

# Overview of Climate Change Impacts for the Region

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.....SAN DIEGO REGION  
For San Diego's Future

University of San Diego

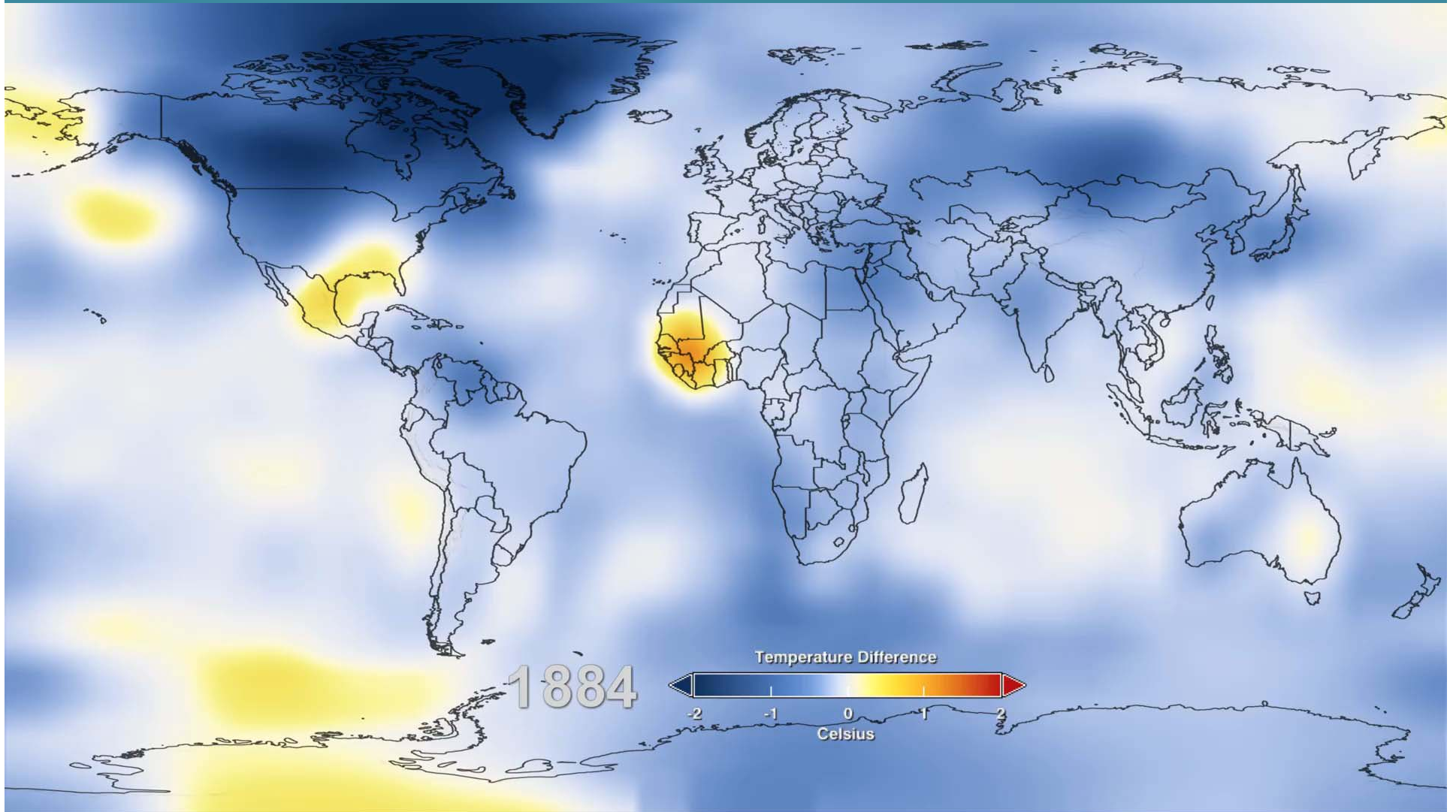
CA LCC Tribal Adaptation Workshop  
September 1-2 2015, San Diego

# Outline

- **Global view of climate change (JSW)**
- **Impacts in San Diego region**
  - Effects of impact on region (NSS)
  - Effects on of impact on tribes (JSW)
  - Opportunities for action - regional level (NSS)
  - Opportunities for action – tribes (JSW)
- **Results of Surveys**
  - Region (NSS)
  - Tribes (JSW)
- **Conclusions**

# What is Climate Change?

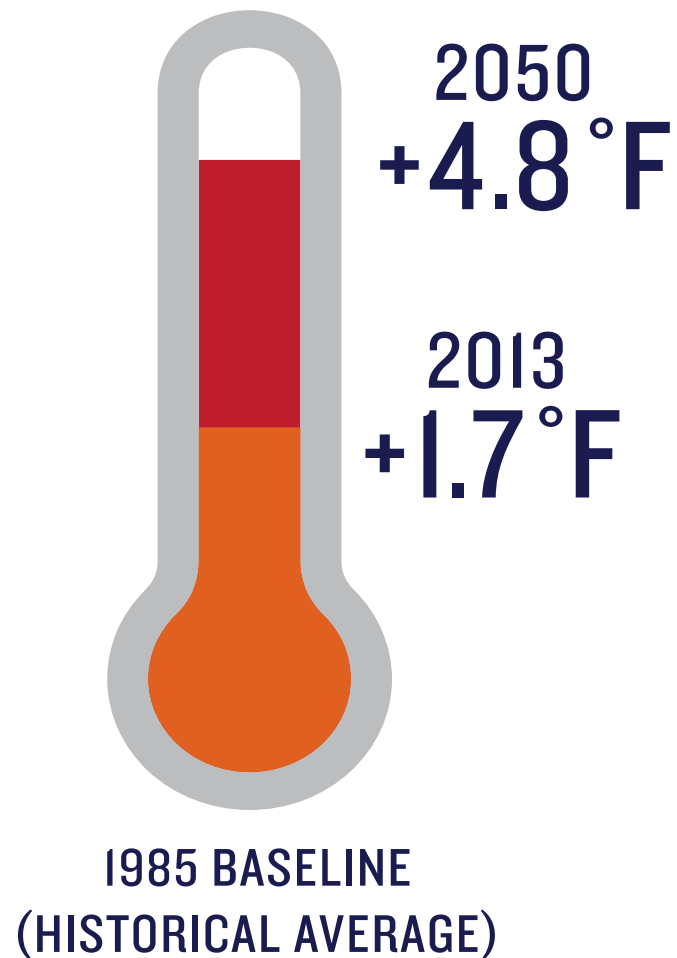
<http://www.nasa.gov/topics/earth/features/2012-temps.html>



# **Climate Change Impacts in the San Diego Region**

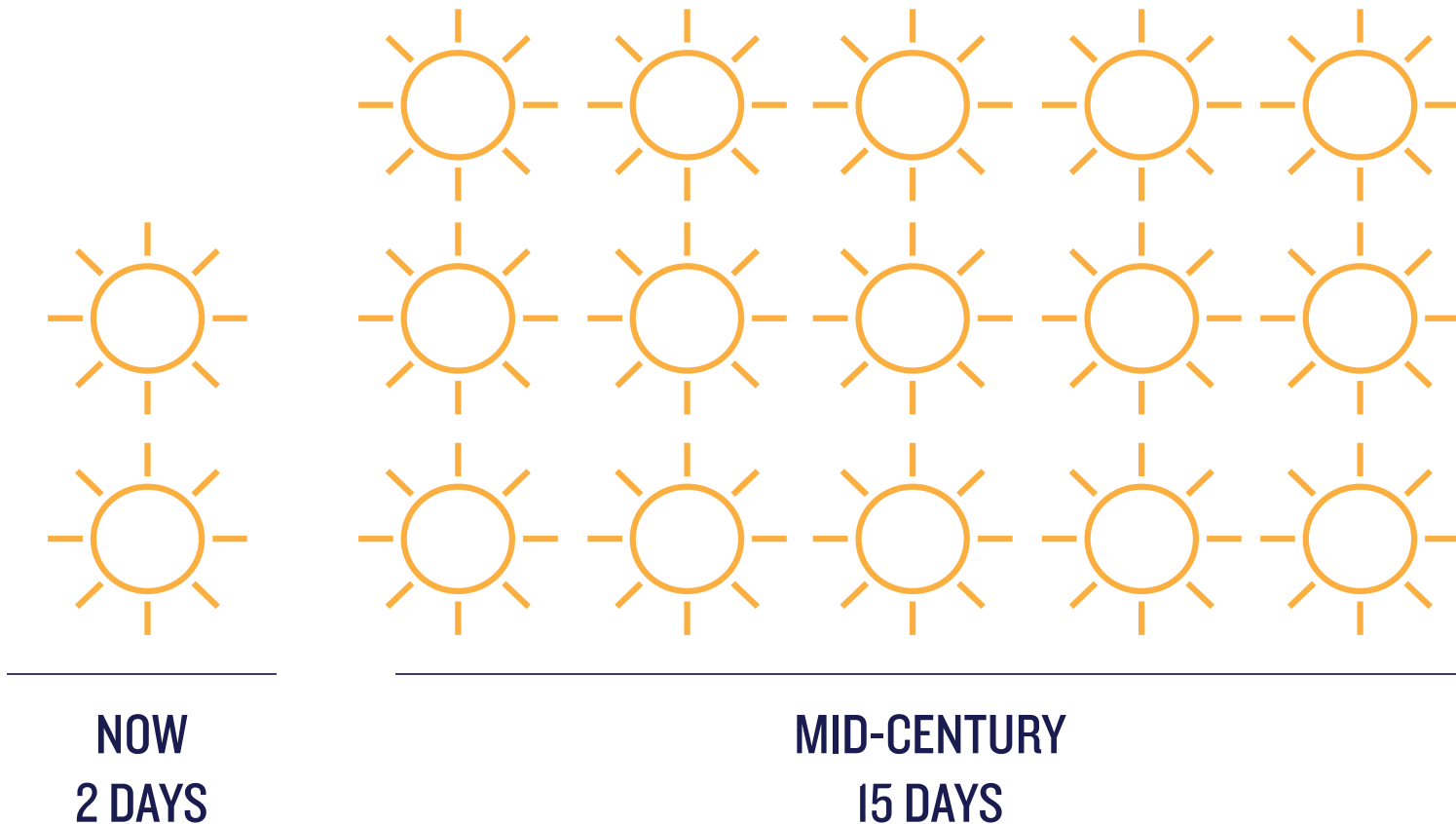
# ANNUAL AVERAGE TEMPERATURE IS INCREASING AND WILL CONTINUE TO INCREASE BETWEEN NOW AND 2050:

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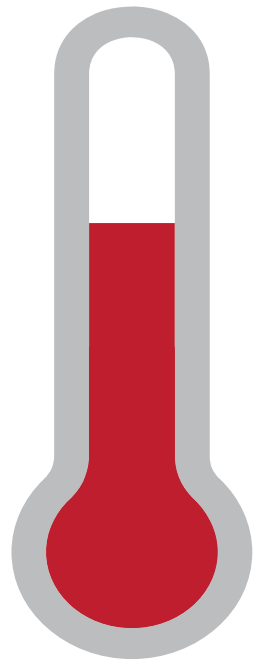


## BY 2050

- **7 TIMES AS MANY EXTREME HEAT DAYS**
- **HEAT WAVES: less cooling at night, more humid at night**

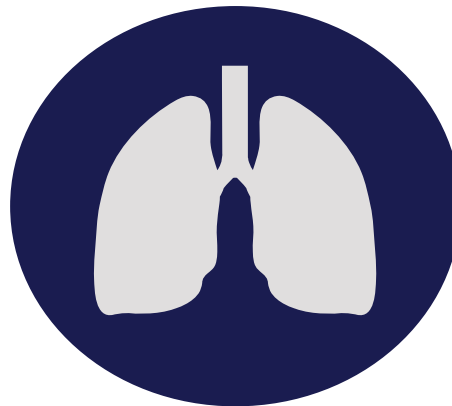


# Public Health Effects in San Diego Region (1999-2009)



  
**10°F**  
INCREASE IN  
DAILY APPARENT  
TEMPERATURE  
ABOVE THE  
LOCAL AVERAGE

=



**+6.3%**

INCREASE IN  
RESPIRATORY  
ADMISSIONS



**+4.9%**

INCREASE IN  
CARDIOVASCULAR  
ADMISSIONS

# MORE FIRES



© John Gibbins/U-T San Diego/ZUMAPress.com

# HOMES LOST TO FIRES - Region

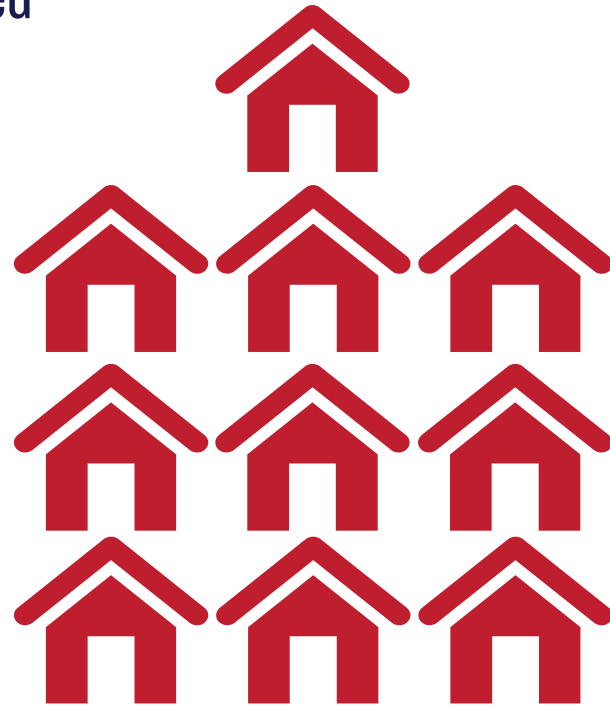
Sprawling urban growth has given rise to a growing number of wildfires in the wildland-urban interface and increased loss of homes in Southern California.

500



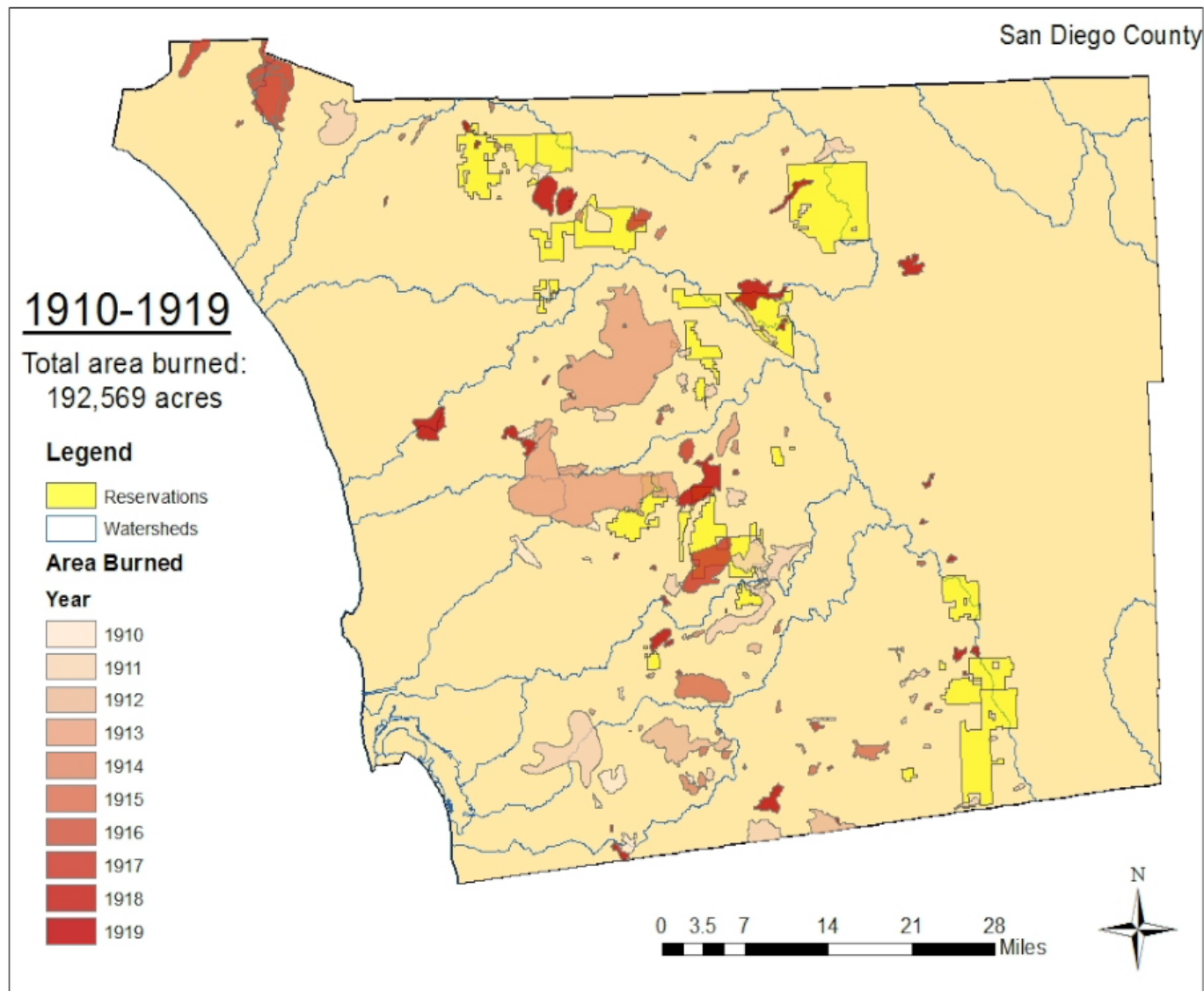
1950 TO 2000

1,000



2000 TO PRESENT

# WILDFIRES IN TRIBAL AREAS



# Fires 2007 – La Jolla



# TRIBES AND FIRES

11 tribes impacted by the 2007 Harris, Poomacha and Witch fires

- Harris Fire (1): Jamul
- Poomacha Fire (5): La Jolla, Pauma-Yuima, Rincon, Pala, and San Pasqual
- Witch Fire (5): Barona, Capitan Grande, Inaja-Cosmit, Mesa Grande, and Santa Ysabel



# TRIBES AND FIRES

- The fires burned 92% of the La Jolla Indian Reservation some called it a “100 year fire”
- 55 homes and 180 tribal members left homeless
- Mud and rock slides came after the fires creating a new set of problems for the tribes: impacting roads, bridges, homes and other infrastructure.



# RECOVERING FROM FIRES

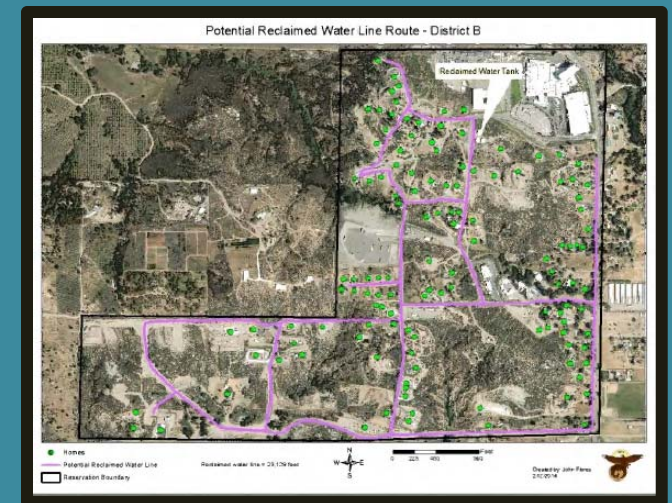


# What is being done - region

- Building types, practices and defensible spaces

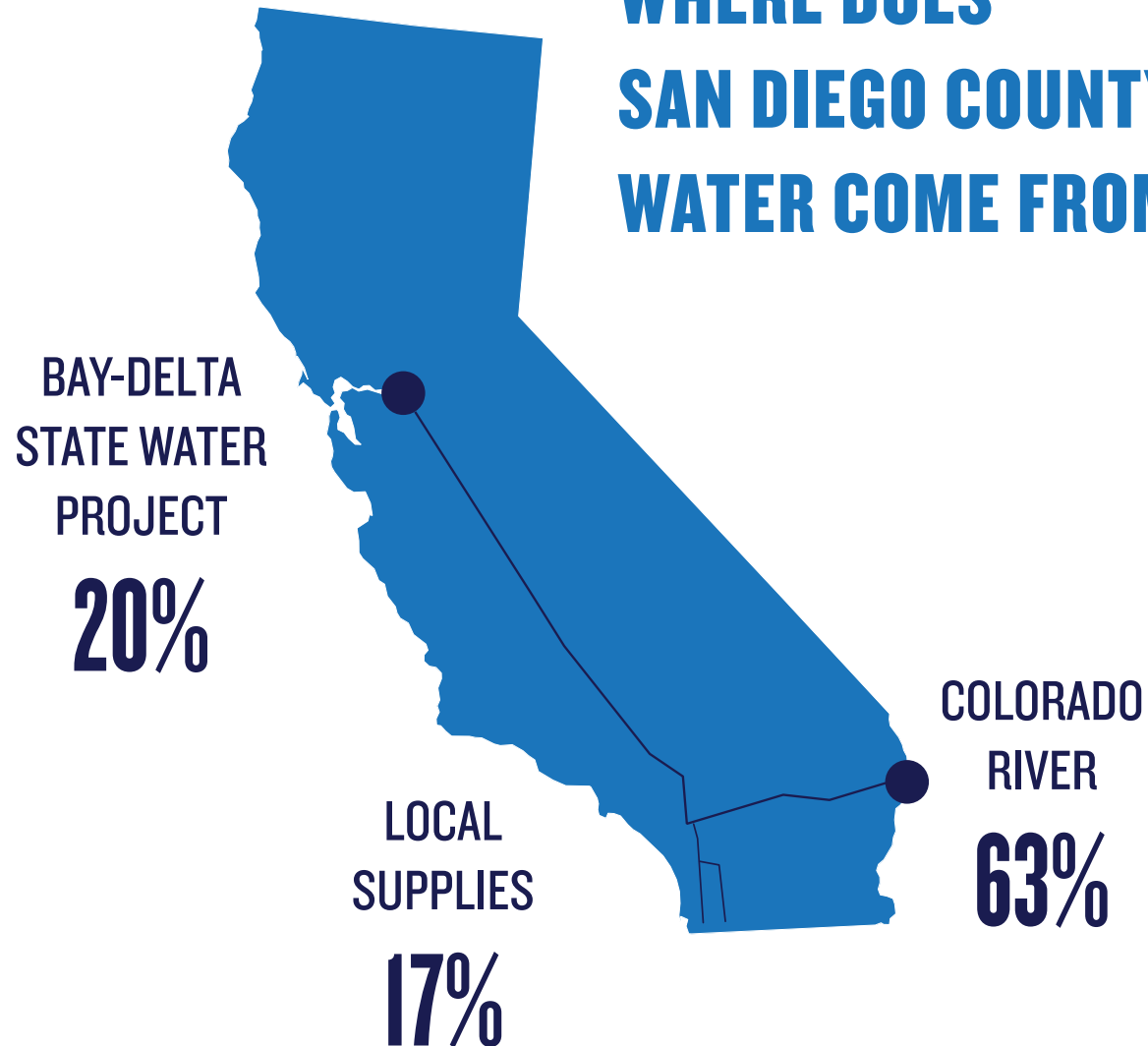


# What is being done - tribes



# LESS FRESHWATER

## WHERE DOES SAN DIEGO COUNTY'S WATER COME FROM?



**What is the region doing to help reduce water use and water imports?**



# DIVERSIFY WATER SUPPLIES

– More groundwater use?

## [Groundwater Interactive Map](#)

### California Drought: Parts of Central Valley sinking 2 inches a month

By Lisa M. Krieger | [lkrieger@mercurynews.com](mailto:lkrieger@mercurynews.com)

POSTED: 08/19/2015 09:00:00 PM PDT | UPDATED: 12 DAYS AGO

17 COMMENTS



# DIVERSIFY WATER SUPPLIES

- Desalination



# CONSERVE WATER

- Transform mix of crops
- Drip irrigation
- Cities: incentives to replace lawns
- Recycle



# **MANDATED CONSERVATION**

## **New state laws:**

- **No community can pump more groundwater than can refill**
- **% reduction targets for water agencies**

## **New city ordinances:**

- **San Francisco: certain buildings must have on-site water recycling**

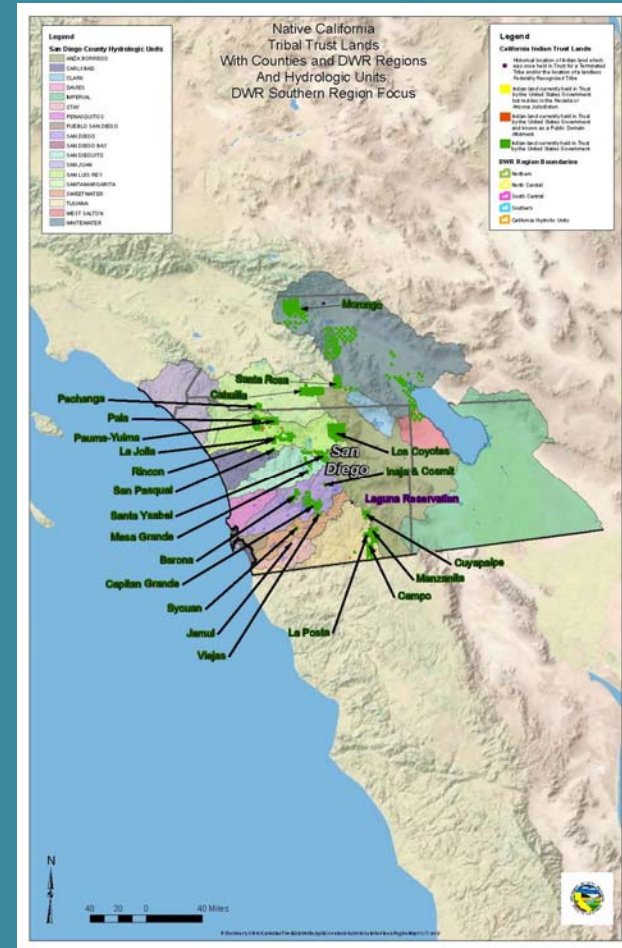
# **SOME INCREASED STORAGE CAPACITY**

- **Emergency Storage Project – 90,100 AF**
- **Improve local storage capacity**



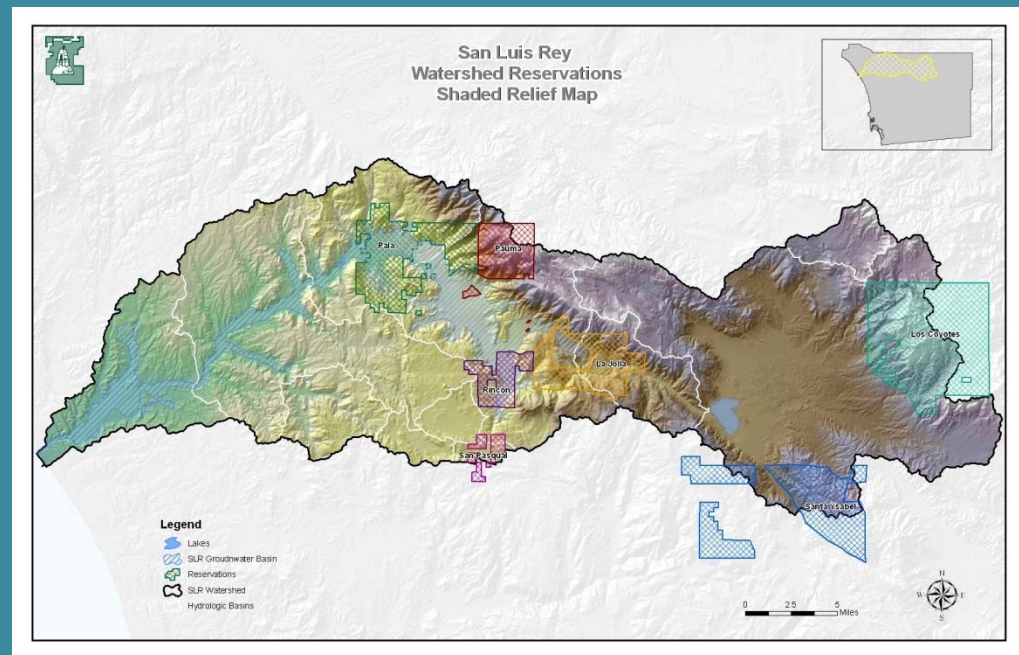
# Where does tribes' water come from?

- San Diego Hydraulic Units:
- Tribal lands fall within 18 separate Hydraulic Units.
- Anza Borrego, Carlsbad, Carlsbad, Clark, Davies, Imperial, Otay, Penasquitos, Pueblo San Diego, San Diego Bay, San Dieguito, San Juan, San Luis Rey, Santa Margarita, Sweetwater, Tijuana, West Salton, Whitewater.



# Where does tribes' water come from?

- For an example:
- 7 San Diego County Tribes are located within the San Luis Rey Watershed



# What can tribes do to conserve water?

## Monthly water charges

Cost charged by Glendale Water & Power for water and its delivery, per hundred cubic feet for 2014-15:

### Single-family rates

|        |                  |        |
|--------|------------------|--------|
| Tier 1 | 0 to 6 hcf       | \$2.27 |
| Tier 2 | 6.1 to 12 hcf    | \$2.80 |
| Tier 3 | 12.1 to 25 hcf   | \$3.18 |
| Tier 4 | More than 25 hcf | \$3.86 |

### Multifamily rates

|        |                       |        |
|--------|-----------------------|--------|
| Tier 1 | No. of units by 5 hcf | \$2.38 |
| Tier 2 | All additional hcf    | \$3.52 |

### Commercial

|                    |        |
|--------------------|--------|
| Rate for all units | \$2.81 |
|--------------------|--------|

### Irrigation (of parks, medians, etc.)

|                    |        |
|--------------------|--------|
| Rate for all units | \$2.90 |
|--------------------|--------|

Source: Glendale Water & Power

Steve Greenberg

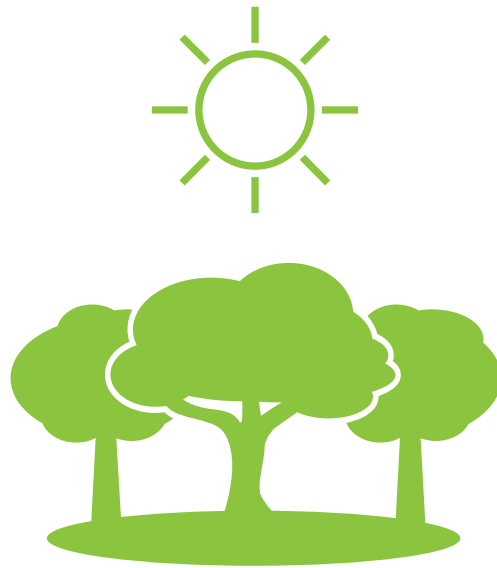


# EFFECTS ON NATURE'S BENEFITS



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**WATER  
PURIFICATION**



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**TEMPERATURE  
REGULATION &  
AIR FILTRATION**



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**FOOD &  
AGRICULTURE**

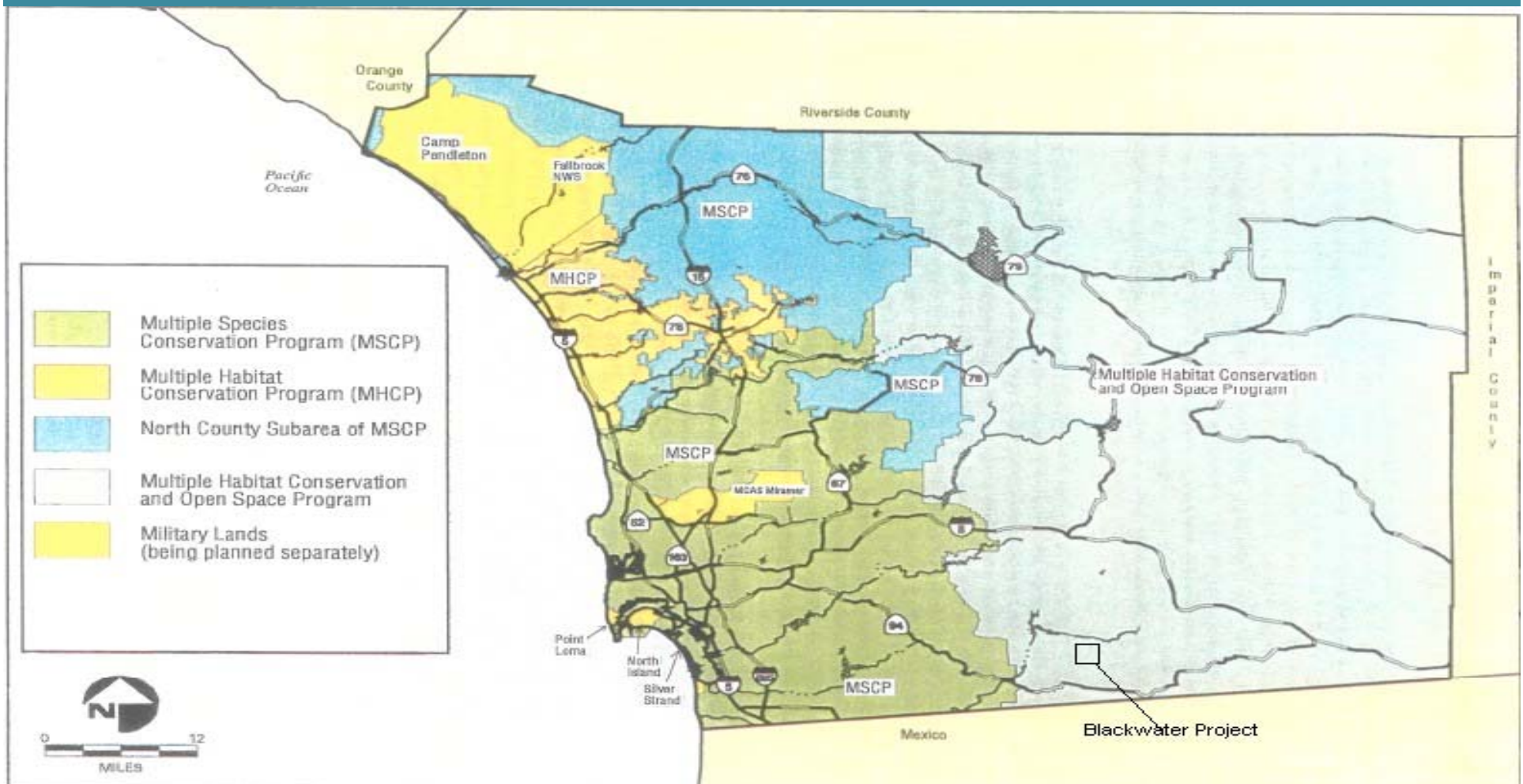


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**LIFESTYLE &  
RECREATION**

# What the region is doing to preserve ecosystems

## Multiple Habitat Conservation Program



# What have tribes noticed

## 2010 Secretarial Order 3289



THE SECRETARY OF THE INTERIOR  
WASHINGTON

ORDER NO. 3289

Subject: Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources

**Sec. 1 Purpose and Background.** Secretarial Order No. 3285, issued on March 11, 2009, made production and transmission of renewable energy on public lands a priority for the Department. This Order establishes a Department-wide approach for applying scientific tools to increase understanding of climate change and to coordinate an effective response to its impacts on tribes and on the land, water, ocean, fish and wildlife, and cultural heritage resources that the Department manages. This Order replaces Secretarial Order No. 3226, Amendment No. 1, issued on January 16, 2009, and reinstates the provisions of Secretarial Order No. 3226, issued on January 19, 2001.

To fulfill our nation's vision for a clean energy economy, Interior is now managing America's public lands and oceans not just for balanced oil, natural gas, and coal development, but also – for the first time ever – to promote environmentally responsible renewable energy development. Sun, wind, biomass, and geothermal energy from our public and tribal lands is creating new jobs and will power millions of American homes and electric vehicles.

The Department is also taking the lead in protecting our country's water, land, fish and wildlife, and cultural heritage and tribal lands and resources from the dramatic effects of climate change that are already occurring – from the Arctic to the Everglades. The realities of climate change require us to change how we manage the land, water, fish and wildlife, and cultural heritage and tribal lands and resources we oversee. For example:

- New water management imperatives associated with climate change may require restoration of natural systems and construction of new infrastructure to reduce new flood risks or to capture early run-off.
- Strategies to address sea level rise may require acquisition of upland habitat and creation of wetlands and other natural filters and barriers to protect against sea level rise and storm surges. It may be necessary to relocate certain iconic and culturally historic structures.
- Shifting wildlife and habitat populations may require investments in new wildlife corridors.
- New invasions of exotic species and new wildland fire threats due to longer fire seasons and more severe droughts will require innovation and more effective ways of managing the Department's resources.

- Established a Department-wide approach for applying scientific tools
- Section 5 for American Indians and Alaskan Natives-”may be disproportionately affected”
- Address Impacts of Climate Change on Water, Land and Other Natural and Cultural Resources

# What have tribes noticed scarce plants

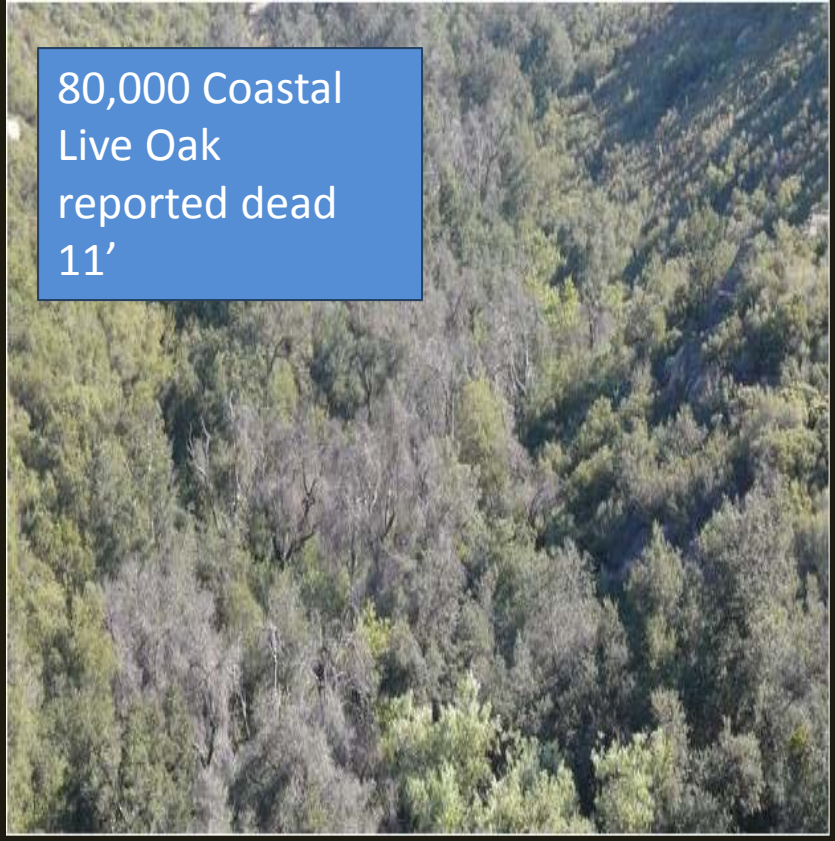
- Acorns
- Pinion
- Wild Celery
- Wild Onion
- Elderberry
- Cottonwoods
- Yucca
- Chia
- Agave

- Dogbane
- Mint
- Water Cress
- Catus Apples
- Manzanita
- Willows
- Oak Trees

# What have tribes noticed

## Scarce Animals

- Deer
- Big Horned Sheep
- Mountain Lions
- Bobcats
- Eagles
- Rabbits
- Quails
- Fish

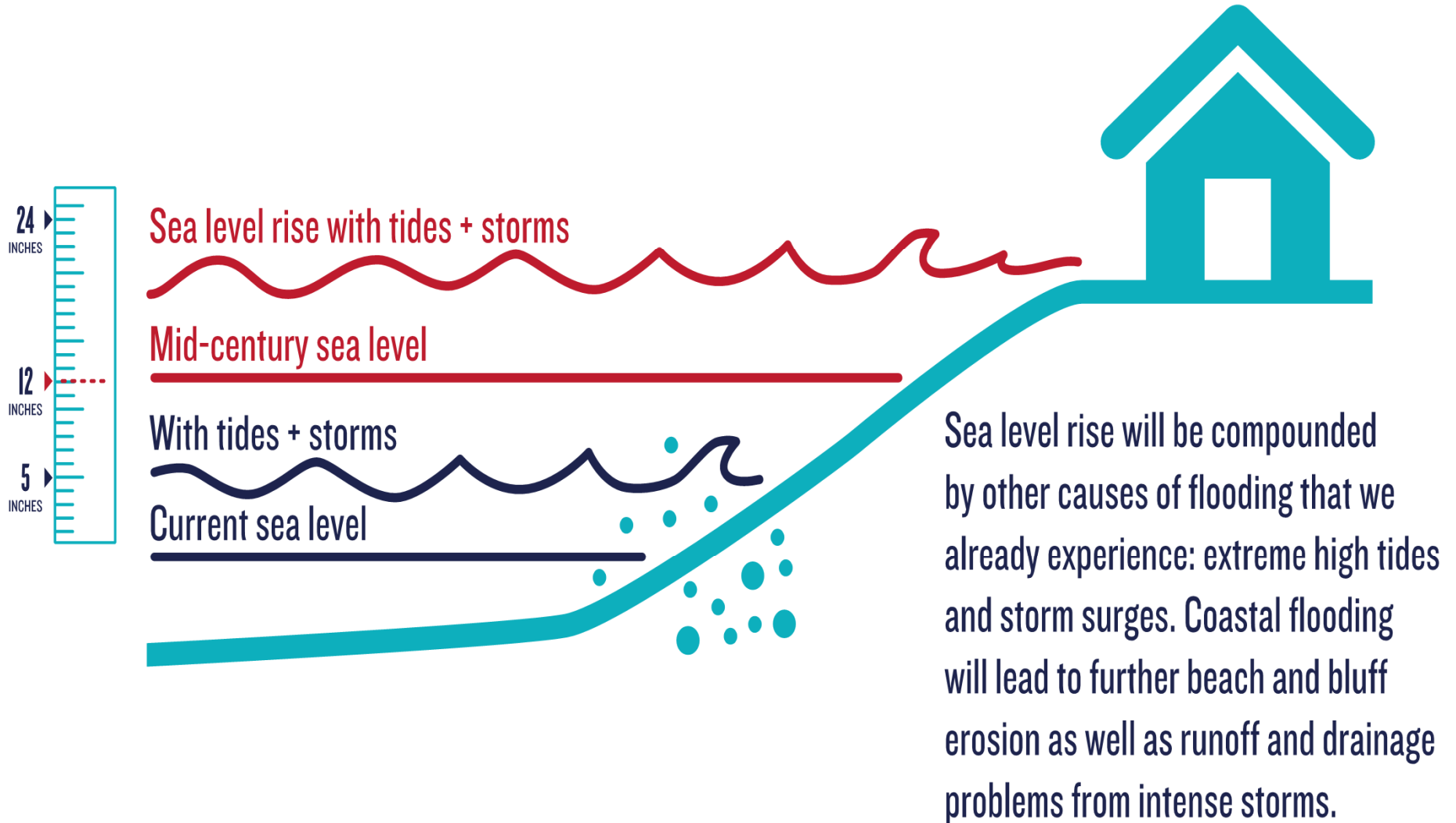


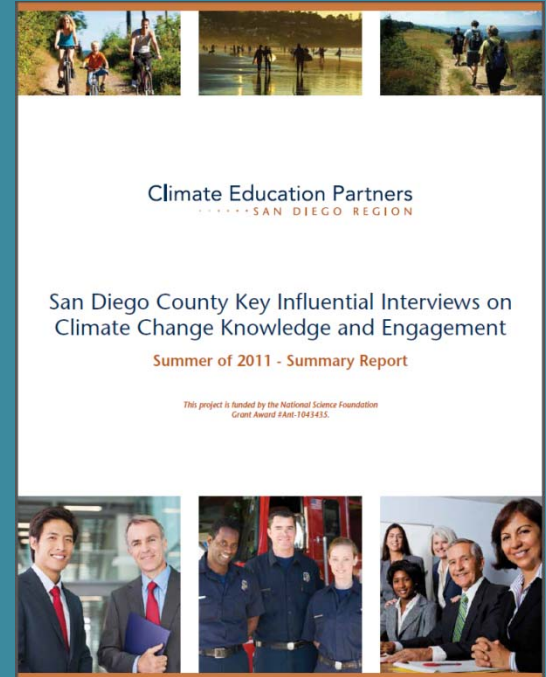
80,000 Coastal  
Live Oak  
reported dead  
11'

# What tribes are doing to preserve ecosystems



# Coastal Flooding from Sea Level Rise

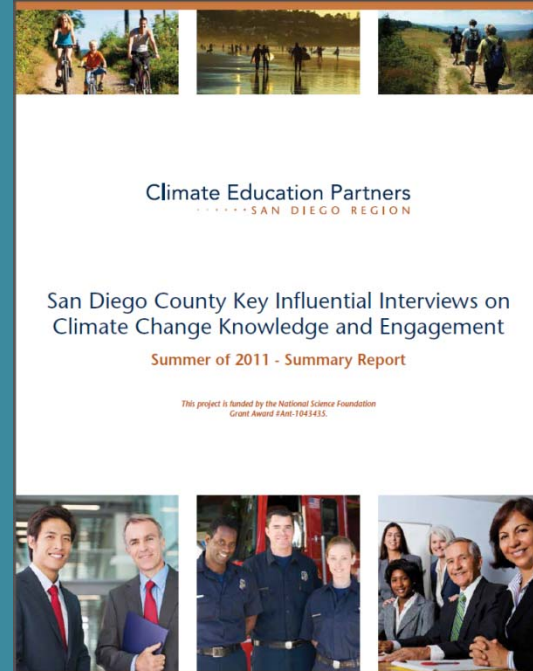




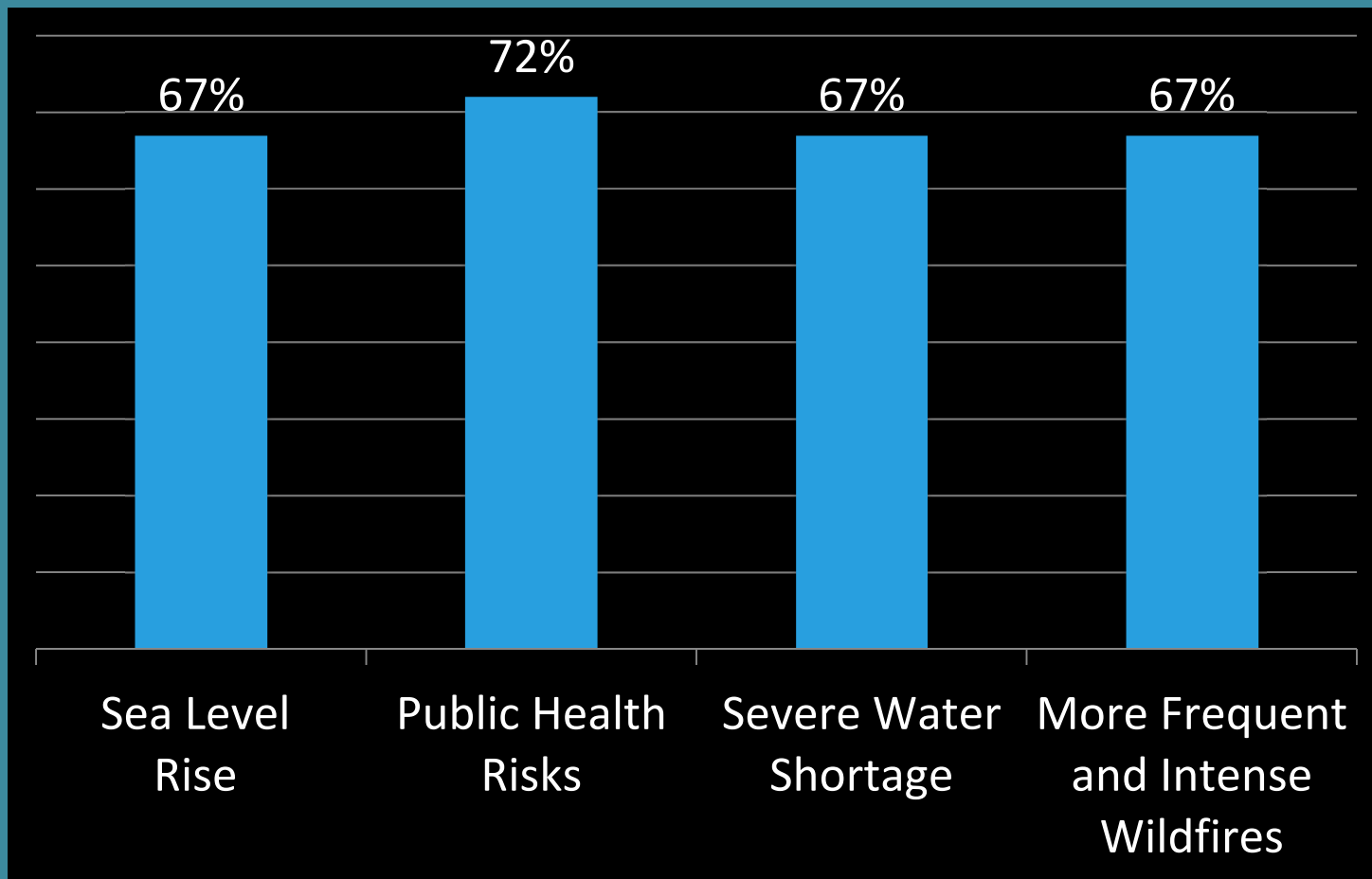
# What People Know About Climate Change Impacts in our Region



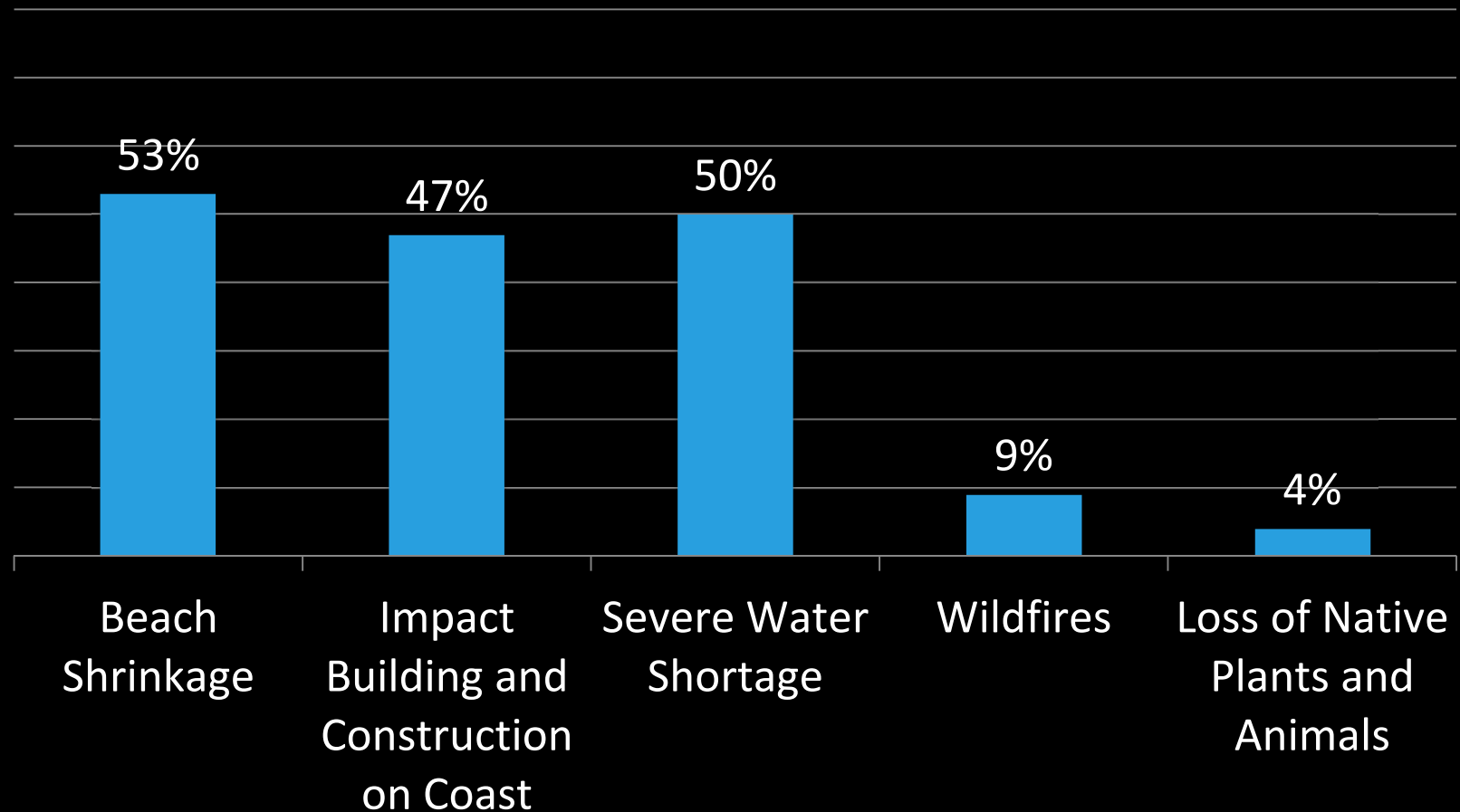
# Interviews and Polls (REGION)



# What Impacts Do San Diegans Know About?

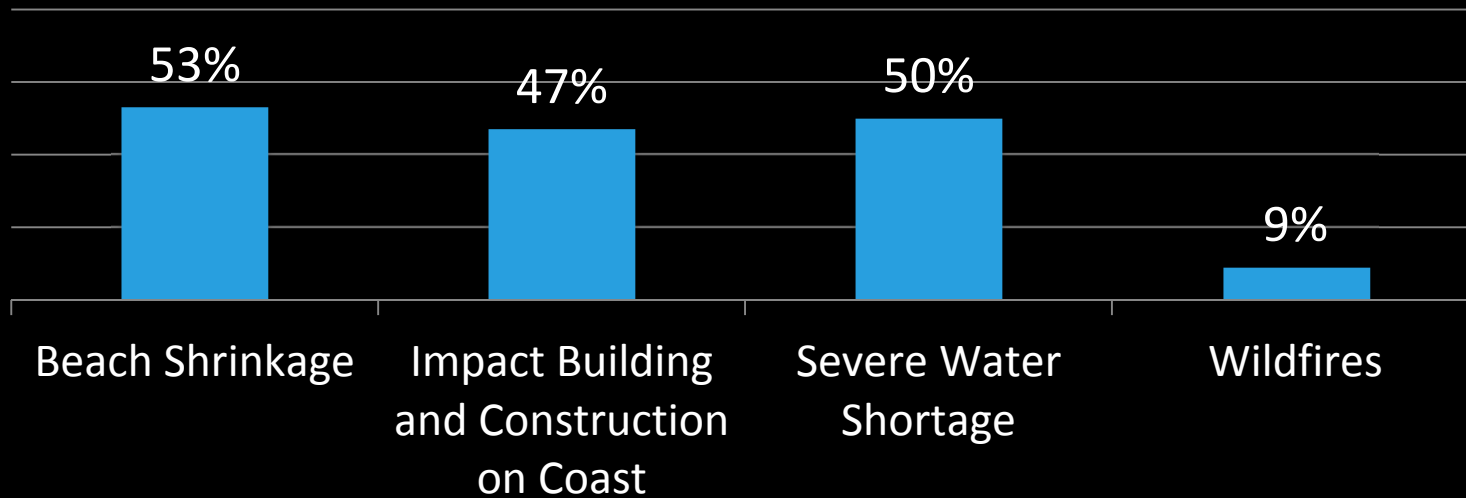


## What Impacts Do San Diego Decision Makers Mention?

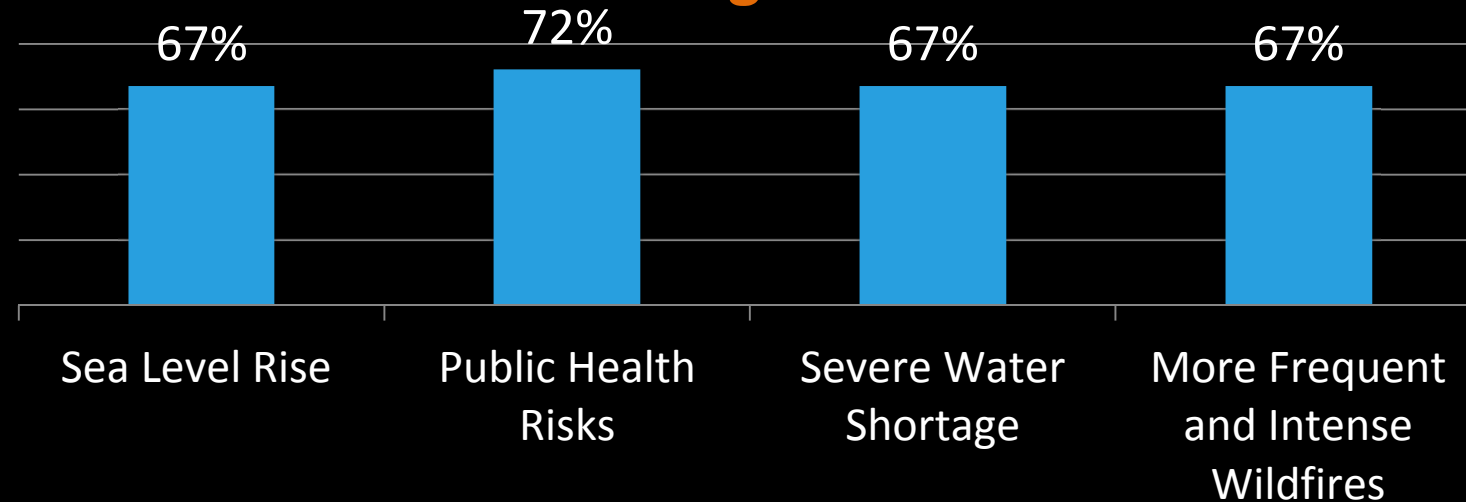


# Decision Makers v Public

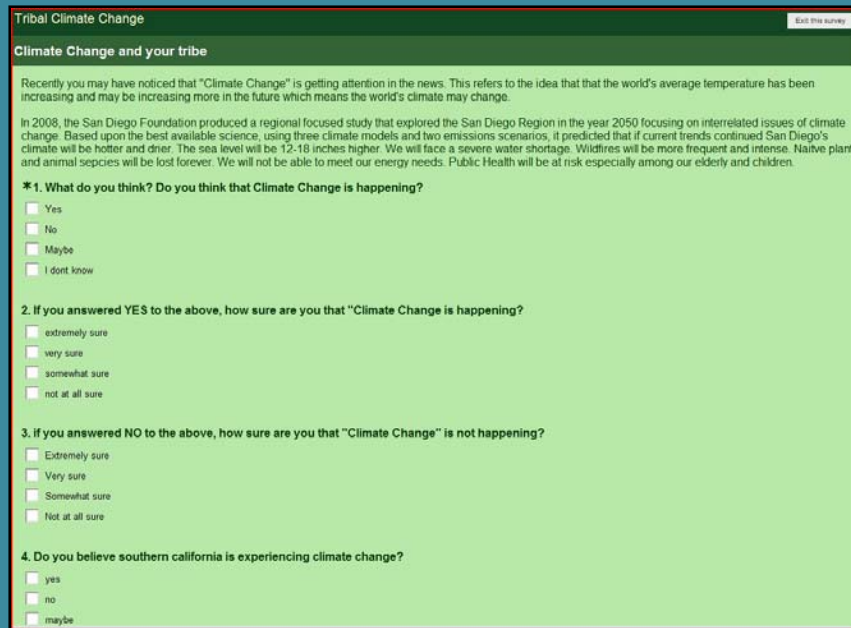
## San Diego Region's Decision Makers



## San Diego Public



# Tribes Surveys



**Tribal Climate Change** Exit this survey

**Climate Change and your tribe**

Recently you may have noticed that "Climate Change" is getting attention in the news. This refers to the idea that the world's average temperature has been increasing and may be increasing more in the future which means the world's climate may change.

In 2008, the San Diego Foundation produced a regional focused study that explored the San Diego Region in the year 2050 focusing on interrelated issues of climate change. Based upon the best available science, using three climate models and two emissions scenarios, it predicted that if current trends continued San Diego's climate will be hotter and drier. The sea level will be 12-18 inches higher. We will face a severe water shortage. Wildfires will be more frequent and intense. Native plant and animal species will be lost forever. We will not be able to meet our energy needs. Public Health will be at risk especially among our elderly and children.

**\*1. What do you think? Do you think that Climate Change is happening?**

☐ Yes  
☐ No  
☐ Maybe  
☐ I dont know

**2. If you answered YES to the above, how sure are you that "Climate Change is happening?"**

☐ extremely sure  
☐ very sure  
☐ somewhat sure  
☐ not at all sure

**3. If you answered NO to the above, how sure are you that "Climate Change" is not happening?**

☐ Extremely sure  
☐ Very sure  
☐ Somewhat sure  
☐ Not at all sure

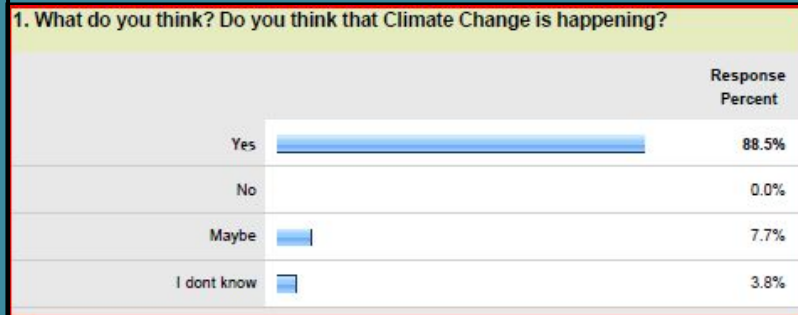
**4. Do you believe southern california is experiencing climate change?**

☐ yes  
☐ no  
☐ maybe

- We needed to know what our tribes knew about climate change for the BIA grant submittal
- This was emailed to the 21 tribes via their board representatives.

# Tribes Surveys

- Is Climate Change happening?



- 88.5% YES
- 0% NO
- 7.7% MAYBE
- 3.8% I DON'T KNOW

# What are tribes doing

## La Jolla Band of Luiseno Indians



## Air Monitoring & Waste Clean Up

- Air monitoring station, Waste Clean Up & Transfer
- Station, Tamarisk removal in riparian areas,
- Drinking and waste water projects



# What are tribes doing

## Rincon Band of Luiseno Indians



## Solar & Water

- Installation of some 4,000 solar panels over a five-acre area to service the tribes' economic development project by producing over one megawatt of solar energy which could power over 2,200 homes. Rincon's project becomes the first casino in Southern California to adopt solar electric power which meets about 90% of the casino's HVAC requirements (or 1/3 of total annual power need)

# CONCLUSIONS

- MANY IMPACTS
  - WATER, SOIL, NATURE, HEAT
- MANY SOLUTIONS
  - STATE
  - REGION
  - CITIES
  - TRIBES
- OPPORTUNITIES TO WORK TOGETHER



# THANK YOU!



NAEPC



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.....SAN DIEGO REGION

*For San Diego's Future*

