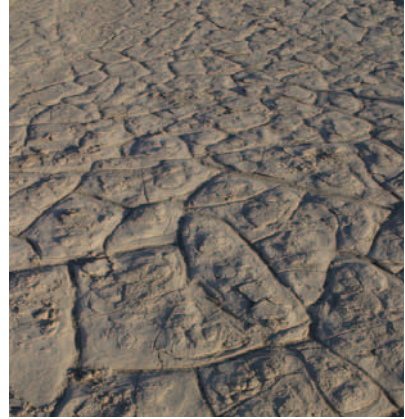


# Fair Warning



## GLOBAL WARMING AND THE LONE STAR STATE

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MAY 2006

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**ENVIRONMENTAL DEFENSE**

finding the ways that work

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Environmental Defense acknowledges the contribution that the Houston Advanced Research Center (HARC) has played in increasing our understanding of the impacts of global warming on Texas. In 1991, HARC assembled an interdisciplinary task force to provide the best available research on climate change and its impacts on Texas. The result of the task force's work was *The Impact of Global Warming on Texas*, published in 1995 by the University of Texas Press.

*Photos:* All hurricane images from NOAA. Other photos from iStockphoto unless otherwise noted.

*Our mission*

Environmental Defense is dedicated to protecting the environmental rights of all people, including the right to clean air, clean water, healthy food and flourishing ecosystems. Guided by science, we work to create practical solutions that win lasting political, economic and social support because they are nonpartisan, cost-effective and fair.

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The complete report is available online at [www.environmentaldefense.org](http://www.environmentaldefense.org).  
Consumer information about combating global warming is available at [www.fightglobalwarming.com](http://www.fightglobalwarming.com)

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# Executive summary

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**“Anthropogenic climate change is now likely to continue for many centuries. We are venturing into the unknown with climate, and its associated impacts could be quite disruptive.”<sup>1</sup>**

Thomas Karl, director, National Climatic Data Center, and Kevin Trenberth, National Center for Atmospheric Research

Last year tied a record for the warmest year in history.<sup>2</sup> In each of the first four months of 2006, at least one day reached a historic high temperature in Texas.<sup>3</sup> It hit 100 degrees in Austin in April for the first time ever.<sup>4</sup>

With 95-degree Easter egg hunts and 100-degree days before May, we’re getting a pretty good taste of what global warming will mean for Texas. But global warming means more than heat waves. If the temperature rises another 3 to 7 degrees Fahrenheit by 2050 as scientists predict, a variety of changes will be triggered around the world. Some places will be hotter, some cooler, some wetter and some drier. For example, if the Gulf Stream shifts or stops, which scientists say is a possibility, England and northern Europe will be substantially colder. In many cases, local weather and temperature extremes will be . . . well, more extreme.

## What global warming could mean for Texas

The Texas impacts of global warming will vary by region. Because of Texas’ size, terrain, location and diversity, the list of those impacts is startling: more heat waves, worse air quality, increased risk of disease, droughts, wildfires and coastal erosion. If the sea level rises by three feet—as scientists predict it will—South Padre Island will be lost. Much of Galveston Island would be uninhabitable.<sup>5</sup>

Global warming already threatens marine ecosystems, jeopardizing Texas’ coastal tourism and commercial and recreational fishing industries. It could undermine Texas’ agricultural economy and affect our wildlife’s migratory patterns. In fact, unless we act now to reduce greenhouse gas emissions, it is hard to imagine any facet of life in Texas that will not be affected by global warming.

More startling than these impacts is the fact that so few of our elected and appointed officials are planning for them or examining ways to prevent them.



Despite the impact that global warming will have on Texas, the State Legislature has taken no action to reduce Texas’ emissions or plan for the consequences.

## Other states are out in front

Legislators in other states from California to New York—Republicans and Democrats alike—are tackling this problem head on. But not in Texas. While some Texas

**Texas emits more carbon dioxide than any other state, and there's no plan to stop it, slow it or deal with the consequences.**

mayors have joined a national effort to get cities to act, most state legislative leaders have been conspicuously absent from discussions on global warming. Texas emits more carbon dioxide, the principal manmade greenhouse gas, than any other state, and there's no plan to stop it, slow it or deal with the consequences.

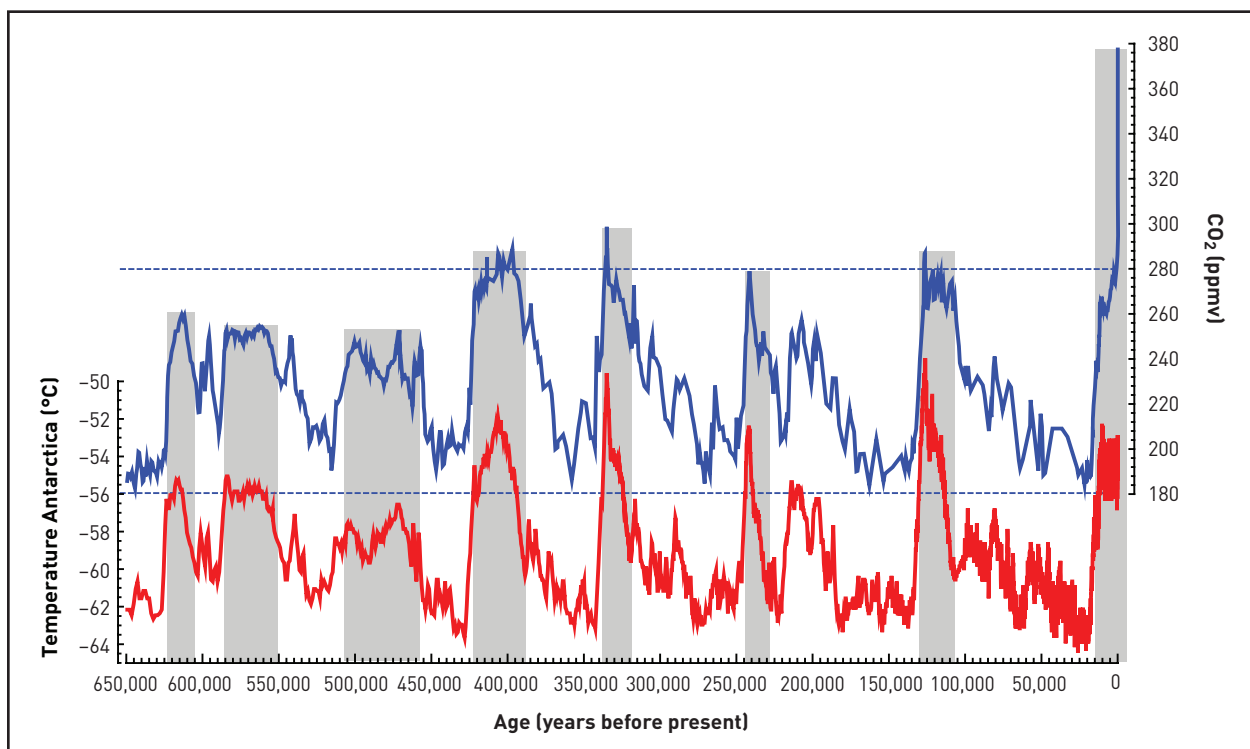
*Fair Warning* is not a guaranteed list of date-certain predictions. No one can produce that. Environmental Defense intends it to be a discussion guide about what Texas may face as global warming becomes more visible and pronounced. And true to our solution-oriented roots, we offer some recommendations for consumers and public officials that will help Texas prepare for and reduce the impacts of global warming on the Lone Star State.

We hope this will jumpstart conversations among families, co-workers, and neighbors, but especially among the leaders who have the responsibility to protect Texas and its citizens, economy, property and quality of life. Texas may look a lot different in 100 years. Will we have done all we could to prevent the worst? If not, will we be prepared to deal with the consequences?

## Facing the threat: What is global warming?

The greenhouse gas “blanket” in the Earth’s atmosphere, which traps the sun’s heat and slows its escape back into space, protects the delicate balance necessary to sustain life as we know it. However, pollution is making this blanket thicker than at any other time in human history. For example, levels of carbon dioxide—the most important greenhouse gas—are higher today than they have been in the past 650,000 years.<sup>6</sup> As a result, temperatures are rising rapidly and our planet’s climate is changing.<sup>7</sup>

Although the Earth’s climate varies naturally over time, the overwhelming scientific consensus is that most of the warming over the past 50 years has been caused by emissions of human-produced greenhouse gases.<sup>8</sup> Once emitted, many greenhouse gases stay in the atmosphere for a long time. For example, carbon dioxide emissions from the world’s first cars are still contributing to global warming. The pollution we emit today will warm the planet for at least another century. That’s why it’s important to act decisively now to cut greenhouse gas emissions as much as possible.

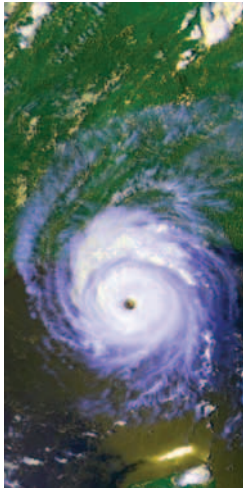


Atmospheric carbon dioxide concentrations (in parts per million, or ppmv, on the right-hand axis) and average temperature in Antarctica (in degrees Celsius, °C, on the left-hand axis) over time, from 650,000 years ago (left) to the present (right). The solid blue line shows carbon dioxide concentrations measured from air bubbles in Antarctic ice cores. The solid red line shows average temperature in Antarctica, based on isotopic analyses of the ice cores. The upper dashed blue line shows the level of carbon dioxide at the start of the industrial revolution and the lower dashed blue line shows the lowest carbon dioxide level on record. Gray shaded areas show periods that were at least as warm as it was 10,000 years ago.<sup>9</sup>



## The big picture: How will global warming affect Texas?

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- Temperatures will be warmer and precipitation patterns will change, affecting human health, air quality, natural resources and wildlife, the economy and other quality of life issues. Heat waves are likely to be longer, hotter and more frequent, increasing heat-related deaths and wildfire risks.
- The sea level will rise, threatening low-lying communities along Texas' 600-mile coast, the many species that rely on coastal and wetland ecosystems, and the multi-billion-dollar coastal economies.
- Hotter weather, more frequent and severe droughts and increased evaporation—on top of Texas' exploding population—will combine to put an unprecedented strain on Texas' already-scarce water supply.<sup>10</sup>
- Warmer ocean water will increase the severity of hurricanes in the Gulf of Mexico, and an increase in sea level would virtually eliminate the protection offered by Texas' barrier islands and coastal wetlands.

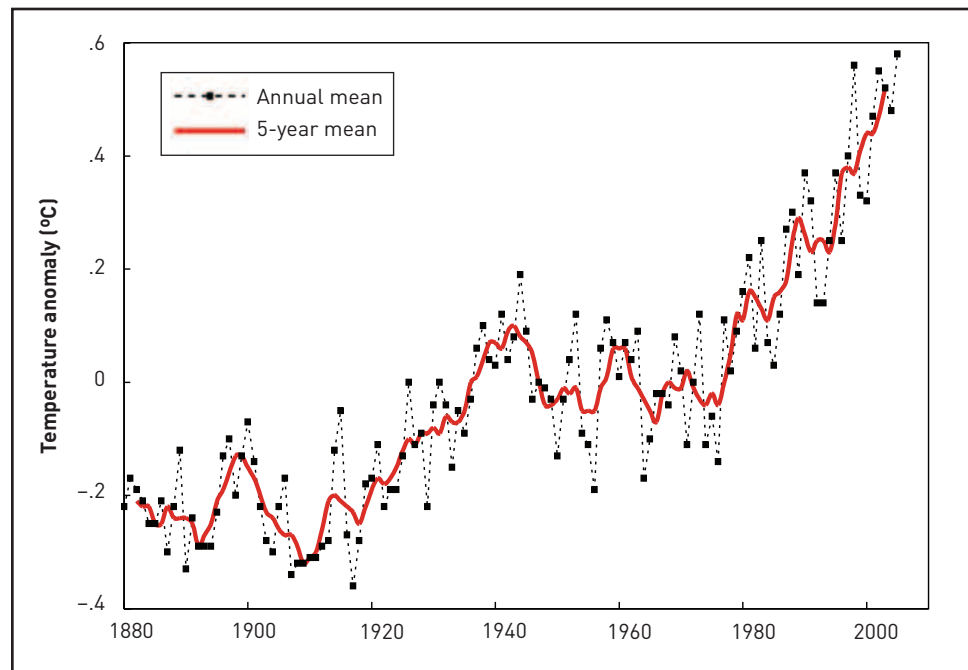


# Getting down to details: Global changes, Texas challenges

## GLOBAL CHANGE: Earth's atmosphere is warming

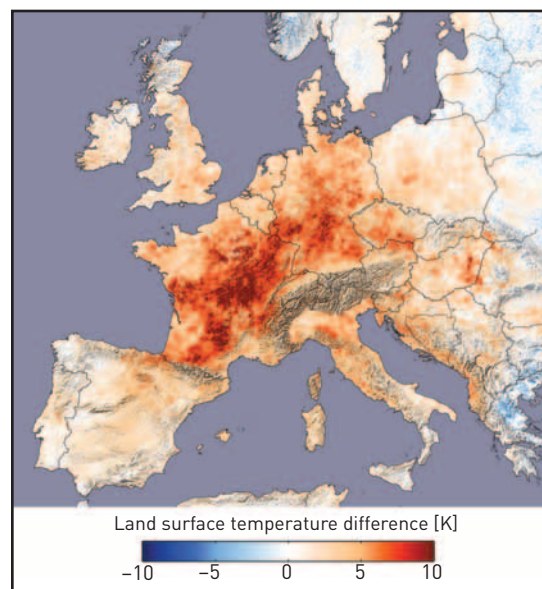
Temperature records show that, although a few areas of the world have cooled, most have warmed—some a great deal.<sup>11</sup> On average, the world is about one degree Fahrenheit warmer today than it was 100 years ago.<sup>12</sup> And the warming is accelerating.

Greenhouse gas pollution has already doubled the risk of extreme heat waves, like the one that killed tens of thousands of people in Europe in the summer of 2003.<sup>13</sup>



NASA GISS

Global air temperature relative to the 1951–1980 average. Black symbols and dotted lines show annual averages; the thick red curve shows the five-year average.<sup>14</sup> A change of 1°C is the same as a change of 1.8°F.



The difference in land surface temperature (in °C) between 2003 and the average of 2000, 2001, 2002 and 2004, for the date range July 20–August 20. A change of 1°C is the same as a change of 1.8°F, so dark red areas were about 10°F warmer in 2003.<sup>15</sup>



## **TEXAS CHALLENGE: A hotter Texas and changes in timing and amount of precipitation will threaten human health, air quality, natural resources and wildlife, the economy and other quality of life issues**

### HEAT WAVES

- Many major Texas metropolitan areas violate public health standards for ozone—a ground-level pollutant that is exacerbated by hot weather. A hotter Texas will result in more frequent “ozone action” days,<sup>16</sup> more asthma attacks, more hospitalizations and higher public health costs.
- Despite Texas’ familiarity with hot summers, longer, hotter and more frequent heat waves will pose new challenges. They will not just be uncomfortable. Their frequency and severity will strain energy resources, public health facilities, business productivity and tourism.
- Energy demand (and costs to Texans) will increase as temperatures rise and summer lasts longer. Ironically, the electric power industry is among the worst greenhouse gas polluters in Texas. So unless our utilities reduce their greenhouse gas emissions, we’ll actually be making the problem *worse* as we use more power to cool our homes and businesses.



### PRECIPITATION

- Global warming will exacerbate normal drought cycles, causing longer and more frequent droughts in Texas.<sup>17</sup> Longer periods without precipitation will decrease runoff to our rivers and recharge to our aquifers, resulting in a reduction in the amount of water available to businesses, cities and agriculture.<sup>18</sup>
- The reduction of fresh water inflows will also affect reservoir storage, an impact that is not easily reversed. The loss of aquifer recharge will further increase pressures on our already overtaxed groundwater resources and drive up groundwater costs.<sup>19</sup>



NATIONAL PARK SERVICE

Top: Texans already face frequent “ozone action” days that can trigger asthma attacks and other respiratory illnesses. Warmer weather will exacerbate the problem. Bottom: Texas is no stranger to droughts. But global warming will make them more frequent and severe. The stretch of the Rio Grande that runs through Big Bend National Park ran dry in 2002 for the first time since the 1950s—a harbinger of things to come.

**“Rising temperatures and associated emission increases will contribute to worsening air quality and respiratory illnesses, including aggravated asthma, increased hospitalizations for respiratory and cardiovascular disease, reduced lung capacity and premature deaths.”**

—American Lung Association of California



Mosquitoes are already familiar pests in Texas. Scientists predict that warmer weather will make mosquito-borne diseases more prevalent.

- Less predictable precipitation is only one of Texas’ water worries. Warmer temperatures will increase the amount of surface water that evaporates. One model predicts that a temperature increase of approximately 4 degrees Fahrenheit and a 5% reduction in precipitation would reduce the amount of river flow to the coast by 35% in normal conditions and up to 85% during droughts.<sup>20</sup>
- Global warming’s impact on Texas’ \$14 billion agriculture industry will vary by crop and location. For example, the EPA projected that global warming could reduce wheat yields in Texas by 43-68%.<sup>21</sup> Corn yields also would be reduced. Other crops, however, such as cotton, may actually benefit from global warming.
- Warmer, drier seasons in already dry regions will result in a significant reduction of soil moisture and an increased demand for groundwater for irrigation.<sup>22</sup> This could have its greatest impact on the agriculture economy in western and southern Texas where water is already a precious resource. Texas agriculture can and will have to adapt by changing to more suitable crops.
- With more heat waves and droughts, wildfires, like the ones that threatened central and north Texas in late 2005 and early 2006, will become more common concerns for a larger portion of the state.

#### DISEASE

- A warmer climate will allow mosquito-borne disease to migrate north from the tropics. Scientists predict that malaria will spread, and Texas has already seen cases of West Nile virus and dengue fever.

#### SHIFTING HABITAT

- Researchers predict that species—from birds and insects to trees and grasses—may try to move north to find more preferable climates.<sup>23</sup> In some cases, suburban development and the resulting fragmentation of habitat will make relocation difficult if not impossible. Successful migration may cause problems, as well, if pollination patterns change and the absence of beneficial insects alters the balance of nature in different regions.
- In addition to literally changing the Texas landscape, this northward migration would significantly alter the annual migration of bird species that cross Texas in the spring and fall and the resulting multimillion-dollar bird watching and hunting industries.
- Species that rely on isolated, seasonal or temporary aquatic habitats will be particularly threatened as these habitats dry up and movement to better areas is restricted. Temporary aquatic areas could become the most endangered habitat in Texas.

## GLOBAL CHANGE: Earth's ice is melting and sea level is rising

### MELTING ICE

Global warming is melting ice around the world. Arctic sea ice is disappearing, endangering traditional hunting societies.<sup>24</sup> Permafrost is no longer permanent.<sup>25</sup> In Alaska, thawing permafrost and slumping ground cause \$35 million per year in damage to houses, pipelines, roads, airports and military installations.<sup>26</sup> Around the world, shrinking glaciers are creating water shortages and threatening tourism in scenic parks.<sup>27</sup> For example, Montana's Glacier National Park could be glacier-free in 25 years.<sup>28</sup>

### RISING SEA LEVELS

As warming waters expand and melting ice sheets and glaciers pour into the oceans, sea levels rise.<sup>30</sup> Historical tide records and modern satellite altimetry data show that the sea level has risen four to eight inches over the past century (10 times the average rate over the last 3,000 years).<sup>31</sup> Depending on future rates of greenhouse gas pollution, scientists project that the sea level could rise another three feet by the end of this century.<sup>32</sup> Even larger changes are not out of the question. The warmer it gets, the more likely that vast ice



Grinnell Glacier in Glacier National Park, in 1938 (left) and 1981 (right). The arrows in the right-hand photo show the glacier's perimeter in 1850. Between 1850 and 1993, the glacier shrank 63% in area.<sup>29</sup>

COURTESY OF CARL H. KEY



NATIONAL PARK SERVICE

Left: Open water and bare soil are not as bright and reflective as ice and snow. When ice melts, the darker surfaces beneath absorb more solar energy. This extra warming melts even more ice, exposing even more dark surfaces, and warming accelerates. Right: Permafrost is permanently frozen soil found at high latitudes, such as Alaska's Denali National Park. These soils store vast amounts of carbon. As long as the soil remains frozen, the carbon is locked in place. Scientists fear that as these areas thaw, they will release large amounts of carbon dioxide and methane.

sheets will disintegrate, leading to potentially catastrophic sea level rise. For example, if the Greenland ice sheet melted completely, the sea level would rise 23 feet, flooding coastal areas around the world.<sup>33</sup>

#### VICIOUS CYCLES

Global warming can set off vicious cycles that cause the Earth to warm even faster. Melting ice is one example that is already occurring.<sup>34</sup> Scientists believe that a second process, thawing permafrost, could also accelerate warming by releasing tons of methane—a potent greenhouse gas—into the atmosphere.<sup>35</sup>

Greenhouse gas levels are higher today than they have been at any time in the history of civilization.<sup>36</sup> As these levels continue to increase, global warming will get worse, and sudden, irreversible changes (like species extinctions and the collapse of ice sheets) will be even more likely to occur. We must act now to cut greenhouse gas pollution, to minimize the amount of warming—and the level of risk—that we and future generations will face.

**TEXAS CHALLENGE:** Texas has more than 600 miles of low-lying coast that will be severely impacted by even the lowest estimates of increased sea level

- Without strong action to curb greenhouse gas emissions, particularly carbon dioxide, even the most conservative estimates of sea level rise spell trouble for Texas (see maps). Unlike some coastlines that are marked by tall cliffs and other abrupt changes in altitude, the Texas coast gradually slopes into the Gulf of Mexico, and much of our coast and most of our barrier islands are less than five feet above sea level. If the sea level rises by three feet, South Padre Island will be lost. Much of Galveston Island would be uninhabitable.
- A three-foot increase in sea level would threaten industrial plants, refineries and residential communities near the Houston Ship Channel and other Texas ports.
- A one-foot increase in sea level would cover approximately 402 square miles of Texas coast. A three-foot rise in sea level would submerge nearly 1,000 square miles. (For context, the City of Dallas covers 380 square miles. Big Bend National Park covers 1,100 square miles.)
- Many of Texas' 1.6 million coastal county residents would be displaced by a rising sea level. Coastal schools, businesses, hospitals and roads would be inundated.
- The Texas coastal ecosystem generates more than \$12 billion in annual economic activity—ranging from tourism to recreational and commercial fishing. All of this will be threatened by a higher sea level. For

Most climate models predict that without strong action to curb greenhouse gas emissions, the sea level will rise one to three feet over the next 100 years. Some predict an increase as high as 10 feet.<sup>37</sup> The current EPA estimates an increase of two feet.<sup>38</sup> The shaded portions of the maps indicate the land along the Texas coast that sits lower than one, three and ten feet above sea level.<sup>39</sup>





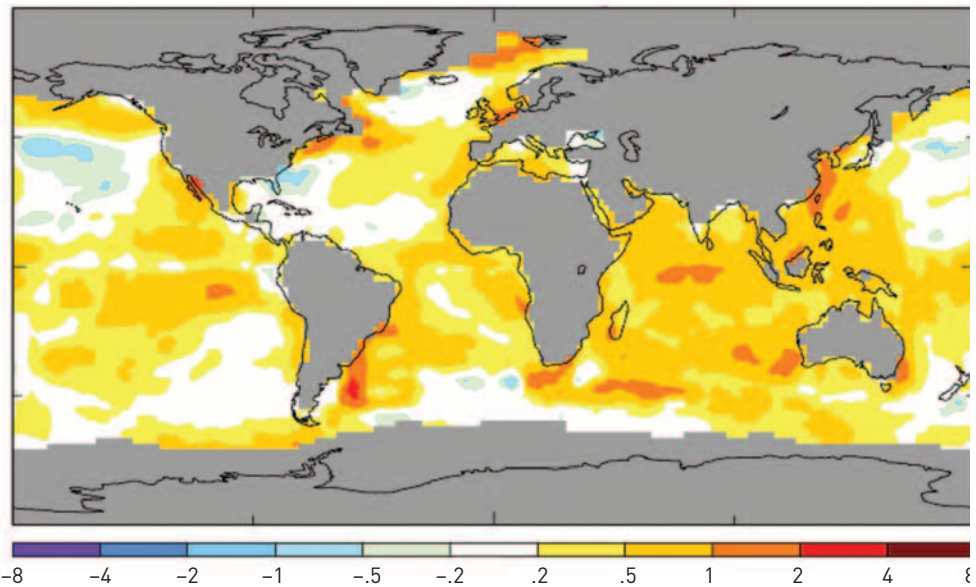
example, Texas bays and estuaries play a critical role in the state's \$2 billion commercial and recreational fishing and seafood industry. Rising seas and altered freshwater flows may change the salinity of these sensitive areas and alter the nurseries of Texas' most valuable fisheries, including shrimp.

- A rising sea may harm migrating birds. Some bird species that cross the Gulf of Mexico barely make it to coastal woodlands where they stop, rest and refuel. A retreating coastline would add distance and risk to their migration.
- Texas' barrier islands and coastal wetlands serve as Texas' first line of defense from hurricane storm surges. A three-foot increase in sea level will virtually nullify any protection they would provide against a strong hurricane.



### **GLOBAL CHANGE: Oceans are warming**

Sea surface temperature is a key factor in hurricane intensity: the warmer the water, the stronger the storm. New scientific studies have confirmed that hurricanes are now more intense worldwide, in part because of warmer sea surface temperatures.<sup>41</sup> Excessively warm waters can kill coral reefs through a process called “bleaching.” Between 1997–1998 (which tied for the hottest 12-month period on record), warm waters damaged 16% of all coral reefs in the world.<sup>42</sup>



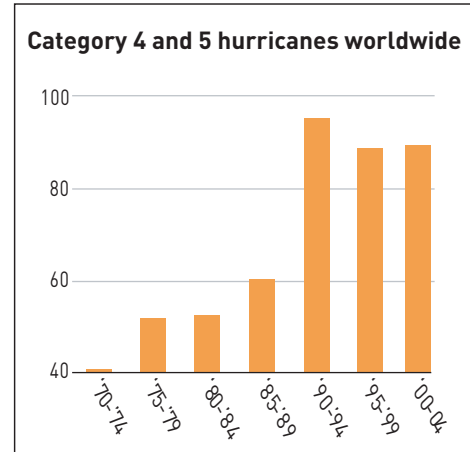
Change in annual average sea surface temperature between 1955 and 2005. The color bar below the map shows the temperature scale in Celsius. (A change of 1°C is the same as a change of 1.8°F.) Yellow, orange and red show warming; green and blue show cooling. On average, the top 300 meters (about 900 feet) of the world's oceans have warmed almost 0.6°F since the mid-1950s.<sup>40</sup>

## TEXAS CHALLENGE: A warmer Gulf of Mexico will threaten the economy, health and safety of the Texas coast

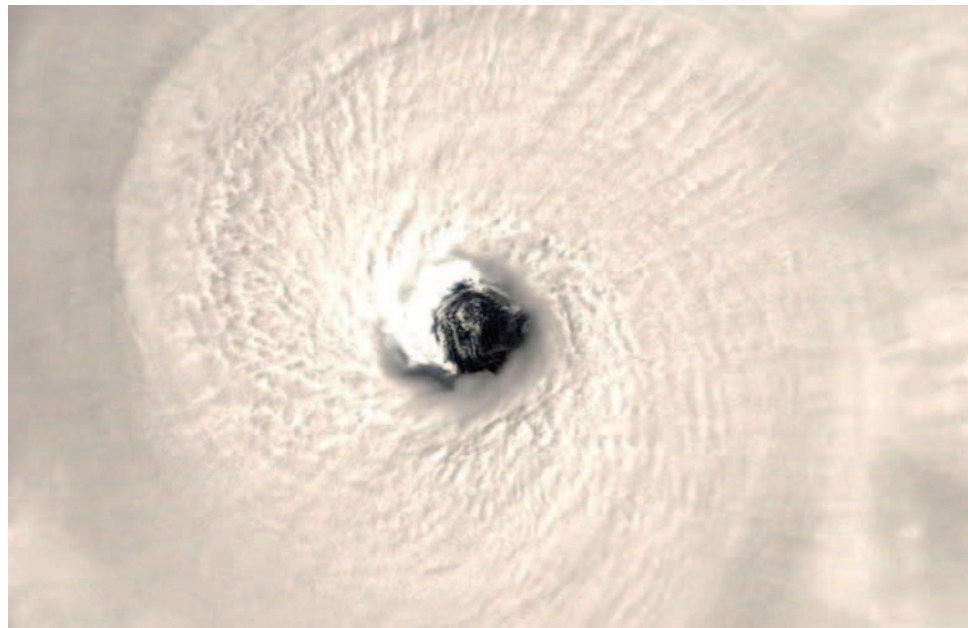
- During the last 23 years, the water temperature in the majority of Texas bays has increased by nearly three degrees Fahrenheit.<sup>44</sup> Coupled with increased salinity, warmer bays could reduce the productivity of Texas' seafood industry.

- Scientists have linked the severity of the 2005 hurricane season to global warming.<sup>45</sup> Hurricanes are fueled by warm water, and a warmer Gulf of Mexico will increase the severity of hurricanes that enter it. So not only could Texas lose the protection of the barrier islands, it would do so as Gulf hurricanes get more intense.

- Global warming will impose new insurance costs on Texas homeowners and businesses. If hurricane “danger zones” move further inland, insurance companies will adjust rates to account for the increasing risk of damage.



The number of category 4 or 5 hurricanes per five-year period since 1970. Worldwide, there are more than twice as many of these destructive storms today than there were 35 years ago.<sup>43</sup>



**“The hurricanes we are seeing are indeed a direct result of climate change and it’s no longer something we’ll see in the future, it’s happening now.”**

Greg Holland, division director, the National Center for Atmospheric Research<sup>46</sup>

# Texas at a crossroads

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**There is no statewide plan to deal with global warming.**

Texas hasn't always been known for its environmental leadership. Among its dubious environmental honors, Texas ranks number one in:

- Amount of toxic emissions from manufacturing facilities
- Number of clean-water permit violations
- Total releases of pollution into the water
- Hazardous chemicals injected underground
- Emission of recognized carcinogens into the air

Texas also leads all states in annual carbon dioxide emissions. It emits more than the UK, Canada or Italy. Unfortunately, that's where Texas' leadership stops. There is no statewide plan to deal with global warming. No plan to curb carbon emissions. No official inventory of risks posed by global warming. No plan to deal with the consequences.

## What other states are doing

In other parts of the country, forward-thinking leaders of both parties are stepping up to tackle their states' contribution to this global problem. Consider the current global warming efforts of other states:

- Seven Northeastern states signed a multistate pact to reduce by 10% greenhouse gas emissions, specifically carbon dioxide, from power plants by 2020 using market-based solutions.
- California has passed legislation that will cap emissions from automobiles and has recently introduced a bill that will cap carbon emissions economy-wide. Nine other states have now adopted the California car standard.
- Oregon's governor appointed a Task Force on Global Warming to develop a strategy to reduce greenhouse gas emissions and to plan for the consequences of climate change.
- Washington State has new carbon dioxide emission standards for fossil-fueled power plants.
- Montana's governor has asked his state's environmental agency to form an Advisory Committee on Global Warming to develop strategies for reducing greenhouse gases.
- Governors of New Mexico and Arizona have implemented the Southwest Climate Change Initiative, committing to collaborate on global warming pollution reductions.
- New Mexico Governor Bill Richardson has directed state agencies to assess the potential impacts of global warming on New Mexico. New Mexico has set a target of reducing greenhouse gases by 10% by 2012 and has joined the Chicago Climate

### Biggest emitters of greenhouse gases

1. United States
2. China
3. Russia
4. Japan
5. India
6. Germany
- 7. Texas**
8. Great Britain



If Texas were a country, it would rank seventh globally in greenhouse gas emissions.

Exchange, a market for non-profits and local governments to trade credits generated by cutting emissions.

- New Mexico (which is already facing water shortages), California and Arizona are among the western states already addressing the impact of global warming on their water supplies. The governors of New Mexico and California have each asked for specific reports addressing potential water resource impacts of global warming.

Some states, like North Carolina and California, are approaching this problem with economic opportunity in mind. The North Carolina Climate Stewardship Task Force completed a study that predicted that preparing for global warming now—developing a plan that helps the state benefit from a new energy economy, establishing a carbon-reduction goal, increasing its energy independence by developing alternative energy sources, and pursuing incentives to promote energy efficiency and conservation—could benefit the North Carolina economy in the future. In California, leaders are pursuing a new law that would unleash a wave of innovation by providing incentives to businesses to develop cleaner power sources.

There is no reason for Texas to stand idly by while the rest of the country rolls up its sleeves and addresses global warming. As the nation's leading carbon emitter, Texas has a moral responsibility to its citizens and its neighbors to show leadership by reducing our carbon footprint and doing what we can to slow the consequences of global warming. Our leaders owe it to this and future generations to protect the health of the state's essential natural resources. But this is more than a moral issue. It's also a money issue.

Other states are examining ways to help their businesses lead (and profit) in the fight against global warming. And Texas should, too. Our cities are home to some of the world's largest energy and computer companies. Our ingenuity played a major role in the computer revolution, and our research universities boast of some of the best talent in the country.

But when it comes to tackling the greatest energy and technology challenge of our lifetime, Texas talent and Texas business savvy have been underused by state leaders who seem dead-set on ignoring the necessity and inevitability of a new energy economy. How much potential revenue is being lost because our leaders are stuck in the carbon-based economy? Is Texas going to let New Mexico, North Carolina or California pave the way to our new energy economy? So far, that appears to be the plan.

**This is more than a moral issue. It's also a money issue.**



Wind power offers Texas perhaps its greatest opportunity to contribute to global warming solutions.

# Charting a new course for Texas

**“The presence of uncertainty need not immobilize us like a deer trapped in the headlights of an on rushing truck. There is enough information to craft a sound program for a rational response to climate change in Texas.”<sup>47</sup>**

Dr. Gerald North, Texas A&M University

Texas can and should lead the way toward solving our global warming problems. But we need to get to it quickly—others have a few years’ head start. Environmental Defense recommends specific actions our state leaders can take immediately to reduce carbon emissions in Texas and some thoughtful processes they can launch so Texas is better prepared for the challenges ahead.

## ADOPT NO-RISK, NO-REGRETS SOLUTIONS IMMEDIATELY

The Legislature and administrative agencies should adopt a series of no-risk, no-regrets initiatives that will either cost Texas nothing or save money while reducing emissions. Following are just a few examples:

**Implement energy efficiency standards and programs.** Adding new efficiency standards to the state building code would significantly reduce energy consumption and save consumers money. The state should also clean up its own facilities by retrofitting all state buildings and facilities to reduce energy consumption and save tax dollars.

**Implement pay-as-you-drive auto insurance.** Studies have shown that basing auto insurance premiums on miles driven is fairer to consumers. It just so happens that it also encourages people to drive less (and emit less carbon dioxide). Though state law allowed insurance companies to offer this pricing model as an option for customers, no companies have. The state should now require them to do so.

**Offer incentives to companies to offer cash rebates to employees** who agree to forego an office parking spot and use other modes of transit to get to work. Companies would require fewer parking spots and employees would make money by reducing their commuting emissions.

**Offer incentives to reduce the greenhouse gas emissions of 18-wheelers.** Large trucks that idle through the night at truck-stops can burn up to a gallon of diesel fuel per hour, emitting tons of greenhouse gases a year and wasting millions of dollars. The state should adopt policies that promote the construction of electrified truck stops that provide truckers heating, air conditioning, and phone, cable and Internet access so they do not have to run their engines while parked.



IDLEAIRE

Trucks that idle all night at truck stops emit tons of greenhouse gas pollution into the atmosphere. Electrified truck stops like this one deliver air conditioning, heating and even phone and Internet service to drivers so they can turn off their engines.



## Citizen action for reducing greenhouse gases

Government intervention is imperative because Texas' carbon emissions are so great and reductions are needed so quickly. But that doesn't mean individual Texans can't make a difference. There are more than 15 million adults in Texas who make annual, monthly and even daily spending decisions that impact the state's emission levels. Even minor lifestyle adjustments add up when multiplied by 15 million. Consider the following steps everyday Texans can take to reduce their carbon emissions without sacrificing comfort, cost or convenience.

- **Replace regular household light bulbs with compact fluorescent bulbs.** Not only do they last up to 10 times longer but they provide the same amount of light as regular bulbs while using about one-fifth the electricity.



Compact fluorescent light bulbs that save energy and last longer than regular bulbs are one of the easiest ways to reduce household greenhouse gas emissions.

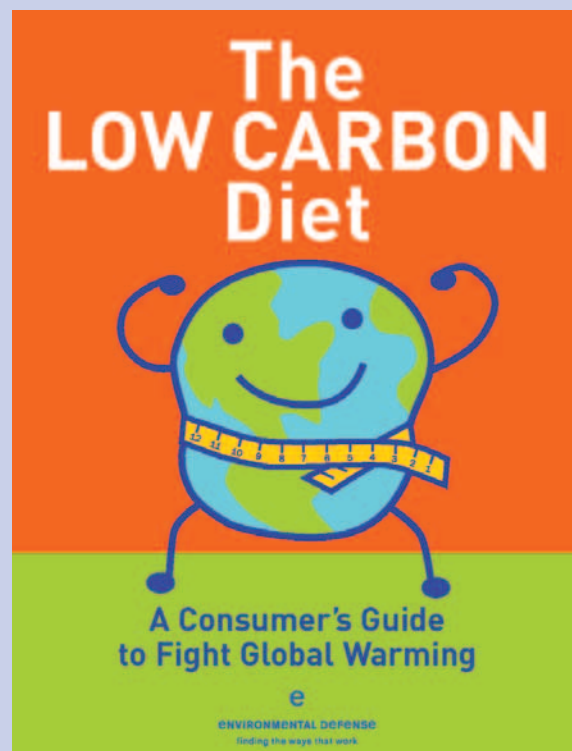
- **Pick an electricity provider that is committed to renewable energy.** In some markets, consumers can "lock in" an electric rate for power generated from low-emission sources, so not only are they curbing their emissions, they also are protected when rising fuel costs cause rate hikes.
- **Weatherproofing**, such as caulking leaky doors, replacing insulation or installing double-pane windows, can save energy and reduce strain on air conditioners.
- **Look for the EnergyStar logo when you shop.** New refrigerators, washing machines, water heaters and air conditioners are much more efficient than older models. When shopping for new appliances, pay attention to their estimated



"annual energy costs" and select less power-thirsty models. In many cases, there are local and

federal rebates available to offset the cost of new energy-efficient appliances.

- **Drive smart.** Emissions from cars and trucks are the most direct "consumer controlled" source of greenhouse gases. But not everyone has to give up driving to make a difference. When shopping for a new car, look for the most fuel-efficient model in the class your family needs. It will reduce emissions and save you money. The difference in fuel costs between a 20 mpg and 30 mpg car is nearly \$700 a year.<sup>48</sup> Keep cars well tuned and tires properly inflated. Combine errands. If your schedule permits, carpool with a co-worker or take the bus to work once a week or once a month.
- **Think globally, vote locally.** As much as consumers can do to reduce Texas emissions, we need our elected officials to take action on global warming. Be an educated voter and demand that your elected officials take action on global warming now.



Texans can help curb global warming at home and on their way to work. To learn more consumer tips that will reduce carbon dioxide emissions, visit [www.fightglobalwarming.com](http://www.fightglobalwarming.com) and download our Low Carbon Diet kit.



## Planning for opportunities and consequences

The Texas Legislature should follow the lead of other states by commissioning a Global Warming Task Force of business leaders, academics, scientists, economists and environmentalists to develop a balanced and expert assessment of the global warming challenges and opportunities that lie ahead.

The Texas leadership is years behind other states in investigating what global warming will mean to our state's resources and economy, what we can do to reduce our emissions, and what economic opportunities might exist in tackling global warming.

Other states have inventoried and begun planning for the risks and consequences of global warming. Fifteen years ago, the Houston Advanced Research Center, a non-profit corporation, had the foresight to convene experts to assess the varied impacts global warming might have on Texas and identify policy options to help Texas prepare. The result of that effort was *The Impact of Global Warming on Texas*, published in 1995. The task force recommended here should build upon the 1995 findings and bring them up to date so that state and local leaders can develop solutions with the best available data. Broad, bipartisan agreement on the likely consequences of global warming will make planning for them possible.

The task force should also examine the quickest and most cost-effective route to lowering the state's greenhouse gas emissions. Other states have implemented market-based tools like emission credit trading to spark new sources of revenue for carbon-emitting industries, and Texas should develop its own plan before one is mandated by the federal government.

And finally, the task force should identify opportunities that could turn the fight against global warming into an economic opportunity for Texas businesses. Corporations like General Electric are investing billions of dollars into products and programs that reduce emissions. Some of that money could come to Texas, and our leaders should be among Texas' greatest new energy ambassadors. For example, renewable energy capacity is one of Texas' environmental bright spots. Texas will soon rank above all states in wind power generation, and the capacity for green economic growth here is staggering. But our leaders in Austin have so far ignored economic upsides to a carbon-reduced world. As other states move toward a clean and prosperous future, an official assessment of just how much money Texas businesses stand to gain (or miss out on) would spur interest and investment.

### States with most wind energy installed, by capacity (MW)

California	2,150
Texas	1,995
Iowa	.836
Minnesota	.744
Oklahoma	.475
New Mexico	.407
Washington	.390
Oregon	.338
Wyoming	.288
Kansas	.264

Capacity—measured in kilowatts (kW) or megawatts (MW)—measures a turbine's generating potential. A 1.5-MW wind turbine operating in a good wind resource area can be expected to generate over 4 million kilowatt hours per year or enough to supply 400 average homes.

California, where the U.S. wind industry began, has had the largest wind power capacity since electricity-generating wind turbines were first installed there in 1981. Texas gained fast last year and is expected to overtake California in 2006.

Source: America Wind Energy Association, [http://www.awea.org/news/Annual\\_Industry\\_Rankings\\_Continued\\_Growth\\_031506.html](http://www.awea.org/news/Annual_Industry_Rankings_Continued_Growth_031506.html)

# Notes

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- <sup>3</sup> Source: National Weather Service, 2006.
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