



# Storm Signals

Houston/Galveston National Weather Service Office

Volume 83 Summer 2010



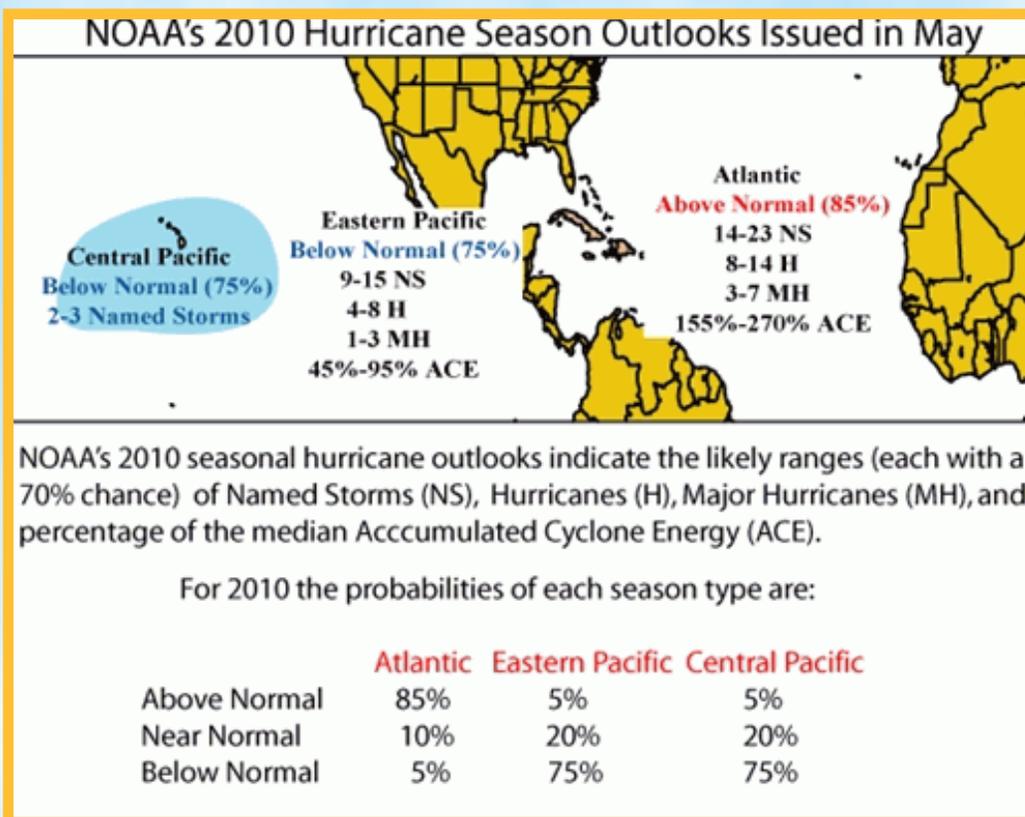
## 2010 Hurricane Season Outlook & Preparedness

On May 27, 2010, NOAA unveiled the 2010 Atlantic Hurricane Season forecast. The forecast calls for an 85% chance of an above normal hurricane season, with the possibility of an extremely active season with 20+ storms possible, including the likelihood of 3-7 major hurricanes (Category 3 or greater).

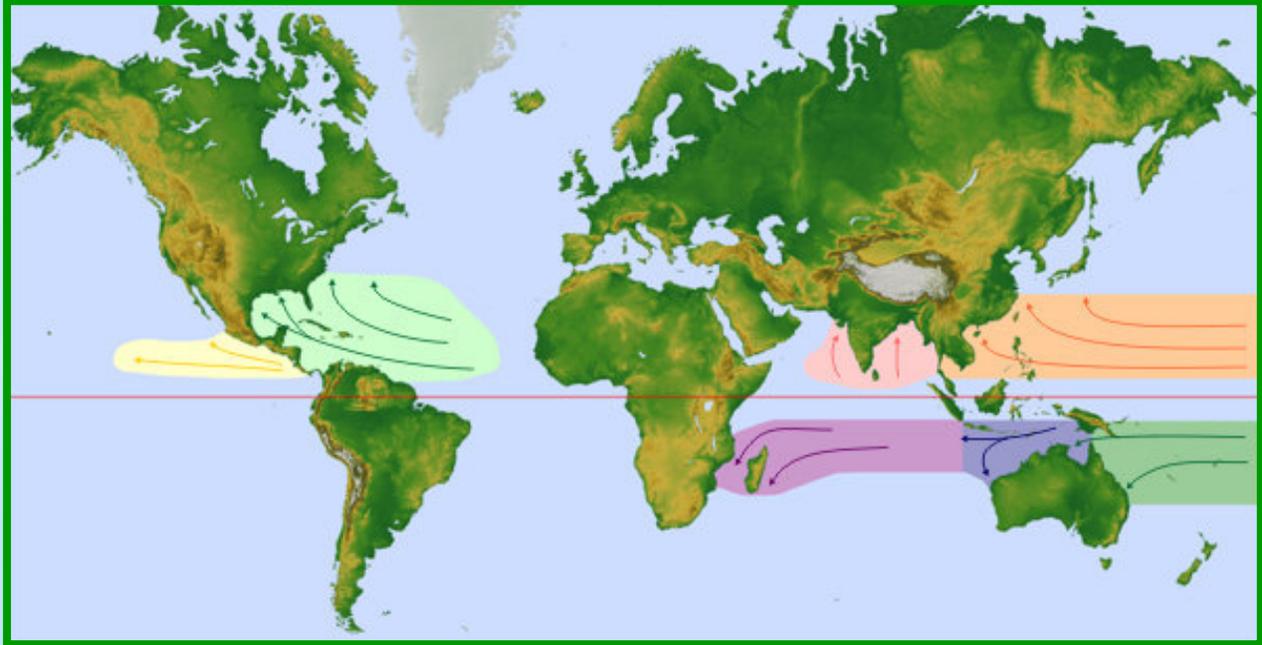
Factors leading to this forecast are record warm sea surface temperatures currently in place across the tropical Atlantic with above average sea surface temperatures expected to continue throughout the season, an increasing chance of La Nina developing this summer, a continued atmospheric signal which favors increased activity in the Atlantic, and computer models which forecast a very active season, even extremely active.

The National Weather Service recommends preparing for hurricanes no matter what the seasonal forecast holds as even inactive seasons pose a risk of a tropical storm or hurricane landfall along the upper Texas coast. For preparedness information, visit:

[www.nhc.noaa.gov/HAW2/english/intro.shtml](http://www.nhc.noaa.gov/HAW2/english/intro.shtml) or [www.ready.gov](http://www.ready.gov)



# Tropical Cyclone Formation Regions



**There are seven tropical cyclone "basins" where tropical cyclones form on a regular basis:**

**Atlantic basin**  
**North Atlantic Ocean, the Gulf of Mexico,**  
**and the Caribbean Sea**

The Hurricane season is "officially" from 1 June to 30 November. Peak activity is in early to mid September. Once in a few years there may be a tropical cyclone occurring in May or December.  
 See the probabilities for the Atlantic basin by month:  
[www.srh.noaa.gov/srh/jetstream/tropics/tc\\_atlclimo\\_pct.htm](http://www.srh.noaa.gov/srh/jetstream/tropics/tc_atlclimo_pct.htm)

**Northeast Pacific basin**  
**Mexico to about the dateline**

A broad peak with activity beginning in late May or early June and going until late October or early November with a peak in storminess in late August/early September.

**Northwest Pacific basin**  
**From the dateline to Asia including the**  
**South China Sea**

Occur all year round regularly though there is a distinct minimum in February and the first half of March. The main season goes from July to November with a peak in late August/early September.

**North Indian basin**  
**Including the Bay of Bengal and the**  
**Arabian Sea**

A double peak of activity in May and November though tropical cyclones are seen from April to December. The severe cyclonic storms (>74 mph / 119 kph winds) occur almost exclusively from April to June and again in late September to early December.

**Southwest Indian basin**  
**From Africa to about 100°E**

Beginning in late October/early November, reaching a double peak in activity-one in mid-January and one in mid-February to early March, and then ending in May.

**Southeast Indian/Australian basin**  
**100°E to 142°E**

Beginning in late October/early November, reaching a double peak in activity-one in mid-January and one in mid-February to early March, and then ending in May. The Australian/Southeast Indian basin February lull in activity is a bit more pronounced than the Southwest Indian basin's lull.

**Australian/Southwest Pacific basin**  
**142°E to about 120°W**

Begins in late October/early November, reaches a single peak in late February/early March, and then fades out in early May.

# Heat Waves

## Know What These Terms Mean...

- \* Heat wave: Prolonged period of excessive heat and humidity. The National Weather Service steps up its procedures to alert the public during these periods of excessive heat and humidity.
- \* Heat index: A number in degrees Fahrenheit (F) that tells how hot it really feels when relative humidity is added to the actual air temperature. Exposure to full sunshine can increase the heat index by 15 degrees F.
- \* Heat cramps: Heat cramps are muscular pains and spasms due to heavy exertion. Although heat cramps are the least severe, they are an early signal that the body is having trouble with the heat.
- \* Heat exhaustion: Heat exhaustion typically occurs when people exercise heavily or work in a hot, humid place where body fluids are lost through heavy sweating. Blood flow to the skin increases, causing blood flow to decrease to the vital organs. This results in a form of mild shock. If not treated, the victim may suffer heat stroke.
- \* Heat stroke: Heat stroke is life-threatening. The victim's temperature control system, which produces sweating to cool the body, stops working. The body temperature can rise so high that brain damage and death may result if the body is not cooled quickly.
- \* Sunstroke: Another term for heat stroke.

## If a Heat Wave Is Predicted or Happening...

- \* Slow down. Avoid strenuous activity. If you must do strenuous activity, do it during the coolest part of the day, which is usually in the morning between 4:00 a.m. and 7:00 a.m.
- \* Stay indoors as much as possible. If air conditioning is not available, stay on the lowest floor, out of the sunshine. Try to go to a public building with air conditioning each day for several hours. Remember, electric fans do not cool the air, but they do help sweat evaporate, which cools your body.
- \* Wear lightweight, light-colored clothing. Light colors will reflect away some of the sun's energy.
- \* Drink plenty of water regularly and often. Your body needs water to keep cool.
- \* Drink plenty of fluids even if you do not feel thirsty.
- \* Water is the safest liquid to drink during heat emergencies. Avoid drinks with alcohol or caffeine in them. They can make you feel good briefly, but make the heat's effects on your body worse. This is especially true about beer, which dehydrates the body.
- \* Eat small meals and eat more often. Avoid foods that are high in protein, which increase metabolic heat.
- \* Avoid using salt tablets unless directed to do so by a physician.

## Signals of Heat Emergencies...

- \* Heat exhaustion: Cool, moist, pale, or flushed skin; heavy sweating; headache; nausea or vomiting; dizziness; and exhaustion. Body temperature will be near normal.
- \* Heat stroke: Hot, red skin; changes in consciousness; rapid, weak pulse; and rapid, shallow breathing. Body temperature can be very high-- as high as 105 degrees F. If the person was sweating from heavy work or exercise, skin may be wet; otherwise, it will feel dry.

## Treatment of Heat Emergencies...

- \* Heat cramps: Get the person to a cooler place and have him or her rest in a comfortable position. Lightly stretch the affected muscle and replenish fluids. Give a half glass of cool water every 15 minutes. Do not give liquids with alcohol or caffeine in them, as they can make conditions worse.
- \* Heat exhaustion: Get the person out of the heat and into a cooler place. Remove or loosen tight clothing and apply cool, wet cloths, such as towels or sheets. If the person is conscious, give cool water to drink. Make sure the person drinks slowly. Give a half glass of cool water every 15 minutes. Do not give liquids that contain alcohol or caffeine. Let the victim rest in a comfortable position, and watch carefully for changes in his or her condition.
- \* Heat stroke: Heat stroke is a life-threatening situation. Help is needed fast. Call 9-1-1 or your local emergency number. Move the person to a cooler place. Quickly cool the body. Immerse victim in a cool bath, or wrap wet sheets around the body and fan it. Watch for signals of breathing problems. Keep the person lying down and continue to cool the body any way you can. If the victim refuses water or is vomiting or there are changes in the level of consciousness, do not give anything to eat or drink.

# Heat Index °F (°C)

## Relative Humidity (%)

<b>Temperature</b>		40	45	50	55	60	65	70	75	80	85	90	95	100	
	<b>110</b> (47)	136 (58)													
	<b>108</b> (43)	130 (54)	137 (58)												
	<b>106</b> (41)	124 (51)	130 (54)	137 (58)											
	<b>104</b> (40)	119 (48)	124 (51)	131 (55)	137 (58)										
	<b>102</b> (39)	114 (46)	119 (48)	124 (51)	130 (54)	137 (58)									
	<b>100</b> (38)	109 (43)	114 (46)	118 (48)	124 (51)	129 (54)	136 (58)								
	<b>98</b> (37)	105 (41)	109 (43)	113 (45)	117 (47)	123 (51)	128 (53)	134 (57)							
	<b>96</b> (36)	101 (38)	104 (40)	108 (42)	112 (44)	116 (47)	121 (49)	126 (52)	132 (56)						
	<b>94</b> (34)	97 (36)	100 (38)	103 (39)	106 (41)	110 (43)	114 (46)	119 (48)	124 (51)	129 (54)	135 (57)				
	<b>92</b> (33)	94 (34)	96 (36)	99 (37)	101 (38)	105 (41)	108 (42)	112 (44)	116 (47)	121 (49)	126 (52)	131 (55)			
	<b>90</b> (32)	91 (33)	93 (34)	95 (35)	97 (36)	100 (38)	103 (39)	106 (41)	109 (43)	113 (45)	117 (47)	122 (50)	127 (53)	132 (56)	
	<b>88</b> (31)	88 (31)	89 (32)	91 (33)	93 (34)	95 (35)	98 (37)	100 (38)	103 (39)	106 (41)	110 (43)	113 (45)	117 (47)	121 (49)	
	<b>86</b> (30)	85 (29)	87 (31)	88 (31)	89 (32)	91 (33)	93 (34)	95 (35)	97 (36)	100 (38)	102 (39)	105 (41)	108 (42)	112 (44)	
	<b>84</b> (29)	83 (28)	84 (29)	85 (29)	86 (30)	88 (31)	89 (32)	90 (32)	92 (33)	94 (34)	96 (36)	98 (37)	100 (38)	103 (39)	
	<b>82</b> (28)	81 (27)	82 (28)	83 (28)	84 (29)	84 (29)	85 (29)	86 (30)	88 (31)	89 (32)	90 (32)	91 (33)	93 (34)	95 (35)	
	<b>80</b> (27)	80 (27)	80 (27)	81 (27)	81 (27)	82 (28)	82 (28)	83 (28)	84 (29)	84 (29)	85 (29)	86 (30)	86 (30)	87 (31)	

Category	Heat Index	Possible heat disorders for people in high risk groups
Extreme Danger	130°F or higher (54°C or higher)	Heat stroke or sunstroke likely.
Danger	105 - 129°F (41 - 54°C)	Sunstroke, muscle cramps, and/or heat exhaustion likely. Heatstroke possible with prolonged exposure and/or physical activity.
Extreme Caution	90 - 105°F (32 - 41°C)	Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.
Caution	80 - 90°F (27 - 32°C)	Fatigue possible with prolonged exposure and/or physical activity.

### Precautions To Take Against Excessive Heat

Increase your intake of non-alcoholic, non-carbonated, caffeine free beverages such as water and juice.  
 Wear clothing that is light in color and loose fitting.  
 Avoid the outdoors during extreme heat. Stay out of the sun.  
 Stay in an air-conditioned environment if possible. Shopping malls offer relief if your home is not air-conditioned.  
 Check on the elderly. They are especially susceptible to heat related illness.  
 Eliminate strenuous activity such as running, biking and lawn care work when it heats up.

### Heat Related Illnesses And Their Symptoms

**SUNBURN** - Redness and pain in the skin. In severe cases there is also swelling, blisters, fever, and headaches.  
**HEAT CRAMPS** - Heavy sweating and painful spasms usually in the leg or abdomen muscles.  
**HEAT EXHAUSTION** - The person becomes weak and is sweating heavily. The skin is cold, pale and clammy. Fainting and vomiting accompanies heat exhaustion.  
**HEATSTROKE/SUNSTROKE** - High body temperature (106 degrees or higher) along with hot dry skin and a rapid and strong pulse. Unconsciousness is possible.

# Lightning Safety Awareness Week

## June 20 - 26, 2010

In the United States, there are an estimated 25 million lightning flashes each year. During the past 30 years, lightning killed an average of 62 people per year. This ties the average of 62 deaths per year caused by tornadoes. Yet because lightning usually claims only one or two victims at a time and does not cause mass destruction of property, it is underrated as a risk. While documented lightning injuries in the United States average about 300 per year, undocumented injuries are likely much higher.

Lightning strike survivors often suffer from a variety of long-term, debilitating symptoms, including memory loss, attention deficits, sleep disorders, numbness, dizziness, stiffness in joints, irritability, fatigue, weakness, muscle spasms, depression, and an inability to sit for long.

The following is some basic information about lightning and lightning safety.



### **Lightning Safety Awareness: An Educational**

**Program.** Few people really understand the dangers of lightning. Many people don't act to protect their lives, property and the lives of others promptly because they don't understand all the dangers associated with thunderstorms and lightning. The first step in solving this problem is to educate people so that they become aware of the behavior that puts them at risk of being struck by lightning, and to let them know what they can do to reduce that risk. Coaches and other adults who make decisions affecting the safety of children must understand the dangers of lightning.

**Watch for Developing Thunderstorms.** Thunderstorms are most likely to develop on spring or summer days but can occur year round. As the sun heats the air, pockets of warmer air start to rise and cumulus clouds form. Continued heating can cause these clouds to grow vertically into towering cumulus clouds, often the first sign of a developing thunderstorm.

**An Approaching Thunderstorm: When to Seek Safe Shelter:** Lightning can strike as far as 10 miles from an area where it is raining. That's about the distance you can hear thunder. **If you can hear thunder, you are within striking distance. Seek safe shelter immediately!**

**Outdoor Activities: Minimize the Risk of Being Struck:** Most lightning deaths and injuries occur in the summer. Where organized outdoor sports activities take place, coaches, camp counselors and other adults must stop activities at the first roar of thunder to ensure everyone time to get to a large building or enclosed vehicle. Leaders of outdoor events should have a written plan that all staff are aware of and enforce.

**Indoor Activities: Things to Avoid:** Inside buildings, stay off corded phones, computers and other electrical equipment that put you in direct contact with electricity. Stay away from pools, indoor or outdoor, tubs, showers and other plumbing. Buy surge suppressors for key equipment. Install ground fault protectors on circuits near water or outdoors. When inside, wait 30 minutes after the last strike, before going out again.

**Helping a Lightning Strike Victim: If a person is struck by lightning, call 911 and get medical care immediately.** Cardiac arrest and irregularities, burns, and nerve damage are common in cases where people are struck by lightning. However, with proper treatment, including CPR if necessary, most victims survive a lightning strike. You are in no danger helping a lightning victim. The charge will not affect you.

Much more information, including the science of this phenomena, indoor and outdoor safety, medical aspects, survivor stories, photos, and tools for teachers can be found on the National Weather Service's Lightning Safety webpage at:

[www.lightningsafety.noaa.gov](http://www.lightningsafety.noaa.gov)

# Lightning Kills

## Play It Safe

**When outside...  
if you see signs  
of a developing  
storm, head to  
a safe place  
immediately!**



[www.lightningsafety.noaa.gov](http://www.lightningsafety.noaa.gov)

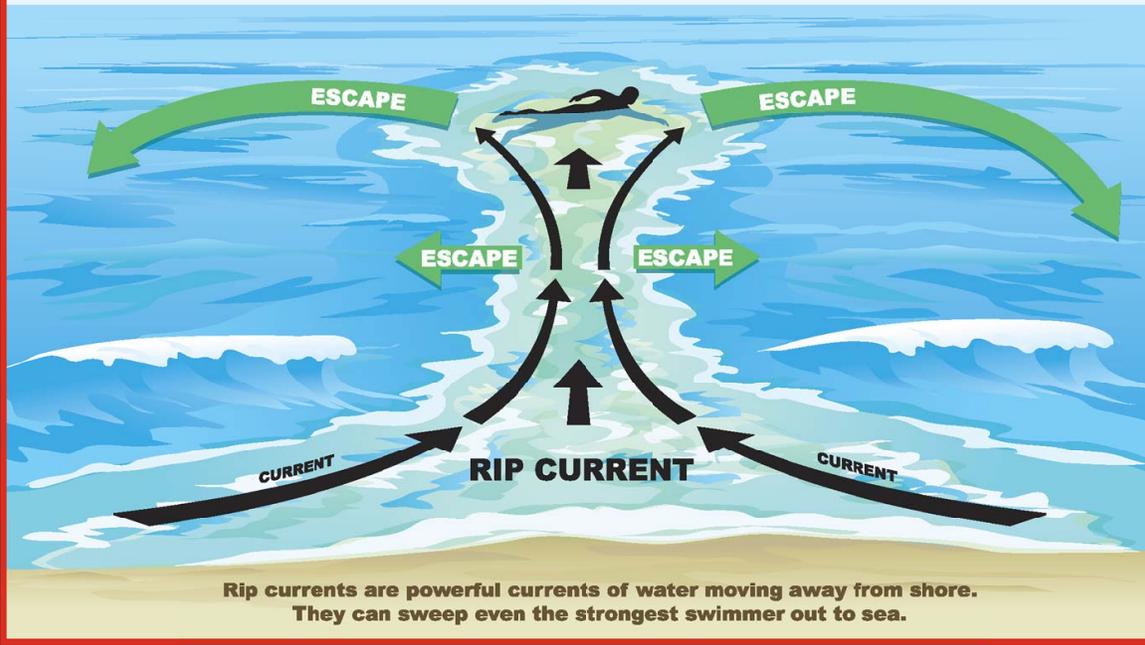


NOAA PA 200666

Rip Currents:  
Break The Grip of The Rip!®  
Awareness Week: June 6-12, 2010

# RIP CURRENTS

## Break the Grip of the Rip!®



### IF CAUGHT IN A RIP CURRENT

- ◆ Don't fight the current
- ◆ Swim out of the current, then to shore
- ◆ If you can't escape, float or tread water
- ◆ If you need help, call or wave for assistance

### SAFETY

- ◆ Know how to swim
- ◆ Never swim alone
- ◆ If in doubt, don't go out

More information about rip currents can be found at the following web sites:

[www.ripcurrents.noaa.gov](http://www.ripcurrents.noaa.gov)  
[www.usla.org](http://www.usla.org)





# Rip Currents

**CAUTION**  
*if possible*  
**SWIM NEAR A  
LIFEGUARD**

What They Are • The Dangers • How to Escape

## **Q** What is a rip current?

Rip currents are channeled currents of water flowing away from shore at surf beaches. They typically extend from near the shoreline, through the surf zone and past the line of breaking waves. (The surf zone is the area between the high tide level on the beach to the seaward side of breaking waves.)

## **Q** How do rip currents form?

Rip currents form when waves break near the shoreline, piling up water between the breaking waves and the beach. One of the ways this water returns to sea is to form a rip current, a narrow stream of water moving swiftly away from shore, often perpendicular to the shoreline.

## **Q** How big are rip currents?

Rip currents can be as narrow as 10 or 20 feet in width though they may be up to ten times wider. The length of the rip current also varies. Rip currents begin to slow down as they move offshore, beyond the breaking waves, but sometimes extend for hundreds of feet beyond the surf zone.

## **Q** How fast are rip currents?

Rip current speeds can vary. Sometimes they are too slow to be considered dangerous. However, under certain wave, tide, and beach shape conditions the speeds can quickly become dangerous. Rip currents have been measured to exceed 5 mph, slower than you can run but faster than you or even an Olympic swimmer can swim.

## **Q** Are all rip currents dangerous?

Rip currents are present on many beaches every day of the year, but they are usually too slow to be dangerous to beachgoers. However, under certain wave, tide, and beach shape conditions they can increase to dangerous speeds. The strength and speed of a rip current will likely increase as wave height and wave period increase.

## **Q** Are rip currents and undertows different?

Rip currents are not “undertow” or “riptides.” These are obsolete terms. In some areas, people have used the term undertow to describe the combination of being knocked down, pulled out, and submerged due to a lack of swimming ability and/or lack of knowing what to do to escape. This is where the myth formed that a rip current (or “undertow”) pulls you under water. A rip current pulls you out, not under.

## **Q** Why do some people use terms like runouts and rip tides when you are calling them rip currents?

These terms, though once commonly used in certain regions or time periods, are now considered to be incorrect. The National Weather Service, Sea Grant, and the USLA are working together to use consistent terminology to provide a clear rip current safety message to the public.

## **Q** Where should I look for rip currents?

Rip currents can be found on many surf beaches every day. Rip currents most typically form at low spots or breaks in sandbars, and also near structures such as groins, jetties and piers. Rip currents can occur at any beach with breaking waves, including the Great Lakes.

## **Q** How do rip currents result in the drowning of swimmers?

Drowning deaths occur when people pulled offshore are unable to keep themselves afloat and swim to shore. This may be due to any combination of fear, panic, exhaustion, or lack of swimming skills. Rip currents are the greatest surf zone hazard to all beachgoers. They can sweep even the strongest swimmer out to sea. Rip currents are particularly dangerous for weak and non-swimmers.

More information about rip currents can be found at the following sites:

<http://www.ripcurrents.noaa.gov>

<http://www.usla.org/ripcurrents>

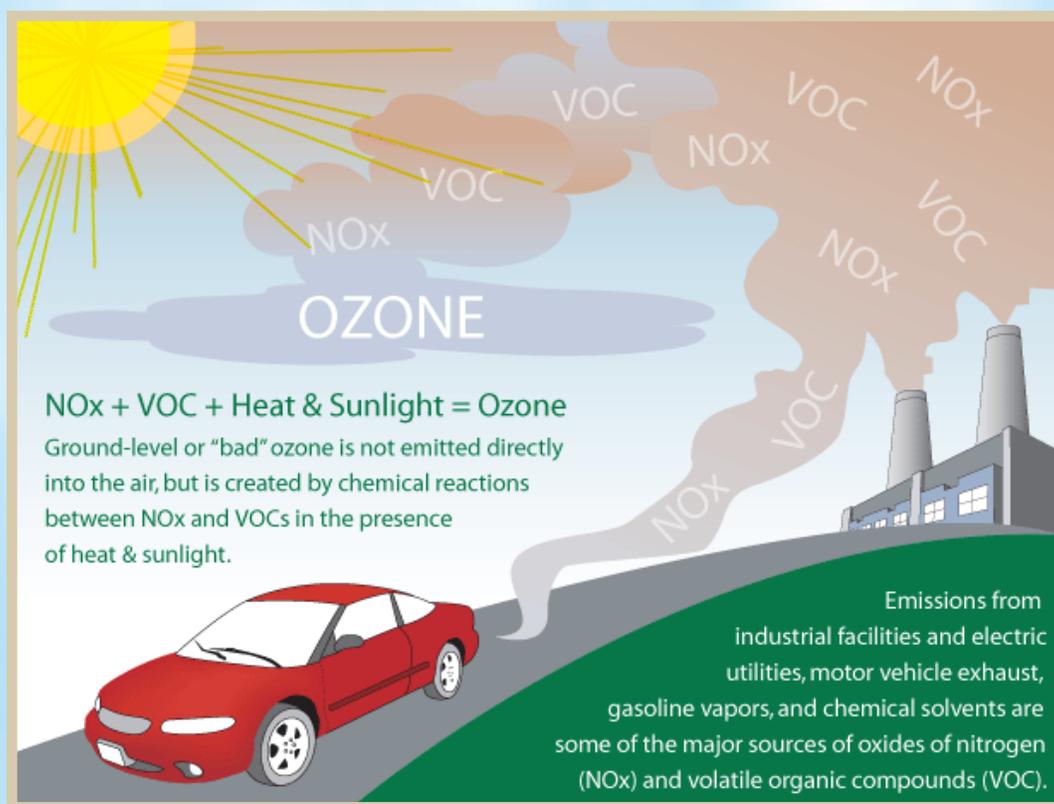
<http://www.weather.gov/nwr/>



# What is ozone?

Ozone is a gas that is formed in the atmosphere when three atoms of oxygen combine. Naturally occurring ozone is found high in the stratosphere (6 to 30 miles above the surface) surrounding the earth. This “good ozone” shields people, trees, property, crops and microorganisms from the harmful effects of the sun’s ultraviolet light. Ozone can also form near ground-level air when lightning reacts with certain substances emitted by trees, vegetation, and microorganisms in the soil.

However, low-level ozone can become “bad ozone” when it is produced by sunlight reacting with pollutants from human activities called precursors. These precursors are produced by a variety of activities, such as transportation, energy production and other industrial and commercial operations. These chemicals break down when exposed to ultraviolet radiation from the sun and produce ozone as a byproduct of this reaction. This “bad ozone” is the pollution that is the most widespread air quality problem in the United States.



## What conditions favor high ozone levels?

As it is driven by sunlight, ozone pollution is mainly a daytime problem during the summer months. The combination of hot weather and plentiful sunlight causes ground level ozone to form in harmful concentrations in the air. This concentration is determined not only by the precursors, but also by weather and climate factors. Intense sunlight, warm temperatures, stagnant high pressure weather systems and light winds can all act to help ozone accumulate in harmful amounts.

## What can high ozone levels do to us?

When concentrations of ozone become elevated they can act as a lung irritant. Individuals with chronic lung diseases (such as asthma and emphysema), small children, and the elderly are particularly sensitive to ozone and should attempt to avoid exposure. Limiting outdoor exertion during the afternoon and early evening hours, or remaining indoors in an air conditioned space during these hours are the best ways to limit exposure to ozone.

## What is an ozone watch or warning and when are they issued?

The Texas Commission on Environmental Quality (TCEQ) issues an alert the day before conditions are forecast to be favorable for high ozone levels in any of nine Texas metropolitan areas. These alerts are issued so that citizens, businesses, and industry can

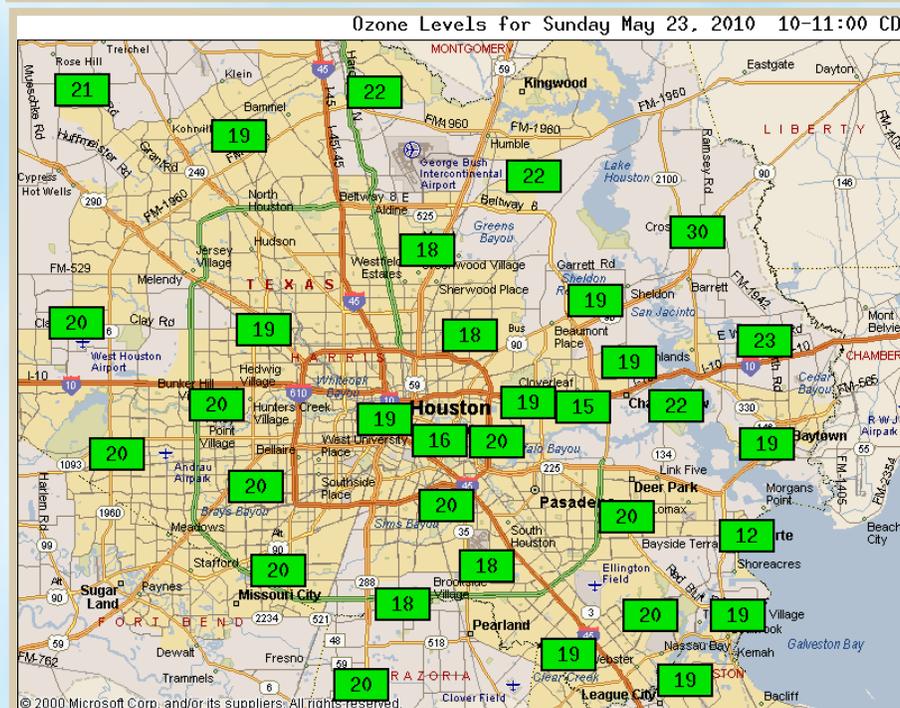
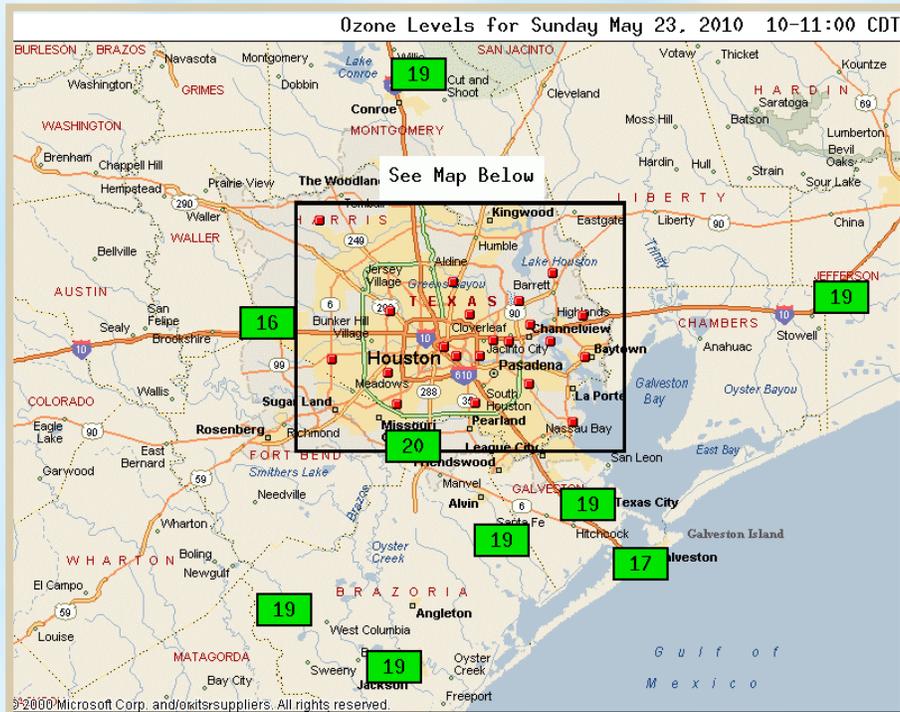
## What is ozone continued

take steps to reduce the pollutants that contribute to ozone formation. When an alert is issued, TCEQ contacts the local National Weather Service Office with the information and an Ozone Watch is issued. If air pollution levels are detected at unhealthy levels, TCEQ will issue an Ozone Warning. When a watch or warning is sent out, the Houston/Galveston National Weather Service Office issues an Air Quality Alert message which can be found on the internet at...

[www.srh.noaa.gov/productview.php?pil=AQAHGX](http://www.srh.noaa.gov/productview.php?pil=AQAHGX)

Residents across southeast Texas are urged to monitor ozone level forecasts this summer and take the appropriate precautions to avoid exposure.

## Ozone Level Maps for Southeast Texas and the Houston area from May 23<sup>rd</sup>.



## What is ozone continued

TCEQ uses the Air Quality Index (AQI) for reporting daily air quality. This index tells you how clean or polluted your air is, and what associated health effects might be a concern for you. The AQI focuses on health effects you may experience within a few hours or days after breathing polluted air. Think of the AQI as a yardstick that runs from 0 to 500. The higher the AQI value, the greater the level of air pollution and the greater the health concern. For example, an AQI value of 50 represents good air quality with little potential to affect public health, while an AQI value over 300 represents hazardous air quality.



Each category corresponds to a different level of health concern. The six levels of health concern and what they mean are:

- **“Good”** AQI is 0 - 50. Air quality is considered satisfactory, and air pollution poses little or no risk.
- **“Moderate”** AQI is 51 - 100. Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people. For example, people who are unusually sensitive to ozone may experience respiratory symptoms.
- **“Unhealthy for Sensitive Groups”** AQI is 101 - 150. Although general public is not likely to be affected at this AQI range, people with lung disease, older adults and children are at a greater risk from exposure to ozone, whereas persons with heart and lung disease, older adults and children are at greater risk from the presence of particles in the air.
- **“Unhealthy”** AQI is 151 - 200. Everyone may begin to experience some adverse health effects, and members of the sensitive groups may experience more serious effects.
- **“Very Unhealthy”** AQI is 201 - 300. This would trigger a health alert signifying that everyone may experience more serious health effects.
- **“Hazardous”** AQI greater than 300. This would trigger a health warnings of emergency conditions. The entire population is more likely to be affected.

Much more information on ozone is available on the internet at the following websites:

TCEQ

[www.tceq.state.tx.us/compliance/monitoring/air/monops/ozonefacts.html](http://www.tceq.state.tx.us/compliance/monitoring/air/monops/ozonefacts.html)

Current Ozone Levels for Southeast Texas

[www.tceq.state.tx.us/us/cgi-bin/compliance/monops/select\\_curlev.pl?region12\\_cur.gifl](http://www.tceq.state.tx.us/us/cgi-bin/compliance/monops/select_curlev.pl?region12_cur.gifl)

Current Ozone Levels around the State

[www.tceq.state.tx.us/us/cgi-bin/compliance/monops/select\\_curlev.pl](http://www.tceq.state.tx.us/us/cgi-bin/compliance/monops/select_curlev.pl)

AirNow

[www.airnow.gov/index.cfm?action=aqibasics.ozone](http://www.airnow.gov/index.cfm?action=aqibasics.ozone)

Much of the information in this article was obtained from TCEQ at [www.tceq.state.tx.us](http://www.tceq.state.tx.us)



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