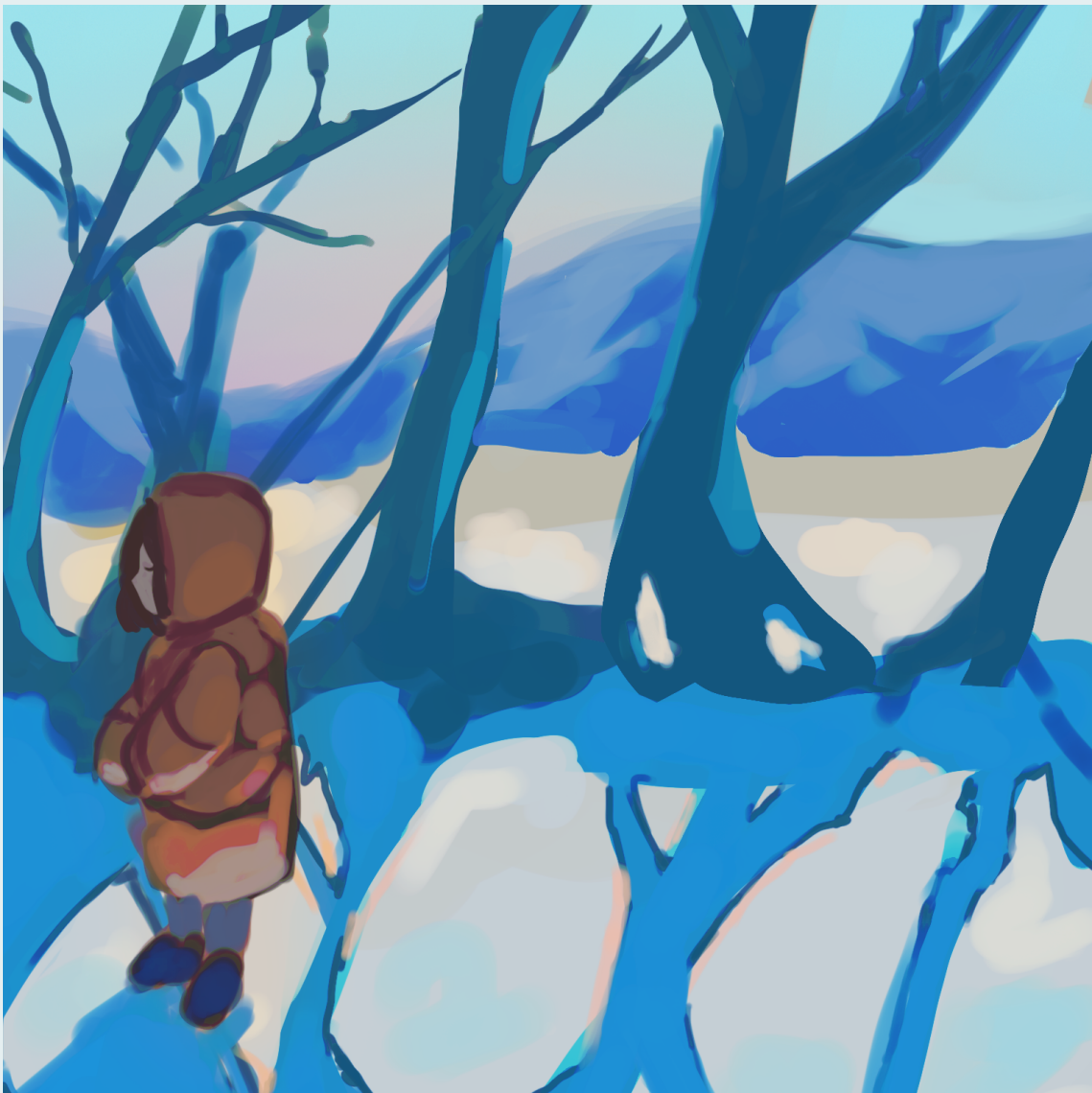


Happy Holidays!

The 28 Percent

Women make up only 28% of the STEM workforce. This newsletter aims to change that.

By Ruby, 12th grade



December 2023

Table of Contents

- 01 Winter Festival
- 02 A Greener New York City
- 03 A Cool Woman: Allison Drake
- 06 Endangered Species Spotlight: Beluga Whale
- 08 Inspiring Girls Expedition Experience PT 3

Winter Festival



Dec. 9 | 12pm - 2pm | Memorial Park
Hosted by the @28percent

RSVP!



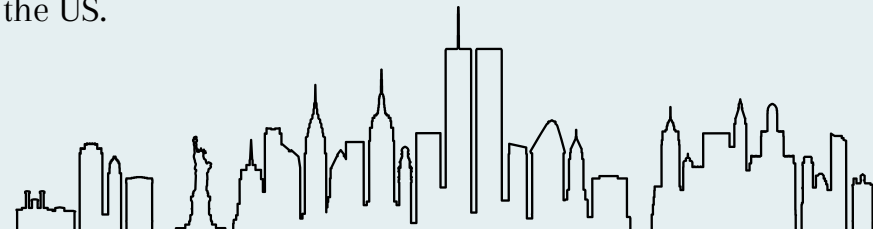
A Greener New York City

written by Ariana Soto
JMHS Chapter

New York City is one of the most populated areas in the US, with a population of around 8 million people. In order to be able to inhabit so many humans within the city space, there had to be lots of industrial changes to the natural landscape. Various buildings were created to act as housing, attractions, and businesses. By now, NYC has changed so much that it's unrecognizable from how it was before its urbanization. That being said, its drastic change has brought along a hoard of tourists with it. This is both a positive and a negative thing. The city's high population density makes public transportation a major method of getting around. This means less car use, AKA less greenhouse gas emissions. As of a study published in 2007, New York City's annual greenhouse gas emissions are at 7.1 metric tons per person. This is less than a third of the US's average of 24.5 tons. However, that doesn't erase the fact that for the same reason (high population density), NYC has a high concentration of pollution. Not only that, but excessive tourism leads to overcrowding and costly living expenses. In light of all these inefficiencies, there's got to be some kind of solution to them.

A rule that the government can implement to help mitigate the negative impact that humans in NYC have had on the environment is to relocate pollution sources more evenly throughout the city to lessen the disproportionate amount of air pollution in certain areas, which results in higher crime rates in those areas. This could partly be attributed to the fact that intense, prolonged exposure to air pollution is shown to cause asthma and induce aggressive behavior in humans.

Another thing that can be done as a sort of damage control would be to encourage the widespread use of solar panels on buildings (funded by state/federal taxes). A third incentive that can be started to help mitigate the negative effects NYC has had on Earth's health is for more large companies based there to put effort and profits towards lessening the air pollution they produce/finding renewable energy sources to replace it. This way, companies can continue manufacturing products without damaging Earth's atmosphere with excess greenhouse gasses. New York is a city with boundless potential as the face of ecological policies in the US.



A Cool Woman: Allison Drake

written by Paulina McConnell

Where can we see women pursuing, partaking in, and leading in STEM on our own campus?

Meet this year's president of Robotics Club, Allison Drake. Living out her senior year amidst piles of scrap metal and wire, Allison has been engaged in the field of robotics since her very first year at Pasadena High. As a freshman, her brother - former President of Robotics Club - shared the passion with her until the ember of engineering was fused into Allison's system as well.

"My brother dragged me there," she muses. "He would wake me up on Saturdays and we'd go to the lead fabricator's house, and we'd work from 11am to 6pm... and I would just have to be there."

Four years later, Allison is guiding her team through bi-weekly robotics competitions and countless hours of sawing and drilling. She's a seasoned veteran in managing the club, also having held the Vice-President position while she was a junior. Allison explains that leadership in robotics entails a wide range of responsibilities - both creative and administrative.

"There's a lot of time that goes into it. Most of it is working on the robot; coming up with designs," she details. Less enthusiastically, she adds: "Some of it is also all the paperwork."

The club participates in several competitions each year, beginning with four smaller meets at Santa Fe Middle School, and culminating in a larger competition at Monrovia High School. Allison tells me that though PHS's robotics team has had a tumultuous history with the meets, this year has brought rapidly improving results - including placing in the top 5 at their latest competition.



As I talk to Allison, it becomes increasingly clear the sheer amount of time and effort she dedicates to this club. It wouldn't be a stretch to say that Robotics is one of the more time-consuming and career-oriented clubs on campus, so the work that each of these members commits to is a feat within itself. But to be president of such a club? To go one step further, taking on organizational duties and a leadership role?

What motivates you? I ask Allison.

She takes a breath. "It's hard to know where to start, honestly. I guess I just love being able to put together whatever I want, or working with the team to make something that's great."

"There's also a lot of independence in it," she admires. The club has its very own room on campus, exempting it from the burdensome designation as a secondary resident to another class or organization. This freedom has allowed the students to shape the room around the unique needs and comforts of robotics, as well as their own as friends and individuals. Proudly, Allison reflects on another source of sovereignty for her team, explaining, "While we have mentors and advisors, it's mostly us who lead the progress."

"I think we're doing better than we used to," she explains with a laugh. "There was a time where it was very much like a boy's club - it was a little on the fratty side - and I think that's changing." Her hope for progress is not unfounded: this fall, the club gained four new members, all of which were girls in the junior or sophomore classes. In the coming years, these rising female members will assume leadership positions, establishing further balance in the club. "It's nice to see that our demographics are kind of evening out now. We're seeing more people feel welcome."



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Future hopes aside, Allison's journey with the PHS Robotics Club will be coming to an end this June. For such a STEM-focused, motivated individual, I'm curious about how she plans to pursue these passions in her next step of education.

In the thick of college applications as this article is written, Allison confesses that her dream school is UC Berkeley. "I'm mostly looking for a really well-rounded college. As much as I love STEM, I don't want to be in a place that's just STEM. I feel like that's kind of limiting myself... and, it can be a little bit tiring to be around people like yourself all the time," she explains. She also seeks a diverse student body, and hopes to study mechanical engineering or a related field.

But getting into college is a competitive process - all the more so for women in STEM. I ask Allison if there's anything she recommends to younger girls who hope to succeed in not only this regard, but also in the broader world of STEM. Easily, she points to her involvement in the Caltech Summer Research Connection at Caltech last summer, praising its success in allowing her to explore the science she's interested in. For girls looking to expand their experience with hands-on STEM work, to collaborate with other peers who share their interests, or to learn from professionals of the field, camps such as that which Allison did couldn't be a better fit. Many are affordable and local, and they cover a spectrum of skill level - from introductory workshops to mentoring in the publishing of theses.

Whatever your direction in science, Allison's leadership in Robotics Club highlights one way that STEM-loving folks can take advantage of the opportunities that our campus and community provide. And, if you have a weekend off, maybe stop by Santa Fe Middle School to watch our robotics team in action - to draw some wisdom from the queen of machinery and engineering herself.

Endangered Species Spotlight: Beluga Whale

written by Kaley Simkins

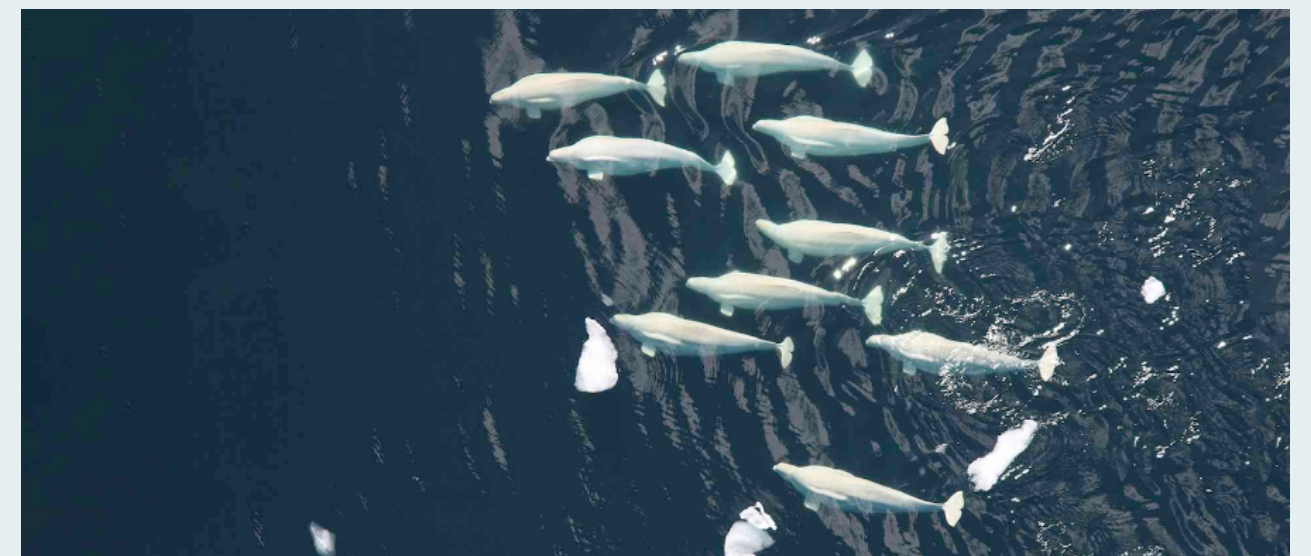
The beluga whale is a marine mammal found in arctic waters that has incredibly thick skin and a fascinating arsenal of communicative sounds. Known as the “canary of the sea”, belugas are incredibly social animals and use a combination of whistles, clicks, and chirps to communicate with their pods. These pods often consist of belugas of the same sex and age range and can span from 2 to several dozen individuals. They utilize echolocation when diving and hunting, feeding on a variety of aquatic species including salmon, herring, shrimp, and crab. When fully mature, their thick layers of blubber take up 40-50% of their body weight and their skin is 100x thicker than terrestrial mammals; having such thick skin is essential for regulating internal body temperatures in freezing arctic waters. Beluga whales can travel back and forth between bodies of fresh and saltwater, stretching from the deepest water to shallow bays and rivers. There are over 150,000 individuals left in the wild but some subpopulations are dwindling, mainly as a result of climate change and habitat degradation.

Oceans are experiencing a rise in pollution as a result of oil and gas development, which expands shipping in sensitive areas. Loud noises tied to these developments mask communication between belugas, affecting their ability to navigate, find food, mates, and avoid predators.

This collectively increases potential collisions and oil spills that damage marine populations. Climate change is another major threat to beluga whales as climbing temperatures shrink sea ice that they rely on to hide from predators like orcas. Dramatic changes like this can lead to nutritional stress and diminished reproduction. Additionally, unpredictable changes in temperature and currents may impact the timing of environmental cues that are crucial for beluga migration and navigation.



Many organizations are racing the clock to provide beluga whales with proper resources and protection to ensure their conservation. The National Oceanic and Atmospheric Administration is specifically focusing on the Cook inlet subpopulation of beluga whales by rebuilding their habitat and monitoring reproduction. They also respond to stranded beluga whales, work to minimize noise disturbance, and monitor other populations in Alaskan waters. The World Wildlife Fund is in partnership with the Natural Resource Defense Council and Ocean Conservation Research to craft campaigns that aim to address the impacts of ocean noise on marine life. Lastly, they are pushing to assist the International Whaling Commission in influencing shipping guidelines that will provide better protection for marine life, regulate whaling, and address the threats of climate change and bycatch.



My Experience on an Inspiring Girls* Expedition Part 3: Homer to KBay

written by Morgan Gaskell

Everyone was already so tired from dealing with death mud for an hour, but it was finally time to start our paddle! Similar to previous days, the skies were gray and the clouds heavy with rain. Midway through our 5 mile paddle, we took a break to eat lunch on a small island, where we observed black shorebirds with bright orange bills called Black Oystercatchers. After we had filled ourselves with calories needed to support our paddle, we were back on the water! About an hour and a half later, we had crossed a channel and arrived at Arch Beach, located at the mouth of Tutka Bay.

The group began our routine of unloading the kayaks and hauling them up the beach, sponging out any water that managed to enter the cockpit and hatches, and finally "unbirthing" ourselves from the dry suits as we called it. Taking an hour to rest, we discovered the beauty of Arch Beach. There were snowy mountains in the distance, tall cliffs eroded by saltwater and decorated with barnacles, a family of bald eagles soaring overhead, and right in the center of our view, a rectangular island with a small arch on its right; the namesake of the beach. It didn't take long before we met our new neighbors: thousands of hungry mosquitoes! Instead of being an annoying hum in your ear, Alaska's mosquitoes are like ginormous flies who buzz in your face until they've drunk from your soul. Everyone quickly raced for the bug spray (we had used an entire three bottles by the end of the expedition) and developed quick reflexes to shoo away and kill mosquitoes.



The mosquitoes were arguably a problem at Arch, but we had lots to look forward to! On the second day there, we got to experience the biggest tidal exchange (difference between highest high tide and lowest low tide) of the entire month and year! As the tide went out, entire islands appeared before our eyes. Day two was all about exploring the animals and seaweeds of the middle and low intertidal zones! Earlier that morning, a local family stopped by the beach to collect clams and told us about an octopus they had discovered during their harvest! We became determined to find that octopus! Taking to the islands, we soon discovered sea stars of many colors, including pink, orange, purple, blue, brown, and green.

We also met numerous species of jellyfish, anemones, and crabs, as well as mussels, barnacles, and bidarkis (also known as chitons). After some investigation, we finally found the octopus too, which blew everyone's minds! The rest of the day also included visiting a waterfall to collect drinking water, a short paddle around the beach and neighboring islands, a crash course on tides, and swimming in 40 degree water in nothing but a sports bra and shorts!

We hadn't intended to stay an extra night, but when we woke up on the third day and discovered the currents in the channel were much too strong to make it to our next camping destination, we made the most of our extended stay! We daringly hung out inside a cave as it slowly filled with water, had a lesson on coastal temperate rainforests and ecological succession, frolicked on the beach, and played a ridiculous game of human knot that left us crying of laughter.

Now midway through our expedition, it felt like all societal pressures and expectation had been lifted and we were really living the dream. The group had bonded so much in the past few days. We no longer asked permission when we slapped each other's backs or foreheads when mosquitos threatened to steal our blood, played every game you could possibly think of, traded snacks, and laughed in our tent groups well past midnight. Our time at Arch over these three days will forever hold a special place in my heart.



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Follow the PHS and JMHS teams!



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