



# CLIMATE CHANGE: COMBATING THE SIXTH MASS EXTINCTION?

Unitarian Universalist  
Fellowship of Sunnyvale  
July 16, 2020

Presented by:

**ROTARY CLUB OF SAN  
JOSE**

**in conjunction with  
Rotary Climate Action  
Council of  
Rotary District 5170**

**Chair of RCAC:  
Hon. Rod Diridon Sr.**

**Credentials:**

**Chair, US High Speed Rail Association**

**Past Chair Intercity High-Speed Rail Committee  
American Public Transit Association**

**Chair Emeritus  
California High Speed Rail Authority Board**

**Emeritus Executive Director (Ret.)  
Mineta National Transit Research Consortium  
Mineta Transportation Institute**

# THE 5 EXTINCTIONS: THE CAUSE

1) 444 MILLION YEARS AGO: ORDOVICIAN PERIOD ENDS – 86% EXTINCTION

2) 375 MILLION YEARS AGO: DEVONIAN PERIOD ENDS – 75% EXTINCTION

3) 251 MILLION YEARS AGO: PERMIAN PERIOD ENDS – 96% EXTINCTION  
(SET EARTH BACK 300 MILLION YEARS IN EVOLUTIONARY CYCLE)

4) 200 MILLION YEARS AGO: TRIASSIC PERIOD ENDS – 80% EXTINCTION

5) 66 MILLION YEARS AGO: CRETACEOUS PERIOD ENDS (DINOSAURS): 76% EXTINCTION

ALL OF THOSE EXTINCTIONS WERE CAUSED BY THE BUILD-UP OF CO<sub>2</sub> &  
OTHER CARBON-BASED MATERIALS IN THE ATMOSPHERE

**6) WILL THERE BE A 6<sup>TH</sup> EXTINCTION FOR THE PERIOD OF MAMMALS ON EARTH BEGAN 66 MILLION YEARS AGO; OR WILL EVOLUTION AS WE KNOW IT BE ALLOWED TO CONTINUE?**

# CLIMATE CHANGE



- **HAPPENING NOW AND HUMAN CAUSED**
- **SOME IMPACTS ARE IRREVERSIBLE**
- **ACTIONS TODAY CAN LIMIT FUTURE WARMING**

# SCIENCE: CONSENSUS



- 99.9% OF SCIENTIFIC RESEARCH STUDIES PUBLISHED IN PEER-REVIEWED SCIENTIFIC JOURNALS FIND THAT HUMAN-CAUSED CLIMATE CHANGE IS HAPPENING.

<http://bst.sagepub.com/content/early/2016/04/25/0270467616634958.abstract>

**The Washington Post**  
*Democracy Dies in Darkness*



Climate and Environment

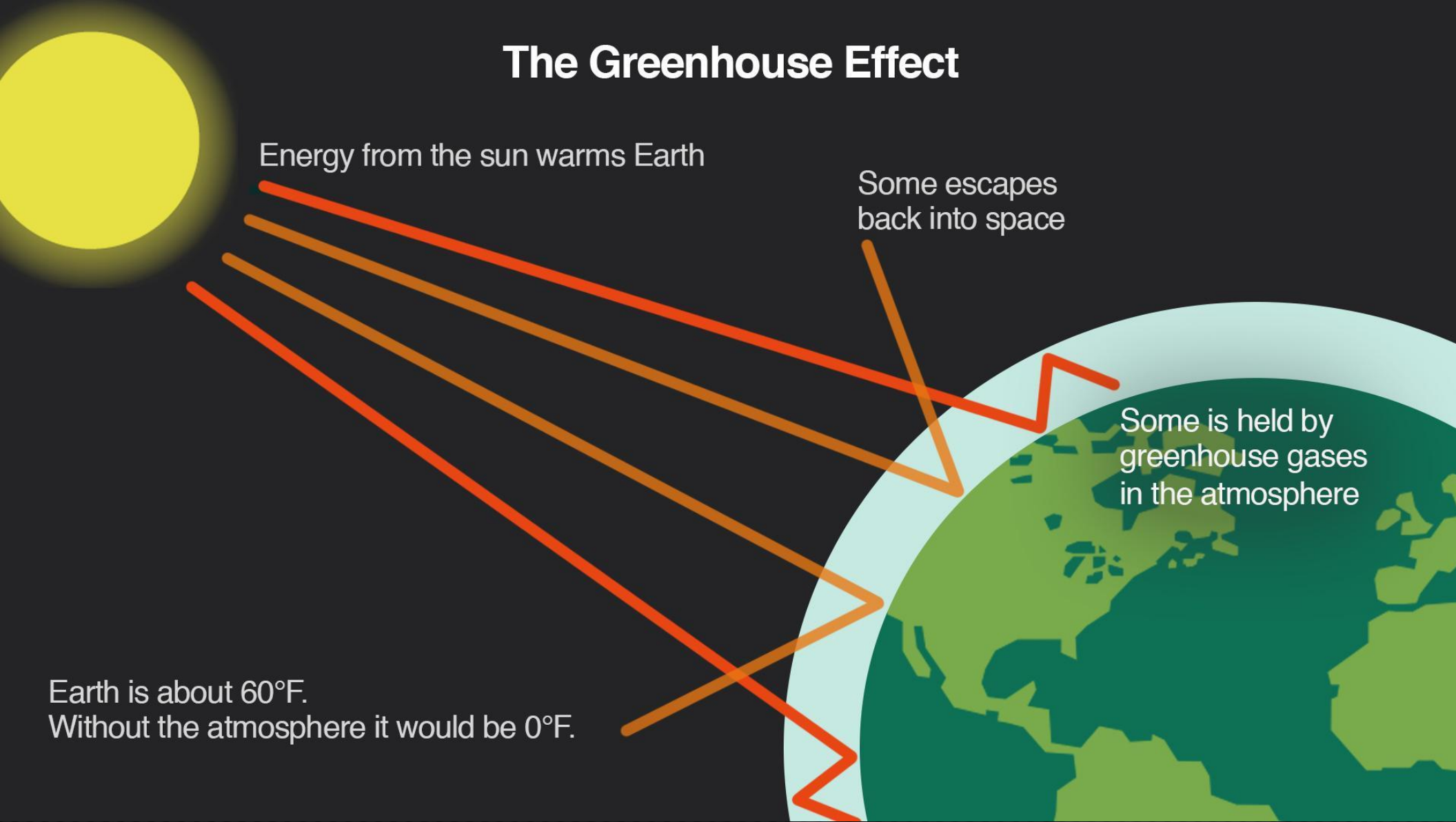
**More than 11,000 scientists from around the world declare a 'climate emergency'**

By **Andrew Freedman**

November 5, 2019 at 7:18 a.m. PST

# SCIENCE: GREENHOUSE EFFECT

## The Greenhouse Effect



# THE CLIMATE CRISIS SOLUTION IS STILL WITHIN OUR REACH – BARELY . . .

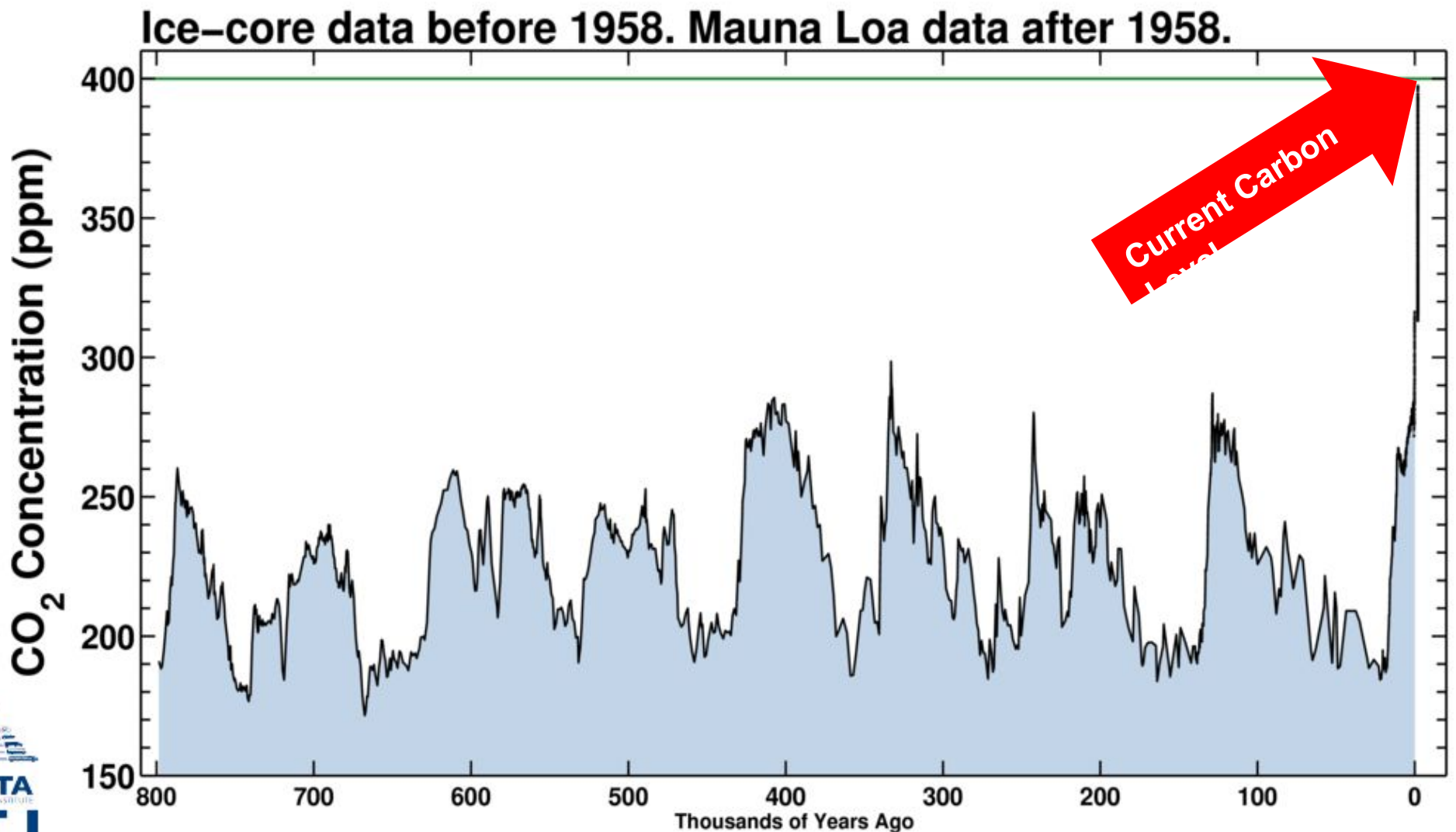
“CLIMATE CHANGE IS THE EXISTENTIAL CHALLENGE OF OUR HUMAN EVOLUTIONARY CYCLE ON EARTH. UNIVERSAL EMERGENCY ACTION BY THINKING INDIVIDUALS MUST TAKE EFFECT WITHIN THE NEXT DOZEN YEARS TO SAVE EARTH FOR OUR CHILDREN AND THEIRS. **WE MUST START NOW AND NEVER STOP!**”

HON ROD DIRIDON, SR.,  
EXECUTIVE DIRECTOR EMERITUS (RET.)  
CONGRESS'S MINETA TRANSPORTATION INSTITUTE  
CHAIR OF THE ROTARY CLIMATE ACTION COMMITTEE

# The New York Times

## Heat-Trapping Gas Passes Milestone, Raising Fears

MAY 11, 2013



# CO<sub>2</sub> Causes Rapid Global Warming

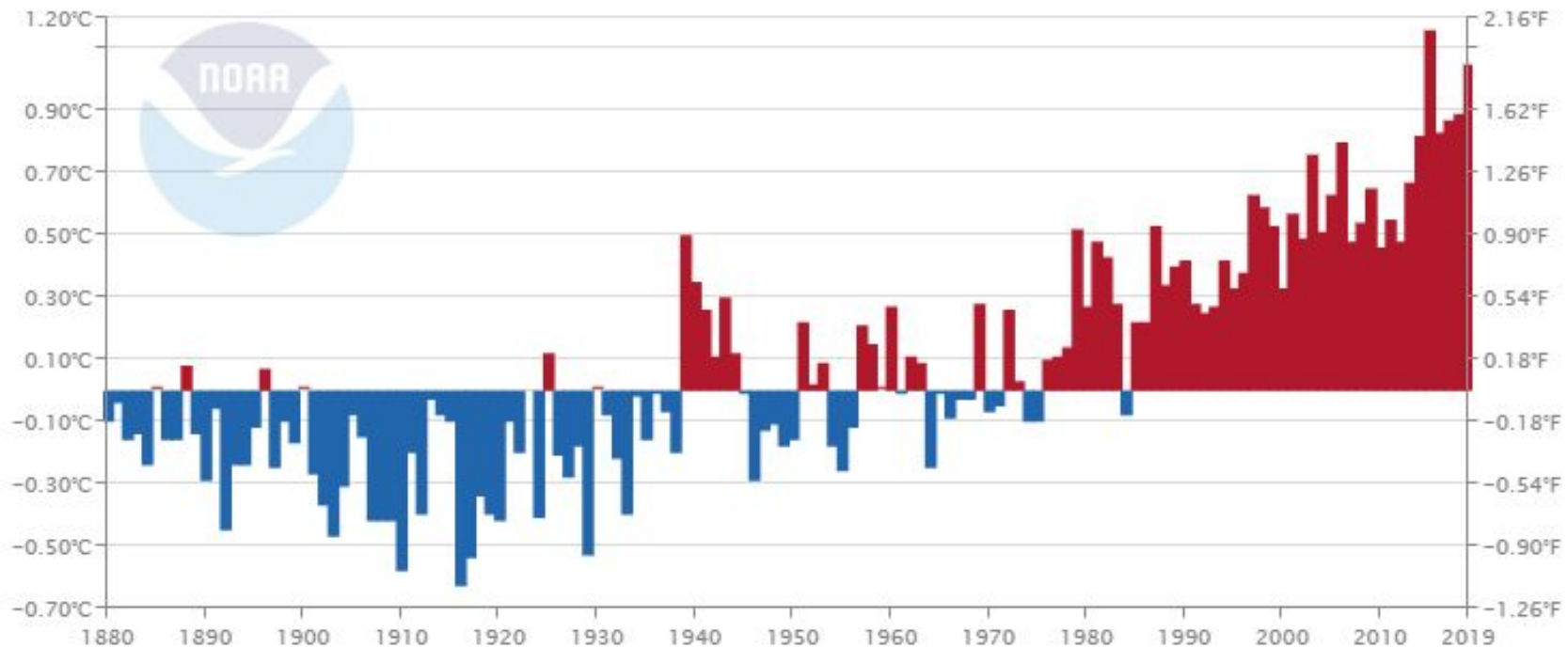
**The New York Times**

## 2019 Was the Second-Hottest Year Ever, Closing Out the Warmest Decade

By Henry Fountain and Nadja Popovich Jan. 15, 2020

Global Land and Ocean

December Temperature Anomalies





# Most CO<sub>2</sub> and Heat caused by Transportation and Electric Generation and Transport

San Jose Mercury News, Page 1, August 8, 2013

## State report says global warming's wrath has already arrived

By Paul Rogers

*progers@mercurynews.com*

Rising ocean waters. Bigger and more frequent forest fires. More brutally hot summer days.

These aren't the usual predictions about global warming based on computer forecasts. They're changes already happening in California, according to a detailed new report issued Thursday by the California Environmental Protection Agency.

Climate change is "an immediate and growing threat" affecting the state's water supplies, farm industry, forests, wildlife and public health, the report says. The 258-page document was written by 51 scientists from the Univer-

sity of California, Scripps Institution of Oceanography, Lawrence Berkeley National Laboratory, U.S. Geological Survey and the National Oceanic and Atmospheric Administration, among other agencies and institutions.

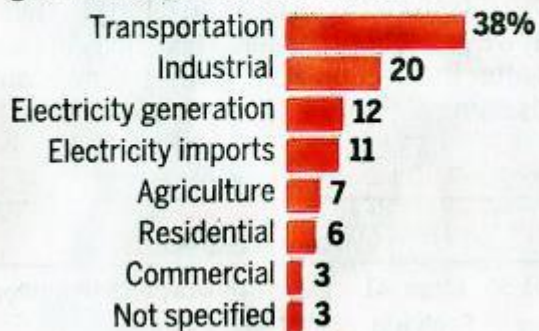
"Climate change is not just some abstract scientific debate," said California EPA Secretary Matt Rodriquez. "It's real, and it's already here."

Most Californians seem to agree. In a poll last month by the nonpartisan Public Policy Institute of California, 63 percent of the state's residents said the effects of global warming are already being felt, while 22 percent

See **WARMING**, Page 8

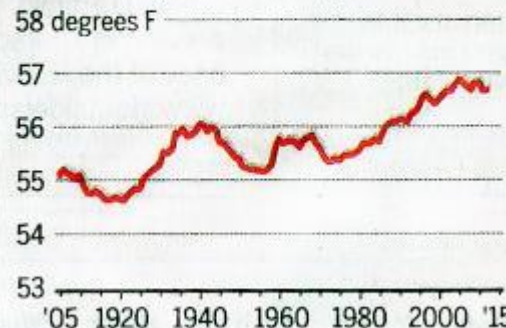
### Sources of emissions

Transportation, industry and electrical generation account for 81 percent of all greenhouse gas emissions in California.



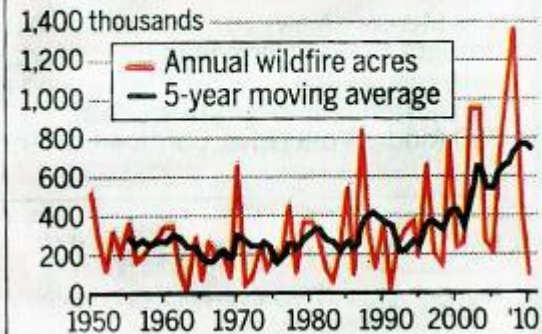
### Rising temperatures

Since 1895, annual average temperatures in California have increased by about 1.5 degrees.



### More severe fires

The average annual acreage burned in wildfires in the state since 2000 is almost twice as high as the 1950-2000 average.



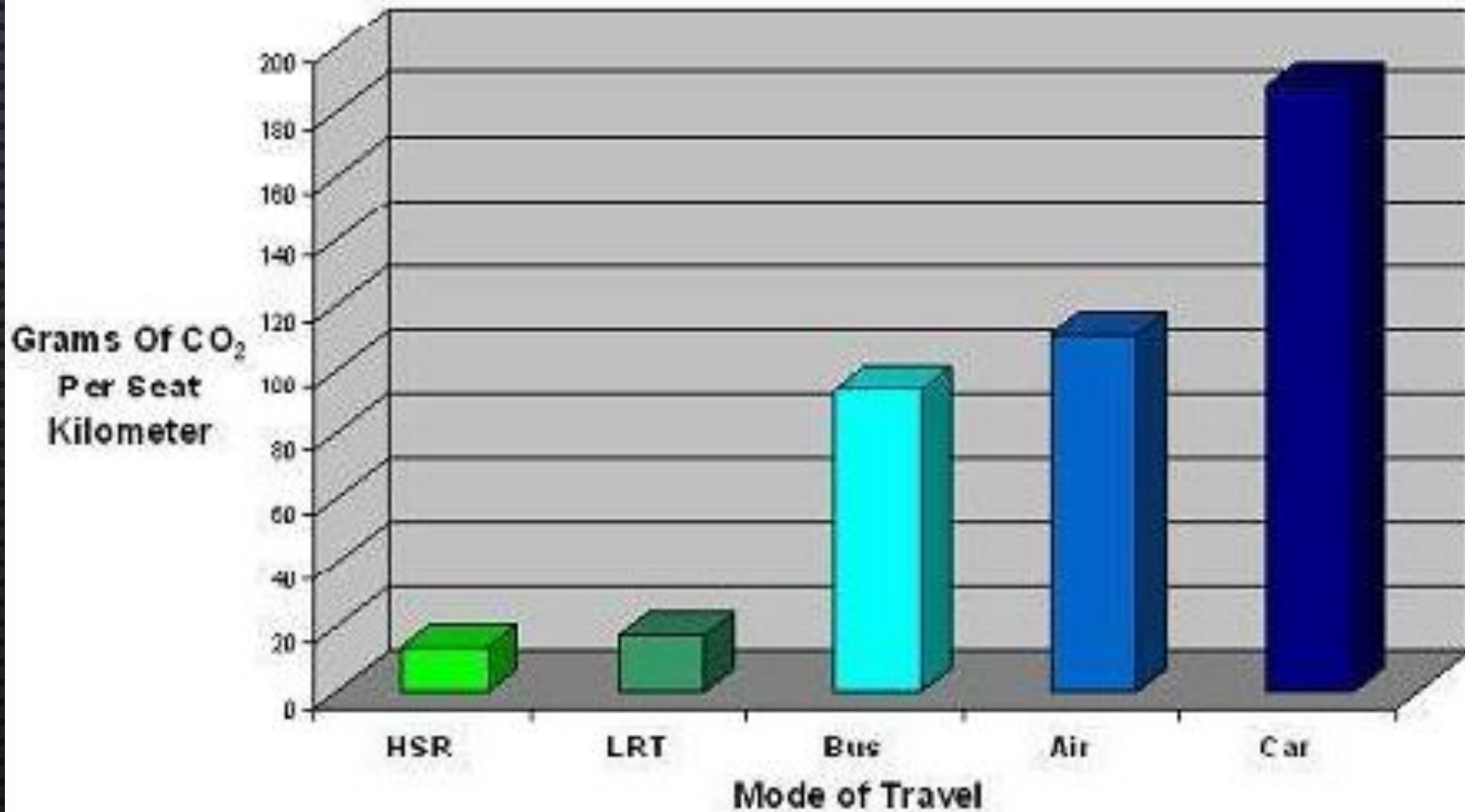
Source: Indicators of Climate Change in California, Office of Environmental Health Hazard Assessment

BAY AREA NEWS GROUP



Created by Congress in 1991

# CARBON FOOTPRINT TRANSPORTATION MODE COMPARISON



HSR = High Speed Rail  
LRT = Light Rail

Dr. Anthony Perl

Mineta Transportation Institute

# WHAT'S HAPPENING?

- FOOD PRODUCTION DISRUPTION LEADING TO STARVATION AND MASS MIGRATION
- UNEXPECTED EPIDEMICS
- WATER SHORTAGES AS MORE LAND TURNS TO DESERT
- RADICALLY INCLEMENT WEATHER CAUSING WILDFIRES, FLOODING AND DROUGHT
- POLAR ICE MELTS CAUSING MASSIVE FLOODING

# The Brief Opener

ENVIRONMENT

## Climate catastrophe seen just 12 years away

By Justin Worland

**C**LIMATE SCIENTISTS HAVE UNDERSTOOD FOR decades that unchecked, man-made global warming will wreak havoc on human civilization.

Now a landmark U.N. report released on Oct. 8 rings what scientists hope is a forceful enough alarm to wake the world up. Even the glimmer of light it offers—that we already know how to address climate change and stave off some of its worst effects—bears a bitter shadow, in the finding that political leaders are nowhere close to fully undertaking the necessary steps.

Scientists on the Nobel Prize-winning Intergovernmental Panel on Climate Change (IPCC) point to a global temperature rise of 1.5°C as a threshold the planet cannot cross without seeing some of the worst effects of climate change—including the destruction of ecosystems, the disappearance of some island nations and unpredictable changes to the planet's weather pat-

**'We need a plan to save us. We have a short window of time and a huge responsibility.'**

have expanded rapidly in recent years largely as a result of market forces. But reaching the target will require government action too, including support for research and development, and modification of the way markets work, in order to account for the negative effects of burning fossil fuels.

"The energy transition we need now for climate purposes needs to move much faster," says Adnan Z. Amin, who heads the International Renewable Energy Agency. "We need policy mechanisms."

**THE IPCC REPORT** is intended to help spur those policies. Negotiators of the 2015 Paris Agreement included the 1.5°C marker as an ideal target, following a push from developing countries that feared their land could be lost entirely if temperature rise exceeds that level. The IPCC was asked to study the feasibility of the 1.5°C threshold and how it might be achieved.

The new report, released in Seoul, shows we're way off track and that even the commitments made in 2015 by some 190 countries to reduce their greenhouse-gas emissions would allow temperatures to rise around 3°C by 2100.

It hasn't helped that in the wake of the historic Paris Agreement, which at the time seemed to herald a new era of cooperation on

**TIME MAGAZINE, Oct. 27, 2018**

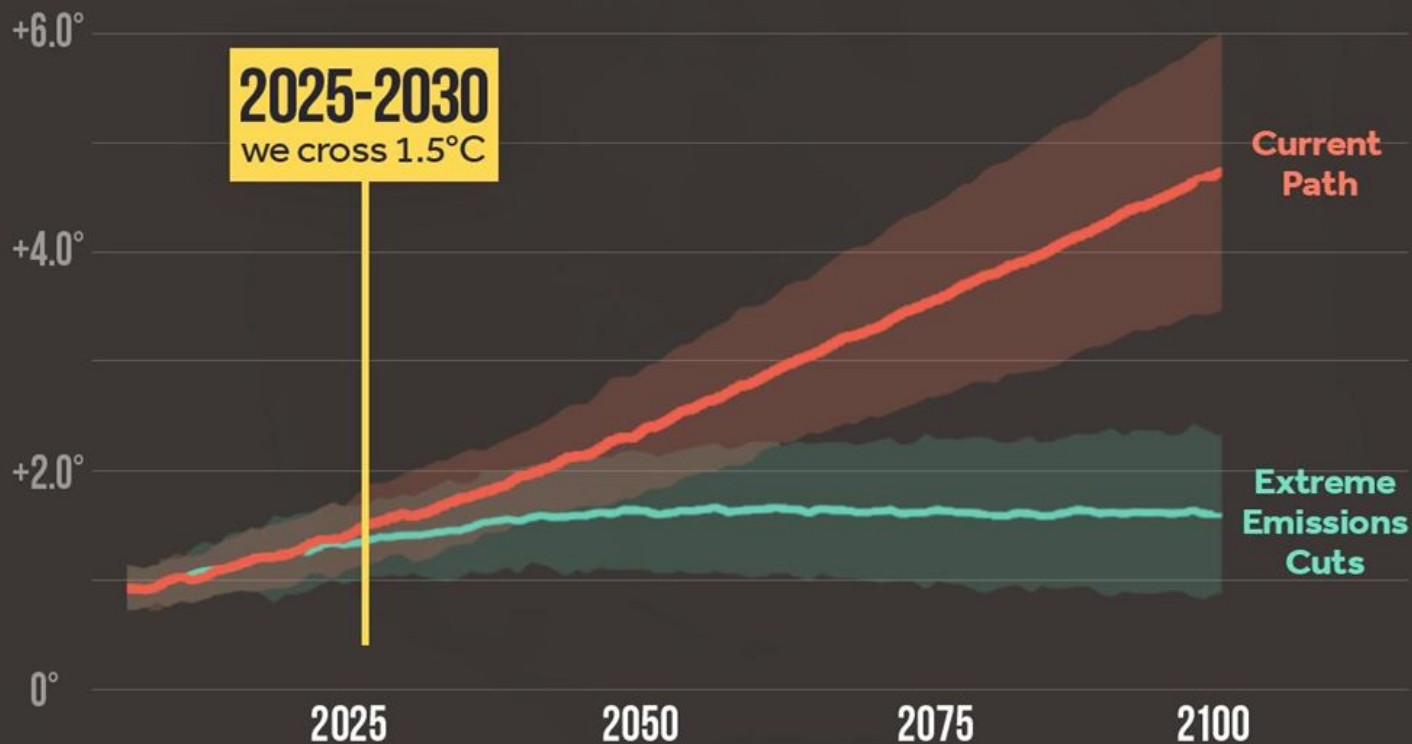


Created by Congress in 1991

# 12 YEARS BEFORE THE POINT OF NO RETURN

## FUTURE WARMING

Projections (°C) Based on Emissions Decisions



Source: IPCC AR5 Summary for Policy Makers  
Temperature baseline adjusted to 1881-1910 to reflect COP 21 targets

## Solving climate change is possible, we already have the tools, says energy expert Hal Harvey



"Electrify everything," improve building codes and modernize the power grid



Hal Harvey, founder and CEO of Energy Innovators, a San Francisco firm that analyzes climate and energy policy. (Photo: Silvio Maricic)

# SOLUTIONS EXIST

## PRIORITIES:

1. TRANSFORM THE POWER GRID.
2. ELECTRIFY EVERYTHING.
3. ELECTRIFY TRANSPORTATION AT A VERY RAPID PACE.

HAL HARVEY, FOUNDER AND CEO OF ENERGY INNOVATION,  
QUOTED IN SAN JOSE MERCURY NEWS ON JULY 25, 2019

# SUSTAINABLE ELECTRIC TRANSPORTATION

- High Speed Rail
- Metro and Commuter Rail
- Light Rail/Trolleys
- Electric and Hybrid Buses
- Electric and Hybrid Cars
- Electric and Manual Bicycles and Scooters
- Walking



# **SUSTAINABLE BUILDINGS**

- Home and Backyard **Solar Panels**
- Home **Battery Power Storage**
- Purchase of only sustainably generated electricity
- Home **Insulation**
- **Eliminate Gas Heating, Fireplaces and other Wood Burning**

Note: Significant technical and financial support is available through Air Quality Management Districts or Metropolitan Transportation Commissions

# **BE A CLIMATE CHANGE AMBASSADOR**

- **Talk** to your family, friends, neighbors.
- **Insert** your climate change concern into your daily conversations.
- **Volunteer** to speak to your favorite community groups using this PowerPoint
- **Buy or lease an electric car; install solar at home and/or work.**
- **Pray** we have a future for our children!

# San Francisco Bay Area Transit Integration

- **Commuter Rail**
  - Caltrain, ACE, Amtrak
- **BART Rapid Transit**
  - Existing
  - Silicon Valley Extension
- **Light Rail Transit**
  - Existing
  - Vasona/Capitol Extensions
  - Potential Future Corridors
- **Bus, Local & Express Service**
- **Proposed High Speed Rail**
- **Multimodal Station Hubs**
  - Downtown Diridon Station
  - SJ Mineta International Airport



# RESOURCES

## NASA CLIMATE

- [CLIMATE.NASA.GOV](https://climate.nasa.gov)

## NATIONAL CLIMATE ASSESSMENT

- [SCIENCE2017.GLOBALCHANGE.GOV](https://science2017.globalchange.gov)

## CLIMATE CENTRAL

- [WWW.CLIMATECENTRAL.ORG](https://www.climatecentral.org)

## WXSHIFT

- [WXSHIFT.COM](https://wxshift.com)

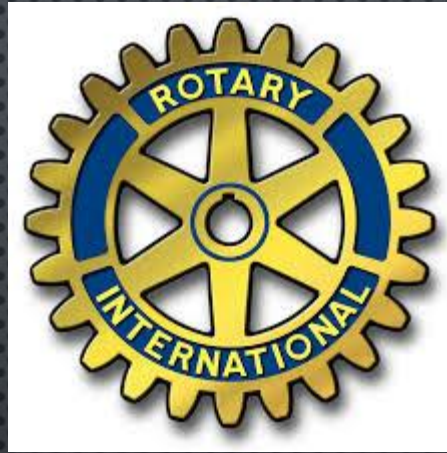
## BAY AREA AIR QUALITY MANAGEMENT DISTRICT

- 415 771 6000 REQUEST BEBA

## METROPOLITAN TRANSPORTATION COMMISSION

- 415 778 6780 AND REQUEST RANDY RENTSCHLER

# CONTACT INFORMATION



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