

# The Weather Report



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## WEATHER RESEARCH CENTER

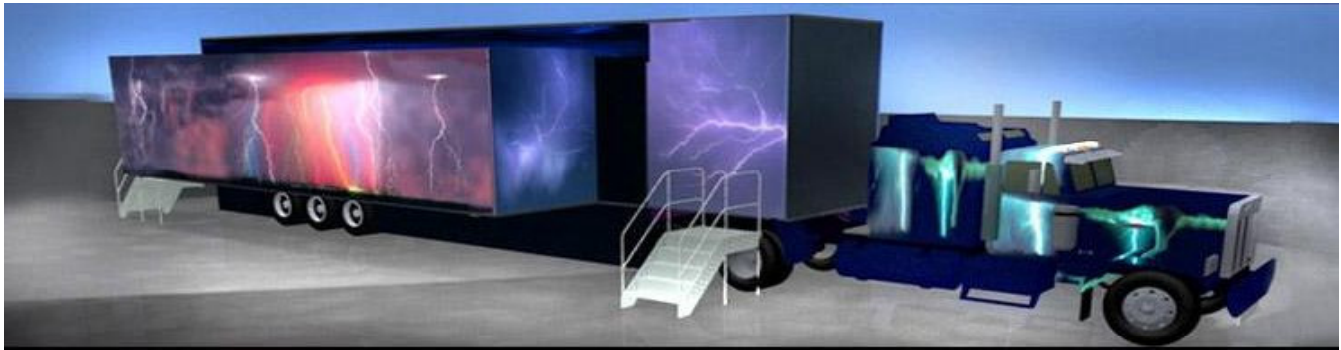


The WRC® Newsletter

December 2004

Houston, Texas

### WEATHER NAVIGATOR®



### WRC® SCIENCE EDUCATION ON THE GO!



Science Education on the Go! is an Outreach Project of Weather Research Center (WRC). WRC Meteorologists go to local schools, community centers and events to make presentations on the weather and conduct experiments. Since 1987, WRC has served over 306,000 people. WRC meteorologists have given weather classes to Houston area schools, community centers, scout troops and senior centers.

WRC wants to (1) expand this outreach and (2) further increase the outreach using Weather Navigator® to take Science Education on the Go! Nationally, and focusing on:

1. Interest children in science and math through something they experience every day – the weather.
2. Educate the Community in Weather Safety to save lives and protect property.

Science Education on the Go! will excite the community about math and science through the weather, furthering an understanding of the weather and weather safety.

**WRC Weather Pods.** These SUV Pods will take Science Education on the Go! to Houston and the surrounding areas. They will be equipped with weather experiments and equipment designed to create interactive learning opportunities. "Weather Modules" will be developed that can be checked-out by teachers, scout leaders and home schoolteachers for in-depth weather lessons. All modules are designed to inspire interest in math and science, by showing that math and science play a role in their everyday lives.

- **WRC Weather Navigator<sup>®</sup> with its own 3 accompanying Weather Pods.** Weather Navigator is a mobile Weather Museum, housed in a 53' double pullout trailer. Weather Navigator will be on the road nationwide, 50 weeks a year, for a minimum of 3 years. It is being developed in collaboration with *TREEHOUSE Events*, a nationally known mobile and museum exhibit design and construction firm. Corporate sponsorships will fund this Project.

**The WRC Weather Museum.** The major funding for this Houston, Texas museum will come from the sponsorships of the Weather Navigator. The Weather Museum will be an interactive museum with exhibits allowing visitors to experience various aspects of the weather, acquire weather and weather safety information, view historical weather instruments and have access to a vast library of data, books and, professional journals and scientific papers. The Museum will be the home base for the Weather Navigator and all of the Weather Pods.

## **WRC MEMBERSHIP DRIVE 2004/2005**

What a great gift for your personal weather nut, a membership to Weather Research Center. With a membership you will receive the Annual Hurricane Summary. Invitations to WRC events.

Weather Research Center is a 501 (c) 3 non-profit center.

**Donations:** The Center accepts all types of donations from pennies to gifts in kind. All donations help with programs such as providing weather camp to at risk children to internships for college students.

### **Center Memberships:**

**\$50 Cumulus Club**

**\$100 Stratus Club**

**\$250 Altocumulus Club**

**\$500 Altostratus Club**

**\$750 Cirrus Club**

**\$1000 Cirrostratus Club**

**\$2500 Cumulus Club**

**\$5000+ Cumulonimbus Club**

**\$10,000+ Cyclone Club**

**Weather Education Endowment:** The Weather Education Endowment has been established at Weather Center Houston to be used for at risk students to attend Weather Camp or for Student Internships.

**Glass Bricks:** Have your name or message engraved on a Glass Brick at WRC.

\$200.00 glass brick donation will be used in the Lobby area with your name or message.

\$500.00 donation glass brick will be used in The Weatherman's Wall in the Lobby.

**Paving Stones:** Have your name or message imprinted on a Paving Stone at WRC.

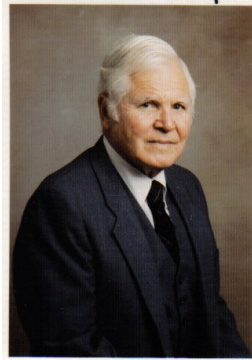
\$200.00 will purchase and engraved paving stone that will be used in the walkway.

**Weather Camp Gift Certificates:** Give you favorite weather nut a gift certificate to the 2005 Weather Camp. \$55.00 gives your loved one an opportunity to get excited about math and science.

Contact the Center at 713-529-3076 or email: [wrc@wxresearch.org](mailto:wrc@wxresearch.org)

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**Dr. John C. Freeman's love of weather and science education touched the lives of many Houstonians, and others across the country.**



Dr. John C. Freeman, native Houstonian and lifelong meteorologist and oceanographer, died quietly Thursday, November 18, 2004 at Memorial Hermann Hospital. Dr. Freeman, 84, worked in the field of meteorology and weather research since 1941. Dr. Freeman's love of weather and science education touched the lives of many Houstonians, and others across the country.

Born in The Heights, he graduated from Sam Houston High School and received a Bachelor of Science in Mathematical Physics from the Rice Institute in 1941. He then attended the California Institute of Technology where he earned a Masters in Meteorology in 1942. He received a Ph.D. in Meteorology from the University of Chicago in 1952.

Since 1941, Dr. Freeman has been a meteorologist and has conducted research for several major companies and organizations. Some of his most notable work includes being a forecaster and researcher for the U.S. Army Air Force, U.S. Weather Bureau, Texas A&M University, Gulf Consultants, and the National Engineering Science Company. He has also conducted research at the University of Chicago, the Institute for Advanced Study, and is Professor Emeritus at the University of St. Thomas. He was the founding Director of the Institute for Storm Research Houston, Texas and continued as director from 1966 to 1987. He was an Assistant Scout Master in the Cypress, Texas area for many years as well as a charter member of the Jersey Village Volunteer Fire Department.

Dr. John C. Freeman was a Certified Consulting Meteorologist and Fellow of the American Meteorological Society. Dr. Freeman was also a member of the American Geophysical Union, the Marine Technology Society, and the National Council of Industrial Meteorologists.

Dr. Freeman's research work has been at Weather Research Center since 1987. Still working energetically at 84, most of his recent research concerns the orbit of the Sun about the center of gravity of the solar system, and the affect of that orbit on sunspots and the Earth's long range weather patterns.

Of his past research most notable would be his continuing development of numerical models for use in weather forecasting. Today's computer models for weather prediction would not be possible without the work of the team he was a member of in 1950 at the Institute for Advanced Study. The team used the ENIAC (Electronic Numerical Integrator And Computer) at the Aberdeen Proving Ground in Aberdeen, Md. to make the first successful computer forecasts in

1950. Work continues today to define and predict the weather using mathematical equations. In 1950, a twelve-hour forecast was the goal. Models today predict weather for the next 14 days. Dr. Freeman was the last surviving member of that team and was honored for his contributions on the 50<sup>th</sup> anniversary of Operational Numerical Weather Prediction and the creation of the Joint Numerical Weather Prediction Unit held at the University of Maryland in June of 2004. The Joint Numerical Weather Prediction Unit was created in 1954. He also was instrumental in the development of The Texas Radar Tornado Warning Network in 1954.

In 1953, Dr. Freeman became an Associate Professor and Research Meteorologist at Texas A&M University at College Station, TX. He helped found the department that today is the Meteorology Department at Texas A&M University. In 1959 Dr. Freeman founded the Meteorology Department at the University of St. Thomas in Houston, Tx. From 1959 until 1990, as a Professor at the University of St. Thomas in Houston, hundreds of students enjoyed his basic meteorology course given for non-meteorology students. Hundreds of other meteorology students benefited from his easy to understand explanation of weather and math. Dr. Freeman has been associated with several well-respected organizations in the science community. From 1975 to 1976 he served as Chairman of the American Meteorological Society (AMS) Applied Meteorology Committee. Dr. Freeman was President of the National Council of Industrial Meteorologist from 1977 to 1978. He was the Chairman of the Marine Technology Society in 1970 and a scholarship has been established in his name at the Houston Chapter.

Dr. Freeman has received the following awards:

- Award for Outstanding Contribution to the Advancement of Applied Meteorology, 2003 from the American Meteorological Society.
- Elected a Fellow of the American Meteorological Society - January 1978
- Certified Consulting Meteorologist - American Meteorological Society
- Outstanding Achievement for 1961 from the American Meteorological Society jointly with Archie M. Kahan, for organizing the Texas Tornado Radar Warning Network.
- Meisinger Award for 1951, from the American Meteorological Society jointly with Morris Tepper for work in hydraulic analogies to meteorological phenomena.

Dr. Freeman was instrumental in re-energizing the Houston Chapter of the Marine Technology Society. Dr. Freeman served as chairman.

Donations in honor of Dr. Freeman may be made to The Weather Museum at Weather Research Center and can be sent to Weather Research Center at 3227 Audley, Houston, Tx 77098.

We are located at 3227 Audley St., Houston, Texas 77098. For information about the Center and its services, please call (713) 529-3076 or toll-free (800) 44-STORM. Our fax number is (713) 528-3538. The e-mail address is [wrc@wxresearch.org](mailto:wrc@wxresearch.org).

Our Internet addresses are [www.weatherresearchcenter.com](http://www.weatherresearchcenter.com) or [www.weatherresearchcenter.org](http://www.weatherresearchcenter.org)

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**November 30<sup>th</sup> marks the end of the 2004 Atlantic Hurricane Season  
Weather Research Center's 2004 OCSI's Atlantic Hurricane Season  
Forecast Verifies**

According to meteorologist Jill F. Hasling of Weather Research Center [WRC®], the 2004 Atlantic Hurricane Season will be remembered for many years to come. The coast with the highest risk of experiencing a land falling tropical storm or hurricane in the 2004 hurricane season was the west coast of Florida with a 70% chance based on the Orbital Cyclone Strike Index [OCSI]. This prediction verified with the landfall of Tropical Storm Bonnie on August 12<sup>th</sup>, Hurricane Charley on August 13<sup>th</sup>, and Hurricane Ivan on September 16<sup>th</sup>. Each day during the month of September there was an active storm somewhere in the Atlantic.

The table below gives the probability of landfall for a tropical storm or hurricane on different coast lines of the United States was forecast for the 2004 Atlantic Hurricane Season based on the OCSI, the probability based on climatology and the name of the storms which made landfall on the section of the coast line which experienced a storm.

**2004 OCSI FORECAST FOR THE ATLANTIC**

<b>COAST</b>	<b>OCSI</b>	<b>CLIMATOLOGY</b>	<b>2004 LANDFALLS</b>
<b>Mexico</b>	<b>50%</b>	<b>40%</b>	
<b>Texas</b>	<b>60%</b>	<b>51%</b>	<b>Ivan</b>
<b>Louisiana to Alabama</b>	<b>40%</b>	<b>59%</b>	<b>Ivan, Matthew</b>
<b>West Florida</b>	<b>70%</b>	<b>71%</b>	<b>Bonnie, Charley, Frances and Ivan</b>
<b>East Florida</b>	<b>30%</b>	<b>41%</b>	<b>Frances, Jeanne</b>
<b>Georgia to N. Carolina</b>	<b>40%</b>	<b>56%</b>	<b>Alex, Gaston</b>
<b>East Coast of US</b>	<b>20%</b>	<b>36%</b>	<b>Gaston</b>
<b>Gulf Oil Blocks</b>	<b>70%</b>	<b>88%</b>	<b>Bonnie</b>

The 2004 Atlantic Hurricane Season began slowly with the first tropical depression forming on the 31<sup>st</sup> of July. The slow start was no indication of what was in store for the remainder of the season. There were 14 named cyclones with 8 intensifying into hurricanes and 1 sub-tropical storm Nicole. Seven Category 3 or stronger hurricanes formed in Atlantic Basin this season: Alex, Charley, Danielle, Frances, Ivan, Jeanne, and Karl. Karl was the only major hurricane that did not make landfall along the United States coast. Nine storms made landfall along the United States with five of these storms [Bonnie, Charley, Frances, Jeanne and Ivan] making landfall in Florida. The last time at least 9 cyclones made landfall on the United States coast was 1916.

The first tropical depression of the season formed on July 31<sup>st</sup> and intensified into Tropical Storm Alex on the morning of August 1<sup>st</sup>. Alex strengthened into the first hurricane of the season on August 3<sup>rd</sup>. Seven more tropical cyclones formed in August for a total of eight named tropical cyclones in August. This is a new record for August surpassing the seven named storms in August of 1933 and 1995.

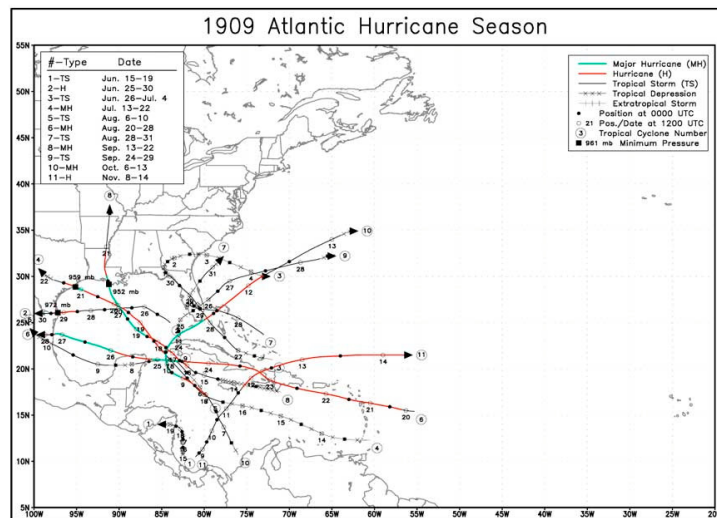
With Tropical Storm Bonnie making landfall near Apalachicola on the Florida Peninsula on August 12<sup>th</sup>, the un-remitting storm strikes began on Florida. Bonnie was the first of five named storms to make landfall along the Florida coast, four of which were hurricanes. Hurricane Charley in mid-August caused extensive damage to Florida. Charley is now the second costliest tropical cyclone in U.S. history behind Hurricane Andrew in 1992, with estimated total damage near 15 billion dollars. Charley was followed by Frances then Ivan and then Jeanne.

There was a 60% chance this year of the first storm forming after August 1<sup>st</sup>. This verified when Alex formed from the first tropical depression on August 1st. The other years with the first forming after August 1<sup>st</sup> in this OCSI phase were 1875, 1897, 1941, 1952, 1962 and 1984.

Each year WRC meteorologists make secondary predictions so this model can be compared with other seasonal predictions. This year the OCSI predicted that there would be at least 7 named storms with 4 of these storms intensifying into hurricanes. Other parameters for the season are given in the following table.

<b>SECONDARY PREDICTIONS:</b>		<b>OBSERVED</b>
<b>Number of Storms :</b>	<b>7</b>	<b>13</b>
<b>Number of Hurricanes:</b>	<b>4</b>	<b>8</b>
<b>Number of Hurricane Days:</b>	<b>16</b>	<b>45</b>
<b>Number of Storm Days:</b>	<b>55</b>	<b>60</b>
<b>US Landfalls:</b>	<b>3</b>	<b>9</b>
<b>Cat 3 or Higher Storms:</b>	<b>60%</b>	<b>Charley, Frances, Ivan, Jeanne and Karl</b>

The OCSI is composed of 11 phases which are 9 to 11 years in duration. 2004 was Phase 9 of the OCSI and the years that were used to make the forecast were: 1875, 1886, 1897, 1909, 1921, 1931, 1941, 1952, 1962, 1972, 1984, and 1994. 1909 is another year in this phase of the OCSI and also experienced a very busy season for Florida with 4 storms making landfall. Other active years for the Florida coast in Phase 9 are 1886 when 3 hurricanes make landfall on the east coast of Florida and a 4<sup>th</sup> hurricane moved just offshore the southeast coast of Florida.



OCSI has been used by Weather Research Center since 1985 to make an outlook for the section of the US coast which has the highest risk of storm landfall. Further research indicates that WRC's OCSI secondary prediction elements verify better over the past twenty years than Colorado State University's Atlantic Seasonal Hurricane Activity predictions. WRC's secondary prediction elements consist of the number of named storms in the Atlantic Basin, number of hurricanes in the Atlantic Basin, number of hurricane days and the number of storm days.

The OCSI indicates that it will be a very busy year in 2005 for the Texas coast and the west coast of Florida which both have a 70% chance of experiencing land falls of a tropical storm or hurricane. Ms. Hasling as a result of new research anticipate a new forecast index in addition to the OCSI. This index will be added to the WRC methodology by the start of the 2005 Atlantic Hurricane Season.

All of WRC's projections including past predictions can be found on the Internet, <http://www.wxresearch.com/outlook> .

Ms. Hasling and Dr. Freeman are both Fellows and Certified Consulting Meteorologists from the American Meteorological Society as well as members of the NCIM.

## **WEATHER RESEARCH CENTER'S PROGRAMS**

Jill F. Hasling and Dr. John C. Freeman, both Certified Consulting Meteorologists and Fellows of the American Meteorological Society, founded Weather Research Center [WRC®] in December 1987. Weather Research Center, Inc. [WRC®] is a 501(c)(3) nonprofit corporation. WRC was founded to respond to a need to educate the community about weather and weather safety. Freeman and Hasling's groundbreaking research in marine and tropical weather forecasting for corporate clients provides WRC with a solid foundation for the education of:

1. Newly graduated meteorologists in the fields of marine and tropical meteorology, and
2. The community, including teachers and their students, who learn about science and math via something they experience every day – the weather. Houston is the ideal location to launch such an effort, because if you don't like the weather, just wait and it will change.

Everyone knows that education saves lives. In recent decades, lightning, tornadoes, floods and hurricanes have killed thousands of people. With the proper safety education, many lives could have been saved and reduce injuries. According to the National Weather Service, the effects of extremely high temperatures cause more deaths in this country than the effects of lightning, floods and tornadoes combined. WRC is filling a void by making weather basics available to the community.

WRC has served over 306,000 people since its inception in December 1987 with in-house and outreach programs.

**PROGRAMS:** WRC has three key programs: OUTREACH AND EDUCATION  
PROFESSIONAL DEVELOPMENT  
RESEARCH

**OUTREACH AND EDUCATION:** WRC meteorologists reach out into the Community and inspire individuals to get excited about math and science through:

Science Education on the Go!                      Weather Camp and Weather Labs  
Weather Classes for Scouts                      Weather Classes for Teachers  
Volunteer Involvement                      Partnerships, e.g., Weather Day at the Zoo

**PROFESSIONAL DEVELOPMENT:** WRC operates a worldwide forecast operations center, which takes newly graduated meteorologists into an intern program, teaching them the art of marine and tropical weather forecasting. These interns remain in the training program from one to three years and then progress into meteorological careers that are not available to them prior to this internship. These interns, as well as other visiting meteorologists, are trained in the art of research by learning investigation and communication skills. WRC hosts:

1. Weather workshops and conferences that help further the profession of meteorology
2. Summer student internships, which teach weather education and forecasting.

**RESEARCH:**

WRC meteorologists are involved in groundbreaking research to improve long range forecasting. Other significant research projects that WRC meteorologists have carried out are: Numerical Weather Prediction; forensic Meteorology; Forecast Verification; Forecast Modeling; and Oceanographic Modeling.

**WINTER OUTLOOK 2004/2005**

The Orbital Temperature Index [OTI] called for a below normal December for the Houston area, and above normal January and below normal February for Houston. However even with a near normal monthly average you could have some very cold days. There is a 40% chance of having some days in January with minimum temperatures less than 26 degrees.

**WEATHERMANS CLASSIC – 2005**

Tentatively the annual Weather Research Center charity golf tournament has been set for Sunday 17 April 2005 at Blackhorse Golf Club. Please contact the center if you or your company would like to be a sponsor this year.

**WEATHER CAMP**

Weather Camp 2004 was a great success with over 100 campers and volunteers. This year's Weather Camp Directors were Texas A&M students Emily Riley and Brad Klotz. Emily and Brad did a wonder job as Camp Directors and all participants enjoyed an educational and fun experience. Thanks to the ExxonMobil Foundation who donated over \$2,000 for internship for Brad. The dates for Weather Camp 2005 are already posted to the Web site.

<http://weathercamp.org>.

**WEATHER CLASSES FOR TEACHERS**

WRC meteorologists have developed and been presenting weather classes to area elementary school teachers. This class includes a review of the basic of weather for their grade level. These classes include hands on experiments as well as providing material and other experiments that the teachers can perform with their classes.

### **WEATHER LABS FOR STUDENTS**

WRC meteorologists have taken weather and science education on the road with the launching of Weather Labs. Weather Labs is a demonstration of weather experiments that explain pressure, temperature, air and many other fun demonstrations. This demonstration lets the students know that science is fun. This has been a very popular program. If you or your company would like to support this endeavor so the program can be taken to at risk students, please contact the Center.

### **TOURS AND TALKS**

The center continues to give weather talks as well as give tours of the WRC World wide Weather Forecast Center. Each talk and tour is unique depending on the audience's participation.

### **VOLUNTEERS NEEDED!**

WRC is looking for a few good volunteers to help in our library, grant writing, Weather Camp, Annual Weatherman's Classic golf tournament as well as Weather Day. We are also in need of volunteers to help us in our library and with data archiving. We have received a donation of books and papers from Dr. William Hildreth's family to the added to the library. Anyone looking for service hours for school...you have come to the right place. Not only will you get to work with great people, you can receive service hours for school too!

**If you would like to volunteer, sponsor or otherwise be involved in any of these events,  
please call us at 713-529-3076.**

### **HAPPENINGS:**

January 9, 2005	5 <sup>th</sup> Annual AMS WeatherFest
January 9-14, 2005	85 <sup>th</sup> Annual AMS Meeting, San Diego, California
February 2, 2005	Groundhog Day
March , 2005	National Hurricane Conference
April 17, 2005	10 <sup>th</sup> Annual Weatherman's Classic
May 2005	Offshore Technology Conference
June 2005	NCIM Annual Meeting