World Wetlands Day

Be the Change: Climate Solutions 2020

In Partnership With:

Newport Bay Conservancy, Ridge to Reef, and Schneider Electric

Conference Team

We would like to thank all of our team members and speakers for their endless dedication and commitment to solving climate change.

Steven D. Allison, UC Irvine Professor, *Welcome*

Steven Allison is a professor of ecology and Earth system science at the University of California, Irvine. His research aims to analyze and predict the functioning of microbes in ecosystems, particularly in the context of global climate change. As principal investigator for Ridge 2 Reef and the Allison Lab, Dr. Allison is an advocate for equity and diversity as well as the responsible application and dissemination of scientific knowledge to address societal challenges.

Randall English, Newport Bay Conservancy President, *Welcome*

Randall English heads up the IT operations at Schneider Electric. In addition to his IT responsibilities, he oversees the company's philanthropic endeavors. He has participated with employees from Schneider Electric on restoration activities in and around the Bay. Randall is an avid outdoorsman and brings a wealth of enthusiasm for environmental issues to the Board. Before acting as the 2018-2019 Board President, Randall has served as NBC's Secretary and Vice President.

John Reager, NASA-JPL Scientist, *Introduction*

J.T. Reager is a Research Scientist at NASA's Jet Propulsion Laboratory in the Earth Sciences Section. He studies the Earth's water cycle with a particular focus on hydrologic extremes, sea level rise and water resources. His primary research interests and ongoing projects include work on the application of satellite gravimetry for terrestrial hydrology, the influence of sub-surface water storage on hydrologic extremes, global water cycle variability and sea level rise, and land surface modeling and data assimilation. He is a member of the GRACE and SMAP mission science teams, and serves as the GRACE Deputy Project Applications Lead. He has won the 2019 PECASE Award, the 2017 NASA Early Career achievement award and the 2016 NOAA David Johnson Award.

Robert Fofrich, UCI Earth System Science, *Climate Solutions Lecture*

Robert Fofrich is a PhD candidate in the department of Earth System Science at the University of California, Irvine. His primary research interests are on coupled human and natural system interactions particularly as they relate to anthropogenic climate forcers, climate change mitigation and adaptation, FEWS (food, energy, and water nexus), biodiversity and habitat loss, and ecological restoration. While at UC Irvine he has been a climate researcher at the Jet Propulsion Laboratory in Pasadena, studying aerosol plume injections from biomass burning, has conducted ecological restoration studies with the Center of Environmental Biology, and is now researching constraints to climate change mitigation and adaptation with the Sustainable Systems Analysis Lab. In addition, Robert is also the conservation chair for the Orange County chapter of the Society for

Conservation Biology where he organizes ecological restoration events with the general public.

Dianalaura Cueto, UCI Civil and Environmental Engineering, *Climate Solutions Lecture*

Dianalaura Cueto is a 2nd year Ph.D. graduate student from the Civil and Environmental Engineering Department at the University of California, Irvine. She earned her bachelor's degree in Renewable Energy Engineering from the Autonomous University of Baja California in Mexico. Before starting her post-graduate studies, she worked in the Environment, Health and Security department at Skyworks Solutions located in Mexicali, Baja California as an Engineering Assistant. Dianalaura is a current fellow of the Mexican Graduate Research and Education Program and a graduate trainee in the Ridge to Reef Training Program at UCI, where she continues her formation as a professional to create, implement and promote solutions that solve current energy and environmental issues.

David Bañuelas, UCI Ecology and Evolutionary Biology, *Climate Solutions Lecture*

David Bañuelas, born and raised in Southern California, formed a close connection with the outdoors at an early age, influencing him to pursue environmental science at Whittier College. After receiving his BA, he worked for the Bureau of Land Management conducting large-scale restoration projects. While pursuing his master's degree in Regenerative Studies at Cal Poly Pomona, David was the inaugural Farm to School Coordinator for the Upland Unified School District. Currently, David is a doctoral student in the Ecology and Evolutionary Biology program at UC Irvine. He is poised to translate his research into novel management strategies to control invasive plants species in the Upper Newport Bay and beyond.

Joana Tavares-Reager, UCI Earth System Science, *Climate Solutions Lecture*

Joana Tavares-Reager is a graduate student at the University of California, Irvine working on a Ph.D. in the field of Earth Science. She holds a M.S in Marine Studies from the University of Delaware and a B.S. from Federal University of Rio Grande in Brazil. She has taught at Long Beach City College and Orange Coast College in the area of oceanography. She has worked as the Community Education Coordinator and Curriculum Developer for the Amigos de Bolsa Chica in Huntington Beach. Joana is particularly keen on promoting strategies that promote water quality through integrated management practices and bottom-up approaches, such as Community Science programs and innovative public education and outreach projects.

Tiffany Eng, CEJA Green Zones Project Manager, *Keynote*

Tiffany Eng is an Oakland native, an educator, and a policy advocate who has organized alongside youth and families in California for over twenty years. As the Green Zones Program Manager at the California Environmental Justice Alliance (CEJA), she supports the groundbreaking initiatives that local communities are leading to transform polluted and under-invested areas into healthy and vibrant neighborhoods. Through CEJA's Green Zones initiative, Tiffany has guided the

alliance's work on the Transformative Climate Communities (TCC) program and SB 1000 (Leyva, 2016) advocacy and implementation work. She is a co-author of the SB 1000 Implementation Toolkit in partnership with PlaceWorks, as well as CEJA's 2018 report entitled CalEnviroScreen: A Critical Tool for Achieving Environmental Justice in California.

Heather Cieslak, Newport Bay Conservancy, *Event Coordinator*

Heather Cieslak grew up in Illinois and moved to California after graduating from Northern Illinois University with a BA in Marketing. Previously, Heather was the Finance and Operations Manager with Amigos de los Rios, a nonprofit committed to protecting and restoring open space in urban environments, specifically in East LA County. Prior to that, Heather spent a number of years as Associate Director with the National Assistance League, responsible for marketing, fundraising and administration to support their 125 chapters nationwide. Also while at NAL, she pursued her MPA in Nonprofit Organizational Management from California State University Northridge. Since October 2013, Heather has been NBC's Operations Director.

Adrianna Burton, Ridge 2 Reef, *Communications Coordinator*

Adrianna is an undergraduate at the University of California, Irvine, seeking a degree in English and Film & Media Studies. Adrianna's personal passion for environmental justice has led to her position as the Communications Specialist for Ridge 2 Reef and the Master's in Conservation and Restoration Sciences at UCI.

Raisha Lovindeer, Ridge 2 Reef, *Art Coordinator*

As a scientist and musician, Raisha believes art and science belong together. A native of the island of Jamaica, she knows first-hand how climate change threatens vulnerable communities, and also the impact of art as a vessel for communication. Now, pursuing her PhD in Earth Systems Science with the Mackey Lab at UC Irvine, she helps understand the ecosystems of marine algae and how they affect coastal communities. She is a 2019-2020 Fellow of Ridge 2 Reef, a program that facilitates inter-disciplinary research and training in urban ecosystem management. Raisha holds a bachelor's degree in Zoology & Botany from the University of the West Indies, and a master's degree in Marine Sciences from Stony Brook University. She has spent close to two decades mentoring students in music, performance, & theatre production in Jamaica.

Carl Norlen, UCI Ecology and Evolutionary Biology, *Mentoring Coordinator*

Carl Norlen is a scientist and educator who has advocated for equity and diversity in science for the past 10-years in Atlanta and Southern California. As a PhD student in ecology at University of California Irvine, his research aims to analyze and predict the functioning of ecosystems in the context of global climate change to address the environmental problems facing California.

Julie Ferguson, UC Irvine Professor, *Online Curator*

Julie Ferguson is a Teaching Professor in the Department of Earth System Science at the University of California, Irvine. She holds a PhD in Earth Sciences from the University of Oxford. After moving to this area 10 years ago, she enjoys having good weather all year round to hike and enjoy the outdoors. She also aims to highlight the various research projects that are being carried out in the area, such as the spread of invasive species and the impacts of sea level rise.

Robin Madrid, California Department of Fish and Wildlife, *Online Curator*

Robin Madrid works for the California Department of Fish & Wildlife (CDFW) at the Upper Newport Bay Ecological Reserve in Newport Beach. She is the Education Program Coordinator at the Back Bay Science Center and has been with CDFW since 2000. Robin has a deep passion for nature and conservation and this drives her determination to make a positive difference for the environment. This message is woven into all of the programs at the Back Bay Science Center with the intent to teach visitors about the ecological importance of estuaries, while incorporating human dimensions as well.

Conference Steering Committee

We would like to thank the steering committee for their tireless leadership and excellence in making this conference a reality.

David Bañuelas, UCI Ecology and Evolutionary Biology

Dr. Peter Bryant, Newport Bay Conservancy

Robert Fofrich, UCI Earth System Science

Robin Madrid, California Department of Fish and Wildlife and Back Bay Science Center

Taylor Sais, Newport Bay Conservancy

Joana Tavares-Reager, UCI Earth System Science and Newport Bay Conservancy

1. The Vision

The vision of this conference is to connect climate scientists from the University of California, Irvine (UCI), ecosystem stewards from Newport Bay Conservancy (NBC), and members of the broader public to answer the question: what more can we be doing to solve climate change?

This conference connected the Newport Bay Conservancy with researchers at University of California Irvine in the the Ecology and Evolutionary Biology, Earth System Science, and Civil and Environmental Engineerings Departments, as well as the Ridge to Reef (R2R) Urban Ecosystem Management graduate training program.The team designed a conference that advocated actions achievable by average community members, encouraged a hope for change, and equipped participants with the information to take action.

Our conference began with morning talks on climate mitigation strategies such as reforestation, regenerative agriculture, soil management, blue carbon, pros and cons of various forms of alternative energy, carbon capture, risks and potential of geo-engineering proposals and individual changes to everyday behaviors and lifestyle. The conference continued with afternoon exhibits by community partners and presentations by local K-12 and community college students. Community college and high school students crafted engaging, well researched presentations with mentorship from UCI graduate students. We provided lunch, childcare, and entertainment to encourage engagement from and socialization between diverse community members. To support continued action towards climate change solutions, attendees will be invited to a series of targeted follow-up events and updated through informational social media posts.

2. Climate Communication

In order to ensure climate change enthusiasts, from concerned residents to academics, would take away valuable lessons from our conference, our speakers shared feedback on talks as a group several times for the conference. Additionally, we included a mix of speakers ranging from theoretical research from NASA-JPL scientist John Reager and a group of UCI graduate students, to our keynote presentation by California Environmental Justice Alliance (CEJA) project manager Tiffany Eng on the day-to-day struggles and political resistance inherent in combating climate change..

In addition to our speakers, we aimed to provide conference preparation materials for climate enthusiasts of all levels at our Climate Solutions Online Resources Hub, https://r2r.bio.uci.edu/climate-solutions-online-resource-hub/. This resource guide is a collection of references (i.e. videos, scientific papers, websites, etc.) specifically related to climate change, with an emphasis on solutions. It is filled with science-based information from highly reliable sources, particularly because this subject can often be confusing, misleading, polarizing, and highly political.

These resources were carefully selected and screened by scientists and educators to streamline and clarify the vast information available on this topic. It is intended to better prepare and inform conference participants both pre- and post- event. The content has been divided into three categories (beginner, intermediate and expert) to match a wide array of knowledge and interest levels. There is overlap within these levels, but hopefully everyone who utilizes this guide will benefit from these resources and learn something new.

3. Community Engagement

In hopes of uniting a diverse community we partnered with community organizations and entertainers for our afternoon activities. While our speakers were informational, our booths and attractions were aimed at fostering a sense of community within attendees, to model the need for a collective fight for climate action.

Community Partners

We would like to thank all our community partners for their assistance at check-in and engagement with our attendees at various booths and activities:

- Amigos de Bolsa Chica
- Importance of Wetlands, Pacific Flyway, & Blue Carbon
- Zero Waste at Irvine Valley College
- Carbon Capture and Sequestration at Orange Coast College
- Climate Policy Team
- Voter Registration
- Meatless Monday at Segerstrom High School
- Behavior Change & Message Framing at Segerstrom High School
- Sustainable and Impact Investing
- Climate Change Chorus Challenge at Irvine Valley College
- Climatepedia Pledge Board
- EcoNow, OC's 1st Zero Waste Shop & Refill Station
- Citizens Climate Lobby
- Climate Reality Project: Orange County, CA Chapter
- Community Choice Energy
- Bick Law LLP
- Road for Climate Action
- Bolsa Chica Conservancy
- U.S. Fish & Wildlife Service
- Newport Bay Conservancy
- Schneider Electric
- Ridge 2 Reef

Artists

We were grateful to benefit from several artists' contributions to our conference. From photos to sculptures, community artists concerned by climate change displayed their work.

In the Fine Arts department at Orange Coast College, Professor Roger Whitridge presented "No Man is an Island unto Himself," an oil on canvas painting. Professor Whitridge's current work deals with Order and Chaos as it affects wildlife, environmental issues and philosophical conundrums.

Katherine Wong, a student from Irvine Valley College, displayed "Blue mannequin wrapped in cords of technology," a photograph depicting a blue mannequin wrapped in cords of technology in front of greenery. She was inspired to create this photograph because, "as humans, we are so caught up in our day-to-day life, much of that is on our devices, that we forget to see the bigger picture, the future."

Grace Yoon, a student from Orange Coast College, presented four pieces as a part of her *Wasted Foods* series. Yoon's intent is to start a conversation that supports environmental mindfulness and encourages the community to join in, continue the dialogue and do not let the mold create trepidation.

Professor Will Hare from Orange Coast College displayed two pieces, which are excerpts from his 2040 Vision series. In Professor Hare's 2040 Vision series of 20 photos, he illustrates what normally heavily populated places would be like without people. His work can be viewed at https://www.hare.photography/2040.

Artist and NBC Volunteer Naturalist Jamie Perlman exhibited a sculpture, “Hope for Soil Health.” Perlman’s piece portrays hope for increase in soil health despite exposure to environmental toxins. Her artwork features clearer lifestyle insights for those keen to move closer towards an environment value and eventually act on it.

From UCI’s Climatepedia organization, activist Emily Lui displayed conference posters.

Live Entertainment

How do we talk to family members, friends or coworkers who doubt that climate solutions are necessary? Comedian Aubree Sweeney, https://www.luvthatdog.com/, helped our audience find their own answers to that question through humor in the face of such devastating topics. Aubree is a nationally touring comedian who discusses the hard stuff with engaging, high-energy storytelling.

American soul songstress Hannah Rooth, part of musician group Wild Hum (https://wildhummusic.com/), aspires to use music to build communal power through intimate connection. Hannah weaves webs of musical inspiration and social change in Orange County, CA. Hannah joined us in support of climate change, community spirit, and OC activism.

Outreach

As part of our mission statement, we engaged our diverse community by creating effective, understandable science communication and services for our attendees. The entire conference was complimentary, including, a vegetarian lunch, child-care during the morning, and parking. The intention behind free services was to provide support for attendees from diverse segments of our community. We worked to make the conference as actively inclusive of community members regardless of economic status, age, race, disability, gender, marital status, immigration status, sexual orientation, native language, educational background, and so on.

In partnership with NBC and R2R, our event committee maximized outreach on Instagram and Eventbrite. Our social media team, @climatesolutions2020, highlighted a series of quick climate facts. Additionally, our conference partners increased the reach of our posts on a range of social media platforms (Twitter, Facebook, Instagram, and Eventbrite). We also promoted the event through organizational mailing lists, contacts with local OC college educators, and flyers at Irvine Valley College (IVC) and UCI with help from IVC's Green Team and UCI's Climatepedia. Social media and promotion relied on accessible, captioned images in both English and Spanish.

A follow-up article by Joana Tavares-Reager will be printed in NBC's TRACKS newsletter, which will be mailed to about 1,500 donors, volunteers, and community partners.

4. Mentorship

The conference team engaged and empowered UCI graduate students as mentors to guide the process and choose presentation topics. The style of the presentation and research was conducted with the mentee, and mentors supported the process by brainstorming possible presentation styles and strategies to guide their students with a concrete frameworks

In December, mentors engaged with their teams of three to five students to prepare their exhibits. Each team had one to two mentors. The estimated time commitment for mentees was approximately 10 hours, while mentors were expected to contribute anywhere from 10-20 hours. Mentors were responsible for the following:

1) Help students frame their driving questions/ goals for their presentations.

2) Assist students in identifying the 3-5 key pieces of peer-reviewed literature that they will use to guide the content of their exhibit (i.e. published papers, IPCC/ UN reports, other reliable technical reports).

3) Help students digest the most important concepts they need to share with the conference attendees during their presentations.

4) Ensure that the communication strategies chosen by the students are in fact effective (e.g. poster presentation, hands-on activity, discussion, etc.).

5) Keep students motivated, encouraged and engaged!

Mentors hosted a campus visit day at UCI to facilitate group work and motivate mentees. Students explored opportunities for future education through campus and lab spaces as well as mentoring for individual graduate students. Each presentation team met in small groups leading up to the event. Mentors and mentees discussed research topics and strategies, created visual aides, and developed science communication skills.

Personal student testimonies highlighted the impact of mentorship for future events. Feedback includes:

- I would have never known about all the programs that Irvine has planned and it gives me hope that we as a city can really change things for the better
- I learned a lot through this research and was a little disappointed to see a lack of statistics and evidence to show the positive effects of the bill and its policies.
- This project reminded us that everyone plays a part in climate change, and thus, that everyone needs to play a part in the creation of solutions for fighting climate change.

Refer to Appendix B: Mentorship Reports for student success outcomes and presentation reports.

5. Lessons Learned

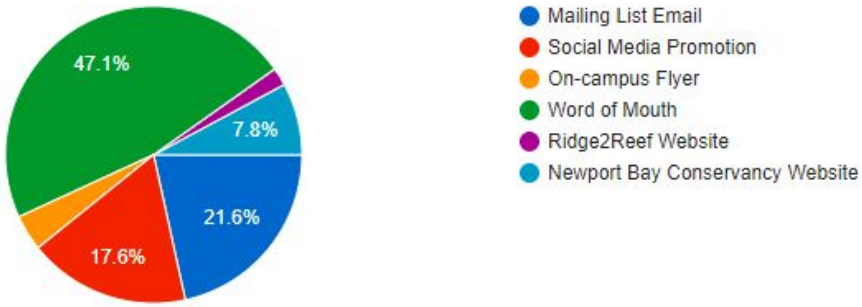
In hopes of facilitating future climate conferences, this section emphasizes best practices and methods of improvement. Our main takeaways in organizing this event included:

- To maximize and increase community engagement and attendance, we recommend creating an organization committee at least six months before the conference date (e.g. August for February conference).
- The day of the conference, we had about 70+ interested participants on our waitlist. However, on the day of the event, we were under our 300 maximum capacity. In order to ensure attendance, it may be best to over-book by approximately 60 tickets, create an enhanced waitlist, or increase event space.
- While we attempted to advertise the conference to students, our approach would have been more effective if we had reached out to OC community college professors when classes are in session (before December).
- Part of our conference goals were to redefine what a “scientist” and “activist” look like. In order to diversify attendance and make a welcoming event, we were able to provide child care. We provided vegetarian options during lunch, but OCC could not guarantee vegan options.
- Our pre-event survey suggests that Instagram and Facebook are the most effective social media platforms for promoting similar events, while word of mouth was the most effective method of invitation. Due to local wetlands, approximately 18% of attendees were interested in learning more about our natural landscape. On the whole, however, 22% of attendees were interested in learning general climate information and 31% were interested in environmental justice and policy. Information geared towards solutions and community involvement, versus specific research, was most effective.
- Mentorship is a key component to this event’s success. While we hoped to increase engagement with the community at large, keeping a narrow focus on students at both the high school and college level not only engaged other attendees at the conference, but helped foster a new generation of passionate climate scientists.

Appendix A: Survey Results

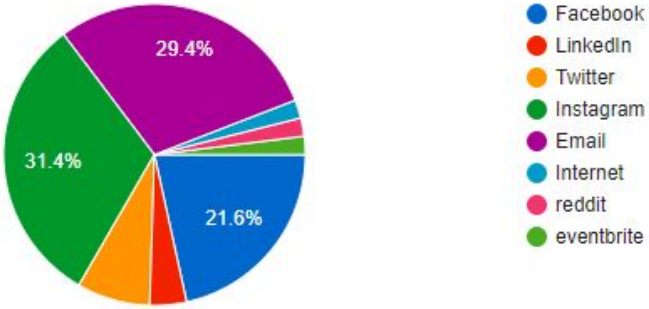
How did you hear about the event?

51 responses



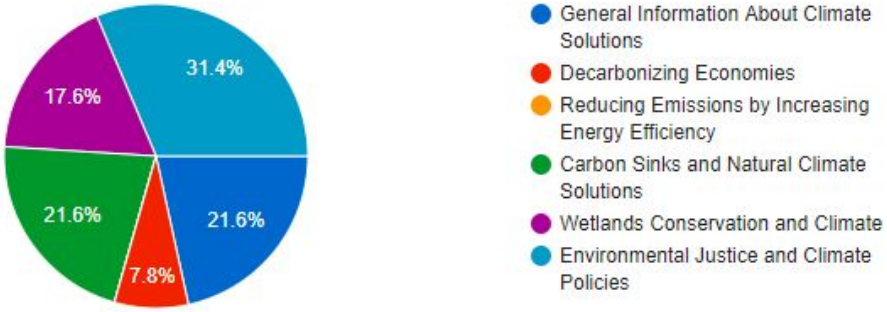
Which social media platform do you prefer?

51 responses



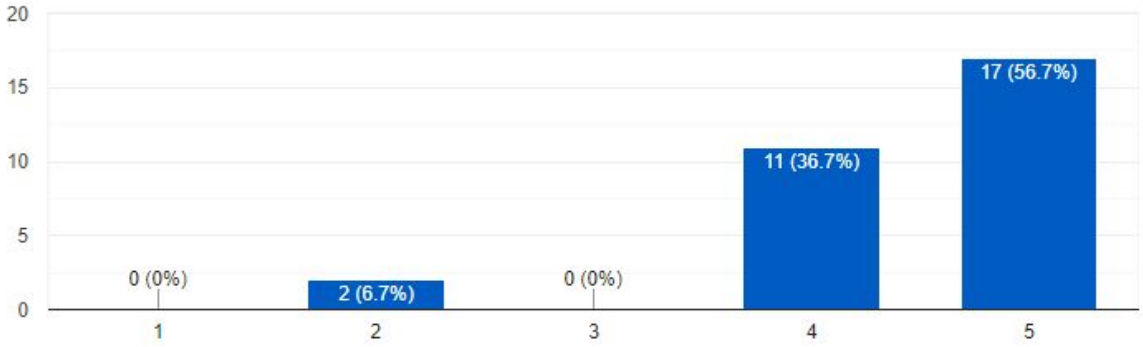
What speaker topics are you looking forward to most?

51 responses



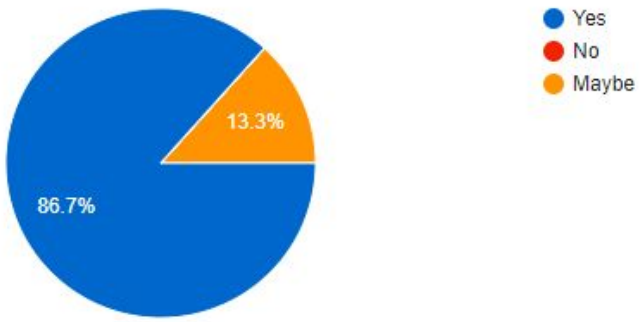
What is your level of satisfaction for this event?

30 responses



Are you likely to participate in one of our events in the future?

30 responses



Appendix B: Mentorship Reports

B.1 Climate Policy Group

Shane Coffield, *UC Irvine Earth System Science* (mentor)
Katelyn Thang, *Irvine Valley College*
Joelle Rango, *Irvine Valley College*
Rebecca Gutierrez, *UC Irvine*
Alina Fatima, *Irvine Valley College*

Objective

Our group created an exhibit to compare and contrast climate policies at four different levels of government: local (Irvine), state (California), federal (US), and international. At each level, we chose one predominant policy to analyze and weighed the pros and cons.

Main Findings

Local level: Irvine's Sustainable Community Initiative is an umbrella term for the sustainable, environmental plans being carried out by the Green Ribbon Environmental Committee. The initiative was adopted in 2010 and is updated quarterly to implement new plans and programs such as a county wide renewable energy program or the OC Great Park's sustainability program. The programs are funded by grants given at the state and county levels. It was found that at the city level, policies are easier to manage and therefore more effective than at other levels of

government. Irvine has many plans being put into action since the adoption of this policy but not much evidence to support that they were effective.

State level: At the state level, the most relevant bill is the California Senate Bill 32 which went into effect January 2017. The bill requires a 40% reduction in greenhouse gasses below the 1990 levels by 2030. The California Air Resource Board is in charge of bringing about this change. Many low income communities or communities of color are affected by this, as many big polluters/factories are located near these communities and thus pose a health hazard to them. The CARB has many policies and ideas to achieve the goals stated by the bill. One of the most well known being Cap-and-trade. The issue with Cap-and-trade is that polluters can buy their way out and thus continue to pollute. Another example of one of CARB's ideas is to have a tax incentive for people who purchase electric cars.

Federal level: The Green New Deal is a proposal to meet the targets of the Paris Agreement (see below) for 2100. It was introduced to Congress in February 2019. It would cost roughly $50-90 trillion, funded by military budget cuts, a tax increase on incomes over $10 million, and a carbon tax. So far it has support from 111 Democratic members of Congress. A less aggressive but bipartisan bill is the Energy Innovation and Carbon Dividend Act (EICDA), a market-based approach with a carbon tax where the revenue is returned directly to the people.

International level: The Paris Peace Agreement is an environmental accord that was adopted by almost every nation in 2015, that aimed to substantially reduce global greenhouse emission in an effort to prevent the global temperature rise this century to 2 degrees Celsius above pre-industrial levels, while limiting the temperature increases to 1.5 degrees historic climate. Each country in the Paris agreement is shooting for a 40% reduction of C02, the U.S announced that in 2014 its intention to reduce its emissions 26–28 percent below 2005 levels by 2025. The agreement also aims to mitigate and increase resilience in countries with emerging economies. The funds towards this mitigation will be 100 billion dollars.

Personal Reflections

- Katelyn: I believe that there is always room for progress. I already knew that at the international and federal levels, these policies were not working. I would have never known about all the programs that Irvine has planned and it gives me hope that we as a city can really change things for the better. I also realized that voting really does matter and everyone should vote if they want change.
- Joelle: The Paris agreement must have the most challenging treaty to make so that everyone can benefit from it. As much as this plan has great initiative, they are not being open and honest about the progress they have made, if any. There is the issue of insufficient data about what they are doing. Lack of accountability is also a big theme in the Paris agreement, countries that do not follow the terms of the Paris agreement are not sanctioned or given any sort of punishment.
- Rebecca: Although I was quite disappointed to find that there was a lack of efficacy on the policies we studied, I believe that being able to pinpoint that a lack of detail in the legislation and not enough accountability taken being the main issues outlines a clear way to improve further legislation. Another main takeaway was that in order to make progress

on implementing climate policies, climate change needs to be seen as a bipartisan issue (which it is, we all live on Earth) rather than just a progressive/liberal one.

- Alina: I learned a lot through this research and was a little disappointed to see a lack of statistics and evidence to show the positive effects of the bill and its policies. I already had some idea that a lot of global warming issues are more economic, but after research I have realized that money is probably the principal cause of lack of progress (for example, cap-and-trade). Although the bill itself does not seem very affirming, I believe that there are still ways to help and that we must have an optimistic outlook.

B.2 Meatless Mondays Group

Ashton Bandy, *UC Irvine Earth System Science* (mentor)
Dewey Duong, *Segerstrom High School*
Chloe Le, *Segerstrom High School*
Kimberly Bonilla, *Segerstrom High School*
Daniela Mondragon, *Segerstrom High School*
Yadira Zenteno, *Segerstrom High School*

Objective

Our team's goal for the presentation was to encourage, if not, persuade the general public to go meatless at least one day out of the week. Some driving questions that were a part of our topic were, "Have you ever participated in meatless Mondays?", "Are you aware of the drastic effect meat has on climate change?", "Did you know that eating one kilogram of beef is equivalent to 67,000 miles driven by an average passenger?", and "Do you know how much water goes into the meat industry?"

Main Findings

The main findings of our research were how a vegan/vegetarian diet can help reduce a person's carbon footprint associated with the impact of land use, water use, and global emissions. There are many misconceptions surrounding plant-based diets. Many people believe that switching to a plant-based diet results in reduced strength. However, research shows that switching diets results in better blood flow, reduced inflammation in muscle tissues, reduced risks of diabetes, reduced obesity, and reduced risks of cancer. People also believe it is difficult to consume enough protein while following a plant based-diet. We learned that the average person who follows this diet receives about 70% more protein than needed daily. Cost is also a big concern for people who consider going plant-based because it is believed that this diet is more expensive. What most people don't know is that avoiding processed foods as well as avoiding eating out will result in cheaper meals. It is also helpful to buy whole foods in bulk, like grains and beans. A vegan diet, therefore, can be both cost effective and healthy. Deforestation is a driving cause of climate change due to the massive amount of carbon dioxide being emitted back into the atmosphere. When deforestation takes place, erosion and degradation occur and the carbon sink in the biomass of the trees are diminished. All the sequestered carbon dioxide is subsequently released, which contributes to atmospheric carbon dioxide levels. Deforestation is occurring as a direct result of needing more land area in order to produce livestock feed. The overall emissions that come from global land use change is 18%. In order to help prevent this from happening, you can reduce your meat intake and adopt a more plant-based diet. When comparing the amount of land cleared for a plant-based diet to a meat-based diet, 1.5 acres of land cleared yields only 375 lbs of meat compared to an astonishing 37,000 lbs of plant-based foods. This change is beneficial to both human health and the health of the Earth.

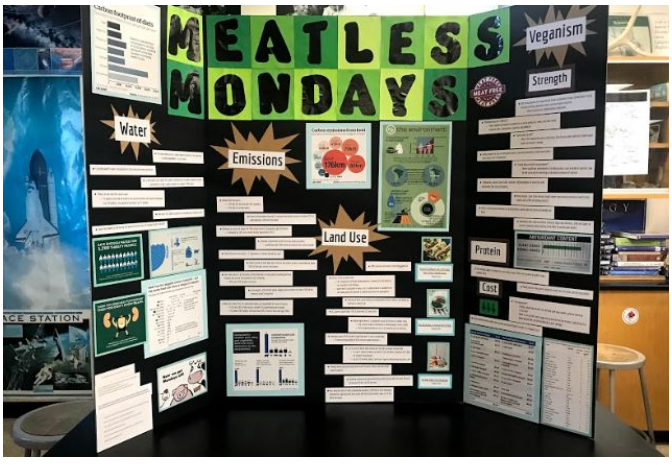
The meat industry uses a large amount of water to raise livestock. Because of our growing population and increasing effects of climate change, longer and more intense droughts as well as increased water scarcity are predicted. A quarter pound burger takes about 425 gallons of water to produce and that is equivalent to the daily water requirements of approximately 1,700 people. This is also equivalent to about 6,800 glasses of water. Plants do not need this much water. For example, only 25 gallons are used to produce one pound of wheat. 30 gallons are used to produce one pound of potatoes. 22 gallons are used to produce one pound of tomatoes. Therefore, by having at least one meatless meal, you can make a huge difference in water use. You can save up

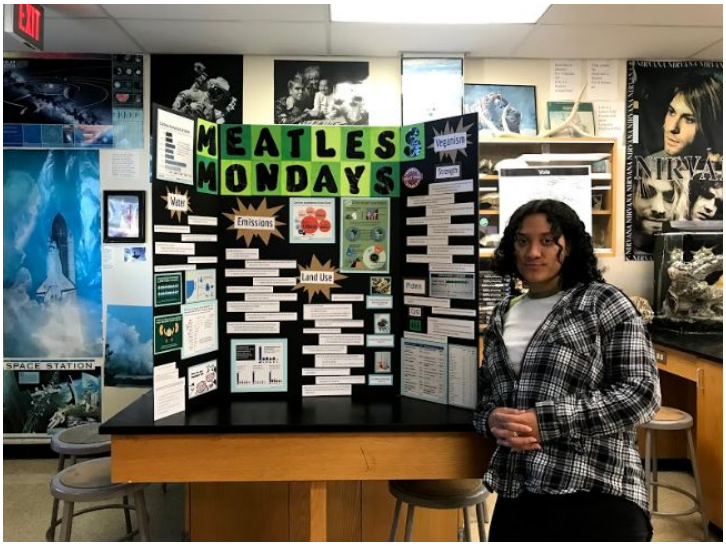
to 133 gallons of water just by eating one meatless meal. You can save more water by not eating one pound of meat than not showering for 6 months.

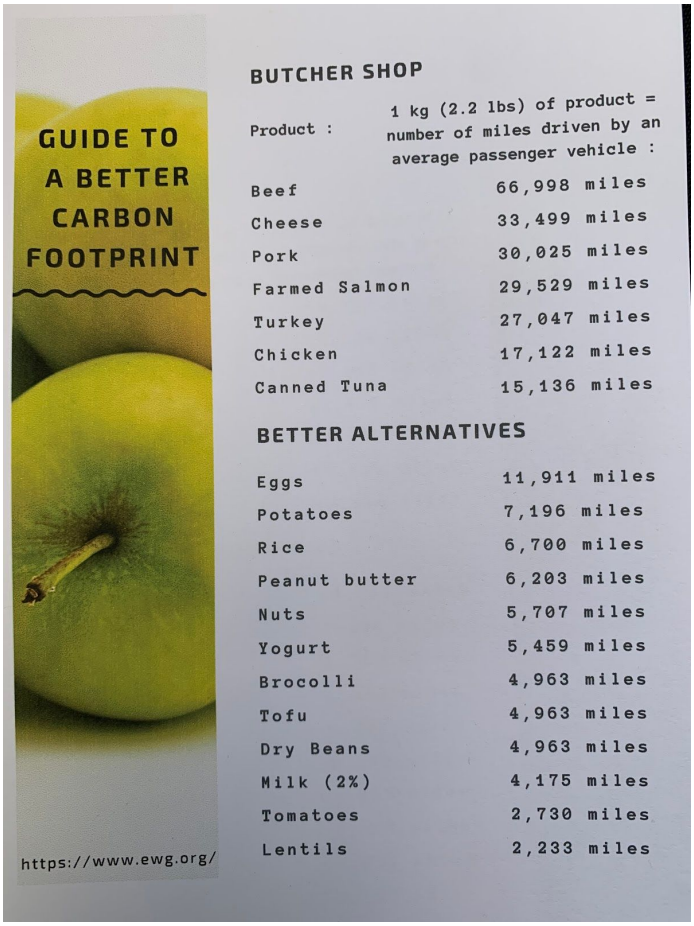
When producing meat, many emissions are released into the air to contaminate the environment and land we are living in. The main findings were that 51% of greenhouse gas emissions are due to livestock and their products. Two main sources of emissions are feed production & processing (including land-use change) and enteric fermentation from ruminants, which is 45% and 39% respectively. Cattle (raised for both beef and milk) are the animal species responsible for about 65% of the livestock sector's emissions. Methane accounts for about 30-40% of agriculture's greenhouse gas emissions. Going meatless on Mondays or any other day can help reduce emissions. An individuals going meatless any day of the week can help because they would be stopping 1,915 pounds of greenhouse gas emissions.

Personal Reflection

As a whole, our group felt that this conference was both enlightening and exciting. As we are still in high school, this was the first time, for all of us, to present in such a formal atmosphere filled with like-minded individuals who also want to make a difference for our environment. In addition, we had the opportunity to meet various types of people of different ethnicities, perspectives, and altogether a diverse body of environmentalists. We were also given the opportunity to educate a number of PhD students with our research and infographics, and it really showed how critical information is hidden from a huge portion of our society. In summation, this conference was a once in a lifetime opportunity and a great journey.







GUIDE TO A BETTER CARBON FOOTPRINT

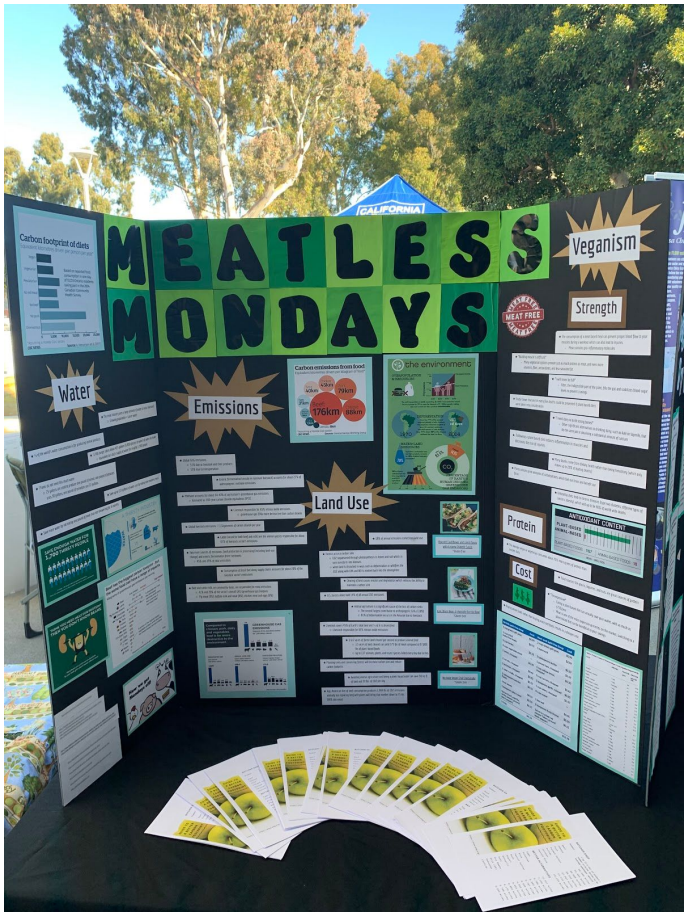
https://www.ewg.org/

BUTCHER SHOP

Product :	1 kg (2.2 lbs) of product = number of miles driven by an average passenger vehicle :
Beef	66,998 miles
Cheese	33,499 miles
Pork	30,025 miles
Farmed Salmon	29,529 miles
Turkey	27,047 miles
Chicken	17,122 miles
Canned Tuna	15,136 miles

BETTER ALTERNATIVES

Eggs	11,911 miles
Potatoes	7,196 miles
Rice	6,700 miles
Peanut butter	6,203 miles
Nuts	5,707 miles
Yogurt	5,459 miles
Brocolli	4,963 miles
Tofu	4,963 miles
Dry Beans	4,963 miles
Milk (2%)	4,175 miles
Tomatoes	2,730 miles
Lentils	2,233 miles



B.3 Climate Communications Group

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Objective

Our team's goal for the presentation was to enlighten people on how they can communicate climate change in a way that they will make an impact on the individual. We hope that by spreading the message of the climate crisis to the general public, people will take the initiative to make a change in their and others' way of living.

Driving Questions: What is the most effective way of communicating with people about climate change? How will people hone that information to further spread the message and address the climate crisis?

Main Findings

First and foremost, communication requires an intense understanding and acknowledgment of others' points of view.

Climate change is the world's problem, not necessarily a first or third world country problem. We can either contribute to the crisis in a negative or positive light depending on how we perceive the crisis; we must all work together to help.

Climate communication can be effective even for those who don't already believe in climate change if you shed light on the situation effectively by strongly connecting it to their personal lives. For example, if they like visiting the coral reefs or one day their goal is to visit one, you can mention how possibly by the time they want to go the coral reefs will be gone, due to ocean acidification. Once they realize what they could lose, you can then give them some possible solutions to implement to help keep these resources around.

Approach people with the idea of small solutions in mind to help the crisis. People feel more in power and in control of small things; let them know of any small things they can do to help. These small solutions can accumulate to something bigger than expected.

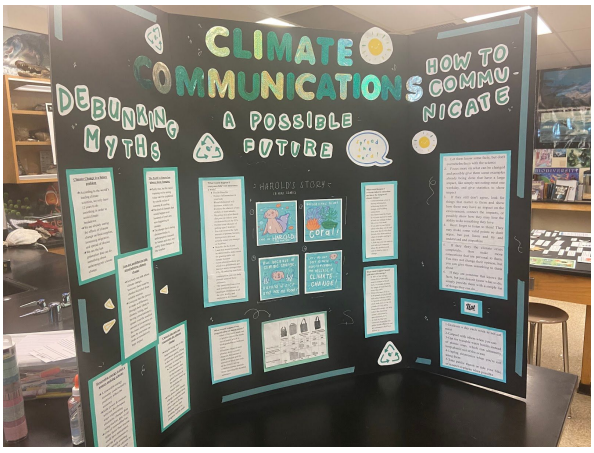
Although there's plenty of information on the internet regarding climate change, make sure your information and resources are accurate and reliable. Some information may be misinterpreted or incorrect and can spread myths such as climate change being a future problem and not something

that needs to be faced in the present or that climate is always changing and thus there is not a problem, etc.

Social media is a powerful resource that may be used to spread messages about the climate crisis to the masses, and it is important to use it correctly and effectively.

Personal Reflection

As a team, we feel that the Climate Solutions Conference helped us better understand climate solutions because we were presented with both new and familiar information about how climate change started and where it is taking us as a species. It reminded us that everyone plays a part in climate change, and thus, that everyone needs to play a part in the creation of solutions for fighting climate change. It has made us more confident as public speakers and presenters because it gave us an unforgettable experience of talking with academic personnel, officials, and the general public; we feel the need to deliver the message more passionately due to this experience. Additionally, we were exposed to information that allowed us to strengthen our belief in reducing our carbon footprint and being a part of the solution for climate change. This has made us more observant and cautious of our actions and the impacts on the environment. Overall, from this experience, we learned that there are many things we can do in everyday life that can range from using a reusable water bottle to reducing our use of single-use plastics, and that these little things can amount to a large impact, especially when you look at it from a global standpoint.


CLIMATE COMMUNICATIONS
DEBUNKING MYTHS
A POSSIBLE FUTURE
HOW TO COMMUNICATE


THIS IS HAROLD!
(the sea dog)


Harold likes to eat
coral!


But because of climate change,
RIP...
RIP...
Harold is sick and has no food :(


Let's do our part to help Harold & spread the MESSAGE of CLIMATE CHANGE!