

# The Pacific Tradewinds Quarterly

## What is a Meteorologist?

**Monday, September 11, 2006**

The SPaRCE program is now 15 years old, and some of the students who have participated in the program while they were in school are now working for the weather service in their country. But what does a meteorologist do? Before we can answer that question, we need to know the answer to a more fundamental question, and that is: What is Meteorology?

Basically, meteorology is the science of the atmosphere dealing mostly with day to day changes in the weather. The word "meteorology" comes from the Greek word "meteoron", which means "something that happens in the sky". Probably ever since the first person walked on Earth, people have observed clouds, wind, and rain, and tried to understand how they are connected. When people started growing food, weather was important because it affected how well the crops would do. Sailors have always had a keen interest in observing the weather, since being able to predict wind and storms had a direct impact on whether they would safely arrive on land again! In a sense, farm-

ers and sailors were the first meteorologists, because they closely observed the sky in an effort to try and figure out what the weather would be like.

In modern times, the American Meteorological Society defines a meteorologist as "someone with specialized education who uses scientific principles to explain, understand, observe, or forecast the earth's atmospheric phenomena and/or how the atmosphere affects the earth and life on the planet". But whether they are in the United States, or anyplace else in the world, there are some basic tasks that nearly all meteorologists have in common.

Most of the time when we think of a meteorologist, we think of someone who forecasts the weather. In the past 30 years or so, forecasters have seen exciting advances in technology that have helped in their ability to predict the weather. In fact, some meteorologists think that new knowledge about interactions between the tropical oceans and the atmosphere may make it possible to eventually predict regional weather patterns months in

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**This a broadcast meteorologist. They deliver the current weather as well as forecasts to the public.** [winktv.com/x8575.xml](http://winktv.com/x8575.xml)

advance.

Weather forecasting involves people in countries all over the world because the systems that bring weather to a particular place are hundreds of kilometers in size, and move across vast regions of Earth's surface. At least four times a day, observers at nearly 10,000 weather stations around the world record measurements of temperature, pressure, humidity, clouds, and many other variables. At about 500 of these stations, observers release weather balloons that travel high into the atmosphere to give us an idea of what is happening far above the surface. Radar, aircraft, and satellites are also used to collect data on what is happening in the atmosphere. All of this information is transmitted to world weather centers in Russia, Australia, and the United States. These data are available to regional and local weather services, where local meteorologists use their skills and knowledge of the

**Here is a research meteorologist taking and checking instruments for data.**

[www.ec.gc.ca/Science/sandemar00/article2\\_e.html](http://www.ec.gc.ca/Science/sandemar00/article2_e.html)



local environment to produce weather forecasts for their area.

National Meteorological Service forecasts not only help the general public, but also groups such as the agriculture and aviation industries. Meteorologists are often called on, to forecast for special sports events and to give forecasts of hot spells or dry spells to local utility companies to help them better prepare for electricity and/or water usage. And, of course, local weather services try to help educate the public about weather and climate, and to help them be prepared for emergencies such as cyclones or floods.

Although we've focused in this article on the roll of weather forecasters, in future newsletters we'll look at some of the other jobs you might have if you want to make a living studying the atmosphere.

-Susan Postawko

**"National Meteorological Service forecasts not only help the general public, but also groups such as the agriculture and aviation industries,"**  
**Susan Postawko.**

## Tonga King dies after Long Illness

**"The sun has set in the kingdom of Tonga," said the formal death announcement.**

Msnbc:  
<http://www.msnbc.msn.com/id/14776920>

**"His death ended one of the world's longest reigns by a monarch in modern times. He ruled 41 years," Msnbc**

Msnbc:  
<http://www.msnbc.msn.com/id/14776920>

**Sunday, September 10, 2006**

NUKU'ALOFA, Tonga - Tonga's King Taufa'ahau Tupou IV, a towering figure in the tiny Pacific Island nation for four decades, has died in a New Zealand hospital, the government said Monday. He was 88.

His death ended one of the world's longest reigns by a monarch in modern times. He ruled 41 years.

King Tupou IV died after a long, unspecified illness in a hospital where he had spent most of the past several months, plunging the remote country into a mourning period expected to last for months, the Tongan government said.

"The sun has set in the kingdom of Tonga," said the formal death announcement.

His son Crown Prince Tupouto immediately ascended the throne. The new monarch, King Taufa'ahau Tupou V, will take the vows Monday, and his coronation will occur later, Tonga's Chief Justice Tony Ford said, according to New Zealand's National Radio.

The end of Tupou IV's reign is likely to fuel a push for more democracy in the near-feudal kingdom. The royal family has ruled with absolute power since tribal groups on more than 170 Polynesian islands united into a single kingdom in 1845.

**Scam artists and bad decisions**

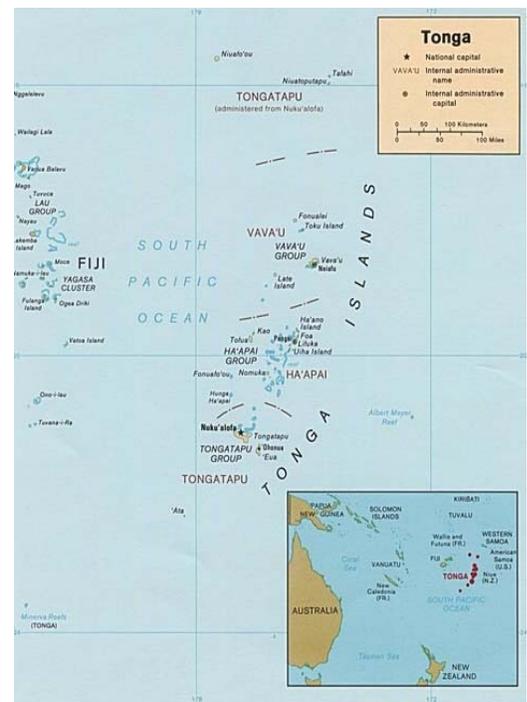
Tupou IV benefited from a histori-

cal reverence for the monarchy. That sentiment has waned in recent years as most people languished in poverty even as the royal family enriched themselves from the nation's meager resources, fell prey to scam artists and oversaw bad economic decisions.

Tupou IV ascended the throne in 1965 after his mother Queen Salote died.

At age 14, he was one of Tonga's top athletes; he could pole vault more than 9 feet, played tennis, cricket, rugby and also rowed competitively in a racing skiff.

But like many of his countrymen, he became obese and remained



**Map of Tonga**

[http://www.gweep.net/~saki/albums/Tonga-1999/Tonga\\_political\\_map.sized.jpg](http://www.gweep.net/~saki/albums/Tonga-1999/Tonga_political_map.sized.jpg)

“The body will be taken to the Tongan royal residence in Auckland Tuesday where it will lie in state for one night...,”  
Msnbc.

Msnbc:  
<http://www.msnbc.msn.com/id/14776920>



### King Taufa'Ahau Tupou IV of Tonga in May 2006

Msnbc.com: <http://www.msnbc.msn.com/id/14776920/>

so for most of his adult life.

#### National diet

In the 1990s, Tupou IV led his 108,000 people on a diet and exercise regime aimed at cutting the levels of fat in a nation where coconut flesh and mutton flaps are dietary staples.

From a weight listed in the Guinness Book of Records as the heaviest for any monarch -- 462 pounds -- the king shed around 154 pounds.

At his death, the king was surrounded by his wife Queen Halaevalu Mata'aho and members of the royal family, the government said.

The body will be taken to the Tongan royal residence in Auck-

land Tuesday where it will lie in state for one night to allow thousands of Tongan residents of New Zealand to pay respects.

A New Zealand air force airplane will then fly his body back to Tonga on Wednesday where it will lie in state.

Details of his funeral were still to be finalized.

The Associated Press

Msnbc

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# 1,000 Pallbearers Carry Tonga King to his Grave

**Tuesday, September, 2006**

NUKU'ALOFA, Tonga - His coffin carried aloft by 1,000 pallbearers dressed in grass mats, Tongan King Taufa'ahau Tupou IV was buried on Tuesday in a ceremony combining Christian hymn-singing and ancient Polynesian ritual.

The streets of Nuku'alofa, the capital of the South Pacific's last monarchy, were draped in the mourning colors of black and purple as thousands of tearful Tongans gathered to pay their respects to the man who had ruled them for 41 years.

Mourners will later feast on pigs roasted in umu, or open pits, dug in the grounds of villages around the nation of 170 coral and volcanic islands before a month of mourning during which dancing and loud music will be banned.

Tupou IV died in a New Zealand hospital on Sept. 10 after a long illness.

The 88-year-old king, who entered the record books in the 1970s as the world's heaviest monarch, is succeeded by his son, George Tupou V, a 58-year-old bachelor known for his penchant for military uniforms and for driving around in a London taxi.

One thousand pallbearers, dressed in black and wrapped in traditional ta'ovala grass mats, carried Tupou IV's huge wooden catafalque in relays of 150 from

the palace where he had lain in state to the Mala'e Kula, the site of Tongan royal tombs.

A 21-gun artillery salute boomed across Nuku'alofa as the black-and-gold topped catafalque made its way down the kilometer-long Road of the King flanked by hundreds of schoolgirls.

Foreign dignitaries including Japanese Crown Prince Naruhito, New Zealand Prime Minister Helen Clark and Australian Governor-General Michael Jeffery joined up to 10,000 ordinary Tongans in a Wesleyan Christian funeral service.

Tupou IV's mahogany and lead-lined coffin was then lowered into his tomb and covered with woven mats before the nima tapu, the royal undertakers called "sacred hands", began to fill the grave with sand carried in woven baskets.

He was buried next to the tomb of his mother, Queen Salote Tupou III, who he succeeded to the throne in 1965.

## **Deep esteem**

The Polynesian nation, dubbed the Friendly Islands by British explorer James Cook, holds its royal family in deep esteem.

Praised in official biographies for leaving a "towering legacy", Tupou IV was the first Tongan to gain a university degree and placed great emphasis on education.



**"The streets of Nuku'alofa...were draped in the mourning colors of black and purple as thousands of tearful Tongans gathered to pay their respects...,"**  
**Msnbc.**

Msnbc:  
<http://www.msnbc.msn.com/id/14776920>

“...Tupou IV was the first Tongan to gain a university degree and placed great emphasis on education,”  
Msnbc.

Msnbc:  
<http://www.msnbc.msn.com/id/14900568>



**Pallbearers carry the casket containing the body of the late King Taufa'ahau Tupou IV to the royal tomb for a state funeral in Nuku'alofa on Tuesday. Msnbc**

Msnbc.com <http://www.msnbc.msn.com/id/14900568/>

As Minister for Education, he toured the country with a movie projector and charged a small fee at film showings to raise money for the impoverished nation's first high school.

The royal family controls a semi-feudal political system in the nation of some 105,000 people about 1,250 miles north of New Zealand.

Tonga witnessed unprecedented demonstrations in May 2005, when an estimated 10,000 people took to the streets to demand democracy and public ownership of assets.

The royal family announced last week that Tupou V, educated at Oxford and Sandhurst military academy, would give up all his

business interests in Tonga's power company, brewery, a telecommunications company and an airline.

The May 2005 protests were prompted in part by steep price rises proposed by the power company.

Tonga's economy depends on subsistence farming, remittances from expatriates, tourism and fishing.

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Msnbc

Msnbc.com:  
<http://www.msnbc.msn.com/id/14900568/>

## Delegation to Attend SPREP Conference

**Sunday, September 10, 2006**

(GovSAMOA PR) - Samoa is sending a delegation to the SPREP Annual Session and Ministerial Meeting in Noumea, New Caledonia, from the 11th to the 15th of September 2006. Matters that will be discussed in this meeting include: Annual Report; Action Plan; Budget; Nature Conservation and Protected areas; and Marine Environment Protection. The delegation following the SPREP sessions will be traveling to Singapore to tend to other high level meetings. Samoa's delegation comprises of the Honourable Minister of Natural Resources and Environment, Afioga Faumuina Tiatia Liuga, together with the CEO and ACEO for



**SPREP (South Pacific Regional Environment Programme)**

**Logo**

<http://www.sprep.org.ws/>

the Ministry of Foreign Affairs and Trade.

Pacific Magazine

Pacific Magazine: <http://www.pacificislands.cc/news/2006/09/10/delegation-to-attend-sprep-conference-in-new-caledonia>

## Guam Receives \$365,000 Grant for Coral Reef Research

**Thursday, September 7, 2006**

(GovGUAM PR) - Governor Felix P. Camacho today announced that the Guam Coral Reef Initiative Coordinating Committee will receive a \$365,000 grant from the Department of Interior to help protect Guam's reefs.

The funds will be used to better manage Guam's coral reefs and to continue to educate the island about our precious natural resources. Current projects include the enhancement of the Piti/ Asan watershed, soft coral research and outreach activities for chil-

dren and their families.

"Our natural environment enhances the beauty of our island and we all have a responsibility to ensure that we protect these resources for our children and future generations," Governor Camacho said. "The Administration continues to support the initiatives of the GCRICC and I encourage the people of Guam to get involved in the many programs and projects that foster stewardship among our people."

Office of the Governor of Guam

<http://www.guamgovernor.net/content/view/437/2/>

**"The funds will be used to better manage Guam's coral reefs and to continue to educate the island about our precious natural resources,"**  
Guam Governor.

<http://www.guamgovernor.net/content/view/437/2/>

## Shrinking Glaciers Blamed on Reduction in Snowfall

**Friday, September 8, 2006**

New Zealand's glaciers shrank last summer but the retreat may have more to do with the lower snowfall than global warming. "Much less snow fell in the Southern Alps," said National Institute of Water and Atmospheric Research senior climate scientist Jim Salinger. The loss of ice mass last year was in contrast to the previous three years, when the glaciers actually grew.

Glaciers are affected by two climatic conditions: Snowfall, which adds to their mass during winter, and warm temperatures, which spur melting in summer. Increased anticyclone weather patterns in the six months to last Christmas produced drier and milder conditions, and temperatures above average. "These conditions produced less snow in winter, and the warmer temperatures in spring resulted in early snowmelt," Dr Salinger said. The annual survey of 50 glaciers by Niwa showed that snow lines in March, at the end of summer, were on average 50m higher than where they needed to be to maintain a constant supply of ice to the glaciers. "The higher the snowline, the more snow has

been lost to feed the glacier."

The heavier seasonal snowfalls this past winter - the coldest in a decade - may mean the glaciers will regain some of their mass, but much will depend on the conditions over the coming summer. Dr Salinger said that worldwide, glaciers were regarded as a canary in the coalmine in terms of global warming. The world's many thousands of glaciers have been stable or in slow retreat for more than 100 years, but since about 1980 most have been retreating drastically, most rapidly in the Himalayas, the Arctic, the Alps, the Rockies and the tropics.

Most glaciologists believe this is being accelerated by global warming, but Dr Salinger said the behavior of glaciers in New Zealand was a little more complicated. "Our glaciers - particularly those west of the main divide - are very sensitive to the rain and snow that falls as well as the temperature. Those to the west have not been retreating to the same extent as glaciers worldwide."

-New Zealand Herald

New Zealand Herald: [www.nzherald.co.nz](http://www.nzherald.co.nz)

**"The heavier seasonal snowfalls this past winter—the coldest in a decade—may mean the glaciers will regain some of their mass....,"**  
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[www.nzherald.co.nz](http://www.nzherald.co.nz)

**NZ's glaciers have shrunk this year, in contrast to the previous three years when they actually grew.**

Gottlieb Braun-Elwert:  
[www.nzherald.co.nz](http://www.nzherald.co.nz)



## Vanuatu Congratulated On Disaster Action Plan

**Monday, September 5, 2006**

The Pacific Islands Forum Secretariat, on behalf of the members of the Pacific Islands Forum and the Council of Regional Organizations, congratulates the Government of Vanuatu for being the first country in the region to champion and design a draft National Action Plan on Disaster Risk Reduction and Disaster Management.

"Vanuatu Prime Minister Hon. Ham Lini and his government must be commended for taking the lead in implementing the decision by Pacific Island Leaders in taking the first few steps towards mitigating and mainstreaming disaster risk management as a development and cross-sectoral issue within all sectors of the society," Greg Urwin, Secretary General of the Forum Secretariat said.

"This is a good example of an issue that has been agreed on at the regional level being successfully implemented at the national level," Urwin said.

The successful completion of the draft NAP has been the result of a collaborative effort between South Pacific Applied Geoscience Commission (SOPAC), the Pacific Islands Forum Secretariat and the Vanuatu National Disaster Risk Reduction and Disaster Management Task Force, in collaboration with the UNDP and the World Bank. Under the Pacific Plan, a SOPAC/PIFS/UNDP/WB Disaster Risk Management Part-

nership was formed to assist Vanuatu to implement the Disaster Risk Reduction and Disaster Management Regional Framework of Action endorsed by the Leaders in 2005.

The Vanuatu NAP includes actions which require a coordinated effort between government, the private sector and civil society to mitigate and minimize risks before a disaster strikes, and not just respond to disaster when it strikes.

Some of the priorities under the National Action Plan are: Establishment of an Observatory Centre made up of the National Disaster Management Office (NDMO) and other institutions dealing with hazards, disaster and environment to provide information, raise awareness both at the national, provincial and community levels; Encourage provincial governments, government ministries and departments, the private sector and NGOs to develop their own disaster risk management plans in line with the NAP; The draft National Action Plan will now go before the Vanuatu Council of Ministers for its endorsement.

Equip institutions dealing with disaster and hazards with proper information systems and tools, such as Early Warning Systems, appropriate telecommunication network system from national to provincial level to local communities to deal with a disaster.

(Pacific Islands Forum Secretariat media release)

Pacific Islands

**"...congratulates the Government of Vanuatu for being the first country in the region to champion and design a draft National Action Plan on Disaster Risk Reduction and Disaster Management," Pacific Islands Forum Secretariate.**

Pacific Islands

## Help May Be on Way for Ailing Lakes

**"Lakes...have all been plagued by algal blooms, which degrade the water quality, harm aquatic life and fill the once pristine lakes with green slime," New Zealand Herald.**

[www.nzherald.co.nz](http://www.nzherald.co.nz)

**Tuesday, September 5, 2006**

Central North Island authorities which traveled to the Beehive to lobby for help in cleaning up Rotorua's lakes say they received a positive response from the Government.

The seven-member delegation met with Finance Minister Michael Cullen, Environment Minister David Benson-Pope and Land and Information Minister David Parker to try and persuade the Government to become an official partner in the lakes' restoration.

Rotorua mayor Kevin Winters said the delegation members presented their views to the ministers in a "very forthright" manner.

"At the end of the meeting, to confirm they were reading off the same page, everyone present signed a memorandum of understanding."

He said the delegation was not asking for a black cheque, rather a partnership based on adaptive management".

Lakes Okaro, Rotorua, Rotoehu, Rotoiti and Okareka have all been plagued by algal blooms, which degrade the water quality, harm aquatic life and fill the once-pristine lakes with green slime.

A report issued by the Environment Ministry in September 2003 said the blooms were caused by fertilizer runoff from farms and septic tanks.

Ideas suggested to clean up the lakes include diverting and screening the lake water, reducing the levels of nitrogen and phosphorus in the water and using oxygen in to prevent the algae from blooming.

Te Arawa Maori Trust Board chairman Anaru Rangihueua said the ministers seemed "genuinely interested" in what they had to say.

"We wanted to reinforce to them the historical and cultural significance of the lakes to Te Arawa.

-New Zealand Herald

New Zealand Herald: [www.nzherald.co.nz](http://www.nzherald.co.nz)



**Lake Rotorua in New Zealand.**

[www.exploit.com/pictures/4934/index.php?pix=37&size=1](http://www.exploit.com/pictures/4934/index.php?pix=37&size=1)



# CLASSROOM WEATHER FOCUS

Welcome to Weather Focus! This section is dedicated to the students and teachers of the SPaRCE program. Every newsletter will have a weather trivia section or an activity. Trivia questions will starts out simple and progressively increase in difficulty with the arrival of your workbooks.

A new section of your workbooks will be arriving soon so the next advanced trivia questions will be in the next newsletter. These following questions are going to cover some of the basic meteorology concepts in future workbook sections.

- |   |  |
|---|--|
| <p>1) Which of the following instruments measure temperature?</p> <p>a) Barometer<br/>b) Thermometer<br/>c) Psychrometer<br/>d) Anemometer</p>  | <p>5) Winds pointing in different directions at different heights in the atmosphere is called:</p> <p>a) Wind components<br/>b) Wind factor<br/>c) Wind shear<br/>d) Tropospheric wind</p> |
| <p>2) At what wind speed is a storm considered a hurricane (cyclone, typhoon)?</p> <p>a) 133 km/hr (83 mi/hr)<br/>b) 100 km/hr (62 mi/hr)<br/>c) 119 km/hr (74 mi/hr)<br/>d) 109 km/hr (68 mi/hr)</p> | <p>6) What is the freezing point of water in Fahrenheit?</p> <p>a) 35 degrees F<br/>b) 40 degrees F<br/>c) 30 degrees F<br/>d) 32 degrees F</p>  |
| <p>3) When water goes to water vapor this process is called:</p> <p>a) Sublimation<br/>b) Evaporation<br/>c) Freezing<br/>d) Condensation</p>   | <p>7) Which of the following is NOT a form of precipitation?</p> <p>a) Lightning<br/>b) Snow<br/>c) Sleet<br/>d) Drizzle</p>   |
| <p>4) True or False:<br/>Humidity is the measure of water vapor in the air</p>  | <p>8) True or False:<br/>Pressure is the measure of the temperature of atmosphere above a certain area.</p>  |

- Answers:
- 1) B. Thermometer
  - 2) C. 119 km/hr
  - 3) D. Evaporation
  - 4) True
  - 5) C. Wind shear
  - 6) D. 32 degrees F
  - 7) A. Lightning
  - 8) False: Pressure is the measure of the mass of atmosphere above a certain area.

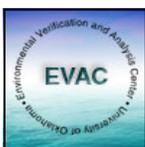
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### WE'RE ON THE WEB!

<http://www.evac.ou.edu/>



# ENSO Diagnostic Discussion

Wednesday, September 13, 2006

Synopsis: El Niño conditions have developed and are likely to continue into early 2007.

By early September equatorial SST anomalies greater than +0.5°C were observed in most of the equatorial Pacific, with anomalies exceeding +1.0°C in the central Pacific between 165°E and 170°W. The latest SST departures in the Niño regions are all greater than +0.5. Beginning in February the basin-wide upper ocean heat content increased, and since early April positive anomalies have been observed. Since early July weaker-than-average low-level equatorial easterly winds have been observed across most of the equatorial Pacific. In August the Southern Oscillation Index was negative for the fourth consecutive month. Collectively, these oceanic and atmospheric anomalies are consistent with developing warm episode conditions in the tropical Pacific.

Climate Prediction Center

[http://www.cpc.ncep.noaa.gov/products/analysis\\_monitoring/enso\\_advisory/](http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/)



This is Lucas' "Hollywood Look"



This is Lucas researching tree rings to aid local forestry.

## Get to Know: Lucas Baze

Tuesday, September 26, 2006

My name is Lucas Baze. I am 22 years old and am a senior majoring in anthropology and geography. I grew up in Yukon, Oklahoma which is just west of Oklahoma City. I moved to Norman when I decided to attend the University of Oklahoma. I study archaeology and paleoclimatology. I plan on going to graduate school outside of Oklahoma next year and am also thinking about joining the Peace Corp. I spent the summer of 2005 on an archaeological dig in Northern Oklahoma. The following summer, 2006, I studied tree rings for a project to aid local forestry services. I started working at EVAC in August of 2006 and am working in both the PACRAIN project which coincides with SPARCE and



Lucas is digging away in Northern Oklahoma for archaeology.

OWPI, Oklahoma Wind Power Initiative. I am graduating in May and am looking forward to the next step in my academic progress. Most of my free time is spent playing volleyball, camping, painting and hanging out with my friends.

SPARCE would like to thank those of you who have made this program possible: NOAA Office of Global Programs, NOAA PI-GCOS and especially Howard Diamond. Thank you!