



**Who better to study the Earth's climate
than an organization of scientists?**



NOAA is an organization of scientists who travel to the ends of the earth to monitor our seas, coastlines, weather and land. This sustained observation from Pole to Pole, and above the Earth with satellites, provides critical findings that impacts our health, our economy and our future. Get closer to a world of information, visit www.noaa.gov



No one is closer to the earth than NOAA.

NOAA Knows
www.noaa.gov

NOAA PHOTOGRAPHY



NOAA is an organization of scientists who go to the ends of the planet, and far above it, by using satellites to see the Earth's climate system. Armed with these sustained, space-based observations, NOAA is a world leader in understanding the oceans, atmosphere and climate, and how they impact our health, our economy, and our future. You can view NOAA's far-reaching work at www.noaa.gov



To see the Earth's climate system
you need another pair of eyes.

NOAA Knows
www.noaa.gov

Charles Stillwell
Scientist- Weather Specialists



National Oceanic and Atmospheric Administration
Miami, Florida 37820

This extreme weather report is brought to you by NOAA.

NOAA is an organization of scientists that monitors the weather, the seas, and the atmosphere to understand the Earth's climate. Through these sustained observations, NOAA creates seasonal climate forecasts, predicts natural climate variability and a wide variety of weather and climate data. In other words, vital information that effects the lives and livelihoods of millions of Americans every day. For the complete report simply log onto www.noaa.gov

NOAA
Knows.

www.noaa.gov

Wilson Roberts
Scientist- Oceanographer



National Oceanic and Atmospheric Administration
Key West, Florida 73402

How deep do you have to go to understand Earth's climate?

NOAA's scientists use planes, ships, satellites and submarines to monitor Earth's climate system from top to bottom. They provide data and information on present and future states of the oceans and coastal ecosystems that result in a coordinated system which gives decision makers, emergency responders and others, quick and easy access to information, that improves health and saves lives. For the in-depth facts, visit www.noaa.gov



www.noaa.gov

One thing about NOAA's scientists,
they're out there.



The scientists of NOAA monitor the oceans and atmosphere from the Arctic to the desert. As a result of these surface-based observations, NOAA compiles seasonal climate forecasts, weather data, drought reports and a host of information that impacts our health, our economy and our future. How far do NOAA scientists go to understand our world? Find out at www.noaa.gov

NOAA Knows
www.noaa.gov



**NOAA can tell you the things you need
to know about climate change.**

*NOAA, the leader in the research and modeling of the earth,
knows the ways climate change will affect you.*



www.noaa.gov/climatechange

NOAA scientists know that climate change from the burning of fossil fuels is causing sea levels to rise at an accelerated rate. In the last decade alone, rates more than doubled over those of the entire 20th century. Scientists expect that rate to continue to accelerate, and adversely affect more than half our nation's population that live in coastal areas. How does NOAA know? Because its scientists travel the earth to monitor the oceans, the tropics, the coastlines, deserts, the Arctic and the Poles; measuring water, weather, sea life, and more. For all the facts on this rising problem, visit www.noaa.gov/climatechange

NOAA Knows.

**AT 3 MILLIMETERS PER YEAR, HOW LONG WILL IT TAKE
RISING SEA LEVELS TO AFFECT 160 MILLION AMERICANS?**

WOODROW
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www.noaa.gov

THE EARTH'S TEMPERATURE IS RISING. SO WHY ARE YOU COLD?

NOAA knows that climate change affects different regions differently. Some locations are warming faster than others, while some are actually cooling. NOAA knows this because its scientists go to the ends of the earth- the poles, tropics, oceans, coastlines and deserts to monitor the planet's vital signs. For the cold, hard facts, visit noaa.gov/climatechange.

Because NOAA also knows that left unchecked, it won't be long before we all feel the impact of climate change.

NOAA Knows.



www.noaa.gov/climatechange

AT WHAT POINT WILL THIS BECOME A REASON FOR WAR?

NOAA scientists know that fresh water is projected to decline as sea levels rise and salt water moves into coastal areas due to climate change from the burning of fossil fuels. Here in the US, increasingly scarce water resources could threaten domestic stability and contribute to intra- and interstate legal conflicts. NOAA scientists know because they go to the ends of the earth to monitor the oceans, the tropics, the coastlines, deserts, the Arctic and the Poles; measuring water, weather, sea life, and more. For all the facts on climate change, visit www.noaa.gov/climatechange today.

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www.noaa.gov/climatechange

**THE SEAS HAVE ABSORBED ABOUT 50% OF THE CO₂ RELEASED FROM BURNING FOSSIL FUEL.
WHEN WILL THEY STOP SUPPORTING LIFE AND START DESTROYING IT?**

NOAA knows that our oceans are becoming more corrosive from manmade carbon dioxide, threatening all marine life. This acidification affects shell formation for corals, marine plankton and shellfish. In fact, due to this and ocean warming, a significant loss of coral reefs is expected by 2020. How does NOAA know? Because NOAA scientists monitor the oceans, the tropics, the coastlines, the deserts, the Arctic and the Poles; measuring water, weather, sea life, and more. For the facts, visit www.noaa.gov/climatechange while there's still time to make a difference.

NOAA Knows.



www.noaa.gov/climatechange

**HOW LONG WILL IT TAKE
BEFORE CLIMATE CHANGE IS FELT HERE?**

The scientists of NOAA know that climate change affects our food supplies. For instance, crop productivity is projected to eventually decrease as the earth's temperatures keep climbing. And invasive species like insects, weeds and water borne pathogens will disrupt local ecosystems, adding to the risk of famine in developing countries. For the facts on this growing problem, visit www.noaa.gov/climatechange. And see how NOAA scientists monitor the earth today.

NOAA Knows.



**IF YOU DON'T BELIEVE
IN CLIMATE CHANGE,
IT'S ONLY A MATTER OF TIME
BEFORE THE CLIMATE
CHANGES YOUR MIND.**



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NOAA Knows.

www.noaa.gov/climatechange



Perhaps you don't believe that the climate is changing. Or that the highest concentrations of CO2 ever recorded from the burning of fossil fuels are impacting the planet. Or that man is causing the earth to warm. At NOAA, an organization of scientists, we believe that man is responsible for climate change. And we know with near certainty of the many implications that a warming planet can produce. How do we know? NOAA scientists go to the ends of the earth, and beyond, to understand. With satellites, planes, ships and submarines, NOAA monitors the oceans, the tropics, coastlines, deserts the Arctic and the Poles; measuring water, weather, sea life and more. If the climate is changing, you can be scientifically sure that NOAA knows. For the definitive facts on climate change, and how we can work to reverse its effects, go to www.NOAA.gov/climatechange

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If you don't believe in climate change, it's only a matter of time before the climate changes your mind.

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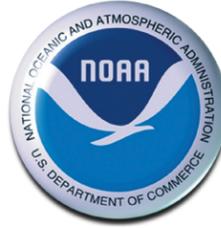


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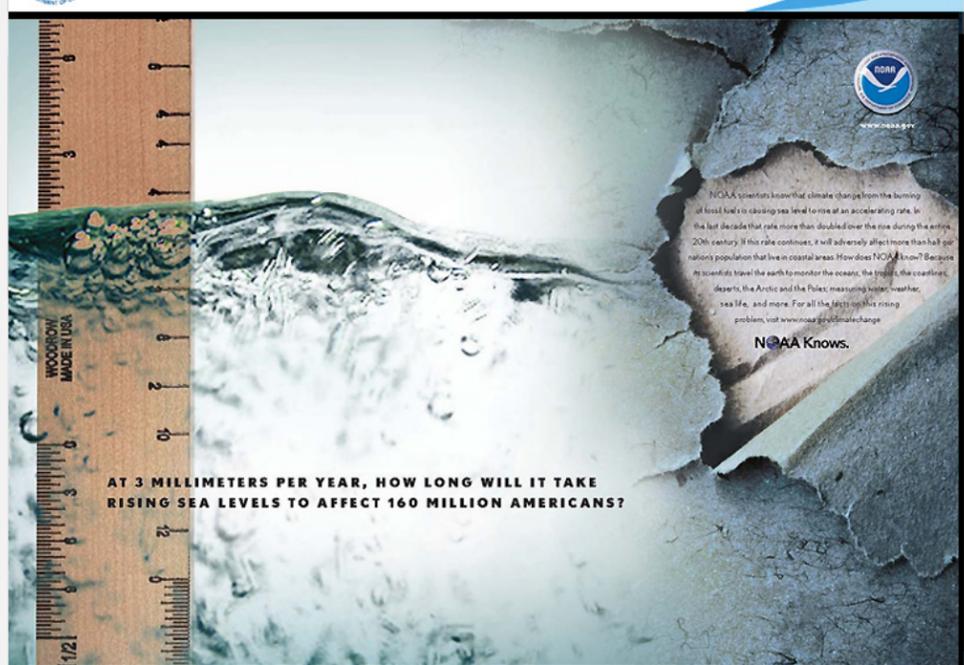
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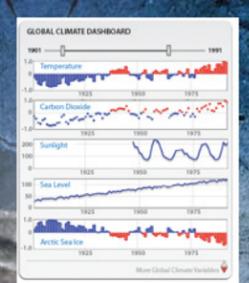
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Monitoring the Ocean's Carbon Balance



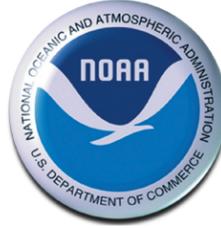
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NOAA, the translators of scientific climate change data.

NOAA is the leader in collecting critical scientific data and helps people understand how a changing climate affects the earth, our health, our economy and our future.

"More intense rainfall will lead to an increase in suspended solids (turbidity) in lakes and reservoirs due to soil fluvial (Leemans and Kleidon, 2002), and pollutants will be introduced (Mimikou et al., 2000; Neff et al., 2000; Bouraoui et al., 2004). The projected increase in precipitation intensity is expected to lead to a deterioration of water quality, as it results in the enhanced transport of pathogens other dissolved pollutants (e.g., pesticides) to surface waters and groundwater; and in increased erosion, which in turn leads to the mobilization of adsorbed pollutants such as phosphorus and heavy metals. In addition, more frequent heavy rainfall events will overload the capacity of sewer systems and water and wastewater treatment plants more often. [WGII 3.4.4] An increased occurrence of low flows lead to decreased contaminant dilution capacity, and thus higher pollutant concentrations, including pathogens."

*Intergovernmental Panel on Climate Change,
Technical Paper VI*

Translation: Climate change threatens our water and food supplies.



www.noaa.gov

Climate change caused by the burning of fossil fuels is affecting our food and water supplies. NOAA scientists know this because they travel the earth to monitor our oceans, weather, atmosphere and more. For more plain talk on the effects of climate change, visit www.noaa.gov **NOAA Knows.**

"In the case of global scale temperature, increased formal detection-attribution studies have detected strong evidence for the presence of the space-time pattern of warming expected due to greenhouse gas increases. These studies find that other plausible explanations, such as solar and volcanic forcing together with climate variability alone, fail to explain the observed changes sufficiently. The good agreement between observed and simulated trends based on climate model experiments with estimated past forcings lends substantial confidence to attribution statements for SST."

(See page 97 of CCSP SAP 3.3)

Translation:

Climate change causes more extreme weather events.



www.noaa.gov

NOAA scientists go to the ends of the earth to monitor changes in our climate due to the burning of fossil fuels. For the latest information on how climate change will effect us all, visit [www.noaa.gov/climate change](http://www.noaa.gov/climate%20change), and understand. **NOAA Knows.**



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Translation: Mankind is causing our planet to warm.

"All GWPs depend on the AGWP for CO₂ (the denominator in the definition of the GWP). The AGWP of CO₂ again depends on the radiative efficiency for a small perturbation of CO₂ from the current level of about 380 ppm. The radiative efficiency per kilogram of CO₂ has been calculated using the same expression as for the CO₂ R, with an updated background CO₂ mixing ratio of 378 ppm. For a small perturbation from 378ppm, the RF is 0.01413 W m⁻² ppm⁻¹ (8.7% lower than the TARvalue). The CO₂ response function (see Table 2.14) is based on an updated version of the Bern carbon cycle model (Bern2.5CC; Joos et al. 2001), using a background CO₂ concentration of 378 ppm. The increased background concentration of CO₂ means that the airborne fraction of emitted CO₂ (Section 7.3) is enhanced, contributing to an increase in the AGWP for CO₂. The AGWP values for CO₂ for 20, 100, and 500 year time horizons are 2.47 °- 10⁻¹⁴, 8.69 °- 10⁻¹⁴, and 28.6 °- 10⁻¹⁴ W m⁻² yr (kg CO₂)⁻¹, respectively. The uncertainty in the AGWP for CO₂ is estimated to be ±15%, with equal contributions from the CO₂ response function and the RF calculation."

Intergovernmental Panel on Climate Change.

Warming of the earth's climate system is indisputable. And man is causing it through the burning of fossil fuels. For both scientific information and plain talk on climate change turn to the scientists of NOAA who travel the earth to know. Visit www.noaa.gov

 NOAA Knows.




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"More intense rainfall will lead to an increase in suspended solids (turbidity) in lakes and reservoirs and pollutants will be introduced (Mimikou et al., 2000; Neff et al., 2000; Bouraoui et al., 2004). The projected increase in precipitation intensity is expected to lead to a deterioration of water quality, as it results in the enhanced transport of pathogens, surface waters and groundwater; and in increased erosion, which in turn leads to the mobilization of metals. In addition, more frequent heavy rainfall events will overload the capacity of sewer systems and water and wastewater treatment plants more often. [WGII 3.4.4] An increased occurrence of low flows lead to decreased contaminant dilution including pathogens."

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Protecting our food and travel the earth to more plain talk
NOAA Knows.



Is it climate change, or isn't it?

*NOAA is the world leader in identifying
and understanding climate change.*

GREENLAND.

NOAA
Long format film



VO: There are people that say climate change isn't real. But NOAA, the National Oceanic and Atmospheric Association, knows. Comprised of scientists that collect data on the oceans and atmosphere, NOAA is nearly certain that man is warming the planet, and that a dramatic rise of CO2 from the burning fossil fuels is the cause.

(VISUAL: The glacier starts to melt and the group of people sink lower.)

VO: But because climate change is felt differently in different places, some people don't believe. NOAA knows that while the whole planet is warming, some places are actually cooling. Wet regions are getting wetter, and dry regions are getting drier. Droughts and severe storms are more frequent.

(VISUAL: The glacier continues to melt and the people sink even lower.)

VO: NOAA knows that rapidly melting glaciers and snow is depleting fresh water, as rising seas reach record levels. And that in 2007 alone, Greenland lost 24 cubic miles of ice.

(VISUAL: The glacier is nearly melted and people have nowhere to go. Some jump to adjoining ice, and others hop off to land.)

VO: So, while there are people who don't believe in climate change, NOAA knows that it's just a matter of time before the climate changes their minds.

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Climate change affects more than just polar bears. It adversely impacts our health, our economy and our planet. And mankind is causing it. By burning fossil fuels, we've increased the level of atmospheric CO₂ to unprecedented levels, thereby raising temperatures, sea levels, and disease. While reducing fresh water and food supplies. How do we know? Because NOAA, an organization of scientists, goes to the ends of the earth, and beyond, to understand. With satellites, planes, ships and submarines, NOAA monitors the oceans, the tropics, coastlines, deserts the Arctic and the Poles; measuring water, weather, sea life, hurricanes and droughts. If the climate is changing, you can be scientifically sure that NOAA knows. For the definitive facts on climate change, visit www.NOAA.gov/climatechange