchery. They had devised this new method of raising eggs using a pump and laying the eggs in freshwater streams that are suitable for salmon eggs. They have worked on habitat restoration projects as well as a part of this effort of hatching eggs in the wild.

## Conclusion.

While investigating the decline in populations in Atlantic salmon I have uncovered many significant influences that this species must undertake throughout the course of its life. Surprisingly with these environmental influences this species is still hanging in there. I truly believe without human help or change in our practices this species may not recover. From my research I found that in fact there are many things currently going on in an effort to assist this particular species of fish, such as NASCO, NOAA with their research and efforts but also the ongoing programs such as the Saco Hatchery Club improving salmon populations. Whether or not these efforts are for economic, social or ecological reasons, the outcome will be beneficial to all of those aspects as well as to the salmon themselves. Atlantic salmon belong in the Atlantic Ocean, in our waters and as a part of the long standing history in our Eastern shores-and, hopefully, a long future.