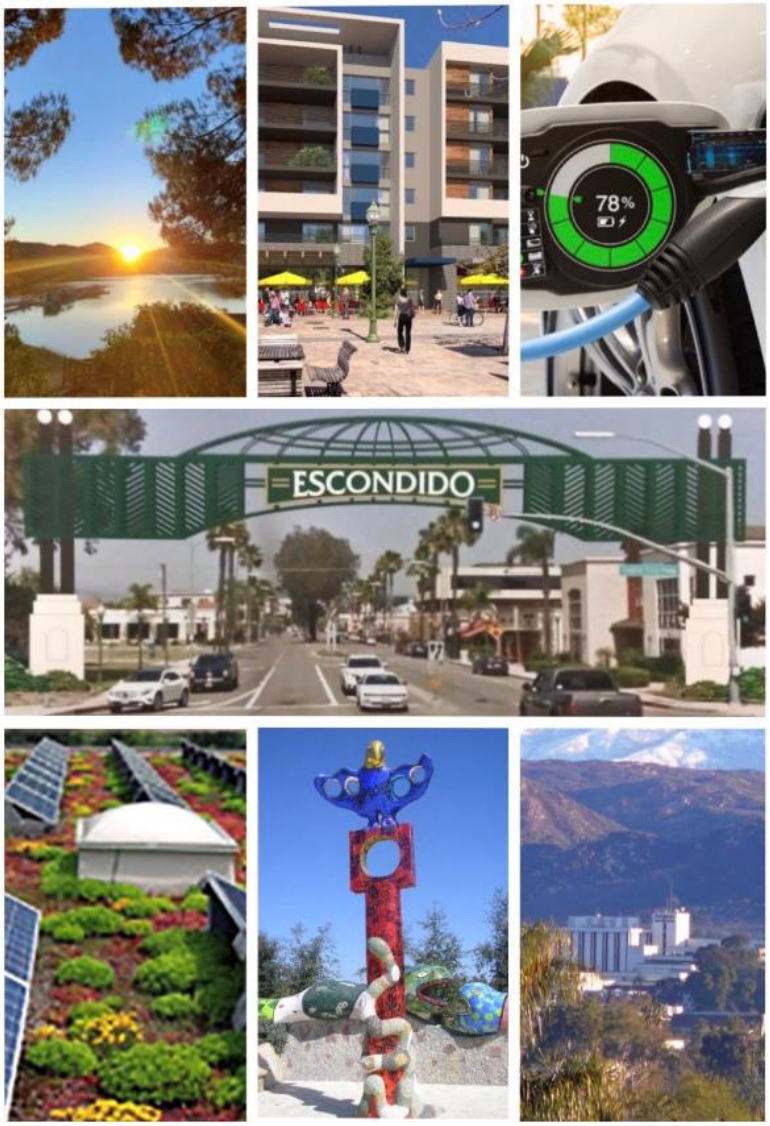
Escondido Community Advisory Group Subcommittee
Summary of Research for Effective & Equitable E-CAP

Community Recommendations for Escondido Climate Action Plan Update

2020



Contributors: Tim Swift, Kate Barba, Richard Miller, Matt Vasilakis, Nathan Serrato, Vickie Castillo-Mercado, Laura Hunter, Charlie Jungk, Aisha Wallace-Palomares, Patricia Borchmann, Marian Sedio, Phil Church

Climate Impacts in San Diego County

San Diego County boasts many unique characteristics, which among other variables, all determine vulnerabilities to climate change and related adaptation measures. San Diego County will be confronted by increasingly warmer average temperatures, more frequent and more intense heat waves, more droughts but with occasionally increased heavy rainfall events and floods, continuing Santa Ana winds and wildfire threats. The impacts will play out in different ways across the complex terrain and differing climates within San Diego County, and ultimately will have an impact on our ecosystem, one of the most biodiverse in the US.

Future changes in global and California temperatures will depend on the accumulation in the atmosphere of carbon dioxide and other heat-trapping gases emitted from human activities. The emissions and buildup of greenhouse gases (GHGs) could take a range of pathways, depending on the success of international and combined local efforts to reduce GHG emissions. The warming experienced under different future conditions are projected using Representative Concentration Pathways (RCPs). The Fourth Assessment uses two RCPs from the Fifth Intergovernmental Panel on Climate Change (IPCC), one of which is a "higher emissions pathway" (RCP 8.5), commonly understood as a business-as-usual (BAU) scenario, and one that's a more "moderate emissions" pathway (RCP 4.5).

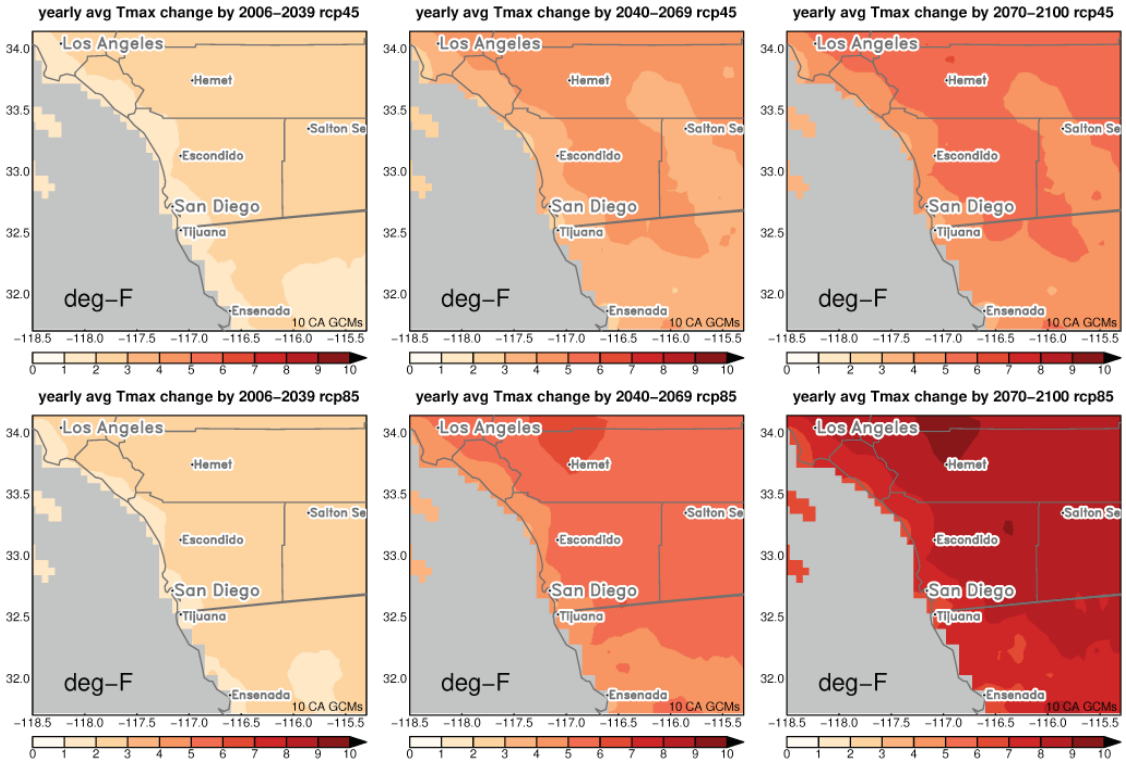
2018 CA 4th Climate Change Assessment: San Diego Regional Report
Climate Science Alliance: San Diego County Ecosystems: The Ecological Impacts of Climate Change on a Biodiversity Hotspot

Climate Science Alliance Report Highlights

- San Diego County is part of a biologically diverse and unique landscape that will be impacted in multifold ways due to current and future climatic variability.
- More frequent and more intense heat waves may disproportionately affect younger age classes and reduce reproductive and survival rates of species sensitive to temperature extremes.
- The region's precipitation regime is projected to become more variable with more dry days and more dry years. However, the few extremely heavy precipitation events, increased over historical levels, could result in increased flooding and occasional wet years.
- Drought may occur more frequently due to increased occurrence of dry days and could intensify because of warmer temperatures. Since drought disproportionately affects some species, these projected changes may cause structural changes to ecosystems.
- Annually, the occurrence of Santa Ana winds during increasingly dry fall months would create ideal fire conditions. Longer dry spells and decreased precipitation in fall may extend fire season into the winter, increasing the risk of Santa Ana wind-driven fires. Regardless of climatic shifts, people will remain the major driver of fires in San Diego
- Effective conservation actions will need landscape-scale planning rather than more traditional single-species approaches. To carry this out will require cross-jurisdictional, multidisciplinary efforts by scientists, policy makers, planners, land managers, and the broader conservation community.

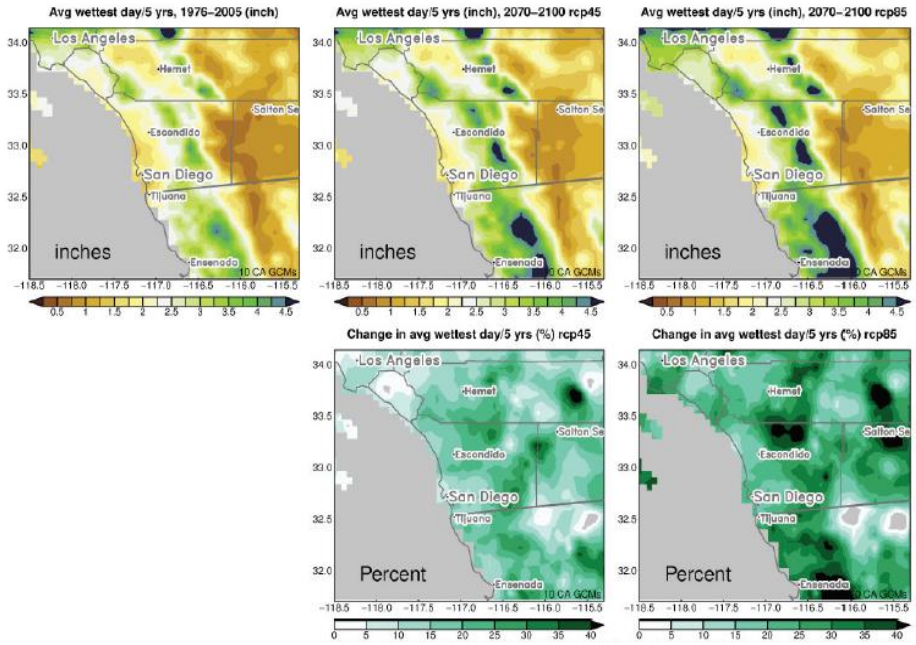
HEAT

Temperatures are projected to increase substantially, by 5˚F to 10 ˚F by the end of the 21st century. Heat wave events will increase, be hotter, and last longer. The map below is showing the average T-max increase at early, mid & end of century, relative to 1976-2005 climatology for RCP 4.5 (top) and RCP 8.5 (bottom). Historically, the average hottest day per year was in the range of 90-100 ºF at the coast and 105-115 ºF in the deserts. At the end of the century, under RCP 8.5 (ie "business as usual), the average hottest day per year is projected to increase to 100-110 for the coasts and 110-125 ºF in the desert respectively

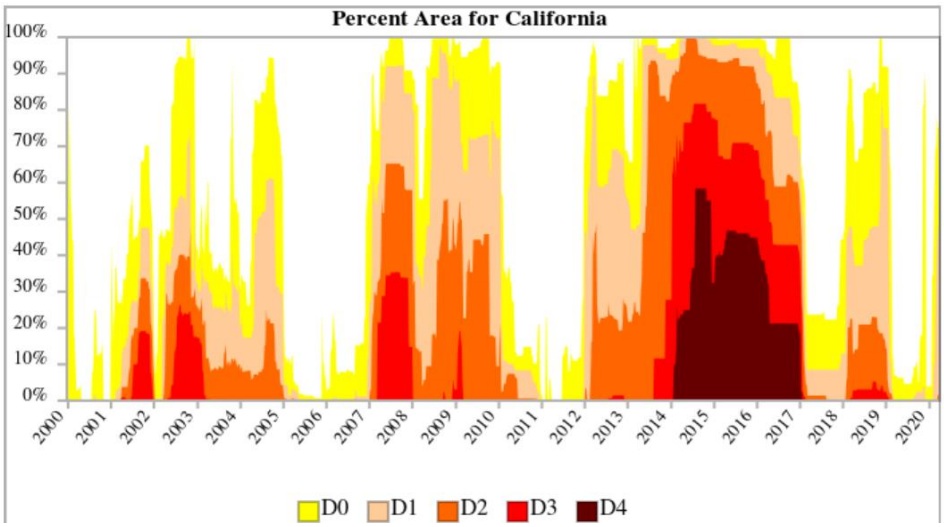


RAIN/DROUGHT

By mid-21st century, GCMs project that very wet days will become more intense, while the number of days with precipitation become fewer. The map below shows the change in average wettest days every five years for 1976-2005 climatology (left), & at the end of the century under RCP 4.5 (middle) and RCP 8.5 (right) in both inches (top) and percent change (bottom) relative to 1976-2005. Climate models indicate that precipitation volatility will intensify in the future as global climate continues to warm. While days with measurable precipitation become less frequent in Southern California, extreme precipitation events will intensify. Atmospheric rivers, which are transports of moisture from the tropics over the Pacific Ocean in long, thin ephemeral filaments responsible for most extremes, will carry more moisture. By the end of the century, the average wettest day every five years is projected to increase by 10-25% under RCP 4.5 and by 15-30% under the RCP 8.5 (ie business as usual)

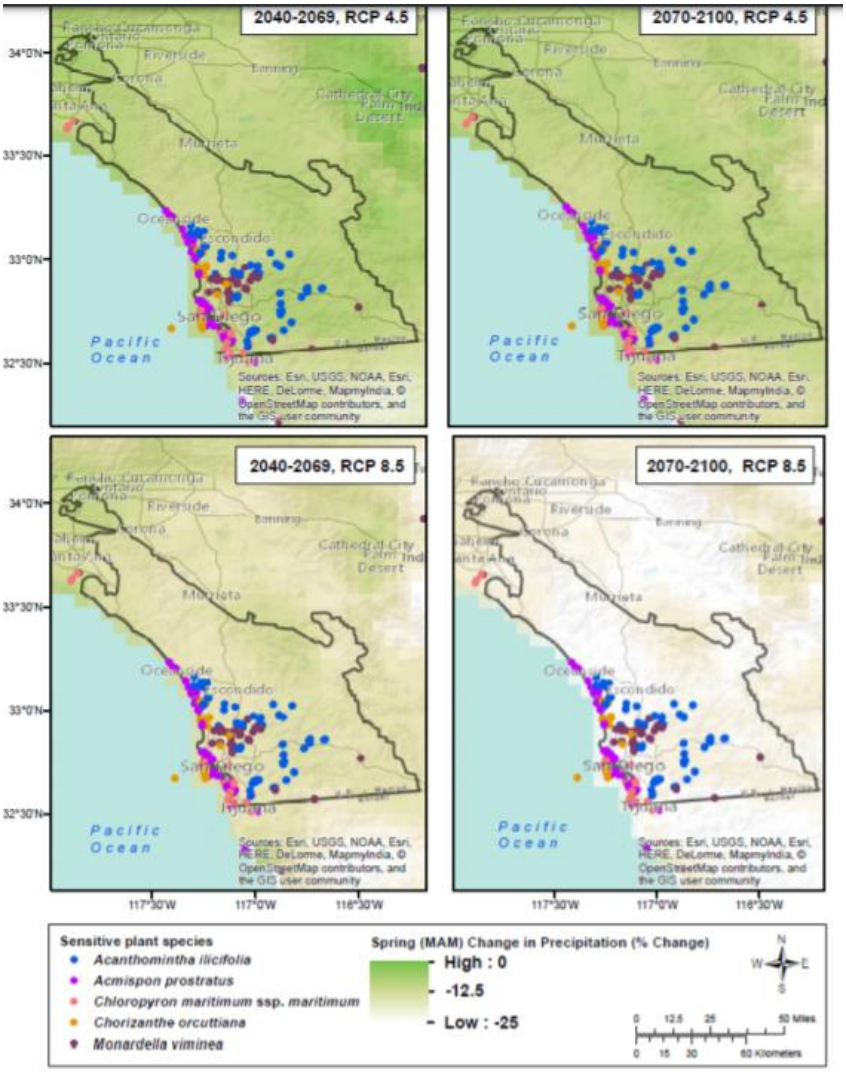


As indicated in the map below, increasing variability is precipitation patterns for the region show a trend of increasing severity (in terms of total % area) of CA droughts in this millennium.



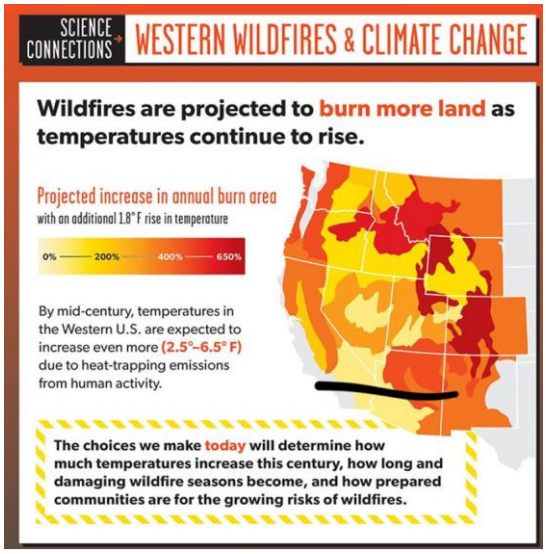
Another aspect of projected intensification of droughts is that GCMs indicate seasonal summer drought in Southern California may become more prolonged due to drying in the spring and fall shoulders of the traditional cool season rainy period. From the GCMs, spring precipitation decreases considerably, by approximately 20% during the mid-21st century and approximately 25% by the end of the century under RCP 8.5. Fall precipitation decreases by approximately 15% during mid-century and approximately 20% by the end of the century. Under RCP 8.5 the spring precipitation decline, combined with effects of warming, result in progressive declines in spring soil moisture, amounting to 10-15% decreases by late 21st century.

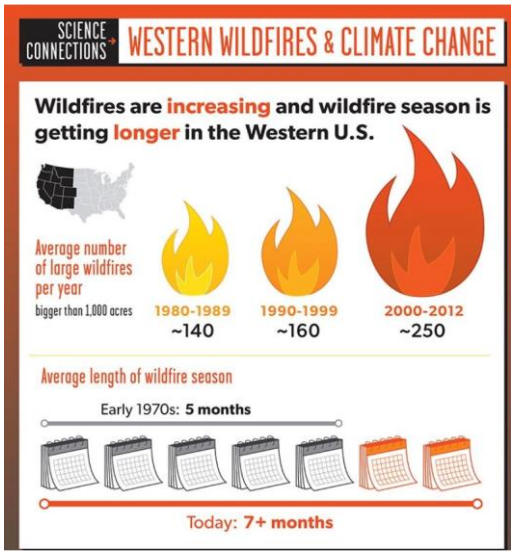
The map below shows the percent change in spring (March-May) precipitation relative to the historical global climate model runs from 1976-2005. The figures on the left are averaged during mid-century (2040- 2069) and the figures on the right are averaged at the end of the century (2070-2100). Top figures are under the RCP 4.5 scenario and bottom are the RCP 8.5 scenario. Overlaid are compiled species occurrence data of select rare, threatened, or endangered plants



WILDFIRE

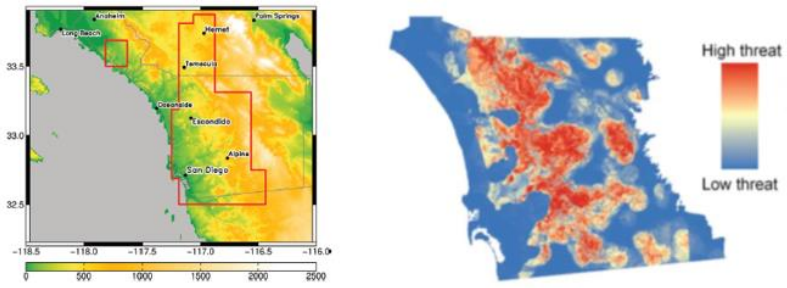
Wildfire is one of the most important yet complex drivers of ecological function and biodiversity in San Diego County. The economic and ecological costs of wildfire in the United States have risen substantially in recent decades. Although climate change has enabled a good portion of the increase in wildfire activity, the direct role of people in increasing wildfire activity has been largely overlooked. In San Diego County, more than **95% of the ignitions** are caused by **humans**. And because highly flammable shrublands and grasslands are closely juxtaposed with human habitations, fire regimes are and will continue to be most strongly controlled by anthropogenic impacts. Humans can affect wildfire patterns in a number of ways, from starting fires to managing fires (e.g., prescribed fire, fuel treatment, or fire suppression), and via changes in the abundance and continuity of fuel through land use decisions. With the enormous population growth and exurban expansion in San Diego County, increased fire ignitions and the changing spatial pattern of ignitions have had the strongest effect on the fire regime.



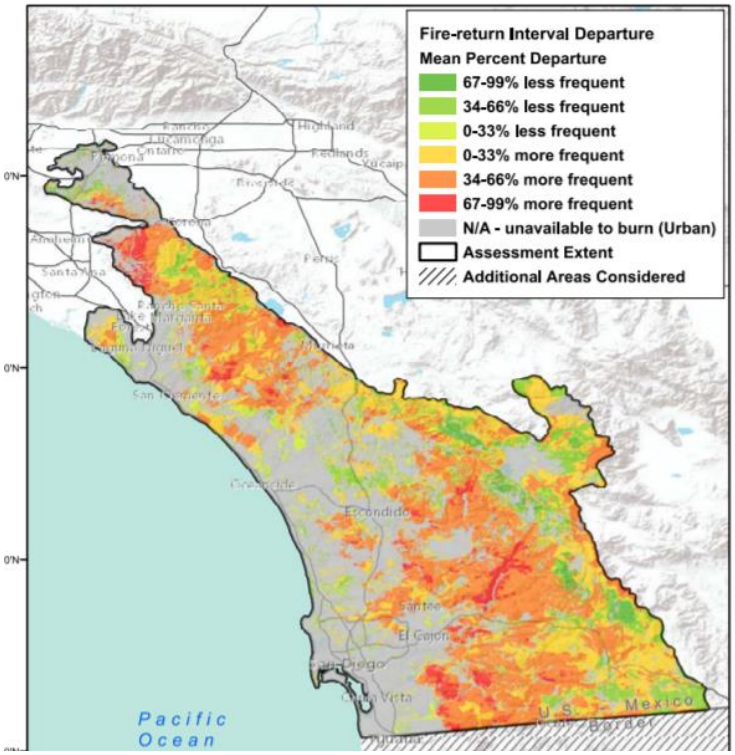


Santa Ana conditions account for the some of the hottest maximum temperatures along the San Diego County coastal zone. In October, Santa Ana events account for over 70% of hot days. Broadly, wildfire risk will likely increase in the future as climate warms. The risk for large catastrophic wildfires driven by Santa Ana wind events will likely increase as a result of a drier autumns leading to low antecedent precipitation before the height of the Santa Ana wind season (December and January).

San Diego Ana Wind & Fire Threat Map



In recent years, wildfires in much of San Diego have occurred significantly more frequently than historical fire return intervals, as highlighted in the map below. Since human ignitions sources are the primary cause of fires in the region, the shorter intervals between fires is attributed to development and population increases in the region.

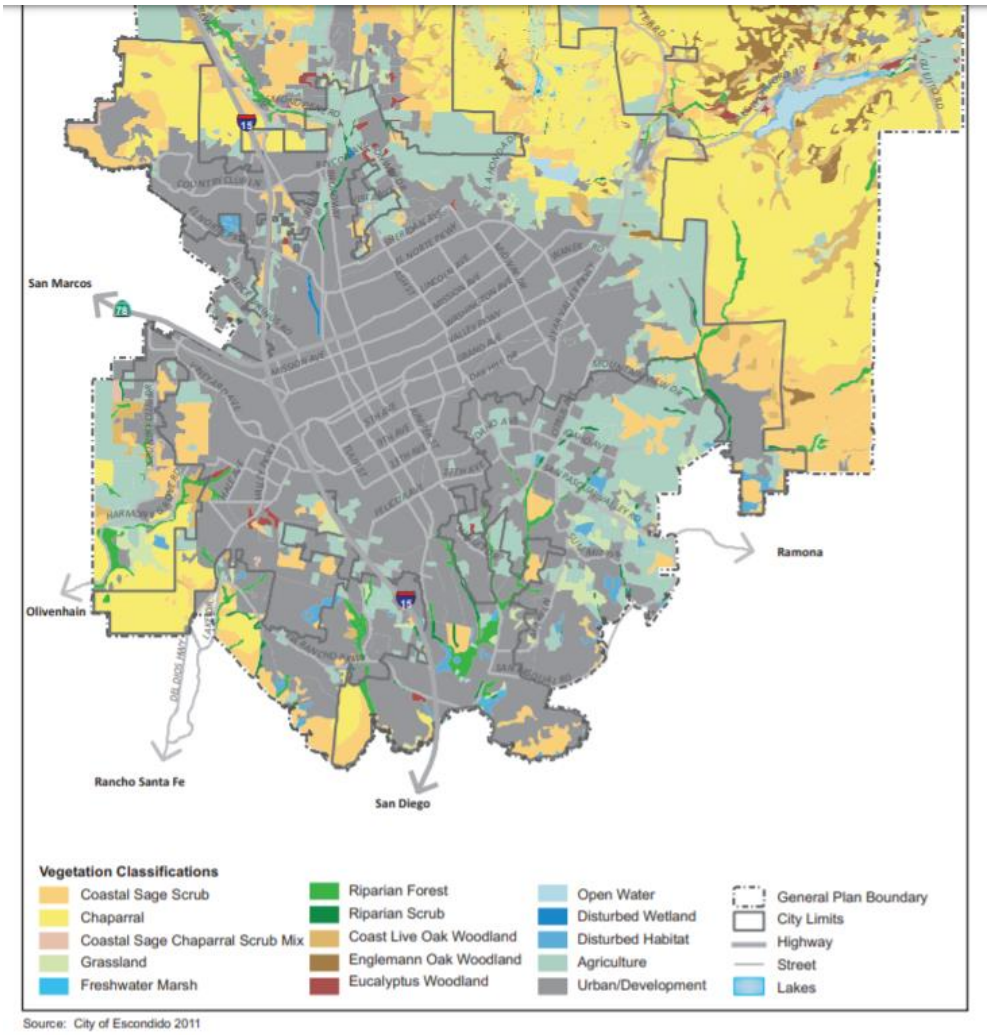


While fire weather conditions, such as Santa Ana winds, have flamed the most catastrophic wildfires in San Diego, other factors, such as development, are important in determining fire risk. Housing development patterns and proximity to human infrastructure like roads have significant correlation to fire frequency and % of area burned, with the highest levels of fire activity occurring at low-to-intermediate levels of development. At low- to intermediate- housing density, houses are generally more exposed to wildfire, and dispersed housing is more challenging for firefighters to defend. Dispersed housing is also contributing to escalating fire suppression expenses, and the role of housing pattern and location has been identified as the most important risk factor for structure loss to 58 wildfires across the continental U.S. In addition to increased fire frequency, exurban development provides conduits for invasive species to expand into wildland vegetation, either through soil disturbance, planting of grass in residential areas, or via mechanical fuel reduction activities that are, ironically, designed to control fires.

References - https://www.energy.ca.gov/sites/default/files/2019-07/Biodiversity_CCCA4-EXT-2018-010.pdf
https://www.climatesciencealliance.org/sdc-ecosystems-assessment
2017_NAS_Study

ECOSYSTEM STRESS

The diverse ecosystems, habitats, plants, and animals in the San Diego County region will be impacted by climatic shifts in multifold ways due to current and future variability, along with other factors including habitat loss and fragmentation, land use shifts, and changing fire regimes. While home to a major metropolitan area, San Diego County still hosts expanses of native and preserved habitats where management and conservation action could be greatly enhanced through science-based assessments and planning for climate change and increased climate variability.

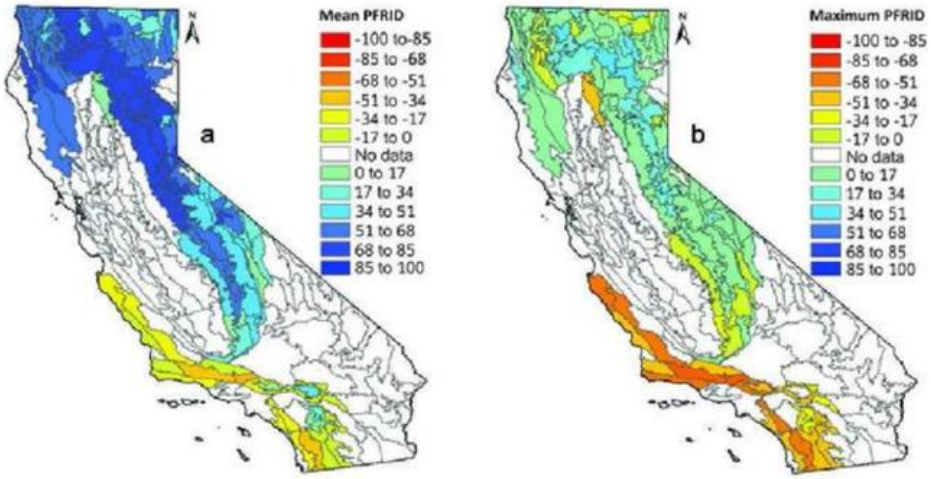


Source: City of Escondido 2011

There is a long and continuing history of land and natural resource conservation planning and action in San Diego County. Long-term monitoring and adaptive management will be critical to managing species and ecosystems into the future, and adaptation and scenario planning will also play a role. The table below highlights the nine major vegetation/land cover types in the San Diego, w/ protected area calculations based on compiled data from the San Diego Association of Governments. In light of projected growing impacts of climate change, it is likely that management goals may warrant re-evaluation, recognizing that managing for the near-term, particularly single-species management, may hamper abilities to build resilience into vulnerable ecosystems.

Vegetation Type	Area mi² (km²)	Percent area	Protected area mi² (km²)	Percent protected
Agriculture	156.1 (404.3)	4.1%	9.6 (24.9)	0.7%
Barren	20.7 (53.7)	0.5%	5.2 (13.5)	0.4%
Chaparral	1,498.3 (3,881.6)	39.2%	860.5 (2,229.4)	58.9%
Coastal scrub	546.8 (1,416.5)	14.3%	240.0 (621.8)	16.4%
Coniferous forest	47.6 (123.2)	1.2%	34.7 (89.9)	2.4%
Grassland/Meadow	413.4 (1,071.1)	10.8%	130.6 (338.4)	8.9%
Oak/Hardwood Forest	243.6 (631.1)	6.4%	88.9 (230.4)	6.1%
Riparian forest	71.2 (184.4)	1.9%	29.6 (76.6)	2.0%
Urban	783.0 (2,028.5)	20.5%	34.4 (89.2)	2.4%
Wetland	37.6 (97.5)	1.0%	27.6 (71.6)	1.9%
Total Area	3,818.3 (9,891.9)	100%	1,461.3 (3,785.7)	38.3%

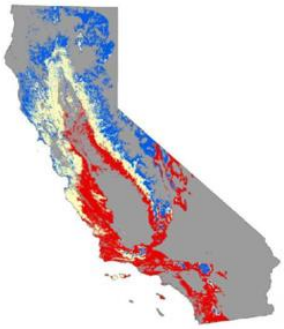
The preeminent threat that chaparral faces, that we all face, is human-caused climate disturbance caused by the unnatural release of carbon from the burning of fossil fuels - stored carbon that has been locked away for millions of years. The maps below indicate that our chaparral habitats are under threat. Hot colors show areas with fire frequencies in excess of natural levels, and cool colors represent areas that may have missed one or more natural fire return intervals. Fragmentation of chaparral habitat increases the likelihood of fires, which are one of the biggest naturally occurring carbon emitters. As mentioned above, land use planning needs to set aside continuous habitat instead of fragmented pieces.



Fire Threat to Chaparral Habitat

The & riparian & chaparral areas in southern CA are among the most negatively departed in the state. In these areas, extensive landscapes characterized originally by dense native shrublands have been converted to degraded, open stands of native shrubs and exotic annual grasses and forbs, which are easily reignited. As shown in the CA map below, under a future high emissions/hot & dry climate scenario for the time period 2070-2099, much of the area (in red) currently occupied by chaparral will no longer be suitable for that plant community. The likely replacement will be highly flammable, non-native weeds.

To the right of the map is a picture of an area east of Alpine off Interstate 8 in SD County showing, and the top left background shows an old-growth chaparral stand last burned during the 1970 Laguna fire. The middle/left of the picture shows an area recovering from the Viejas fire in 2001. It is composed primarily of chamise, deerweed, and several other shrub species. To the right is a portion of the Viejas fire scar reburned in the Cedar fire in October, 2003. As you can see, the Cedar fire scar is now filled with non-native grasses because the interval between the two fires was too short, causing the elimination of the chaparral plant community. This negatively results in both a loss of carbon sequestration capability, while further increasing fire risk with more flammable invasive species.



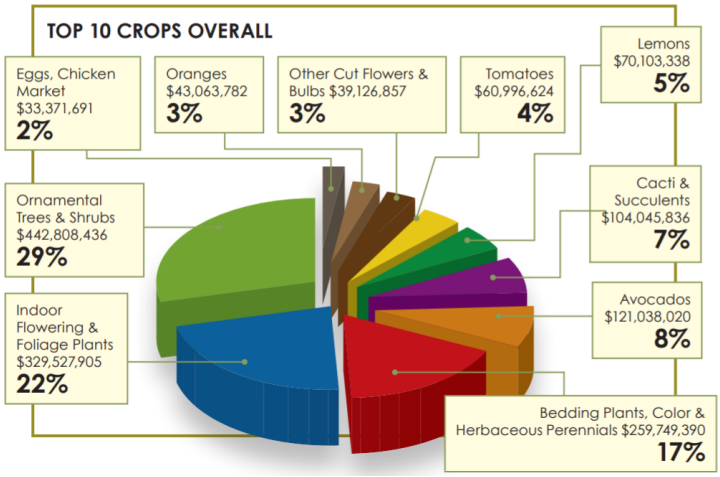
Along with the threat that warming climate and fire pose to chaparral, the human threat is of high concern as well. The picture on the left below are of giant masticators clearing away natives in Los Padres National Forest. On the right is a photo from Ventura county showing how years of clear cutting, "fuel treatments" & abuse have led to the elimination of carbon sequestering chaparral in favor of flammable, invasive weeds.

References:

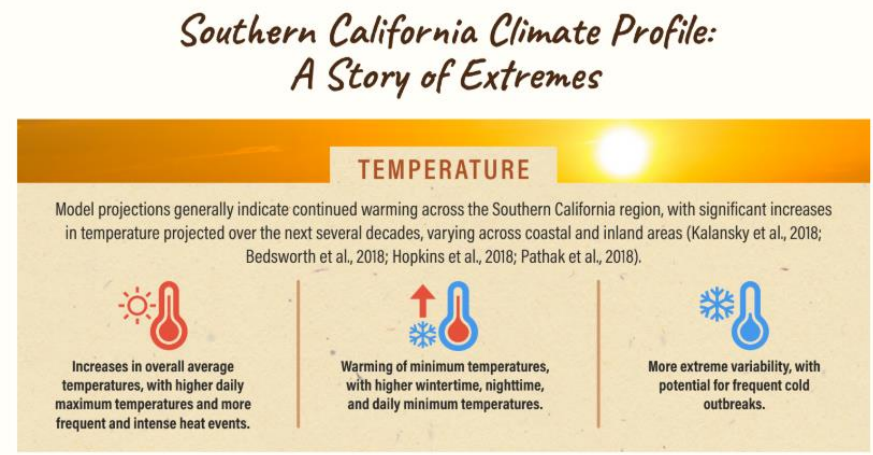
https://www.californiachaparral.org/
https://www.escondido.org/Data/Sites/1/media/PDFs/Planning/GPUpdate/Vol1Biology.pdf
https://www.climatesciencealliance.org/sdc-ecosystems-assessment

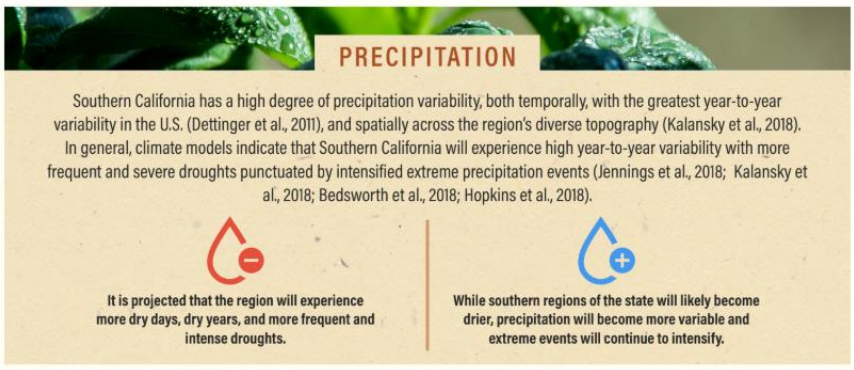
Climate Change Impacts on Agriculture & Specialty Crops

San Diego agriculture boasts a value of ~$1.8B, with a general breakdown show below:

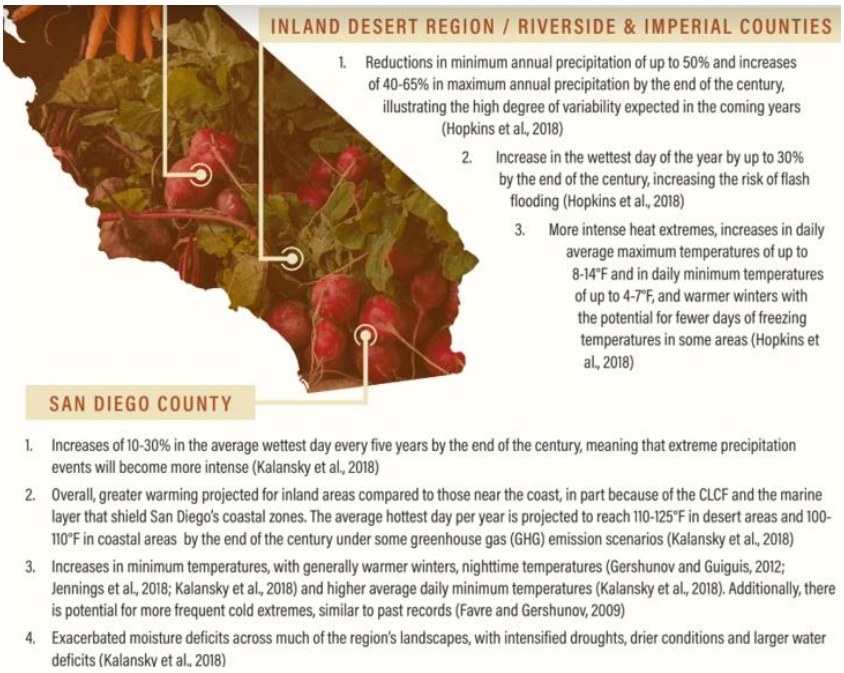


Specific to Escondido & the surrounding area, avocados comprise 8% of total county agriculture output, making it the nation's leading producer and valued at $121M. Next are tomatoes valued at $61M, followed by lemons ($70M) and oranges ($43M). Southern California is already experiencing the impacts of a changing climate, which will have implications for the region's agriculture & economy. Despite these challenges, agricultural producers play a critical role in building on-the-ground resilience and are an important part of the region's climate change solutions.





In Southern California, the impacts of a changing climate will vary across the region's diverse topography and micro-climates. Major agricultural regions, including San Diego County and counties within the Inland Desert and South San Joaquin regions, will experience distinct climate impacts in the coming years, as listed below:



Climate change is expected to alter the quality, phenology, harvest yield, & producton of many crops. Here are some specific predictions/projections for Escondido's primary agricultural crops:

Avocados

- ➔ Projections show potential for up to a 45% reduction in avocado yields statewide by 2060
- ➔ Extreme heat/ heat waves could suppress persea mite populations that are key pests for California-grown avocados
- ➔ Challenges associated with limited water availability and drought, with specific sensitivities to increased salinity.

Oranges/Citrus

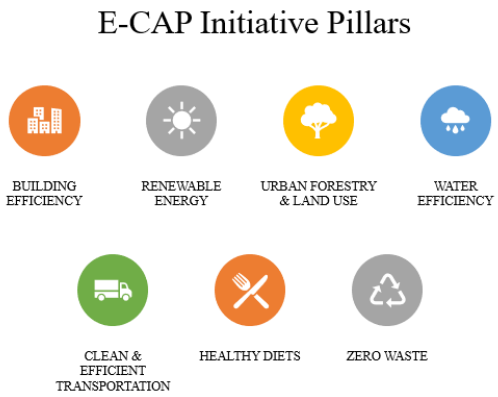
- ➔ High temperatures can cause "scorching" of the blossoms, & sudden cold snaps can cause frost damage. Temp variation could also negatively impact fruit color
- ➔ Extreme precipitation/flooding events can delay harvesting
- ➔ Moderate to substantial yield declines by the end of the century
- ➔ Projections show a substantial reduction in areas that exhibit high yields of oranges

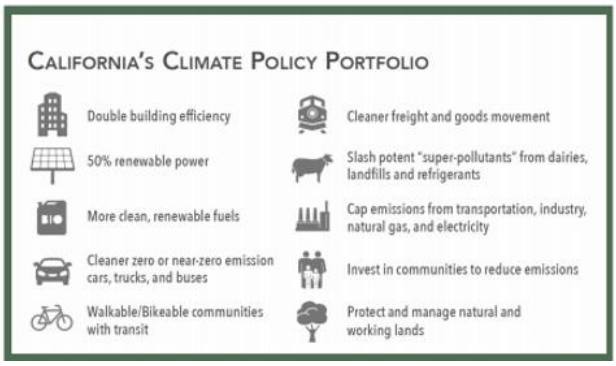
References

https://drive.google.com/file/d/1LtldEKFFBv5mYhljZKC8T7pZJTajslAQ/view
https://www.climatesciencealliance.org/
https://www.sandiegocounty.gov/content/dam/sdc/awm/docs/2018_Crop_Report_web.pdf

E-CAP Initiatives & GHG Reduction Strategies

Below is a snapshot of the major initiative pillars we will be focusing climate action planning proposals around, and which are in alignment with California Climate Action Plan framework.

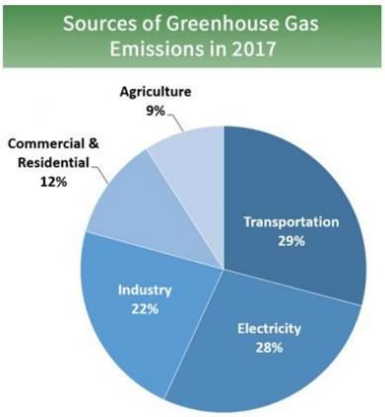


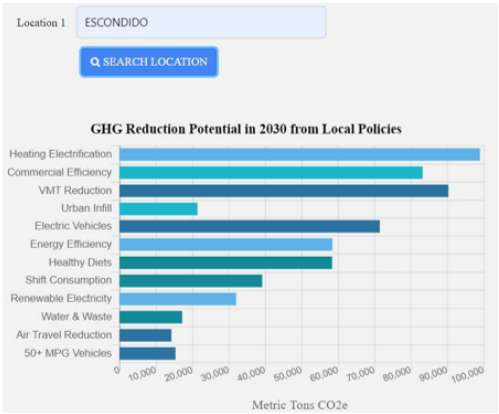


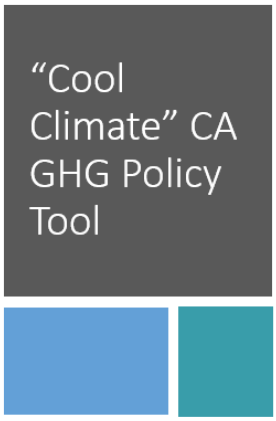
Additionally, here are some additional resources putting forth "best practice" and where we can look to adopt key aspects findings in the Escondido CAP:

- ➔ Colorado College 100% Carbon Neutrality Plan
  - CC_Sustainability_Landing_Page_2019_State_of_Sustainability_Report 2014_Sustainability_Report/Priorities CC_Carbon_Action_Report
- ➔ "Start Here, Start Now": An Environmental Justice Assessment of the City of SD CAP
- ➔ "Growing Cooler": The Evidence on Urban Development and Climate Change
- ➔ "Bending the Curve": Ten Scalable solutions for carbon neutrality & climate stability
- ➔ "Kansas City Climate Playbook"
  - https://www.marc.org/Environment/Climate-Action/pdf/Climate_Action_Playbook.aspx
- ➔ City of Lancaster "Going Green"
  - https://www.cityoflancasterca.org/about-us/sustainability/green-practices/alternative-fuel-vehicles

To visualize some of the most effective measures our city can adopt, here is a GHG reduction calculator tool that specifically highlights for a given locale the strategies that will lead to the biggest GHG reductions, with results populated for Escondido:







Strategy to Achieve Social Equity

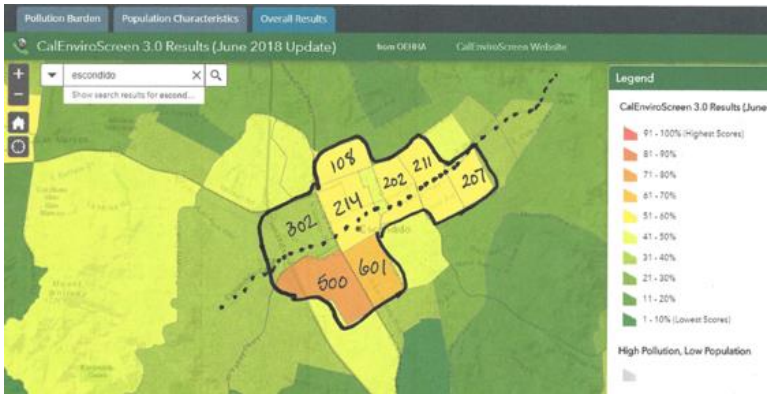
Environmental justice recognizes that certain communities - generally lower-income & communities of color - have historically borne the brunt of pollution exposure, have traditionally been left out of important decision-making processes, and ultimately will be impacted first (& worst) by climate change. **Equitable action** is an EFFECTIVE approach for meeting the needs of under-served communities and vulnerable residents through policies and programs that reduce disparities while fostering places that are healthy and vibrant. It's critical that our ECAP prioritizes investment towards the closing of racial and socioeconomic gaps:

- ➔ Identify Priority Investment Neighborhoods as areas where location, pollution, & climate change combine with inherent population characteristics to pose higher health risks to residents, & with fewer resources to address them.
- ➔ Focus on increased education and outreach in these areas.
- ➔ Receive highest priority for funding and action on key climate initiatives.
- ➔ Support partnerships that can fully capture the current state of inequity in various cross sections of our communities.
- ➔ That it ultimately develops programs and leverages funding for long term countermeasures that can mitigate future harm, while also garnering authentic community-based participation and power.
- ➔ Implement programs and initiatives for heat island reduction & urban forestry
- ➔ Provide an energy and water conservation retrofit program to upgrade housing stock, reduce costs to residents, and reduce carbon emissions.
- ➔ Implement programs and initiatives for more/better/cleaner public transit
- ➔ Initiate air quality requirements & pollution reduction
- ➔ Outreach & education programs
- ➔ Create affordable housing and initiatives for efficiency upgrades to existing stock.

Identifying Priority Investment Neighborhoods

Below is a snapshot of CAL EnviroScreen results from 2018. These effectively score and rank **cumulative pollution burden** (ie contaminants in air, water) on various communities, which have been segmented out by census track**.** EnviroScreen also compiles population characteristics such as underlying health conditions, education level, linguistics, isolation, etc., which all serve as conditions that ultimately determine **vulnerability to impact**.

Based on the results, we can effectively draw a line around specific census tracks to create priority investment neighborhoods for outreach, funding, and implementation of various CAP initiatives.



Priority Neighborhood Infrastructure Initiatives

With average temperatures in San Diego County projected to increase by 5 to 10 ˚F by the end of the 21st century, as an inland city Escondido is especially vulnerable. Along with this substantial mean average increase, the frequencies of 100 degree+ heat waves will also increase, they will hit with more intensity & with longer duration. Given these projections, housing and infrastructure planning is absolutely essential when developing an effective response to climate change, and with a high degree of focus on underserved communities that are most vulnerable.

These are recommended actions at a minimum:

- ➔ Adaptation measures for communities at higher risk for extreme weather events such as floods & drought.
- ➔ Improvements of walkways & public transportation routes, with increased tree shading.
- ➔ Identify at risk-areas that lack in-home cooling systems & help establish cooling centers within these neighborhoods.
- ➔ Focus solar & energy efficiency programs in neighborhoods that are traditionally left out of redevelopment & improvement.
- ➔ Restore natural areas to improve carbon sequestration & pollution reduction, to beautify & cool neighborhoods, & to create a welcoming natural space for its residents to enjoy.
- ➔ Measures that require development of affordable multi-family units near transit and employment centers, while also allowing for 50% fewer parking spaces than standard requirements to maximize density.
- ➔ Adopt an inclusionary housing ordinance that would require a portion of all multi-family housing to be set aside, for example, for families earning less than 80% of the Area Median Income.
- ➔ Direct new infrastructure - sidewalks, bike lanes, transit access improvements - to underserved areas
- ➔ Cease projects that increase fire risk and draw considerable community financial resources away from areas in need of investment, infrastructure
- ➔ Leverage funding for long-term community health & organizational capacity

Energy Use Reduction Program Opportunity:

Save money, improve health, and reduce GHG emissions by improving energy and water efficiency in older houses and rentals

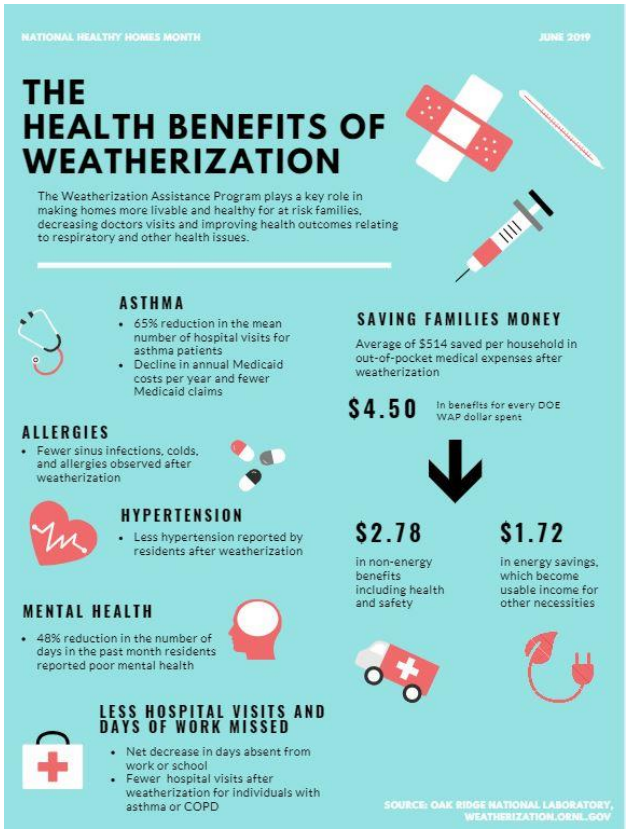
Overview and potential for action to reduce or avoid GHG emissions.

Half of Escondido residents are renters. One of our goals is to achieve high levels of energy-efficiency improvements and GHG reductions through rehabilitation and weatherization of older homes—especially rentals and especially in heat islands. We want to make sure we have a good program for landlords in Escondido to 'Weatherize' /improve energy efficiency in rental units as part of our Climate Plan.

Major GHG Reduction Potential

Energy efficiency should be a cornerstone of energy and/or climate policies at all levels of government, based on its proven status as a cost-effective option for reducing CO2 emissions and reducing the cost of climate policies. [i]

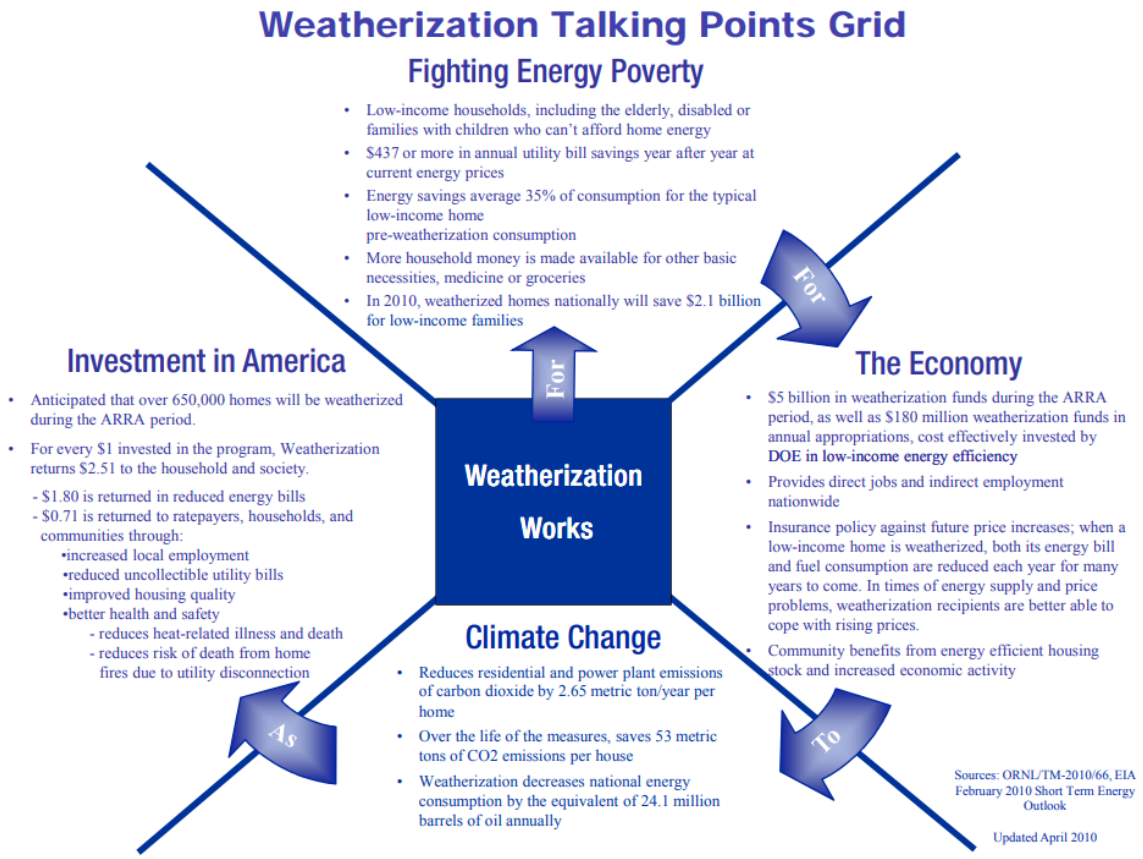
Efficiency measures reduces residential and power plant emissions of carbon dioxide by 2.65 metric ton/year per home. Over the life of the measures, saves 53 metric tons of CO2 emissions per house.[ii] If we could do efficiency measures on 100 homes a year, that would equal 265 metric tons a year of reductions. A single light changed to an energy efficient bulb reduces emission of 20 lbs per year.



Greenhouse gas (GHG) emissions attributable to buildings in California currently represent about a quarter (25%) of the state's total emissions. In order to achieve California's climate goal of an economywide 40% GHG reduction by 2030, greenhouse gas emissions from buildings will need to fall by 40% or more over the next decade.2 Furthermore, to reach California's carbon neutrality goal by 2045, high levels of building electrification are likely to be required.

Electrification is found to reduce total greenhouse gas emissions in single family homes by ~30% – 60% in 2020, relative to a natural gas-fueled home. As the carbon intensity of the grid decreases over time, these savings are estimated to increase to ~80% – 90% by 2050, including the impacts of upstream methane leakage and refrigerant gas leakage from air conditioners and heat pumps.[iii]

Of course, energy efficiency save money in energy costs. But, it is healthier too.[iv]



State provides assistance for weatherization energy conservation and improvements

The California Weatherization project provides free energy upgrades to low-income household. All improvements made are with energy conservation in mind, and the goal is to help people lower their monthly utility bills. The extra insulation and other improvements can keep the heat in a home, or ensure it stays cool during the hot summer months. Another side benefit of weatherization is that it will also improve the health and safety of the household's occupants. When someone enrolls, they will also be provided with energy budget counseling, education on the best conservation practices and they will also receive instruction on the proper use and maintenance of installed weatherization measures.

The program is often called WAP, and it will increase the energy efficiency of homes that are owned, rented or occupied by low-income persons. The upgrades made can cost the federal government as much as $6000. The state of California and the federal government pay for all costs, and **the service is free to the client.** The end result is it will reduce the homeowners total residential expenditures for expenses such as heating and cooling bills. **On average recipients will experience a 25% reduction in their annual energy costs, with noting up to a 35% reduction.**[v]

We asked, EHC's Healthy Kids Campaign Director at EHC, Leticia Ayala, how they went about their Healthy Homes program. Environmental Health Coalition approach to removing lead and other

health hazards and improving energy efficiency in older housing rental stock in San Diego. She made the following points:

- *We passed the lead ordinance with a clause that requires landlords to inspect and fix lead hazards at turnover. The incentive was the HUD Lead Hazard Control & Healthy Homes Grants available for landlords to make their homes lead-safe.*
- *Then, we would team up with the local Weatherization programs via MAAC Project, Campesinos Unidos, and the Energy Team to refer the HUD cases to get weatherized. At one point, we included energy efficiency home visits into our program.*
- *The first visit was a lead educational visit which included filling out the program application and deep lead education such as where to get your kids tested for lead etc.*
- *The second visit was about healthy homes including mold, pesticides, non-toxic cleaning products and we would give each family a healthy homes kit – including non-toxic cleaning and indoor pest control.*
- *Third visit was the energy efficiency visit which included deep energy efficiency education tied to polluting power plants, asthma, water conservation, a free home audit with a customized energy plan for the family, and a kit to jump start them to taking action – kit included a reusable bag, smart strip, LED light bulbs, thermostat for Refrigerator, tracking card to help them reduce their trash.*

Environmental Health Coalition may be a good resource to help us figure out how we can do this in Escondido.

Another model might be the Conservation Home Makeover Project in Chollas Creek. **($542,000 in grant funding – Groundwork San Diego)** – This project will engage low-income families in San Diego's Encanto neighborhood to mitigate drought impacts through water capture and greywater reuse for food production and landscaping.[vi]

Home Energy Score. Many cities have successfully implemented policies requiring that energy labels be provided as part of residential real estate transactions Portland[vii] , Austin[viii], and Minneapolis[ix] are two examples. Cities should enact home energy labeling policies as a key method to increase residential energy efficiency. Fannie Mae and Freddie Mac are also actively engaged in understanding how this data can be translated into value for buyers and sellers in the mortgage process.[x],[xi]

PACE Program. Another means to fund efficiency improvement is through a Property Assessed Clean Energy (PACE) program which allows local government to help its residents overcome the high up-front cost on investing in clean energy and energy efficiency.[xii] PACE allows local and state governments to loan money to home and business owners for energy improvements, which owners repay over time through property taxes. Cities must authorize and provide support for a PACE program.

Measures to be included in the E-CAP

1. Create a Climate Impact fee on new development and include climate action in Community Services Facility Districts to fund, in part, retrofitting of older homes.
2. Develop a program with measurable goals specifically for landlords which requires energy efficiency measures when a property is turned-over and resources to help them achieve that.

3. Provide weatherization and other energy efficiency upgrades for low and moderate income households through Community Development Block Grant and Water Conservation funding programs.
4. Ensure low-income residents and landlords know and access the California Weatherization program above.
5. Support Property Assessed Clean Energy (PACE) financing to facilitate residential and commercial property upgrades
6. Develop, set goals, and fund a Residential Home Retrofit program in identified equity areas.[xiii]
7. Develop a Home Energy Disclosure ordinance requiring sellers of single-family homes and landlords of rental properties to obtain and disclose a Home Energy Report which will explain to buyers and renters how well the property performs relative to others and provides recommendations for improvement of efficiencies.

References

A program for landlords and tenants in Mass https://www.greenenergyconsumers.org/landlordstenants
[1] https://www.epa.gov/sites/production/files/2015-08/documents/ee_and_carbon.pdf
[1] [1]https://www.eesi.org/files/wap_facts.pdf
[1] https://www.ethree.com/wp-content/uploads/2019/04/E3_Residential_Building_Electrification_in_California_April_2019.pdf
[1] https://nascsp.org/healthy-homes-month-2019/
[1] https://www.needhelppayingbills.com/html/california_liheap_and_weatheri.html
[1] https://www.sdcwa.org/more-31-million-awarded-water-projects-san-diego-region
[1] https://www.pdxhes.com/
[1] https://austinenergy.com/ae/energy-efficiency/ecad-ordinance/energy-conservation-audit-and-disclosure-ordinance
[1] http://news.minneapolismn.gov/2019/02/15/minneapolis-require-residential-energy-disclosure/
[1] https://www.earthadvantage.org/creating-change/city-help%E2%84%A2.html
[1] http://news.minneapolismn.gov/2019/02/15/minneapolis-require-residential-energy-disclosure/
[1] https://pacenation.org/pace-programs/#!US-CA
[1] https://www.energy.gov/sites/prod/files/2014/01/f6/residential_retrofit_program_design_guide_508.pdf

Building Electrification

Greenhouse gas (GHG) emissions from buildings in California currently represent about a quarter (25%) of the state's total emissions. In order to achieve California's climate goal of an economy-wide 40% GHG reduction by 2030, greenhouse gas emissions from buildings will need to fall by 40% or more over the next decade. If California is going to reach it's carbon neutrality goal by 2045, high levels of building electrification are likely to be required

Electrification of buildings represents an important opportunity for Escondido to reduce greenhouse gas emissions while providing health, economic, climate, workforce, and safety benefits.

HEALTH BENEFITS

- Burning gas in homes releases dangerous toxins - leading to air pollution levels in many homes cooking with gas that would be illegal if measured outside. [1]

[1] Pollution in the Home: Kitchens Can Produce Hazardous Levels of Indoor Pollutants

- Children are particularly at risk. Kids living in a home with a gas stove are 42%[2] more likely to have asthma, a dangerous health condition that costs Californians more than $11 billion annually.[3]
- Moving to all-electric construction will give kids the chance at a healthier life and their parents a break from constant worry and medical bills.

ECONOMIC BENEFITS

- We can build more quickly and affordably with all-electric new construction. Installing gas lines and hookups adds anywhere from $3,000 up to $15,000 in unnecessary construction costs in new buildings.
- Research[4] shows the vast majority of homeowners and developers in California can expect financial savings - between $130 – $540 per year - from building and living in all-electric homes compared to homes that burn gas.
- Moving to all-electric homes & buildings will protect communities against the increasing cost of maintaining California's aging gas system - which will be spread among fewer customers as gas demand declines in line with our climate targets. A comprehensive statewide study[5] projects gas rates could increase from about $1.50 per therm today to as much as $19 per therm by 2050.
- The most fiscally responsible choice we can make is to stop expanding a gas system - by moving to all-electric new construction, while helping income-constrained residents transition to electric appliances.

CLIMATE BENEFITS

- California's homes and buildings are responsible for more than a quarter of the state's greenhouse gas emissions. The latest studies show that beneficial building electrification can reduce those emissions up to 90 percent by 2050.[6]
- This path of emissions reduction is also the most cost-effective - saving around $20 billion[7] every year by 2050 compared to other scenarios.
- Our gas infrastructure leaks methane - a powerful greenhouse gas that can warm the planet more than 80 times as much as carbon dioxide over a 20 year period - at every stage of its lifecycle.

- The increased production and use of gas has led to a massive spike in methane emissions in recent years. Gas is now the primary driver of emissions growth worldwide - and it has overtaken coal as the largest source of climate pollution in the U.S.[8] Continuing to burn gas in our buildings will prevent us from staving off the worst impacts of climate change,

WORKFORCE BENEFITS

- New research from the UCLA Luskin Center on Innovation[9] shows that beneficial building electrification can generate more than 100,000 construction and manufacturing jobs

[2] Meta-analysis of the effects of indoor nitrogen dioxide and gas cooking on asthma and wheeze in children

[3] Asthma's Impact on California: Recent Data from the California Breathing Asthma Program

[4] Residential Building Electrification in California

[5] https://gridworks.org/wp-content/uploads/2019/09/CA_Gas_System_in_Transition.pdf

[6] Residential Building Electrification in California

[7] https://gridworks.org/wp-content/uploads/2019/09/CA_Gas_System_in_Transition.pdf

[8] Carbon Dioxide Emissions Hit a Record in 2019, Even as Coal Fades

[9] California Building Decarbonization Workforce Needs and Recommendations - UCLA

annually in California - even after accounting for modest declines in gas industry employment.
- Over the course of 25 years, electrification will create more than 8 times the number of jobs that will be lost in the gas system - and with a two-decade lead time, policymakers can work with unions and members to transition the small number of gas workers that will not retire on their own before 2045.
- The quality of the jobs, not only the quantity of jobs created is important - three out of every five jobs required to meet building electrification goals would be in "high-road" sectors - where firms compete on the basis of skill, experience and qualifications, and worker pay tends to be higher.

SAFETY & RESILIENCY

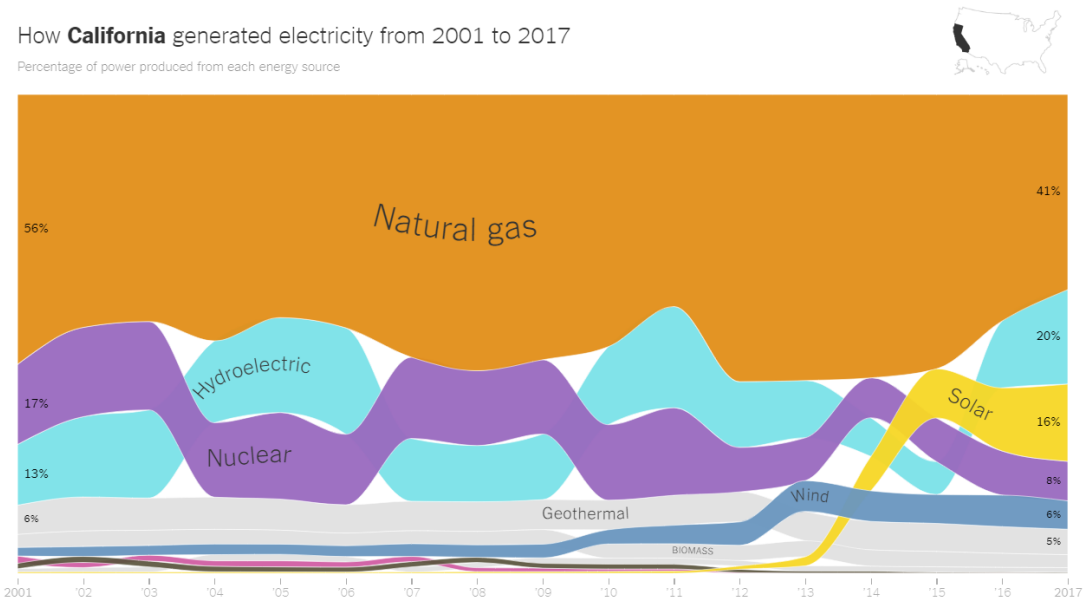
- As we've learned from the SoCalGas Aliso Canyon gas leak and the gas explosion in San Bruno, gas pipelines and storage facilities are a serious threat to the safety of Californians.
- In fact, over the past three years in the U.S., there was a gas pipeline incident that killed someone, sent someone to the hospital or caused a fire or an explosion every four days.
- Gas infrastructure is particularly dangerous in California's earthquakes and fire-prone areas. Gas is responsible for up to 50% of post-earthquake fire ignitions.
- We can't rely on gas during public power shut offs, since most new gas appliances have electric ignitions - which means they do not work when the electricity is off regardless of their primary fuel source. And when gas service is turned off due to fire risk or earthquakes, it can take weeks to restore - unlike electricity.
- All-electric appliances on the other hand can be set up to use a backup power source during disasters when the grid is down - and with appropriate solar inverters or battery backup power, heat pump water heaters can use electricity from rooftop solar to heat water and store it for up to 24 hours, so families will have hot water even if the grid is down.

We strongly recommend the following:
1. Incentivize all-electric new construction and update the building code.
2. Incentivize high-efficiency heat pump HVAC, particularly as it pertains to air conditioning.
3. Align energy efficiency goals and savings with GHG savings opportunities.

E-CAP Renewable Energy Initiatives

Natural gas has been California's top electricity source since 2001. But half of the power produced in the state last year came from renewable sources, including solar, wind, geothermal, and hydroelectricity. Solar power has grown quickly over the past five years, largely because of state policies like an aggressive renewable energy standard. This year, California committed to get all of its electricity from zero-carbon sources by 2045.

Last year, about a fourth of the electricity consumed in the state, including some generated by coal power, came from outside of its borders. (Imports are not pictured in the graphic above.) But California plans to stop buying electricity from coal-burning plants in Utah and other states.



Natural gas has been California's top electricity source

Community Choice Energy (CCE)

We strongly recommend the city to create or become a part of an existing CCE program

What: Community Choice Energy is tried and true program that allows communities to take control of their clean energy future. CCEs are stand-alone government agencies tasked with purchasing energy contracts, and selling said energy to residents and businesses, as an alternative to the existing utility. They have existed in the state of California for nearly a decade, providing:

- Lower rates and more affordable clean energy for residents and businesses than the traditional monopoly Investor Owned Utilities (IOUs)
- More renewable energy compared to the IOU
- Reinvestment of local revenue for local green energy projects and jobs
- Focused attention to communities of concern, driving conversations about equity and inclusion in the renewable energy sector
- Local control over a community's energy mix, and a real say in how green energy is developed to meet local and state clean energy goals

How: The City of Escondido has partnered with the cities of San Marcos and Vista to complete a CCE feasibility study. The study will likely be completed within the next 6 months, after which:

- The City will vote on whether to accept the results of the study
- The City will vote to decide on whether and how to proceed with CCE
- If the City decides to move forward with CCE it may:
    - Create an independent standalone CCE program
    - Join an existing CCE program as part of a Joint Powers Authority (JPA)
    - **Note:** Today's CCE best practice is to join with other cities and counties in JPA, which offers a number of protections and opportunities over a standalone, one city only program

Next Steps for Advocates: Now that the City has signed off on the feasibility study with San Marcos and Vista, it would be helpful to encourage the city to:

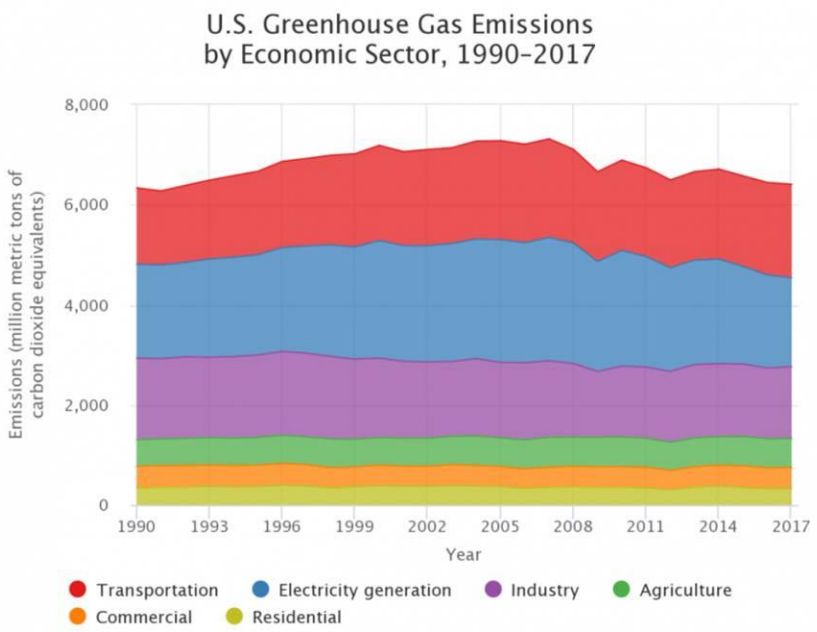
- Host CCE workshops after the feasibility study is drafted for the public to learn and participate in the conversation
- Comment to city council and staff that the study must include revenue projections for individual cities, and determine how feasible Escondido may be as a stand alone CCE program vs joining a JPA
- Engage with community members on the benefits of CCE (CAC CCE One Pager)
- Examine the two existing CCE JPA programs in the region, San Diego Community Power and Clean Energy Alliance; specifically their JPA agreements (SDCP linked here, CEA linked here), and ask:
    - Does the JPA identify specific clean energy targets that may help Escondido reach its CAP targets?
    - Does the JPA offer specific provisions for working families, communities of concern, and environmental goals to ensure equity and inclusion?
    - Do the values and mission of the JPA align with Escondido?
    - What cities are involved, and what kinds of programs and projects may be achievable?

Additional Supporting Initiatives for Renewable Energy:

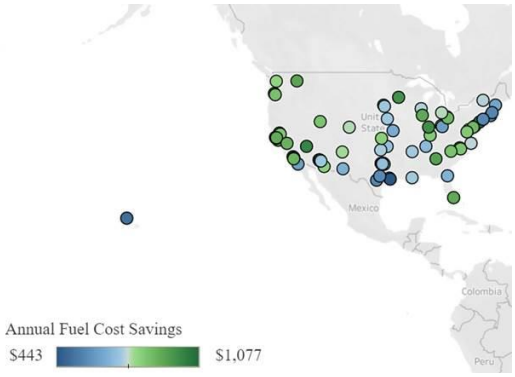
- ➔ Require ALL new single-family housing to be NetZero and all new multi-family to use solar/electric to the maximum extent possible.
- ➔ Develop energy retrofit program for local Escondido residents
- ➔ Provide resources/incentives for Priority Neighborhoods to implement energy conservation projects.
- ➔ Focus efficiency/solar programs in neighborhoods that are traditionally left out of redevelopment
- ➔ Pursue resources from the new CA's "Solar on Multifamily Affordable Housing" (SOMAH) for focus neighborhoods
- ➔ Create funding services for target areas residents for energy efficiency, clean renewables, composting, & zero-emission transportation projects.
- ➔ Adopt Community Choice Energy
- ➔ Establish a PV installation goal for non-city owned production

Clean & Efficient Transportation

Transportation is the biggest carbon-emitting sector in the U.S. at 29% of all emissions, & with light-duty vehicles accounting for 59 percent of those emissions within the sector. It's also a primary source of air pollutants that contribute to health problems such as heart and respiratory diseases and cancer. Due to disproportionate exposure, these health impacts are frequently more pronounced in low-income communities next to major transportation corridors. In addition, the extraction, production, and global distribution of fuels for transportation can damage environmentally and/or culturally significant ecosystems and may financially benefit hostile and/or oppressive governments.



As the window of time for substantial carbon reduction efforts change gets smaller, electric vehicles (EV's) are a primary solution to mitigate the massive amount of emissions coming from the world's transportation sector. According to the Union of Concerned Scientists, median cost savings per year for an EV owner would be $770, dependent on the electricity provider, the choice of electricity rate plan and the local cost of gasoline. Here is an Alternative Fuel Calculator that allows for comparison of fuel/maintenance costs of gas-powered vs. electric equivalent.



According to an interview by NPR, total emissions "has to do with the power mix in that individual state. A state like CA where utility companies are powered by good degree of renewable energy means that there are a lot less total emissions occurring through the overall life cycle. This is a critical area for systemic change, as we encourage our legislators to create a Renewable Portfolio Standard (RPS) that "establishes the percentage of electricity sold by an electric utility to retail customers that must come from renewable sources."
Overall, we do need a rapid transition to EVs both nationwide and globally. According to the Rocky Mountain Institute, "15–20 percent of global light-duty vehicles would need to be electrified by 2030 in order to limit global temperature rise to less than 2°C and avoid the most catastrophic effects of climate change," and since here in the U.S. only about two percent of new vehicles sold are EVs, we still have a ways to go.

In order to reach this goal, we need accessibility of EVs to increase, as most people don't have a wide array of choices. This problem was spearheaded in California, with their introduction of a Zero Emission Vehicle (ZEV) program, which requires car manufacturers to produce and make available a number of ZEVs and plug-in hybrids based on the total number of cars sold in CA by the manufacturer. Since CA launched its modern-day ZEV program in 2012, 10 states have implemented similar standards.

In terms of cost savings, while EVs may be more expensive up front (for now, and there tax credits and other financial incentives to encourage purchase), electricity is cheaper than gas, AEVs are more efficient and have less maintenance costs than traditional vehicles and with improvement in range and increased prevalence of rapid charging stations, EVs are becoming a competitive option for those in the market for a new car.

Recommendations for ECAP

The city of Escondido primarily employs fossil fueled vehicles in both the city fleet and that of its private residents, and thus can reap benefits from modeling sustainable transportation systems. In addition to the major carbon emission reduction potential of this clean transition, co-benefits include reduced operating/maintenance expenses, improved air quality, reduced noise pollution, and enhanced revenue streams via addition of public charging stations. The picture below shows real life examples of electric options: Tesla Model X Police Vehicle, a Tesla Cybertruck vehicle, Parking enforcement vehicle, municipal bus, school bus, electric city shuttle, gas station converted to EV charging station, solar charging canopies over parking lots.

Priority Measures to be included in the ECAP

- ➔ Replace city fleet vehicles with electrics as soon as possible.
- ➔ Develop and conduct surveys to assess transportation modes of city residents for future reporting and to develop incentive programs for more sustainable modes of transportation.
- ➔ Incorporate measurable, verifiable, & enforceable annual reductions in regional vehicle miles traveled (VMT) per capita
- ➔ Require reports on VMT per capita every 2 years
- ➔ Avoid expansion of arterial roads

- ➔ Increased solar canopy arrays on parking lots & city property.
- ➔ Increase city-wide EV solar-powered charging infrastructure & adopt measures to promote use
- ➔ Direct clean energy surplus to fund additional electrification projects
- ➔ Electrify long haul vehicles and prioritize **zero-emission vehicle** infrastructure for transit

Supporting Initiatives:

- ➔ Incentivize local businesses to add charging stations
- ➔ Creation of shared bicycle/pedestrian paths and provide bicycle racks in
- ➔ Provides a free shuttle service for getting around Escondido. Offer real-time GPS tracking and text message notification to provide riders with accurate wait time estimates at shuttle stops.
- ➔ Offer shuttle services to San Diego Lindbergh Field on major travel days for reduced prices.
- ➔ Create a community Facebook page for a Ride Share, which will help community members seeking rides with those seeking traveling companions and/or gas money.
- ➔ Adopt ordinance to limit/excessive car/truck idling.
- ➔ Investigate the possibility of offering a condensed workweek options for employees as a matter of policy or standard practice to reduce the need to commute daily.
- ➔ Initiate "Hertz on Demand", an hourly car-sharing program, to provide an adequate number of hybrid/EV's as an alternative for residents who do not own (or wish to own) vehicles.

References

https://www.facebook.com/ElectrifyEscondido
https://electrek.co/2019/07/17/california-electric-school-buses/
https://cleantechnica.com/2020/01/05/police-department-adds-2020-tesla-model-3-explains-why/
https://www.energy.ca.gov/sites/default/files/2019-05/Cost-Effectiveness.pdf
https://evcharging.enelx.com/news/blog/579-the-ultimate-guide-to-electric-vehicle-public-charging-pricing
https://uspirg.org/feature/usp/electric-buses-healthy-kids
https://www.ucsusa.org/resources/going-pump-plug#.WqKZrOgbOUl

Climate Protection through Land Use Measures: Permanent Conservation of Natural, Working Lands (Ag) & Open Space

Climate Resilient Connectivity: Summary below of SDSU Climate Resilient Connectivity Report

Maintaining regional biodiversity and ecological function in the face of the direct and indirect impacts of climate change is one of the central and burgeoning issues facing land managers. Rapid land use development has been observed and is expected in southern California, where high population density and growth is correlated with increasing numbers of rare and threatened California plants and animals and increased fire frequency. Without strategic, science-based mitigation and management, climate and land use change are expected to cause unprecedented species extinctions at the local and global-scales. Habitat connectivity is the most frequently recommended strategy to support adaptation to climate change & habitat fragmentation.

In southern California, the California Natural Community Conservation Planning (NCCP) program and Habitat Conservation Plans (HCPs) have resulted in protected area networks to address widespread habitat fragmentation across the region. Connectivity is essential if these networks are to support the long-term goals of protecting biodiversity, particularly as species' ranges are likely to

shift in response to climate change. Landscape connectivity allows for movement among patches of suitable habitat, reduces the chance of extinction for small populations, and maintains gene flow in patchy landscapes. Over longer time scales, and in the face of changing environmental conditions, connectivity will prove critical for facilitating range shifts in response to landscape changes caused by changing climate and altered disturbance regimes.

Efforts to develop proactive, adaptive planning for linked and connected landscapes under climate and land-use change have been increasingly employed in other regions of the western U.S. However, they have yet to be applied to coastal southern California (Figure 1 below), despite the region's long history of actions to preserve biodiversity. To accomplish this task, SDSU built on this history of conservation planning and reserve design to identify a linkage network that addresses landscape dynamics for regional connectivity planning. This linkage network was designed to allow for local movements among individual preserves while supporting landscape-scale regional connectivity.

Figure 1. Map depicting the primary study area within the South Coast Ecoregion of California and the expanded analytical extent.

Area 4 (below) is located in the coastal area of central San Diego County and encompasses Lake Hodges and several riparian corridors (i.e., Escondido, Lusardi, and Penasquitos Creeks) managed by the City of San Diego and County of San Diego that are part of the San Diego Multiple Species Conservation Plan preserve network. This zone is bordered by Interstate 15 to the east, Interstate 5 to the west, the cities of San Marcos and Escondido to the north and the Mira Mesa neighborhood of San Diego to the south. The area serves as an important north-south connection among the conserved lands in the highly fragmented coastal plain. Connectivity among these riparian preserves may also support movement between constrained lands to the west to larger blocks of contiguous open space to the east. This zone is threatened by expanding development along the SR-56 corridor, Carmel Valley, and in the City of San Marcos. SR-56 to the south, SR-78 to the north, and I-15 to the east, as well as numerous secondary roads (e.g., Carmel Valley Road, Black Mountain Road) pose constraints to wildlife connectivity in and out of the area and should be considered for wildlife road crossing improvements.

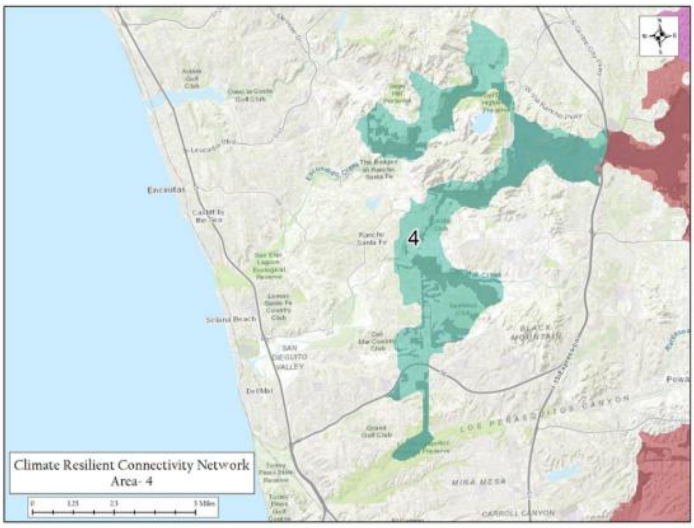
Area: 4

North Western San Diego County

Acres: 15,497

43.0% **Conserved**

(Conserved areas shown in darker color on map)



Land Cover	Vegetation Composition	
23.4% Urban	65.9% Vegetation	
1.9% Agriculture	*20.4% Chaparral*	*21.5% Coastal Sage Scrub*
5.8% Water or Wetlands	*0.0% Conifers*	*18.0% Grasslands*
2.9% Barren	*6.0% Hardwood*	*0.0% Desert Sage Scrub*
4 **Focal Species**: Big-eared woodrat, Bobcat, Western toad, Wrentit		
Majority Land Owners: City of San Diego, County of San Diego, Escondido Creek Conservancy		

Area 5 (below) is located in northern San Diego and southern Riverside Counties and encompasses the inland valleys east of Interstate 15 up to Palomar Mountain in the Peninsular Range, including lands in the managed by the U.S. Forest Service, County of San Diego, Vista Irrigation District, and Cities of San Diego and Escondido. This zone is bordered by Interstate 15 to the west, the desert in the east, SR-78 to the south, and SR-79 to the north. Conserved lands in this zone are primarily in the east whereas the western half includes agricultural lands, rural communities, and lands proposed for conservation under the Draft North County Multiple Species Conservation Plan. Tribal lands for the Pechanga, Pala, La Jolla, San Pasqual, and Mesa Grande tribes are also located in this zone. The northern segment of this linkage includes the eastern half of the critically important linkage between Palomar Mountain and the Santa Ana Mountains, which has been previously identified in the CEHC and SCML modeling efforts. This area is at risk from expanding low- and medium-density developments and the increased fire frequency. Numerous rural roadways constrain wildlife connectivity within this area, and Interstate 15 at the San Diego-Riverside County boundary is a major barrier to wildlife movement that should be considered for wildlife crossing improvements.

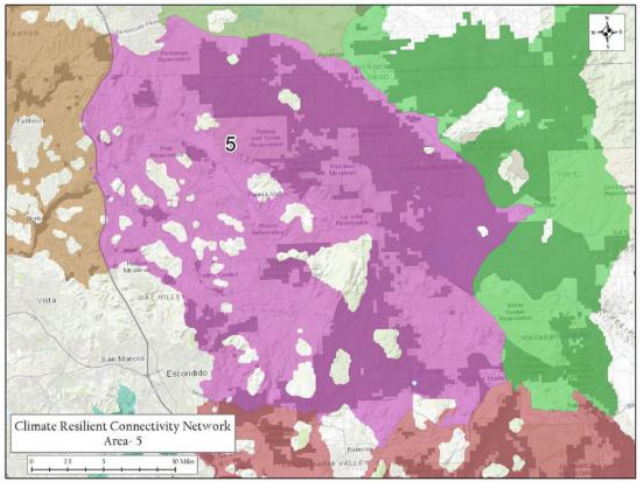
Area: 5

Palomar/Agua Tibia Mountains

Acres: 341,038

38.6% **Conserved**

(Conserved areas shown in darker color on map)



Land Cover	Vegetation Composition	
4.5% Urban	82.8% Vegetation	
10.7% Agriculture	*43.6% Chaparral*	*9.3% Coastal Sage Scrub*
1.6% Water or Wetlands	*2.8% Conifers*	*11.4% Grasslands*
0.4% Barren	*15.5% Hardwood*	*0.1% Desert Sage Scrub*
***5* Focal Species**: California spotted owl, Big-eared woodrat, Bobcat, Western toad, Wrentit		
Majority Land Owners: Cleveland National Forest, Vista Irrigation District, County of San Diego		

Overview and potential for action to reduce or avoid GHG emissions.

Land use has a very significant impact on climate change. In the face of the climate crisis, it makes sense to ensure that we are building in areas that are already part of the urban footprint, avoiding conversion of natural areas, and restore those critical areas that can be restored. Each metric ton of GHG avoided is also the path to climate stability. **Leaving native habitats can sequester 0.2 tons/acre/year. 1,100 acres will sequester 220 metric tons a year**. Luo et al Chaparral as Carbon Sink In recognition of this, the state has a priority to restore natural lands, protect agriculture lands, and reforest riparian areas and has many funding opportunities for this. It is one of the major categories of California's Climate Policy. Ca Natural and Working Lands Climate Change Implementation Plan.

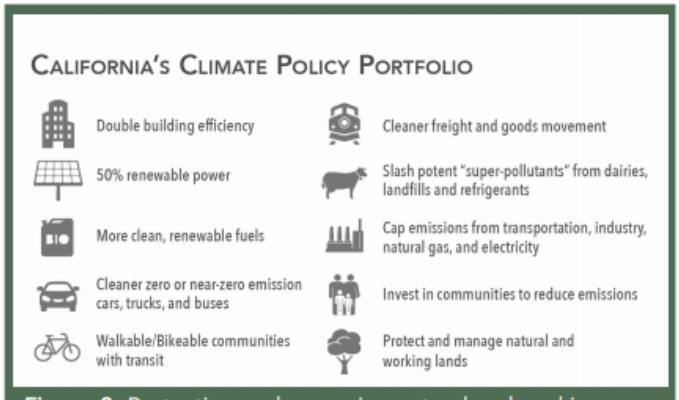


Figure 2. Protecting and managing natural and working lands is a key strategy within California's broader climate change policy portfolio.

Agricultural lands are also important areas to ensure we avoid conversion to other, more impactful, types of land uses. The Strategic Growth Initiative has also stated this as a priority and links land preservation to landform e.g. compact, transit-oriented communities.

The Sustainable Agricultural Lands Conservation Program (SALC) utilizes Cap-and-Trade proceeds to protect agricultural lands that are at risk of conversion to other uses. Studies show that farmland produces 70 times less greenhouse gas emissions than urbanized land, and protecting farmland provides an opportunity to capture carbon in the land base. SALC's mission is to support California's need for agricultural conservation, economic growth, and sustainable development.

"SALC fights climate change by protecting our productive farm-lands and encouraging compact transit-oriented communities."

Multiple benefits of carbon farming

Carbon farming or regenerative agriculture can reverse climate change within our lifetime. The data show that if implemented on a larger scale than currently practiced, regenerative agriculture — from tropical home gardens to temperate permaculture — could draw down more than 100 billion tons of carbon into the soil. This equal to 367 billion tons of carbon dioxide (CO_2). Climate scientists report that to reverse the disastrous course we're now on, we need to draw down an estimated 200 billion metric tons of CO_2.

Not only can carbon farming sequester great quantities of carbon currently in the atmosphere, it also offers resilience in the face of drought and flooding. Bringing carbon into soil builds soil organic matter, which improves the soil's ability to capture water. This can help prevent runoff during floods and increase water retention during times of drought. For every 21 tons of carbon sequestered per hectare (2.5 acres), soil organic matter goes up about one percent, which in turn increases the soil's ability to hold water by 25,000 gallons.

Because it involves high levels of on-farm biodiversity, regenerative carbon farming produces lucrative combinations of food, fiber, building materials and biofuel. It also protects water resources, pollinators and wildlife habitat, and improves soil quality and productivity.

Removal of invasive grasses

Further, allowing invasive, fire-prone grasses to invade a natural habitat increases fire risks and reduces carbon sequestration success. Invasive grasses reduce carbon storage
Depending on the type land conserved or restored, there are many potential co-benefits. More habitat, cleaner water, more food, more parks, more opportunities for residents to be in nature.

Identifying open spaces, natural and working lands for protection near highly impacted. Underserved neighborhoods is also a priority for the state and funding is provided for such projects.

The University of South California has urged actions around Natural and Managed Ecosystem Solutions including regeneration of damaged natural ecosystem and restoration of soil organic carbon to improve natural sinks for carbon. (p 20)

Riparian restoration can also sequester carbon.

One study demonstrates that per km of restoration over 4,000 tons of carbon is sequestered. This is equivalent to emissions from 3,400 cars or 1,400 homes.

Chaparral restoration is a significant option for sequestering carbon.

- Riparian/chaparral ecosystems absorb large amounts of atmospheric CO2 & store the carbon in their biomass.
- Chaparral habitat has the largest biomass per acre in Southern California, making it our largest natural carbon sink.
- Riparian Habitat improves water quality by filtering nutrients and nitrogen fixation.
- Chaparral habitat can adjust to high levels of air pollution and planting chaparral plants in urban environments could significantly lessen the impact of air pollution.
- Chaparral habitats are one of the most resilient & sturdy in Southern California, but also one of the least restored.
- With climate change converting many of our currently forested areas, the role our chaparral habitat plays will be more important than ever.

Proposed Sustainable Land Use Measures for the E-CAP

- ➔ Define/execute a comprehensive policy to conserve key natural habitat areas & agricultural lands by increasing goals and metrics for 'avoided conversion' through preservation and restoration for habitat and agricultural lands.
- ➔ With VMT's a primary GHG contributor in our region, we need measures that halt annexation of lands that are primarily served by individual cars
- ➔ Restore Escondido creeks and waterways for carbon sequestration, cooling, and habitat/community enhancement.
- ➔ Add a measure to remove 500 units of development from natural habitat from projects included in the General Plan.
- ➔ Add a measure to prohibit annexations and development in fire-prone areas and focus infill within current urban footprint.
- ➔ Update, adopt, and implement the city's Sub-Area Plan under the MHCP.
- ➔ Adopt a Sustainable Development Codes for Vegetation Protection Areas https://sustainablecitycode.org/brief/vegetation-protection-areas-8/
- ➔ Assess the E-CAP actions and apply for state funding support for applicable actions.
- ➔ Include program to increased "carbon farming" to protect a $1.7B agricultural industry in SD County.
- ➔ Regarding carbon offsets, if unable to be fully mitigated on site, purchase of subsequent carbon offset credits must occur within the city limits
- ➔ Divert city compost to regenerate damaged natural ecosystems where appropriate & restore natural carbon sinks

Regional and Local Support Roles:

- Work with the County, Natural Resource Agencies, and landowner to ensure the purchase for critical habitat and restoration of the Safari Highlands Ranch Critical habitat, such as Safari Highlands Ranch, would be a prime candidate for Federal and State Land and Water Conservation Funds.
- Through support at SANDAG of a Regional Conservation Funding Source, the city could receive funds for acquisition, management, and monitoring

- City could take a support role in the region by supporting and advocating for full implementation of the Natural Communities Conservation Plans in our region.

References
Bending the Curve: Ten Scalable solutions for carbon neutrality and climate stability, University of California
Climate Action Playbook KC, pp 30-31

Land-use considerations for wildfire prevention

The 2017 National Academy of Sciences Study, **Human-started wildfires expand the fire niche across the United States** outlines the economic and ecological costs of wildfire in the United States have risen substantially in recent decades. Public dialog and ongoing research have focused on increasing wildfire risk because of climate warming, overlooking the direct role that people play in igniting wildfires and increasing fire activity. Human-started wildfires accounted for 84% of all wildfires, tripled the length of the fire season, dominated an area seven times greater than that affected by lightning fires, and were responsible for nearly half of all area burned. Research indicates that strategies focused on prescription burning in San Diego's shrubland systems would only worsen the ecological impact of fire. Other research suggests that mechanical fuel reduction has limited effectiveness and that fuel breaks and mechanical treatments such as mastication pose serious ecological consequences, such as furthering the spread of invasive grasses. National and regional policy efforts to mitigate wildfire-related hazards would benefit from focusing on reducing the human expansion of the fire niche

Fire Prevention Measures to include in ECAP

- ➔ We need to adapt state-of-the-art wildfire behavior modeling that can factor in future climate conditions.
    - These are needed to identify future fire threat/risk
    - Improve understanding of where and when to conduct fire management strategies in order to reduce fire risk and protect biodiversity
    - Integration of fire hazard maps for future development accordingly.

- ➔ Land-use planning efforts that focus on infill development rather than expanding development into wildlands not only reduces fire risk to humans but can protect critical wildlife and uphold sequestration. We need to STOP building in fire prone areas

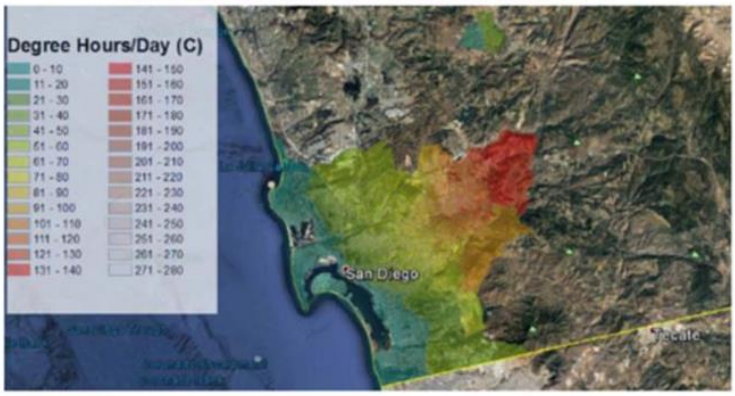
- ➔ Replace roadside vegetation clearings or otherwise with natural habitat to mitigate an increase in invasive/flammable species.

LAND USE OPPORTUNITY: Protect & Increase Urban Tree Canopy

TREES mitigate climate change in two ways: By reducing emissions related to air conditioning & heating with their shade, and by sequestering carbon and other greenhouse gas emissions. Therefore, in urban areas trees are especially valuable as they provide for pollution reduction & improved pulmonary health for residents. Additionally:

- ➔ A single mature tree sequesters 50lbs of carbon per year
- ➔ Increased real estate values & neighborhood beautification
- ➔ Topsoil & stormwater retention (1000g/y per mature tree)
- ➔ Critical for wildlife habitat.
- ➔ Shade and "Evapo-transpiration"

Figure 10: Urban Heat Island Index for San Diego County (CalEPA 2015)

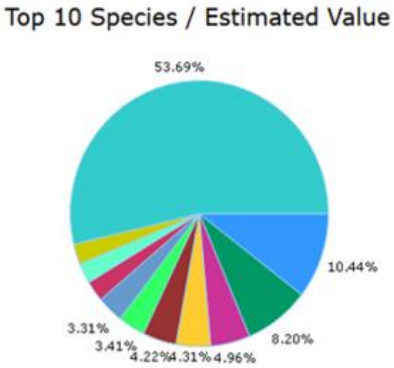


It is estimated that trees can reduce urban heat island effects by as much as 10-20 degrees F! Most notably, with more than 1/3 of all carbon emissions in the US being created by electricity production, minimizing heating/cooling in buildings via shade trees significantly lowers carbon footprint. Accounting for all benefits, it's estimated that urban trees return $3+ for every $1 invested in their planting & care over their lifetime. Heat Island Basics Trees/Vegetation How Trees Combat Urban Heat

ECAP Primary Initiative Focus: Protect and Increase Urban & Suburban Forests.

It's estimated that tree canopy for the San Diego region as a whole is **60-70% below** what it should be for the health of both humans and the environment (note that 15% total canopy coverage is optimal for a semi-arid city like Escondido). The most concerning aspect is that San Diego's tree canopy is likely further decreasing via drought, disease, & human indifference. That said, the City of Escondido's ~50,000 trees still potentially mitigate **8-10+ tons** of air pollution per year and remove an additional **400-700+ tons** of carbon per year. It's estimated that Escondido's current tree population (see figure/charts below) provides annual ecosystem benefits valued at **~$100-150M,** be it pollution control, carbon & water sequestration, cooling and shade, etc.

Escondido should develop and implement a management plan along with best practices to both increase total canopy coverage as well as assure the long-term vitality of its urban/suburban forests.



	Botanical	Common	Total	Pct.	Estimated Value
	Syagrus romanzoffianum	QUEEN PALM	5,177	10.44%	$8,698,620.00
	Quercus agrifolia	COAST LIVE OAK	4,064	8.20%	$24,210,650.00
	Washingtonia robusta	MEXICAN FAN PALM	2,461	4.96%	$9,533,400.00
	Platanus X hispanica	LONDON PLANE	2,137	4.31%	$4,218,040.00
	Liquidambar styraciflua	AMERICAN SWEETGUM	2,092	4.22%	$5,205,460.00
	Lagerstroemia indica	CRAPE MYRTLE	1,689	3.41%	$1,303,060.00
	Eucalyptus camaldulensis	RED GUM	1,640	3.31%	$9,743,170.00
	Jacaranda mimosifolia	JACARANDA	1,246	2.51%	$1,940,970.00
	Cupaniopsis anacardioides	CARROTWOOD	1,228	2.48%	$2,464,520.00
	Lophostemon confertus	BRISBANE BOX	1,226	2.47%	$2,758,000.00
	Other	OTHER	26,623	53.69%	$79,929,420.00
	Total Trees		**49,583**	**100%**	**$150,005,310.00**

Step 1: *Assess the current state of its urban forest*

- ➔ The Assess current total canopy coverage % for the city, evaluate species, location, and potential for shade coverage and carbon sequestration.
- ➔ Continue monitoring diseased/declining trees, remove dead ones.
- ➔ Identify areas of deficiency in business and residential sectors & assess feasibility to increase coverage.

Step 2: *Develop a master plan to fund, maintain, and improve urban forest.* Target to plant enough trees – public & private – by end of 2023 to reach 15% canopy coverage in 10 years.

- ➔ Create a City Forester position and assign a certified horticulturist/arborist
- ➔ Initiate capital improvement programs, public works & parks budgets. Consider ballot measure to fund?
- ➔ Adopt ordinances to require tree preservation, private owners included.
- ➔ Replacement and planting for private development.
- ➔ Enhanced inspection and enforcement capabilities.

Step 3: *Plant & Protect Street & Shade Trees*

Street trees provide special benefits in that they protect sidewalks and asphalt, reduce automobile accidents by slowing traffic, absorb UV rays and pollution, improve retail viability, reduce energy use and even reduce crime, which increases with heat. Their cool greenery also provides a more appealing atmosphere that encourages walking and biking. Carefully situated shade trees can play a powerful role in reducing air condition burdens and utility bills. A deciduous shade tree placed on the southwest corner of any building can reduce air conditioning bills by at least 25 percent, and these benefits begin to accrue within just a few years of planting. In winter, evergreen trees are effective when placed on the northeast corners of buildings, serving as wind breaks and reducing heating bills.

- ➔ Ensure city planning master plan incorporates increased street tree plantings, and that tree planting is funded.
  - Assign highest priority to low equity residential neighborhoods
  - Plant trees along streets and in medians.
  - Plant shade trees around municipal buildings as warranted by assessment.

- ➔ Require street trees (of appropriate species for location) to be planted in new commercial developments. City of Vancouver Tree Requirements

- ➔ Akin to Free Tree SD, Escondido should fund a community tree program that provides residents with free street trees and horticulture information about their planting and care.

- ➔ Consider replacing invasive & Mexican palm species with more favorable shade tree species.

- ➔ Pursue funding a tree planting project via The Escondido Community Foundation

- ➔ Utilize **Community Group Development Grants** (up to $5k per group) for street planting in needy areas. (discuss details with Consuelo Martinez)

- ➔ Create a community-led Go Fund Me to solicit donations for specific tree planting projects in underserved areas.

    - Or it can be a something like "Escondido Team Tree's", where we create a website like this one, partner with Arbor Day to assist with planting, get it out on social media to solicit funds, and then carry out planting in underserved areas in Escondido.

- ➔ Continued participation in Cool Parks, where recently volunteers planted 300 trees in Grape Day Park, Kit Carson Park, Mountain View Park, Washington Park, Jesmond Dene Park and South Center City Parkway.

- ➔ Find a local partnership akin Tree People and their collaboration with the Leonardo DiCaprio Foundation LA Urban Forestry Initiative

- ➔ Provide cost-sharing for planting of shade trees. Encourage incentive programs with local utilities/SDG&E. Riverside Shade Tree Incentives San Antonio Green Shade Program

- ➔ Increased City of Escondido & Community collaboration w/ Arbor Day Foundation

    - Host an annual Arbor Day Event where volunteers work to plant trees!
    - Become an Energy Saving Trees Partner (SDG&E is a Arbor Day Partner!)
    - Become a Community Canopy Partner
    - Tree Certification to ensure tree care and health is standardized and trees will henceforth be cared for by certified arborists and supported by the tree advisory committee made up of professionals & community partners.
    - Earn Recognition for Urban Forest Stewardship with a Tree City Arbor Day Award Example: Boulder, CO

Water Conservation Measures to include in the ECAP

In the coming years and decades, precipitation will remain highly variable but will change in character, with wetter winters, drier springs, and more frequent and severe droughts punctuated by more intense individual precipitation events. In the regional impact report it was noted that the San Diego County Water Authority continues to diversify its supply by developing more local sources, developing more recycled water, & encouraging greater water conservation. Along these lines, we should highlight some initiatives in our cities CAP plan:

- ➔ Expanded conservation and recycling efforts by the San Diego County Water Authority
- ➔ Mandate all newly constructed homes be equipped with gray water irrigation systems, drought tolerant landscaping, & water efficient fixtures
- ➔ Programs and incentives to offset the cost of conversion to drought tolerant landscaping.
- ➔ Free rain barrel program for lower income households
- ➔ Cost-free city sponsored water efficiency inspections for home plumbing & irrigation.
- ➔ Programs & funding for increasing water efficiency – both plumbing fixtures and landscaping – for commercial entities.

Agriculture: Impacts on Climate Change & ECAP Measures for cultivating Urban Agriculture

Animal Agriculture Contributes to Climate Change

Along with concerns of long-term climate change impacts on our crops and food supply, agriculture – specifically the farming of animals – is a major source of emissions and a contributor to climate change. It's clear that the world cannot meet global greenhouse gas reduction targets without curbing consumption of animal products. High-meat eating nations like the United States, which consume 2.6 times more meat than the global per capita average, must help shoulder this responsibility.

Feeding massive amounts of grain and water to farmed animals and then killing them, processing, transporting, and storing the produce (refrigeration required) is extremely energy intensive. Carbon dioxide, methane, and nitrous oxide are all powerful greenhouse gases, and together, they cause the vast majority of climate change. Together, the world's top five meat and dairy corporations are now responsible for more annual greenhouse gas emissions than Exxon, Shell or BP.

- ➔ CO2**:** Burning fossil fuels releases carbon dioxide. On average it requires 11 times as much fossil fuel to produce a calorie of animal protein as it does to produce a calorie of grain protein, & thus considerably more carbon dioxide is released.

- ➔ Methane**:** Chickens, turkeys, pigs, and cows who are kept in factory farms each year produce enormous amounts of methane, both while they digest their food and from the acres of waste pools. The U.S. Environmental Protection Agency has shown that animal agriculture is globally the single largest source of methane emissions and that, pound for pound, methane is more than 25 times as effective as carbon dioxide at trapping heat in our atmosphere.

In order to fully account for their climate impacts, municipalities should consider upstream emissions — that is, the embedded emissions associated with the production of food purchased and served by the city or county. Co-negatives of the livestock industry are rampant land degradation, water waste and pollution, air pollution, and loss of biodiversity. For human health risks of disease and death are lower in plant-based diets as well as are health care costs.

Reduced Emissions and Resource Use with Plant-Based Diets
Numerous studies document the beneficial role of plant-based diets in reducing greenhouse gas emissions, resource consumption, and environmental degradation. While this area of research is evolving, studies generally find that plant-based foods (with some exceptions) require less energy to produce and generate fewer greenhouse gas emissions than animal foods. Plant-based diets result in 0.8 ton/year annual emissions reduction compared to those who frequently eat a meat in their diet. Using this number, even a modest goal of 50,000 Escondido residents reducing their meat consumption by 50% could achieve a 20,000 ton reduction annually.
Supporting local commercial agriculture is important and is a stated priority for the City. In addition, there are many things the city can do to increase local food security on a residential and 'uber' local level.

Create a Network of Climate Victory Gardens in Escondido
As part of the WWI and WWII war efforts, the nation rallied to feed their communities at home and support troops overseas by planting Victory Gardens. To many this might seem a trivial effort. How much can a few gardeners grow? By 1944 nearly 20 million victory gardens produced 8 million tons of food, equaling about 40% of the fresh fruits and vegetables consumed in the US at the time.

We are once again in the position where we, as everyday residents, have the opportunity to use our gardens as a force for change. Instead of gardening in support of war efforts, we are gardening to fight climate change. Shifting garden practices towards principles of regenerative agriculture can be a meaningful part of reversing climate change and sequestering carbon out of the atmosphere and back into the soil.

An effort like Green America's Climate Victory Garden Campaign is one we could amplify in Escondido neighborhoods and under-used urban lots. Food2Soil, a successful local composting collaborative could be replicated in Escondido to improve soil quality, and carbon sequestration, in resident gardens.

Enhance support for Farmer's Markets and Community-Supported Agriculture (CSA) programs
Escondido is so fortunately to have several local farmer's markets. Some of our local farmers also have CSAs. However, they could serve many more people than access these great programs. Modeled on "Birding Trail" or "Wine Tour" maps, the city could develop a Local Food Map or other communication material to continually reinforce the availability and healthfulness and climate sense of eating locally and supporting our local farmers.

Get serious and creative about "Urban Ag" programs.
A movement to bring agriculture into the cities and already developed neighborhoods is also an action that could be promoted in the city. A great organization working on this issue is the San Diego Food System Alliance. The value of urban agriculture is not just about the food. In reality, few, if any, urban agriculture projects are intended to replace traditional food retail or would claim to lead to food self-sufficiency for individuals or for cities.

However, urban farms and community gardens *do* supplement household, community and municipal food security with seasonal and culturally-appropriate foods. They also build social capital, gather communities, catalyze civic engagement, and perform ecosystem services. Another important initiative of the SDFSA is the preparation of a San Diego County Food Vision 2030. This would be a fruitful effort for our community to be involved in.

Measures to be added to the ECAP:

1. Develop a Climate Victory Garden program for Escondido.
2. Develop a model for a Food2Soil community composting program that builds off or expands current local composting offerings.
3. Develop a Local Food map or other communications program for city residents.
4. Set a goal and metric for urban agriculture activities.
5. Adopt and "Urban Agriculture Incentive Zone (UAIZ) program to offer a property tax incentive to encourage urban Ag in Escondido.
6. Engagement in the Food Security 2030 Vision could also help focus on resiliency and future stability of our community.

ECAP Support Initiatives

- ➔ We request that the draft of the Climate Plan include an assessment of actions related to reducing emissions by promotion of a plant-based diet.
- ➔ E- CAP should include goals for residential tree planting, home gardening, and incentives to use rain barrels.
- ➔ E-CAP could include information on 'climate-friendly diets' for residents and the city can determine its own behavior and purchasing actions in what could be measurable and enforceable actions.
- ➔ We strongly urge the climate planners pursue the recommendations contained in the report ***MEAT OF THE MATTER: A Municipal Guide to Climate-Friendly Food Purchasing***, adapted for Escondido.
- ➔ ECAP should create a staffed working group to evaluate resources and develop a plan to increase food security, reduce climate emissions, and improve health for the city and environs.
- ➔ The City should provide pathways for institutional procurement of local produce that would facilitate investment in local plant-based farms and offer farm microloans, tax-incentives, and grants.
- ➔ The CAP should include requirements or incentives for institutional adoption of a minimum number of fully plant-based meals at government meetings, hospitals, schools, universities
- ➔ Begin a community campaign to educate the public about food choice as part of a climate-friendly lifestyle.
- ➔ Implement a "Buy climate-friendly first" food purchasing policy for public institutions including city and county governments, schools, and hospitals
- ➔ Develop an updated regional emergency food distribution plan that accounts for climate- and energy-based disruptions. The level of need for such a plan will be made clear by conducting a vulnerability assessment…
- ➔ Expand community gardens on public and private lands including school campuses, City lands, and church properties.

- ➔ Support urban tree food programs of such advocates as Tree by Tree, and the Eugene Tree Foundation (now Friends of Trees).
- ➔ The City should encourage and fully support the local Farmer's Markets in the region to promote more consumption of locally grown foods which have the lowest carbon footprint.
- ➔ The City should support a climate and public health campaign to encourage more plant-based, whole foods eating in the region. The CAP should include commitment to educational materials, workshops on plant based eating, and promotional events to encourage more plant-based eating.
- ➔ Climate-friendly menus (locally-sourced, plant-based) should be served at all City and city sponsored events with educational materials to accompany them.
- ➔ The CAP should include measures to create an *Eat a Climate-Friendly Diet* working group and partner with local vegan and plant-based groups, farmers, & businesses have expertise to share.
- ➔ The CAP should include measures to offer tax-incentives to restaurants where 50% or more of the menu offerings are plant based.
- ➔ The CAP should include measures to increase suitable agriculture reserve lands suitable for produce farming and create urban agricultural zones to put vacant parcels into produce food production in urban areas.
- ➔ The City should partner with organizations that support produce farmers and help them sell locally. Groups like San Diego Food System Alliance, California Food Link, and the San Diego New Farmers Guild would be good partners.
- ➔ The CAP could investigate programs to incentivize food technology industry to develop plant-based and cellular agriculture alternatives to animal products.

References

https://1bps6437gg8c169i0y1drtgz-wpengine.netdna-ssl.com/wp-content/uploads/2017/12/MunicipalReport_ko_120117_v2-1.pdf
http://www.worldwatch.org/files/pdf/Livestock%20and%20Climate%20Change.pdf
http://ajcn.nutrition.org/content/early/2014/06/04/ajcn.113.071589.short
http://www.pnas.org/content/113/15/4146.abstract
https://www.eugene-or.gov/ArchiveCenter/ViewFile/Item/2385
http://www.pcrm.org/sites/default/files/images/health/pplate/EveryMealPowerPlate.pdf
https://www.grain.org/article/entries/5976-emissions-impossible-how-big-meat-and-dairy-are-heating-up-the-planet
https://ediblesandiego.ediblecommunities.com/food-thought/confronting-climate-change-local-level-san-diego-county?utm_source=Edible+San+Diego+Newsletter&utm_campaign=2980eb0cf1-EMAIL_CAMPAIGN_2020_02_04_09_42&utm_medium=email&utm_term=0_fc60b9132f-2980eb0cf1-334998197&mc_cid=2980eb0cf1&mc_eid=fca8f7009a

E-CAP Implementation, Administration, & Community Support Activities

As great as it is to have a solid plan framework for CAP initiatives, it's critical that we have all the right tools, resources, & expertise in place at the onset to get set the wheels in motion, to continue to build out and integrate CAP measures into city planning, funding, monitor adoption success, failures, and ultimately to sustain. The following are recommended:

- ➔ Ensure CAP is legally binding with CA requirements & preserve/improve elements that align with best practice.
- ➔ Set Zero Carbon target goal in alignment with Executive Order B-55-18 of carbon neutrality by 2045.
- ➔ Include DETAILED timeline of strategies along with cost analysis & expected GHG reduction results for each.
- ➔ Produce a GHG inventory every 3 years, & annually monitor each initiative implemented
- ➔ Establish/fill a Climate Coordinator position accountable directly to City Manager or Mayor
- ➔ Climate Coordinator to create a Climate Task Force, open to the public, to implement ECAP & to maximize grants/funding.
- ➔ Create a Resident Advisory Sustainability Commission to advise the city on implementing the CAP and other environmental, & quality of life issues.
- ➔ Create a Climate Justice Ambassadors program to assist with outreach in Equity Priority neighborhoods.
- ➔ Hold an annual Escondido Climate Event (or week!) to focus education & attention around carbon emission reduction.
- ➔ While measures/metrics are critical aspects to a CAP, we must ensure that a comprehensive & detailed "Plan" is put forth.