







OUR FUTURE OUR RESPONSIBILITY


by Mason Harris '24



IT'S NOT TOO LATE. Whatever you may have read over the past year — the global heat wave, the severe, irreversible Colorado River drought, heightened hurricane frequency, fatal floods across multiple continents, rising sea levels, unprecedented wildfires that burned through 1.6 million acres of California, and newspaper headlines declaring, “The End is Nigh” — climate change is not binary. It is not a simple “yes” or “no.” Instead, it is a problem that gets worse over time as we produce harmful greenhouse gases. This means that no matter how unbearably hot it gets, no matter how fully climate change transforms the planet and the way we live on it, it will always be the case that the next decade could contain more warming and more suffering or less warming and less suffering. Just how much is up to us, and always will be.



A century and a half after scientists first identified the greenhouse effect, we are left with grim predictions that can appear falsifiable and outrageous. While it is true that we might never understand the magnitude of the effects of climate change and that today, we live under clouds of uncertainty about the future of climate change, those clouds are, overwhelmingly, not projections of collective ignorance about the natural world but of blindness about the human possibility for innovation. They can be dispersed by human action. The question of how bad things will get is not a test of science; it is a bet on human activity. How much will we do to forestall disaster, and how quickly?



These are the disconcerting, contradictory lessons of climate change, which counsels human humility and grandiosity, each drawn from the same perception of peril. Unfortunately, many seem inclined to run from that responsibility rather than embrace it. Alternatively, even admit we see it, though it sits in front of us as plainly as a steering wheel. That climate change is all-enveloping means that it targets us all and that we must all share in the responsibility so that we do not all share in the suffering — at least not share in so suffocatingly much of it.

In a world full of grim predictions of the future, climate change might not be entirely preventable. However, the world is also full of spectacular and wondrous innovation—geothermal energy, modular nuclear reactors, new irrigation systems, efficient renewables, new climate legislation, and a generation determined to face the daunting challenges of such a threat head-on. Climate change *does not* have to pose a threat to humanity. Instead, it could be the blossoming start of a new, climate-conscious group determined to make the world a better place.



PAYING THE PRICE FOR PLASTIC

COLORADO'S NEW LAW ADDS A CHARGE FOR PLASTIC BAGS

by Leonardo Osuna '24

How many plastic bags do we use each year? The answer: Way too many. That's why at the beginning of this year, Colorado passed a law where each customer will be charged ten cents for each plastic bag they use from grocery stores and retailers. Now, Coloradans must remember to bring reusable bags to the grocery store or pay ten cents per bag. The goal is to limit the state's plastic bag usage and transition to banning plastic bags at the start of 2024. These steps aim to reduce the pollution caused by the disposal of plastic bags, a problem that is not always visible to Coloradans.

"Because we have trash collection where we live, because we have recycling collection where we live, we have a big disconnect between what happens when we throw it in the trash and what takes place after that," said Sydney Timme, supervisor of Environmental and Sustainability clubs at Regis Jesuit.

In contrast with coastal states which have had such laws for many years, Colorado has not seen the impact of plastic bags directly. Colorado does not have waste floating in the ocean, a clear sign of the destruction plastic bags

can create. Instead, waste is found in our rivers and creeks, the habitats of Colorado's wildlife.

Plastic bags are a leading polluter taking into account its manufacturing process through the use of fossil fuels. According to the Center for Biological Diversity, "Americans use 100 billion plastic bags a year, which require 12 million barrels of oil to manufacture."

This law intends to reduce to usage of plastic bags in the state of Colorado, resulting in fewer fossil fuels being used and a cleaner environment. On the flip side, this law will significantly decrease the convenience of the average consumer in the state of Colorado. By 2024, not only will plastic bags be banned, but so will the foam takeout containers utilized at restaurants.

The law to ban these plastic bags and these styrofoam containers are small steps that can make a big impact on our world. Each action leads to more considerable changes and a ripple effect that will help the environment. Every community can make small changes that can help preserve our natural work

by keeping the environment clean. Each person can start making small changes—from stopping the usage of plastic bags and remembering to bring reusable bags when going shopping.

"I think that the public and our school community need to understand why these choices are being made, what the consequences are, and what they can do to do the right thing, to do it the right way," said Mrs. Timme.



OUR DIRE WATER DISTRIBUTION

THE IMPORTANCE OF COLORADO'S WATER SUPPLY

by Leonardo Osuna '24 Illustration by Mason Haas '24

The most essential element for all life is water.

Roughly 70 percent of the earth is made of water, but it's mostly salt-water. The fresh water on the planet is limited, and due to recent La Niña years, we are seeing an increased drought that is greatly impacting the distribution of fresh-water to millions of people.

The Colorado River is the main supply of fresh water to seven states and is split into two basins. The Upper Basin—including Colorado, New Mexico, Utah, and Wyoming—and the Lower Basin, containing the states of Arizona, California, and Nevada. Rising temperatures and perpetual drought have led to greater struggles dividing this water in the Colorado River Basin.

"When we look at the Colorado River in particular, in 1922, there was a compact created where they decided how to divide up the Colorado River supply," said Kevin Russell, Sustainability teacher at Regis Jesuit.

"In that compact, there was a bit of a misstep in that they based those water projections on a few very wet years where we had a huge amount of snowpack."

With the past three years all being La Niña years, climates of less precipitation and more frequent dry conditions, the

Colorado River Basin is drying up faster than it can be replenished. Rising temperatures cause a yearly decrease in snowpack—large amounts of snow that will not melt for long periods of time. This snowpack is expected to melt and supply water to the Colorado River

and several smaller rivers. The Colorado River Compact can no longer efficiently and equitably divide the water from the Colorado River with there not being enough water.

"The compact cannot achieve what states defined as equitable apportionment with today's river flows," said Jennifer Pitt, director of the Colorado River program at the National

Audubon Society, an organization dedicated to the conservation of wildlife and their habitats. "Extended drought exacerbated by climate change has led to an average Colorado River yield of 12.4 million acre-feet of water in recent decades, while the Compact is premised on a flow of at least 16 million acre-feet."

Agriculture has been draining these water sources in the west. The seven states that are part of the Colorado River Compact are known for being dry while also having large agricultural sectors. Southern California's desert has built a thriving agriculture sector because of the water from the Colorado River. Some of these crops are water-intensive crops, yet they are being grown in these very dry climates. These large agricultural sectors deplete the water in our reservoirs and our rivers, making water more expensive to pay for and use.

"It's important to know the different aspects of the state and the distribution of water and where we get our water from," Russell said. "And most importantly, it's important to know how we're using it and the inefficiencies of how we're using it, so that we can start to conserve more water."

DID YOU KNOW?

Since December 2004, the basin of the Colorado River lost nearly 53 million acre feet of freshwater. Roughly 75% of the loss was groundwater.

THE UNTAPPED POTENTIAL OF GEOTHERMAL ENERGY

HOW GEOTHERMAL ENERGY CAN CONTRIBUTE TO A NEW RELIABLE ENERGY GRID

by Mason Harris '24

Just a decade ago, climate projections for this century looked increasingly apocalyptic, with most scientists warning that sustained inaction would bring the world four or even five degrees Celsius of warming — a change disruptive enough to call forth not only predictions of food crises and heat stress, state conflict and economic strife, but, from some corners, warnings of civilizational collapse. However, according to a new United Nations report from the COP27 climate conference in Sharm el Sheikh, Egypt, with the world already 1.2 degrees hotter, warming this century will almost certainly fall between two or three degrees. Due to astonishing declines in the price of renewables, a global political mobilization, and serious policy focus from world leaders, the world has cut expected warming almost in half in the span of a decade. One of the most significant developments in renewables that has led to this astonishing turnaround is geothermal energy.

“Colorado has great wind and solar potential, but both of those have the drawback of big drops in production. Whereas geothermal is interesting because, if we can tap into that

geothermal energy, it’s perpetual. It doesn’t matter if it’s night or day because it’s constant,” said Kevin Russell, a science teacher at Regis Jesuit High School.

Geothermal technology extracts the heat found within the subsurface of the earth. Geothermal energy primarily centers around reservoirs of hot water that exist at varying temperatures and depths below the Earth’s surface. Wells, ranging from a few feet to several miles deep, can be drilled into underground reservoirs to tap steam and very hot water to be brought to the surface for

various applications, including electricity generation, direct use, and heating and cooling.

“They can use geothermal energy for independent houses and other buildings around Denver. This potential of residential geothermal energy, not for energy production but for heating and cooling homes, and the efficiency of it, is pretty astounding. The cost of installation varies, but it’s relatively attainable, and that idea of using heat pumps instead of propane reduces carbon dioxide emissions tenfold,” Russell said.



Geothermal energy plants harvest heat stored in the subsurface of the earth to create steam in order to turn turbines producing renewable energy for individual and commercial use.

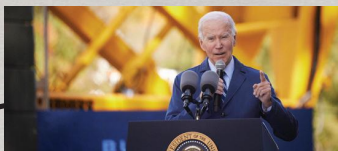
GLOBAL EFFORTS TO LIMIT CLIMATE CHANGE FROM 2016 TO 2050

PARIS CLIMATE ACCORDS NOV 4, 2016



Adopted by 196 different parties at the UN Climate Change Conference, this international treaty focused on limiting the increase of the global average temperature to less than 2 degrees Celsius above pre-industrial temperatures.

BIPARTISAN INFRASTRUCTURE LAW & BUILD BACK BETTER ACT NOV 15-19 2021



President Biden signed the Bipartisan Infrastructure Bill into Law increasing government investment into cleaner infrastructure and cleaner energy of the future.

USAID CLIMATE STRATEGY 2022-2030



The United States Agency for International Development developed a strategy in order to combat climate change in the United States and the around world. This agency is responsible for administering civilian foreign aid and development assistance.



UNDERSTANDING THE GLOBAL CLIMATE AGENDA

COMBATING AMERICA'S DECLINING INFRASTRUCTURE THROUGH THE BIPARTISAN INFRASTRUCTURE LAW AND THE BUILD BACK BETTER ACT

by Mason Harris '24



In November of 2021,

President Biden passed the Bipartisan Infrastructure Law and the Build Back Better Act into law, providing over \$3.5 trillion to combat the increasingly complex climate crisis. This new legislation aims to rebuild America's roads, bridges, ports, rails, airports, expand access to clean drinking water, ensure widespread access to high-speed internet, and fund public works projects. The legislation addresses a broad range of needs in the United States' built environment, rated C-minus by the American Society of Civil Engineers (ASCE) in their 2021 Report Card for American infrastructure. According to the ASCE, growing wear and tear have left 43% of public roadways in poor or mediocre condition, which has remained stagnant over the past several years. In addition, 42% of all bridges are at least 50 years old, and 7.5% of the nation's bridges, are considered structurally deficient and at risk of collapse.

"This Bipartisan Infrastructure Law makes a down payment on ensuring that future generations have clean air, drinkable water, fertile soil, and an overall quality of life that is currently threatened by the worsening climate crisis," said Secretary of the Interior Deb Haaland. "Over the last year, it has helped us put significant resources into the hands of

local communities to meet their everyday challenges."

Colorado has 481 bridges and over 3,620 miles of highway in poor condition. Colorado expects to receive approximately \$3.7 billion over five years in federal funding for highways and bridges.

"When you think of concessions, I think the reality is that congress can become intransigent and not willing to give in on one side or the other, mostly out of a fear of how their voters will see those concessions. However, the new Bipartisan Infrastructure Law allows states to decide individual needs," said Heidi Kabadi, Social Studies Chair at Regis Jesuit High School.

The Bipartisan Infrastructure Law includes many categorical and competitive grant programs. Categorical grants, also called conditional grants, are grants issued by the United States Congress that may be spent only for narrowly defined purposes, including roads, bridges, dams, and more. On the contrary, competitive grants are awarded based on states' applications to facilitate programs in their regions. The Rebuilding American Infrastructure with Sustainability and Equity (RAISE) grant allows states to apply for federal grants for surface transportation infrastructure projects.

"While severe partisanship exists currently, and that's with environmental legislation and most other forms of legislation, more and more people are recognizing how much the public cares about these issues, and that means federal aid will continue to reflect the public's desires," Kabadi continued. "These programs really have a chance to meet the public's needs."

DID YOU KNOW?

The Biden Administration has announced over \$185 billion in funding and over 6,900 specific projects, including public works projects in Colorado?

UNITED NATIONS' 2030 SDG ACHIEVEMENT BY 2030



The United Nations' goal to limit world poverty and hunger, as well as keeping the world's habits safe and sustainable with the development of more sustainable practices.

CARBON NEUTRAL GOAL BY 2035



President Biden set the goals to have 100% carbon-free electricity powering the grid in the United States by 2030 and to have 100% zero-emission vehicle acquisitions by 2035.

UNITED NATIONS' NET-ZERO GOAL BY 2050

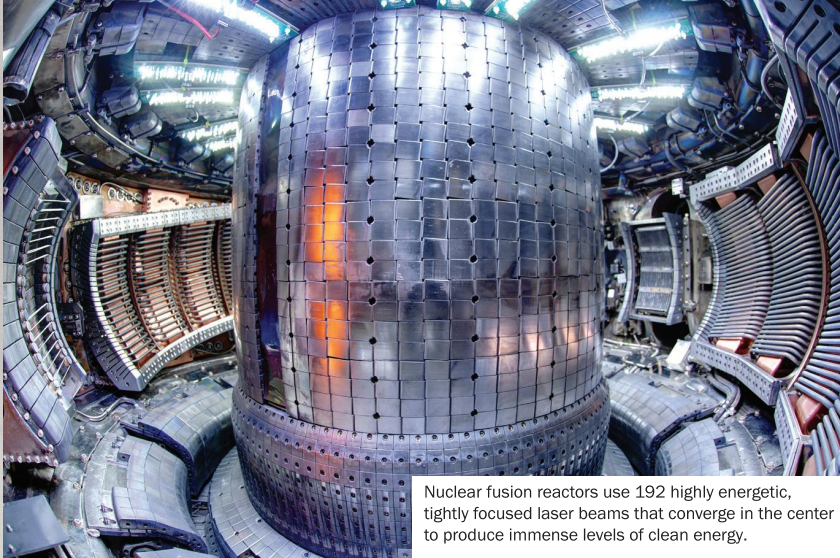


The United Nations set a goal to reach zero greenhouse gas emissions by the year 2050. A global effort to mitigate the effects from climate change.

THE REVIVAL OF THE NATION'S SILENT ENERGY SOURCE

NUCLEAR FISSION AND FUSION DEVELOPMENTS CATAPULT NUCLEAR EFFICACY

by Mason Harris '24



Nuclear fusion reactors use 192 highly energetic, tightly focused laser beams that converge in the center to produce immense levels of clean energy.

Nuclear power has silently sustained the United State's energy grid since 1957, accounting for nearly 20% of the nation's annual electricity generation from 1990 through 202. An increased [GB1] focus on decarbonization initiatives, and an influx of public and private-sector investments make nuclear energy an asset in the fight against climate change. Nuclear energy now provides roughly 10% of the world's electricity. It's the world's second-largest source of low-carbon power, with over 50 countries utilizing nuclear energy in about 220 research reactors. Over the past 50 years, nuclear power has reduced CO2 emissions by over 60 gigatonnes – nearly two years' worth of global energy-related emissions.

"The indirect benefit of nuclear fission power plants is that they're already built, they're already running, and they're already efficiently producing all this energy. So, we don't have to build anything new. There's no reason why we shouldn't keep using them," continued Doctor Sandra Robertson, science teacher at Regis Jesuit. "It's a very safe

and mature technology. It gets a lot of profile when it goes wrong, but nuclear fission power plants don't omit a lot of greenhouse gases like a coal power plant would."

Nuclear is a zero-emission clean energy source. It generates power through fission, which is the process of splitting uranium atoms to produce energy. The heat released by fission is used to create steam that spins a turbine to generate electricity without the harmful byproducts emitted by fossil fuels. According to the Nuclear Energy Institute (NEI), the United States avoided more than 471 million metric tons of carbon dioxide emissions in 2020. That's the equivalent of removing 100 million cars from the road and more than all other clean energy sources combined. However, in advanced economies, nuclear power has begun to

fade due to public safety concerns with plants closing and little new investment made, just when the world urgently requires more low-carbon electricity.

"The primary issue with nuclear energy in the modern landscape is, albeit there's a low potential of meltdowns and breaches, the potential of disasters. The potential of a nuclear meltdown is very scary to the average person. I'm highly confident in the systems being built, but there's always that potential," said Kevin Russell, science teacher at Regis Jesuit.

With nuclear power facing an uncertain future in many countries, the world risks a steep decline in its use in advanced economies that could result in billions of tonnes of additional carbon emissions. Some countries have opted out of nuclear power, considering concerns about safety and other issues. In the United States, nuclear electricity generation capacity peaked in 2012 at about 102,000 MW when there were 104 operating nuclear reactors. However, at the end of 2021, there were 93 operating reactors with a combined generation capacity of about 95,492 MW. From 2013 through 2019, annual nuclear generation capacity and electricity generation increased

each year (except in 2017) even as the number of operating reactors declined. Power plant uprates—modifications to increase capacity—at nuclear power plants have made it possible for the entire operating

nuclear reactor fleet to maintain a relatively consistent total electricity generation capacity. These uprates helped nuclear power plants maintain a consistent share of about 20% of whole annual U.S. electricity generation

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from 1990 through 2021. The absence of further lifetime extensions and new projects could result in an additional 4 billion tonnes of CO₂ emissions, underlining the importance of the nuclear fleet to low-carbon energy transitions around the globe.

While new legislation in recent years has often aimed to reduce the new construction of nuclear fission power plants due to public safety concerns, the U.S. Department of Energy (DOE) released a report showing that hundreds of U.S. coal power plant sites could potentially convert to nuclear power plant sites, adding new jobs, increasing economic benefit, and significantly improving environmental conditions. In addition, this coal-to-nuclear transition could add a substantial amount of clean electricity to the grid, helping the U.S. reach its net-zero emissions goals by 2050.

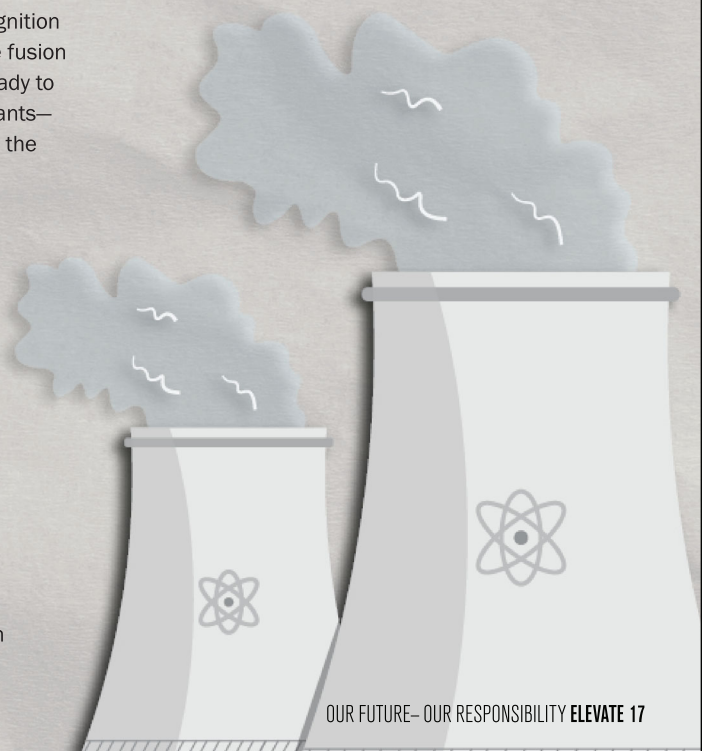
“I think it would be very useful to replace some of the coal power plants since we’re concerned about carbon dioxide emissions and those are some of the highest carbon dioxide emitters. They also emit a lot of other undesirable things like sulfur into the atmosphere. Replacing those plants with nuclear plants would be a big improvement. Replacing any fossil fuel plants for nuclear electricity generation would be a big advantage. It would be a good way of reducing carbon dioxide emissions,” said Kevin Kramer, a physicist at the Lawrence Livermore National Laboratory in Livermore, California.

While the construction of new nuclear fission facilities is becoming increasingly difficult, a myriad of nuclear alternatives

has allowed the nuclear energy industry to expand despite restrictive legislation in recent years. Advanced Small Modular Reactors (SMRs) are a key part of the department’s goal to develop safe, clean, and affordable nuclear power options. The advanced SMRs currently under development in the United States represent a variety of sizes, technology options, capabilities, and deployment scenarios. These advanced reactors, envisioned to vary in size from tens of megawatts up to hundreds of megawatts, can be used for small-scale power generation, process heat, desalination, or other industrial uses. In addition, researchers at the U.S. National Ignition Facility in California revealed nuclear fusion experiments released more energy than was input by the lab’s groundbreaking, high-powered lasers, a landmark achievement known as ignition or energy gain. While the fusion technology is far from ready to turn into viable power plants—and is not about to solve the climate crisis—scientists hailed the breakthrough as evidence that the power of the stars can be harnessed on earth in the distant future. The Bipartisan Infrastructure Law appropriates \$2.4 billion of vital funding for renovating preexisting nuclear reactors, new modular reactors, and advanced reactors and authorizes an additional \$3.2 billion

through 2027. With this support, the U.S. nuclear community—utilities, suppliers, scientists, and engineers—stand ready to usher in a new generation of technology to decarbonize and keep the nation’s electric grid resilient.

“This is a critical step toward ensuring that our domestic nuclear fleet will continue providing reliable and affordable power to Americans as the nation’s largest source of clean electricity,” said Jennifer M. Granholm, U.S. secretary of energy. “Nuclear energy will help us meet President Biden’s climate goals, and with these historic investments in clean energy, we can protect these facilities and the communities they serve.”





TIME TO MAKE THE SHIFT TO THRIFTING

HOW THRIFTING CAN MITIGATE THE EFFECTS OF CLIMATE CHANGE

by Leonardo Osuna '24

Illustration by Mason Haas '24

The global apparel market earned an estimated \$1.53 trillion in 2022. The industry makes up 10% of the world's carbon emissions, dries up water sources, and pollutes rivers and streams. Recently, these companies have come under criticism for destroying unsold products and sending piles of clothing to landfills in the Global South. In addition, these companies have been known for their exploitative and dangerous conditions for workers. According to the United Nations Economic Commission for Europe (UNECE), 85% of all textiles go to the dump each year, while these global practices pose a dire threat to the world's natural resources and environment, the effects will only continue to become more serious in the future.

"While the impact of the fashion industry is already significant today, it


is likely to increase even further in the upcoming decades. If consumption continues at its current rate, there will be three times as many natural resources needed by 2050 compared to what was used in 2000," said the UNECE at The Regional Forum on Sustainable Development for the UNECE Region in 2018.

As the effects continue to become more dire, the UNECE has committed to enforcing their 17 Sustainable Development Goals (SDG) on the industry. SDG 12 commits to ensuring sustainable consumption and production and is structured over eight targets, addressing the use of natural resources, chemical waste, fossil fuels and the integration of sustainable practices into the production cycles – all of which apply to the fashion industry. While the UNECE will continue to restrict the industry's harmful practices, individuals

can also help alleviate the effects through sustainable practices such as thrifting.

"I actually thrift a bunch of clothes, and I alter clothes that I have thrifted. That is a better thing to do. In all honesty, we should be sharing. Why would I throw something away when someone else might need it?" said Ms. Sarah Sherwood, the founder of the Regis Jesuit Clothing Swap.

Thrift shopping is an overlooked way of practicing sustainability. Thrifting reduces energy consumption as well as pollution of our natural resources. Thrift shopping helps reduce the demand for new clothing, thereby reducing the number of textiles in circulation. While the prospect of thrifting might be uncomfortable for some, the newly introduced Regis Jesuit Clothing Swap is simple way to be sustainable in our community.

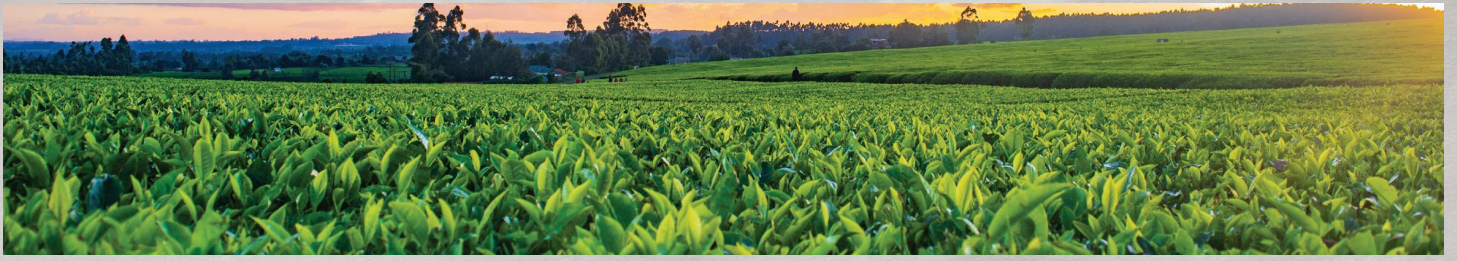
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THE LETTER

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AGRICULTURE IN THE FACE OF DROUGHT?

HOW THE AGRICULTURAL INDUSTRY CONTRIBUTES TO THE DETRIMENT OF THE AMERICAN LANDSCAPE by Mason Harris '24

Agriculture plays a central role in our society—shaping our landscapes, economies, communities, and cultures. Over the last century, agriculture has evolved from primarily a local activity to a global industry feeding an ever-growing global population. However, the worldwide expansion of the agricultural economy has led to widespread pressures on the environment and climate. These pressures pose a threat to the health of people, the planet, and to the viability of food systems in the future. Numerous, intertwined drivers of change bring about new risks and uncertainties. These drivers include urbanization, digitalization, lifestyle shifts, climate change, environmental degradation, resource scarcity, geopolitical instability, crop failure, disruptions affecting international supply chains, price shocks, and animal disease outbreaks. As the severity of these drivers rapidly increases, imminent change is on the horizon for the increasingly complex agricultural industry.



“Agricultural industries are immensely important to our economy and food security, but there are some consequences that come along with that. By far, the biggest consumer of water in Colorado and the surrounding states that rely on the Colorado River is agriculture,” said Kevin Russell, a science teacher at Regis Jesuit High School.

Russell introduced the Sustainability: Environment, Economy, and Equity course to Regis Jesuit students, which analyzes current global predicaments such as the vastly complex agricultural industry and the water-intensive livestock industry.

The Colorado River Basin, which extends into seven U.S. states, two Mexican states, and 29 federally recognized tribal reservations, provides water to nearly 40 million people and is a \$5 billion localized agricultural industry. However, the watershed is under monumental pressure due to the demands of rising food production, expansive urban areas, and unusual weather patterns.

“Industrial agriculture has led to more water consumption in the basin, primarily due to the mass production of monocrops. Those monocrops aren’t always being grown in the most efficient places,” said Russell.

These extreme fluctuations in the Colorado River Basin’s flow were not accounted for when water rights agreements were first drafted in the Colorado River Compact, resulting in more water being allocated than can be accounted for. Consequently, from 2000 to 2015, water consumption exceeded the total river flow almost 75% of the time. In August 2021, the federal government declared a water shortage in the basin for the first

time since the compact was drafted. As a result, the agricultural industry has to abide by various new restrictions.

“The seven states that use water from the Colorado River are tasked with trying to reduce their consumption by an astounding amount. Nothing is off the table,” Russell continued. “There is the possibility of subsidizing farmers and paying them to not grow crops and to let their fields fallow so that they aren’t using water from the basin. We need to definitely consider what types of crops we’re growing if they’re water-intensive, and where we’re growing them.”

Agriculture uses approximately 80% of the Colorado River’s water, using it to irrigate 15% of the nation’s farmland, and produce 90% of the winter vegetables. The production of wheat, corn, berries, and fresh produce are likely to be particularly strained by new federal mandates that aim to provide relief for the basin. The anticipation of water reductions for the lower basin states has already led some farmers to leave fields fallow or switch to less water-intensive crops, while others will increase their usage of groundwater pumping and drip irrigation systems. As new federal mandates continue to restrict the agricultural industry, farmers will have to turn to a variety of new systems.

“There have been a lot of advancements in irrigation systems in recent years, but there’s still a lot more work to do,” Russell continued. “The agricultural industry will certainly look different over the next few decades.”

