

JENI: We established last week that the Bible tells us many times that the world belongs to God. Today, we're going to look at some facts about God's world. Now, everyone is entitled to their own *opinion*, but not their own facts. 97 percent of the world's scientists agree that climate change is real, it is occurring faster than they once thought, and most of it is caused by humans. But it's been very hard to process these facts when we live in a society where people make things up and claim they are true. You will hear people say, *I don't believe in Climate Change*. But science doesn't ask us to believe anything. Science collects and analyzes the data, then draws conclusions in the natural world. Belief is a word reserved for faith. It looks at things beyond the natural world. Science can't do that. Belief is not part of the scientific method.

So, I'm not making this up. The data we are using in this seminar is not just our opinions. The facts we are talking about this morning are the consensus of the world's scientific community.

What will be our legacy?

- Last week we looked at God's commandments to Care for Creation
- We learned:
 - Bible has a lot to say about caring for the world
 - Humans created in the image of a God who loves
 - The planet is not ours, it is God's world
 - God loves Creation and tells us we must watch over it and protect it, as good tenants
 - God holds us accountable for our actions

JENI READ 1st bullet: We said that if we still think the 10 commandments should be followed, then God's other commandments in the OT should be taken very seriously.

READ rest of slide.

What will be our legacy?

- What will we leave our children and grandchildren?
- Will we leave them the beautiful, thriving world like we have enjoyed or will we leave them a hot mess?
- Do we want future generations to say, *“They knew the situation, but they just did not care enough to change their lifestyles.”?*

JENI: Now let’s turn to what our legacy will be. Many of us will die over the next 20 to 30 years, most all of us probably in 50. We will not experience the very worst of what scientists fear will happen. As Christians though, our own personal self-interest is not *all* we should be thinking and caring about!

Read the slide.

In addition to caring about our own future families, let’s look at the legacy we are leaving in God’s world.

The State of the Planet

- Humans have altered almost two-thirds of Earth's land surface
- Over the last 50 years, we have lost more than 68 percent of this planet's animals
- More extinctions are imminent

Source: WWF Living Planet Report 2020

JENI READ

The State of the Planet

- One million plant and animal species globally are threatened with extinction.
- Human population has doubled since 1970 – and is set to reach 10 billion by 2050.
- Humans are consuming natural resources at more than 170% of what the earth can regenerate.
- We need 5 planet earths to maintain our consumption and earth's resources.

JENI: One million plant and animals species are headed toward extinction.

The Human population will reach 10 billion by 2050.

We are consuming our natural resources 170 percent above what the earth can regenerate.

That's about 5 planet earths to maintain our current consumption.

The earth's inability to reproduce and support our consumption is linked to rising temperatures.

Every farmer and gardener knows that excessive heat means poor crop production. And droughts mean more wildfires.

That heat limits our food supply and destroys forests, our homes and our infrastructure.

The State of the Planet

- From (2021–2050), annual average temperatures are expected to rise by 2.5°F or more for the United States

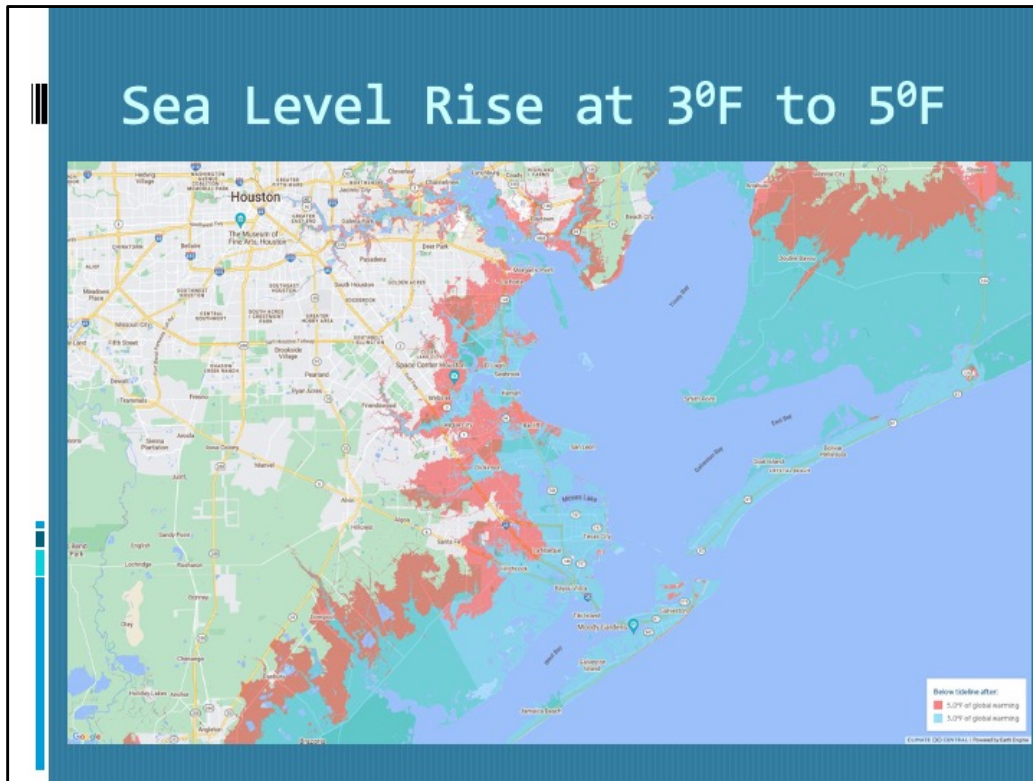
JENI: Looking ahead, scientist agree that by 2050, in just 28 years, the expectation is that annual average temperature will rise by about 2.5 degrees. That's their hope. It's very likely that it will be more. That may not sound like much, but we'll see why this really matters.

The State of the Planet

- Since 1993, the global average sea level has risen by 3 inches
- By 2100, seas are expected to rise 1–4 feet putting 410 million people at risk

JENI: Another change in our planet is the rise in sea levels. Ray is going to show you what we can expect these rising sea levels to do in a couple of Texas cities by 2050.

Remember though, that a rise in sea level also affects rivers. As the water increases in the oceans, it will also rise in rivers and tributaries. People who live on or near the rivers will be impacted more and more frequently, as well.



RAY: Here's what happens when the sea level rises in the Houston area if we have a 3 to 5 degree increase in temperature. A 5 degree rise in is not out of the realm of possibilities.

A 3 degree increase wipes out all of Galveston and the low lying areas up and down the gulf coast.

A 5 degree rise puts the NASA space center under water, including the thousands of high and middle income homes that surround it.

That's about 35 miles of lost coastal land just in the Houston area.

Good news: We can make changes

- Bald eagle endangered species list in 1967
- Ban on DDT, habitat reversal and captive breeding reversed the decline.
- In 2007, the bald eagle species fully recovered
- 2009, estimated 143,000 bald eagles in the United States



RAY: The good news is that when humans decide to act, we can make dramatic changes to restore God's creation.

The Bald eagle became endangered in 1967 from our use of the pesticide DDT and other factors.

But with human intervention, the bald eagle fully recovered by 2007.

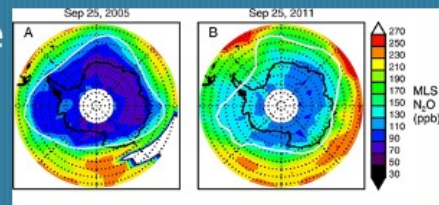
Others species we have saved from extinction include the Louisiana Black Bear, Gray wolves, Bison and others.

God has created a resilient world. God has given us the latitude in creation to correct our errors.

But to do that we must be obedient to God's commands and act as stewards, not just takers.

We can make changes

- 30 years ago, hole in Ozone layer in atmosphere was more than twice the size of the United States due to chlorofluorocarbons such as Freon and aerosols.
- An international movement to reduce the size of the hole, included a ban on CFCs.
- By 2100, the hole could be completely gone, according to a NASA study.



RAY: Here's another success story about when humans intervene and do the right thing. 30 years ago, when the hole in the ozone layer was discovered, the American society was not yet in denial about the scientific facts being true.

We accepted the facts and acted globally.

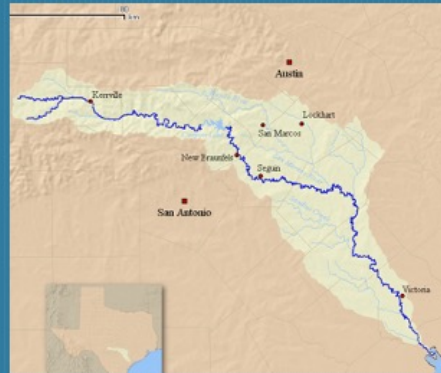
The world banned freon and many aerosols.

As a result, the hole in the ozone is closing.

By 2100, NASA projects the hole will be completely closed.

We can make changes

- 2001 Guadalupe River listed as impaired waters due to E Coli at dangerous levels
- Kerrville improved wastewater collection-sewer infrastructure,
- In 2015 volunteers collected over 31,000 pounds of trash from the river
- Today E Coli is minimal and the waters are safe



RAY: READ SLIDE

Notice that in this project, individual volunteers made a difference in correcting the damage done to the river by careless, irresponsible people.

The Colorado River is another success story. When the waters were polluted by improperly capped and abandoned oil wells, we fixed those leaking wells, and the Colorado River was restored.

Will we make changes now?

- We have brought some animals back from extinction
- We have cleaned up pollution in waterways
- We are closing the hole in our atmosphere that causes harmful radiation (that would kill us)
- Now, we are faced with a GLOBAL CLIMATE CRISIS that endangers the life of everything including us.

Ray: But what will we commit to now?

READ SLIDE

How we keep warm



Without Green House Gasses we would be covered in ice.

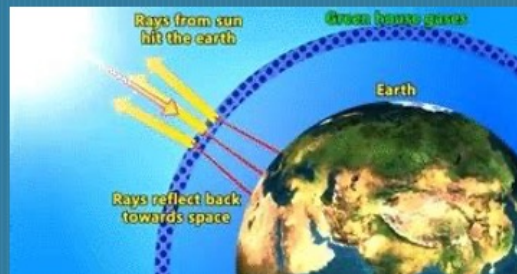
Ray: Without Greenhouse gasses, the earth would be covered in ice.

When the sun's rays hit the earth atmosphere and clouds, half of the sun's energy is reflected back into space.

The sun's rays that are not reflected are absorbed by the land and oceans as heat.

Some of that heat is released back into space but less and less of it is getting out because of Greenhouse Gasses. Here's why.

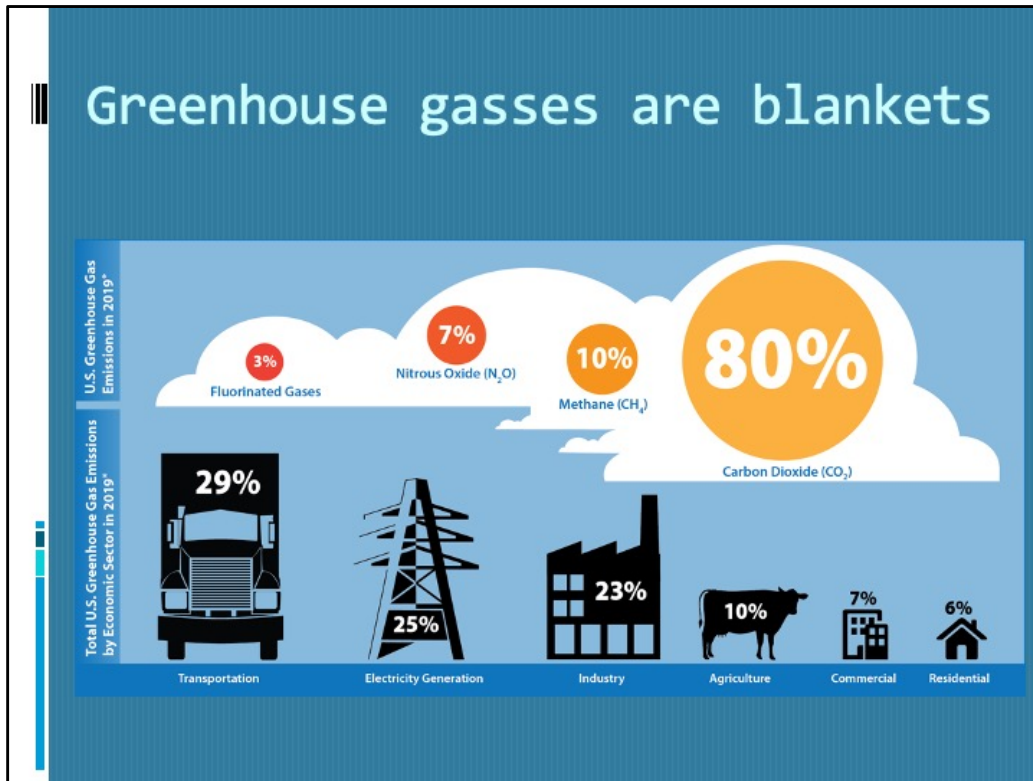
GHG blanket is getting thicker, heavier



Ray:

We are dumping more and more Greenhouse gasses into the atmosphere and are creating a thick blanket around the earth, making it warmer.

In essence, the earth is running a fever and it's going up. Think back to how you feel when you are running a fever at 101 degrees. You feel lousy. So what's causing the earth's fever?



Ray:

When you look at this slide from a distance, it's important to know that the top half with the percentages does not relate to the figures on the lower half. Each half is a separate demonstration.

At the top, you see that (CO₂) is the largest part of the GHG blanket. It represents 80 percent of the total. CO₂ is a natural product from human and animal respiration and volcano eruptions.

But since 1950, humans have increased CO₂ by almost 50%.

Here's how we done that. 29 percent is from transportation. 25 percent is from the production of electricity and 23 percent is caused by industry emissions.

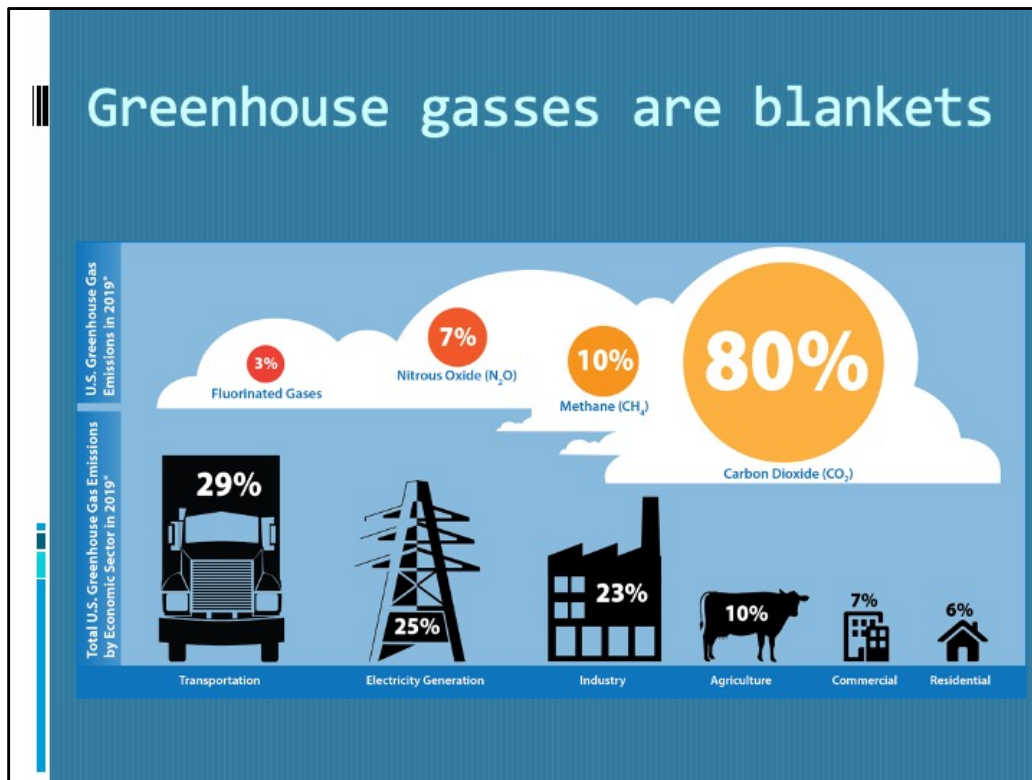


Ray:. **Methane is a greenhouse gas produced by the decomposition of organic materials as well as animal and human waste.**

It is also a result from the production of oil, landfill wastes, and current methods used in raising livestock.

Methane is a far more dense & harmful than carbon dioxide but not as prevalent.

Permafrost in the northern areas of the globe covers rotting organic materials. But as the permafrost melts large amounts of methane will be released increasing global warming. This is a vicious cycle. Alaskan homes, roads, tunnels and bridges are being destroyed by melting permafrost.



Ray: The other Green house gasses include nitrous oxide and chloroflourocarbons.

Nitrous oxide. Produced by soil cultivation, especially the use of commercial fertilizers.

Chlorofluorocarbons (CFCs) are largely regulated by the global community with much success.

Notice that the information on the bottom of this slide is all human activity and not from natural causes.

50% Rise of CO2 since 1950



Ray: For 15 million years CO₂, the biggest trapper of heat driving Climate Change, did not rise above this yellow line-- above 280 ppm.

According to NASA reports, just since 1950, we have reached 440 ppm almost doubled. It's going up quickly now and it is seriously affecting our climate.

So what effect do greenhouses gasses have on God's planet?

Weather vs. Climate

"Global warming isn't real because I was cold today. Also great news: World hunger is over because I just ate."

---Stephen Colbert

Jeni: Now we need to have a serious discussion about the difference between weather and climate. As you know, Stephen Colbert can be rather sarcastic. But he does make a point here.

READ.

You may have seen footage of an OK congressman bringing a snow ball onto the senate floor as an argument against the fact that our global temperatures are rising.

Or during a 40 degree day in April, you've probably heard Texans say, "So much for global warming."

Sometimes, it's hard for us to see the big picture when we are experiencing colder weather at home.



Jeni: Like this! You remember Feb. 2021. Believe it or not, this is actually *an effect* of climate change. Rising temperatures means more evaporation. The means more water hanging in the atmosphere. So we have larger snowfalls and heavier rainstorms.

Weather patterns are also shifting throughout the world. And we are seeing more extreme events like snows, floods, hurricanes and other unusual events in unexpected places.

We can all see the normal patterns of weather changing...this is because the average annual temperature is rising. Our climate really is changing. We will see more of these unusual events.

Weather is not Climate

Weather refers to:

current temperatures,
current rainfall,
current wind speed,
etc.

Climate measured by 30
year periods and is
over large areas.



Jeni: Weather is what's happening here and now.

Climate refers to the average temperature and other conditions for each year over a 20-30 year period.

The rising average temperature over long periods of time influences things like the intensity of hurricanes, the increasing number and severity of wildfires during that period, the annual average temperature, the acidity of the sea, and the rate of glaciers that are melting.

If we think of weather as a tree, climate is more like the forest. It's a bigger picture of what is happening in God's world.

Weather vs. Climate

- A 3°F increase in temperature from one day to the next is different from the climate warming by 3° F.
- When temperature is 3 hotter, we go into air conditioned spaces
- What does that do to the rest of God's creation? How can animals and plants adjust?



Jeni:

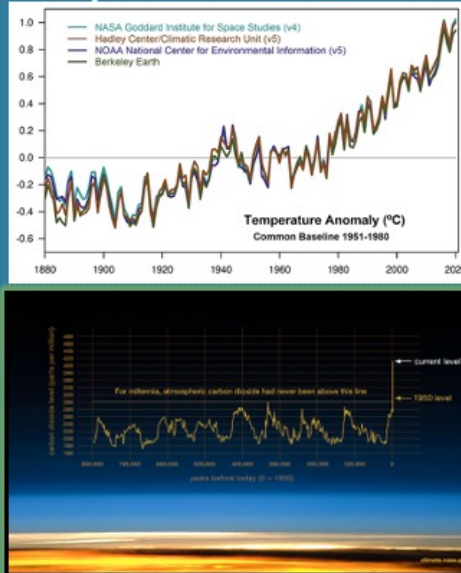
On any given day, a 3 degree increase in temperature might change our family's plans from a picnic to just spending the day inside in air conditioning. We don't like it, but we can deal with it.

But what about livestock and wild animals?

What about God's other creatures and plants?

What about the homeless? And what about everything else that doesn't have air conditioning? They suffer in the heat. And when we think not just in terms of weather, but rather climate, that's *ongoing heat and ongoing suffering* that affects everything outside.

Climate Change: Rising Annual Temperatures



Ray:

The planet's average surface temperature has risen about 2 degrees Fahrenheit since the late 19th century. This change has been driven largely by increased carbon dioxide emissions into the atmosphere by human activities.

The earth began heating up when the industrial revolution began in the late 1700s. By the 1950s, the world's technology led to rapid advances in the creation of steel, chemicals and electricity which fueled mass produced consumer goods and weapons.

Most of the warming occurred in the past 40 years.

The past seven years have been the warmest years in human civilization.

The Ocean is warming




Ray: Earth stores 90% of its extra heat energy in the ocean. The top portion of the seas are warming.

Most of the marine life is found in this shallow, coastal waters. But because of the heat, the a lot of the foods eaten by the fish are dying and so are the fish. In most cases, schools of fish are moving to deeper, cooler waters.

Let's look at how this impacts life on this planet.

Other effects of Ocean warming

- Water expands as it warms
- Sea levels are rising
- Coastal communities are flooding
- Poor people are suffering



Jeni: As water warms the volume increases. This causes the sea levels to rise, flooding coastal communities.

Most people around the world who live in coastal and especially island communities, are the poor and vulnerable who Jesus tells us to take care of.

In Virginia we lived in a coastal community where the poorest people lived closest to the water. Many were what they called “watermen” who worked and fished long, exhausting hours to eek out a living.

They were affected by every flood, hurricane and the creeping sea level increases which often claimed their property and their homes. Most of them lacked health care and property insurance. And Jesus talked a lot about these people. They don’t want handouts or charity. But, we can help them by advocating change and insisting that our governments create policies and actions to address the problems caused by Climate Change.



Ray: Carbon dioxide also dissolves in the oceans making the waters more acidic.

Look what happened to this area of the Great Barrier Reef in only 8 months. This process is occurring worldwide.

When corals suffer heat stress, they expel the algae that live inside their tissues, revealing their white skeletons. It is known as coral bleaching.

Bleached corals are not dead, but they are more at risk of starvation and disease. 50 percent of shallow areas in the Great Barrier are bleaching.

Living Reef



Dead Reef



Ray: As a scuba diver I saw it in it's vibrant state in 1986. Now it's looks like this.

Shrinking Ice Sheets 1993-2019

- Greenland and the earth's other polar region of Antarctica have together lost 6.3tn tons of ice since 1994.



Jeni: The Greenland Ice Sheet is the world's largest island and the second largest ice sheet on the planet. It contains enough water to refill the Great Lakes 115 times over. The Greenland and Antarctic ice sheets have decreased in mass (raising global sea levels and affecting animals like polar bears and others) and the ice is decreasing at faster rates than ever.

NASA reports that if the Greenland ice sheet melts completely, it will raise sea levels by 25 feet worldwide.

Greenland lost an average of 279 billion tons of ice per year between 1993 and 2019, while Antarctica lost about 148 billion tons of ice per year.

Glaciers breaking off into the seas

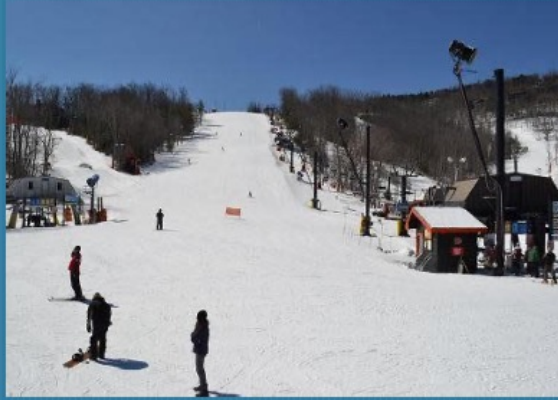


Jeni: Glaciers are melting rapidly everywhere around the world. The arctic ice is melting twice as fast as global temperatures, endangering wildlife as well as humans.

Not only does this make sea levels rise, but it also reduces the reflective surfaces of the earth, which send heat back into space. Naturally, ice sheets, glaciers and snow reflect more heat from our planet than does dry land. Let's talk about snow.

Do You Like to Ski? Better do it soon.

- Less snowfall
- Faster melts
- More rain on snow
- Shorter seasons
- Less snowpack at lower elevations.



Jeni: Well, maybe your ski trip doesn't have to be THIS year...but Scientists in Boulder with the National Center for Atmospheric Research say that warming will result in faster snow melt, less snowfall, more rain on snow, shorter ski seasons and less snow at lower elevations.

Some areas are currently losing as much as a month of ski season.

Ski resorts are investing in more artificial snow-making machines and focusing more on their warm weather sports like mountain biking for additional revenue streams.



Ray; Major hurricanes are by far the world's costliest natural weather disasters, in some cases causing well over \$100 billion in damage. While the *number* of Hurricanes have not increased, hurricane intensities have increased significantly.

Hurricanes like Harvey, Irma, Maria and Michael in 2017 and 2018 have prompted Scientists to study if there is a rapid intensification of hurricanes caused by climate change. Rapid intensification is an increase of wind speed of 35 mph in 24 hours.

Wildfires

- **More Blazes** in:
 - Western U.S.
 - Northern Siberia
 - Central India
 - Eastern Australia
- **Catastrophic wildfires globally** could increase by 1/3 by 2050
- **Over 50% by 2100**

UN Research Report 2022

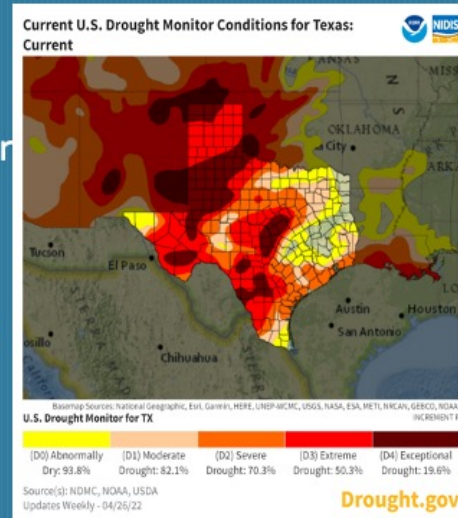
The image is a composite of two photographs. The top photograph shows a wildfire at night, with bright orange and yellow flames consuming a hillside covered in trees. The bottom photograph shows a firefighter in full gear, including a yellow helmet and a backpack, standing in a field of dry grass and brush, actively fighting a fire with a hose.

Ray: Wildfires are on the increase and are more devastating. While we often think wildfires occur in California and the Pacific Northwest , Since the start of 2022, Texas wildfires have burned through more than 133,000 acres of land.

While we can readily grieve the loss of life (and remember – not just human life), homes and vegetation, according to the Texas A&M Forest Service, soil erosion is the most damaging impact on ecosystems.

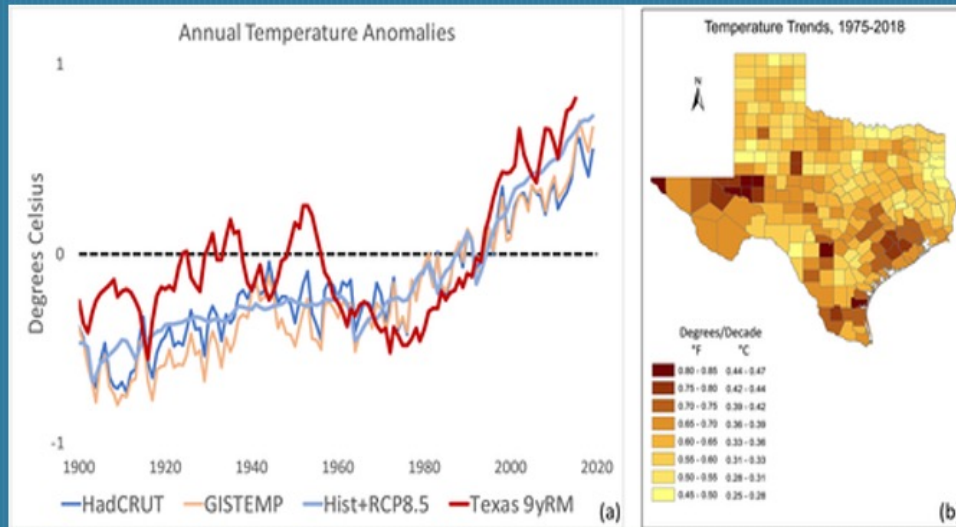
Texas Droughts: Current data

- **16,802,026** people in Texas are affected by drought
- **1,714,773** people in Bexar County are affected by drought
- **16th driest March** on record, over the past 128 years
- **12th driest year to date** over the past 128 years (January-March 2022)



Jeni: We have all enjoyed the rainfall relief from the most recent drought. Still, current data shows that almost 17 million Texans are being affected by our dry conditions. 1.7 million in Bexar County. March was the 16th driest on record in Texas. Year to date we are experiencing the 12 driest year.

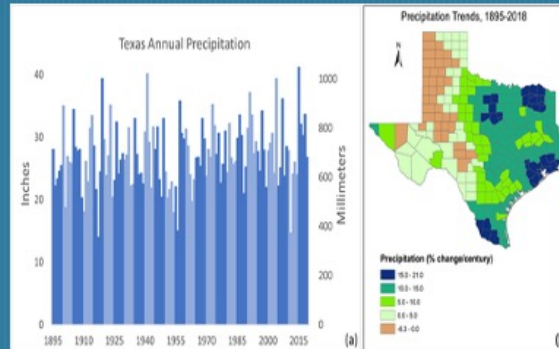
Texas Temps going up



Ray: In a 2020 study, Texas A&M scientists said, our state's future climate will feature drier summers and decreasing water supplies for much of the state for the remainder of the 21st century -- likely resulting in the driest conditions the state has endured in the last 1,000 years.

Texas Precipitation

- Precipitation is up in parts of the state
- Drier than normal in west Texas
- Evaporation from aquifers is high



Ray: While precipitation is up over some areas of Texas, the same report says that the Texas state water plan doesn't explicitly consider climate change when assessing water supply and water demand for the future.

Any gains in precipitation in the state thus far have been offset by evaporation, run-off and rising populations and will put a dramatic strain on water supplies.

Parable of the Talents Matthew 25:14-30

- The Master gave 3 Stewards properties
- Two of the stewards invested the properties and reaped rewards
- One steward did nothing
- Jesus says that those who act as faithful stewards will be blessed but those stewards who sit on their hands and do nothing will lose everything

Jeni: As we start to wrap things up here, I want to remind you of this parable that Jesus told. As the master was leaving to travel, he gave 5 “talents” to one steward, 2 talents to another and 1 talent to the last. The first two stewards *did something*. They traded or invested the property of their master and reaped rewards for him. However, the last steward was frozen by his fear. He did nothing. And the results for him were disastrous.

Information about climate change can be frightening, but we can’t let that scare us into inaction. We can’t stick our heads in the sand and be irresponsible in our assignment to serve and protect God’s world. God has said that we are accountable.

Promise of the Rainbow



Genesis 9: ¹³I have set my bow in the clouds, and it shall be a sign of the covenant between me and the earth.¹⁶When the bow is in the clouds, I will see it and remember the everlasting covenant between God and **every living creature** of all flesh that is on the earth.”

Jeni: Gen 9 says: READ.

The rainbow always gives us hope. It reminds us of God’s promise not to destroy us. It reassures us of a loving God.

More to the rainbow...

"The rainbow is a half-picture, lacking a second half to complete the circle of wholeness. God can pledge not to destroy humanity, but since He created humanity with freedom of choice, He cannot guarantee that humanity will not destroy itself."

--Rabbi Riskin



Jeni: Yet, let me read to you, for your consideration, what Rabbi Riskin has stated, READ...

As God's stewards on God's earth...are we going to continue to ignore the facts about what our actions and inactions are doing to God's world?

The Rabbi raises the question, "Will we destroy ourselves?"

In the next 2 weeks, we will discuss what it will mean if we stay on the current course – inaction – and we do nothing. But we have choices to make.

Today we have become the greatest threat to the health of our planet. We're the first generation to know what we're doing, and the last who have a chance to put things right.

▪ David Attenborough

Ray: Read

Next Week

- Look at why we know it is humans causing climate change
- How we can put things right
- **Assignment:**
 - Read: [Saving Us: A Climate Scientist's Case for Hope and Healing in a Divided World](#)
By Katherine Hayhoe

Ray: Read