



# California: Trying to live in Harmony

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# Plastics

## Plastics in California

★ Plastics harm our Earth playing a factor in climate change as it results:

- in harming wildlife
- our ocean
- air pollution

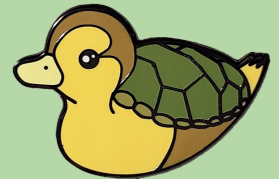


### Plastics Harming Ocean & Wildlife:

A recent study found that 73% of fish caught at mid-ocean depths in the Atlantic had microplastic in their stomachs.

### Statistics:

Globally almost 360 million tons of plastic were produced in 2018.



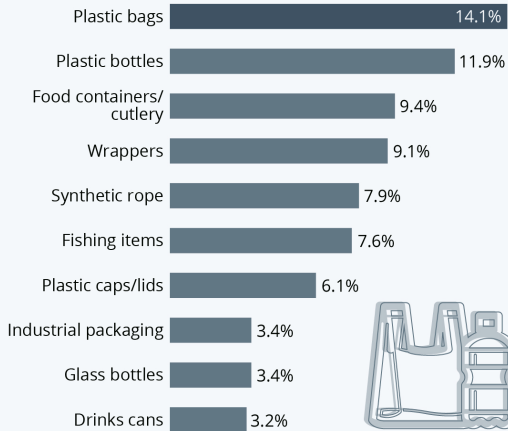
# Plastics

## Polluting the World's Oceans :



### Plastic Items Dominate Ocean Garbage

The 10 most widespread waste items polluting the world's oceans\*



\* Based on waste items found in seven aquatic ecosystems globally. Source: Carmen Morales-Caselles et al. (2021)



## Generated, Recycled, Landfilled, etc:

### Plastics Table and Graph

The data below are from 1960 to 2018, relating to the total number of tons of plastics generated, recycled, composted, combusted with energy recovery and landfilled.

1960-2018 Data on Plastics in MSW by Weight (in thousands of U.S. tons)

Management Pathway	1960	1970	1980	1990	2000	2005	2010	2015	2017	2018
<b>Generation</b>	390	2,900	6,830	17,130	25,550	29,380	31,400	34,480	35,410	35,680
<b>Recycled</b>	-	-	20	370	1,480	1,780	2,500	3,120	3,000	3,090
<b>Composted</b>	-	-	-	-	-	-	-	-	-	-
<b>Combustion with Energy Recovery</b>	-	-	140	2,980	4,120	4,330	4,530	5,330	5,590	5,620
<b>Landfilled</b>	390	2,900	6,670	13,780	19,950	23,270	24,370	26,030	26,820	26,970

# How to Improve our Earth:

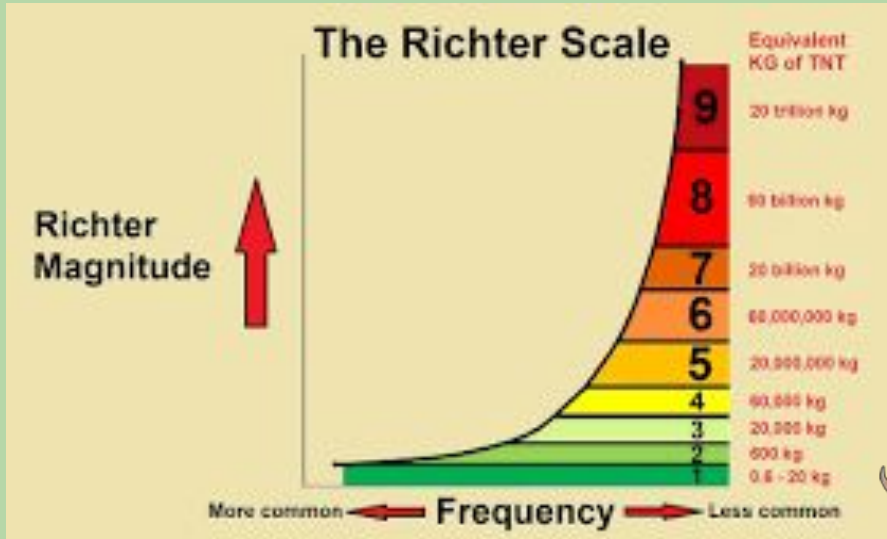


- ★ Bioplastics : alternative use of plastics that are more sustainable and biodegradable
- ★ Daily uses of your lifestyle, change to:
- ★ Carry reusable shopping bags.
- ★ Carry your own containers for take-out food and leftovers.
- ★ Carry reusable utensils and glass drinking straws.
- ★ Shop your local farmers market.
- ★ Check labels of personal care products!
- ★ Carry lunches in reusable stainless containers or cloth bags.

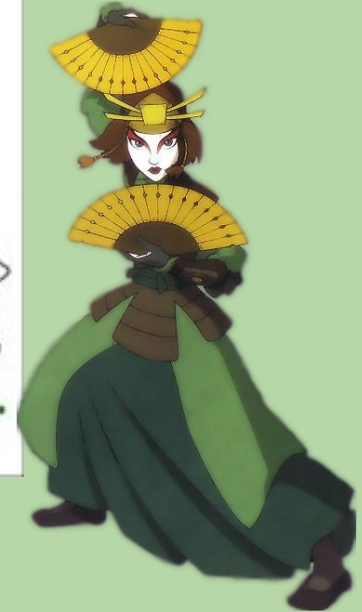
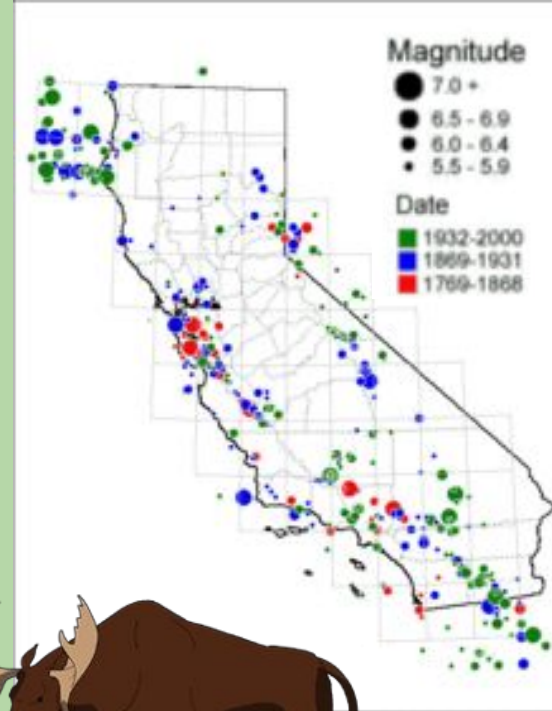


# Side note: Earthquakes

Earthquakes in California throughout the years



Higher magnitude level = more damage

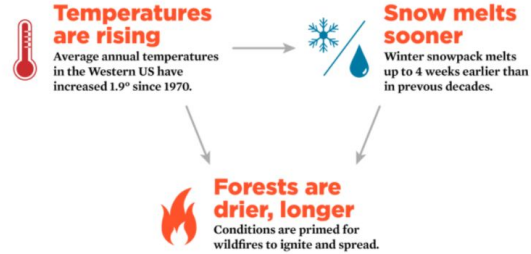


# Wildfires



- ★ **Behavior influenced by:**
  - Living + Decaying plant matter.
  - Weather: humidity down, winds carry embers, droughts cause “dry thunderstorms” – lightning, but no rain.

- ★ **Causes:**
  - Lightning
  - Human Accidents: cigarettes, equipment, vehicle crashes, campfires, etc.
  - Arson
  - Electrical fires account for 10% of all
  - Drought (about 120 to 150 million trees died in California from 2012 to 2016)
  - Climate change



## Side effects

- ★ **Fire can cause increased:**
  - Erosion,
  - Vegetation changes
  - Runoff
  - Flooding
  - Landslides
  - Air pollution
  - Water and ground contamination
  - Health effects



Fires are expensive; the cost to fight is rising!

# California's Recent History



- ★ California 2017
  - 9000 fires, second worst on record for property damage for climate and natural conditions

- ★ Campfire, North California, 2018:
  - Deadliest, most destructive in California history = 85 dead, 240 mi. Burned
  - 18,805 structures destroyed, \$16.5 billion “most expensive global natural disaster in 2018”



- ★ California 2020: largest wildfire season on modern record

- 4,359,517 acres, >4% of the entire state
- Intense thunderstorms + dry lightning + historic heatwave + COVID-19
- Largest fire on California record

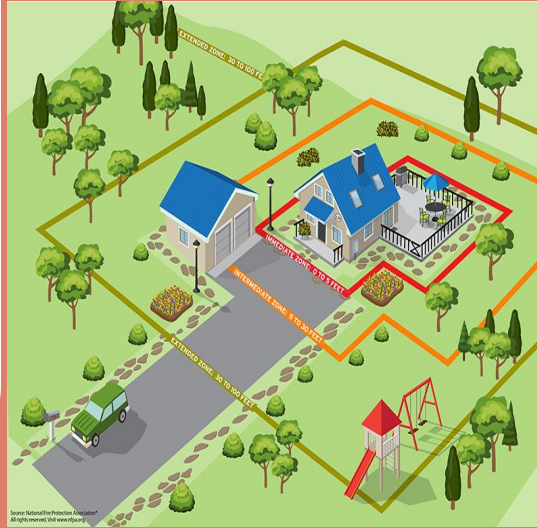


# What can we do to protect ourselves?



## Globally:

- ★ Deal with climate change/wildfire feedback loop
- ★ Fund wildfire preparedness/wildfire suppression
- ★ Collaborate with indigenous peoples
- ★ Revise forest management policies
- ★ Reform public utilities, example PG&E, through “grid hardening”
- ★ Inspect, repair, replace overhead power lines
- ★ Use improved materials and tech like drones



## Institutionally:

- ★ establish alerts and warnings, education, firefighting by fire crews, Quick evaluation

## Individually:

- ★ use fire resistant construction, develop a defensible space around homes, be prepared to evacuate.
- ★ Be mindful!





# Drought

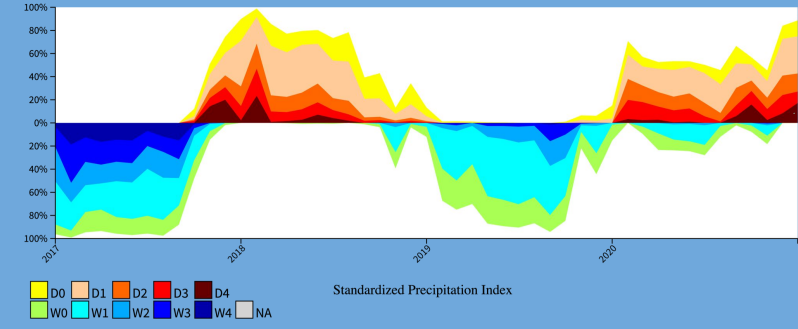
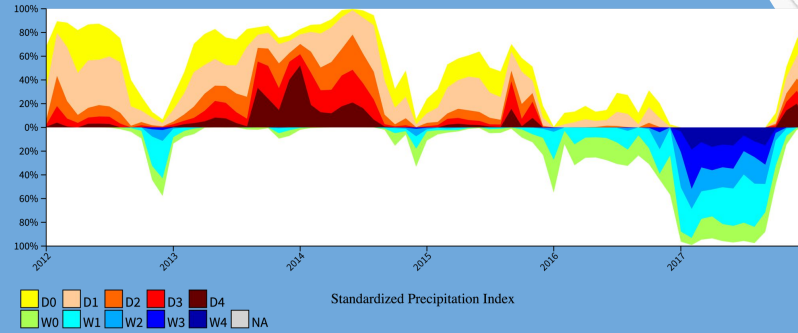
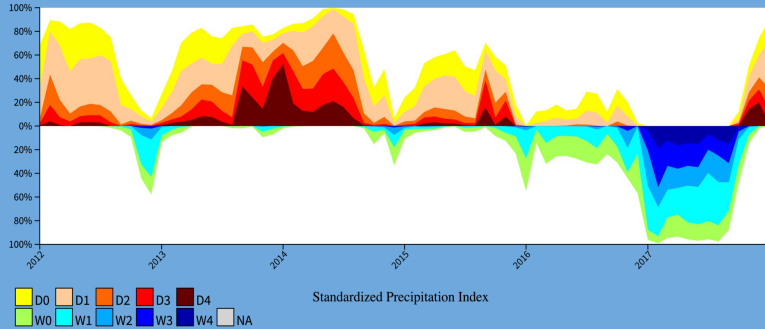


- ★ **California started to experience abnormal dryness beginning in 2012, meaning**
  - Soil is dry; irrigation delivery begins early
  - Dryland crop germination is stunted
  - Active fire season begins
- ★ **Since 2012 the California drought has been increasing at a substantial rate leading up to 2021**
- ★ **Exceptional Drought (2012–2017, 2021)**
  - Fields are left fallow; orchards are removed; vegetable yields are low; honey harvest is small
  - Fire season is very costly; number of fires and area burned are extensive
  - Fish rescue and relocation begins; pine beetle infestation occurs; forest mortality is high; wetlands dry up; survival of native plants and animals is low; fewer wildflowers bloom; wildlife death is widespread; algae blooms appear
- ★ **Within the last decade the year with the most rainfall was 2017**
  - This was due to



# Drought

## Drought conditions from 2012–Present



# Solutions to Drought

- ★ Take shorter showers/don't take baths
- ★ only use the amount of water you need
- ★ Consume/ use products that take less water to make
- ★ recycle water
- ★ don't leave water running when doing dishes
- ★ do larger amounts of laundry
- ★ Use plants that don't require a lot of water

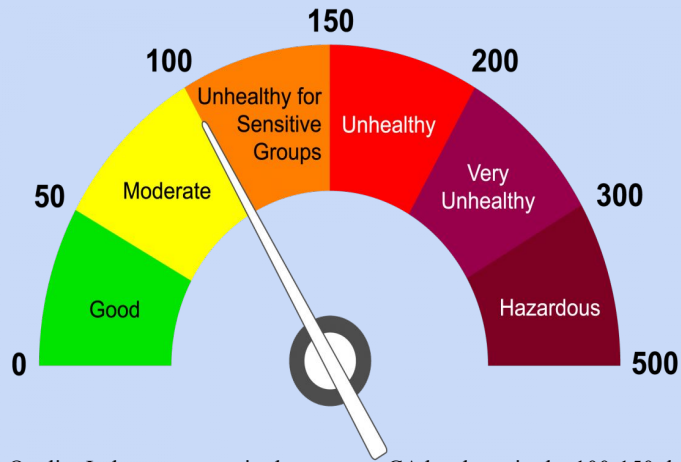


# Air Pollution

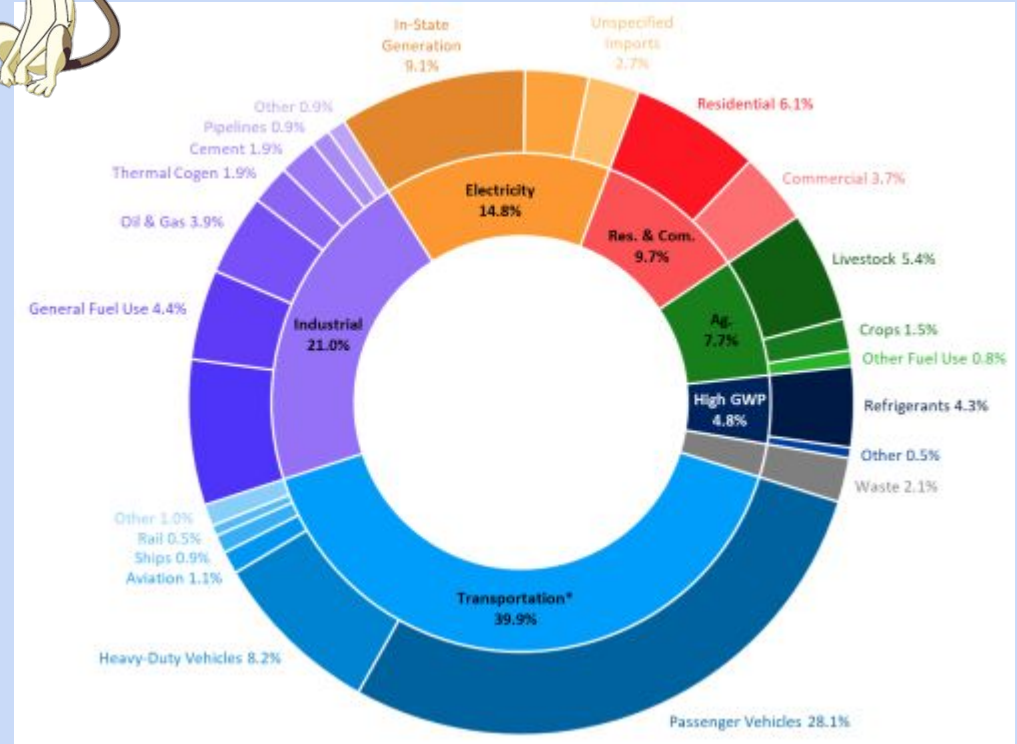


- The three main factors for unhealthy levels of air pollution in California
  - the activities of over 39 million people,
  - a mountainous terrain that traps pollution
  - a warm climate that helps form ozone and other pollutants
- Change in our climate are leading to a A number of air pollutants which will continue to impact the health of California residents
  - 7,200 premature deaths
  - 1,900 hospitalizations
  - 5,200 emergency room visits.
  - Estimated total cancer risk is 730 per million
  - 90% of Californians breathe unhealthy levels
- What is the largest source of Pollution in California?
  - California's largest source of greenhouse gas emissions, accounting for about 40% of the state's total.

# Air Pollution



Air Quality Index —> note: in the summer CA has been in the 100-150 due to wildfires



A Diagram depicting the causes of air pollution in California and its %s

CA is one of the states with the highest pollution rates

# **SOLUTIONS** to Air Pollution



## 1) **Limit Transportation**

- Carpool, use public transportation, walk or ride a bike

## 2) **Recycle**

- Limit use on plastic and recycle paper, as well as use organic material → breaking down plastic is toxic to the environment as it releases harmful chemicals

## 3) **Utilize the power of the sun**

- Open the blinds, instead of turning on a lamp → simple tasks make all the difference

## 4) **Education**

- Educate society on the effects of air pollution through campaigning and advocating for a better lifestyle!



Questions or Concerns?



