



The Pacific Tradewinds Quarterly

PACRAIN & PI-GCOS

Monday, March 6, 2006
By Mark Morrissey

SPaRCE Program Support for the Assimilation, Analysis and Dissemination of Pacific Rain Gauge Data

The SPaRCE supports our overall effort to enhance the climate observations in the Pacific. As everyone is the Pacific is aware, we have a real lack of measurements in an extremely important region. This makes forecasting events like cyclones and El Nino very hard for forecasters. Fortunately, we are having a lot of success with SPaRCE working in cooperation with the regional Meteorological services, We urge everyone to not only send us the data, but send a copy to your own weather service as they can use the data as well.

Our project supports United States National Oceanic and Atmospheric Administration's Office of Global Program's (OGP) Climate Observation Element's mission to "build and sustain the global climate observing system that is needed to satisfy the long-term observational requirements of the operational forecast centers, international research pro-



Vanuatu Meteorological Service putting in a tipping bucket rain gauge

grams, and major scientific assessments". We also are continuing in our role as the Surface Reference Data Center (SRDC) a core program which supports the Global Precipitation Climatology Project (GPCP). This effort includes expanding our mission to collect, analyze, verify and disseminate global rainfall data sets and products deemed useful for Operational Forecast Centers, International Research Programs and individual researchers in their scientific endeavors. Housed in the Environmental Verification and Analysis Center (EVAC) at the University of Oklahoma, the EVAC/SRDC has built upon work from past NOAA-supported pro-

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"It is our belief that by working directly with local Pacific Island meteorological services, we bring tangible benefits to the global climate research community through data base enhancement."

Mark Morrissey

jects to become a unique location for scientists to obtain scarce rain gauge data and to conduct research into verification activities. The data you collect are continually analyzed to produce error-assessed rainfall products.

Rainfall data is particularly important in the tropics. Not only is it an indicator of how powerful the storms are, it is vitally important to the understanding of ocean properties as well, such as heat flows, salinity changes and ocean circulation changes. In addition, rain gauge observations from low-lying atolls are required to conduct verification exercises of nearby buoy-mounted rain gauges.

Scientists need only to access the EVAC/SRDC web site <http://www.evac.ou.edu/pacrain> to obtain the most comprehensive Pacific rainfall data set anywhere and <http://www.evac.ou.edu/srdc> to obtain critical regional rain gauge data sets. Many of these regional data sets are impossible to obtain elsewhere. The EVAC/SRDC serves the research community by actively working with individual countries in environmentally important locations to help provide them with infrastructure,

education and other short and long-term support.

The return on this investment by NOAA has been significant in terms of enabling EVAC/SRDC to provide the scientific community with critical, one-of-a-kind rain gauge data sets and to have established ongoing mutually beneficial relationships, which should lead to future collaborations. Past successes with this strategy have proven very worthwhile on a cost-benefit basis.

Due to the importance of tropical Pacific rainfall data to climate research and operational and climate forecasting we are intensifying our efforts by working collaboratively with the Pacific Island Global Climate Observing System (PI-GCOS) program to effectively and efficiently match the areas of commonality among both NOAA's Climate Observations and PI-GOS (<http://www.pi-gcos.org/>) objectives. One of these common areas is the strengthening of the existing Pacific observation climate networks for both atmosphere and ocean.

We are using the above strategy to expand our efforts to increase the rain gauge climate observing data base representing specific, environmentally critical locations. It is not our intention to collect all rain gauge data world-wide, but to assimilate rain gauge data 1) in environmentally critical locations (e.g. tropical Pacific), 2) where dense rain gauge networks exist and 3) where agreements can be made to help construct rain gauge networks in these critical locations.



(left) SPREP: Secretariat of the Pacific Regional Environment Programme. (right) GCOS: Global Climate Observing System.

SPREP logo courtesy of:
<http://www.pi-gcos.org/>

GCOS logo courtesy of:
<http://www.wmo.ch/web/gcos/gcoshome.html>



Rain Gauge picture courtesy of: <http://www.forestry-suppliers.com>

An experimental effort focused on the latter objective with the government of Kiribati has resulted in a network of 15 new rain gauges located on 15 atolls managed by the Kiribati Meteorological Service. In addition, similar pilot projects have produced a relatively dense rain gauge network on the island of Niue in the south Pacific and a critical all weather observation platform on Pitcairn island in the south-east Pacific. The success of these relatively low-cost efforts has motivated us to expand these pilot projects in collaboration with PI-GCOS to other Pacific Island locales.

It is our belief that by working directly with local Pacific Island meteorological services, we bring tangible benefits to the global climate research community through data base enhancement. In turn, the local meteorological services benefit directly through enhanced forecast products developed by the scientific community using these critical data sets.

To better accomplish these tasks, the Principal Investigator (i.e. P.I.) of this project took leave from his University of Oklahoma position to become the first PI-GCOS coordinator headquartered at the Secretariat for the Pacific Regional Environmental Program (i.e. SPREP) in Apia, Samoa. During his 1.5 year tenure there (from January 2004 through May 2005) he helped consolidate the PI-GCOS program by working with or initiating various high priority PI-GCOS projects outline in the PI-GCOS action plan. He coordinated the



Min/Max Thermometer and Rain Gauge SPaRCE is sending to schools and meteorological services. SPaRCE is a part of PACRAIN.

Min/Max Thermometer picture courtesy of: <http://www.forestry-suppliers.com>

10th Regional Meteorological Director's meeting hosted by the island nation of Niue and ran the 1st meeting of the PI-GCOS steering group. Since returning to the University of Oklahoma, the P.I. is working with the PI-GCOS program by focusing on building a sustainable basic climate instrument network in collaboration with the Pacific Island Meteorological Services. Currently, we are supplying the Pacific Island countries with high quality tipping bucket rain gauges complete with HOBO data loggers and running field experiments in the Pacific to test their accuracy and reliability. We currently have a new PI-GCOS Coordinate, Mr. Dean Solofa. We plan to continue on our mission in providing instrumentation and information where it is most needed.

By: Mark Morrissey
Monday, March 6, 2006.
EVAC/SPaRCE

"...expand our efforts to increase the rain gauge climate observing data base representing specific, environmentally critical locations."

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PACIFIC SHOULD TAP 'RENEWABLE' ENERGY

Friday, January 13, 2006
By Samisoni Pareti

SUVA, Fiji – Up to half-a-million kilowatts of energy can be produced by Pacific Islands' nations if they resort to renewable energy, a regional-wide audit has discovered.

The assessment put the total potential energy that could be generated through hydro, solar and other renewable sources at 365,349 kilowatt hours.

This is equivalent to half of Fiji's power consumption in 2004. Put another way, if a medium-sized home consumes 100 to 250 kilowatt hours of electricity, then approximately 120,000 homes can be serviced by the 365,349 kilowatt hours.

Working on the assumption that a diesel plant conversion can be in the order of 0.25 liter per kW_r, island countries can save 90 million liters [of fuel], or US\$60 million.

The Apia-based Secretariat of the Pacific Regional Environmental Programme [SPREP], which conducted the audit under its Pacific Islands Renewable Energy Project, said the energy volume should be more since data out of Papua New Guinea, the largest of all islands nations, was not available. This was true in the volume of energy PNG gets from biomass (agriculture, forestry or bio-fuel) and wind power.

The only other country that has the potential of tapping into biomass in some real way is Fiji.

The United Nations Development Programme-funded audit shows that Fiji can produce 11,000 kilowatt electricity from agriculture, 3,000 kilowatt electricity from forestry and 125 kilowatt electricity from bio-fuel.

For wind power, Fiji has the potential of producing 75 kW_r, which is so much more than the less than 1 kW_r it got from this source in 2003.

Papua New Guinea, given its size and topography, holds great promise in hydropower. The SPREP audit reveals it enjoyed 910,000 megawatt hours from hydro in 2001. But if properly harnessed, some 222,000 megawatt hours more could be found and exploited, the audit says.

PNG is also the only country in the region that holds some promise in utilizing geothermal energy. SPREP believes it can produce 6,000 kilowatt electricity of geothermal power.

No data was available on PNG's use of solar energy, yet the audit asserts that 15,000 kilowatt electricity could be produced through solar water heaters and 525 kW_p in solar home systems.

Solar energy also holds a lot of promise for Fiji, the Cook Islands and Tonga, with each holding the potential of producing 3,000, 2,000 and 1,000 kilowatt electricity respectively.

Apart from PNG, five other islands countries have the potential to exploit hydro energy, the audit says.

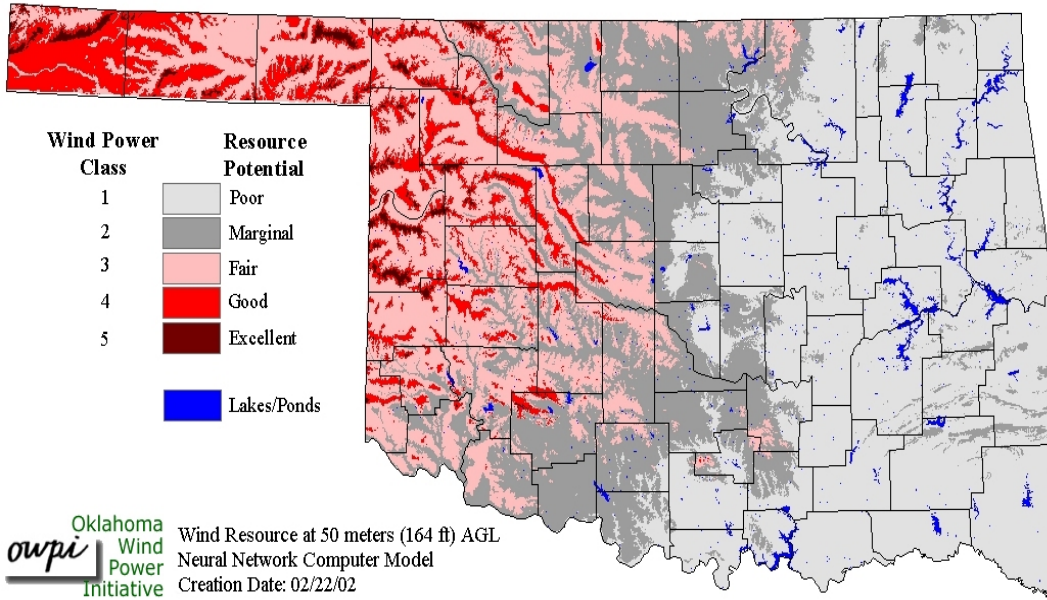
"It is always said that it is more cost effective to save a unit of energy than to generate an additional unit of energy," said Fifita.

Island Business Magazine:
<http://www.islands.business.com>



Wind Tower

<http://www.calder.net/mwright/2003-10-06-renewable-energy.html>



Renewable resource: Wind Power Map of Oklahoma

<http://www.seic.okstate.edu/owpi/WindRes/neuralnetwork.htm>

Fiji can produce 90,185 kilowatt electricity more, Samoa 11,060, Federated States of Micronesia 2,060, Vanuatu 600 and the Solomon Islands 455.

Said Solomone Fifita, SPREP's energy adviser: "Rising oil prices, and this is not the first time, has given the clear signal that Pacific Islands' countries must look for alternatives besides fossil fuel.

The countries have individually and collectively made their commitments to embark on a renewable energy path at various international, regional and national forums.

Cost and maintenance, admitted Fifita, were identified as factors that hamper the wider use of renewable energy in the Pacific. This factor was made clear in the audit SPREP did.

"The obstacles or barriers are many and are intertwined. There are institutional, financial, market, awareness and capacity, technical, policy and regulatory.

PIGGAREP will address this through target packages of activities in each country."

PIGGAREP [Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project] will also initiate cost analysis, which Fifita hopes would show savings each country would make if they turned to renewable energy, instead of fossil fuel.

Added Fifita: "At a time of rising oil prices and any other time, it is important to look for alternative fuels like renewable energy and equally important too to be energy efficient, regardless of whether you are using fossil fuel or renewable energy."

"It is always said that it is more cost effective to save a unit of energy than to generate an additional unit of energy."

January 13, 2006

Islands Business Magazine:

<http://www.islands.business.com>

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"Rising oil prices, and this is not the first time, has given the clear signal that Pacific Islands' countries must look for alternatives besides fossil fuel," said Fifita.

Island business magazine:
<http://www.islands.business.com>

TSUNAMI REEFS TO HEAL IN 10 YEARS

Saturday, January 21, 2006

BANGKOK, Thailand - Most coral reefs escaped "serious damage" from the 2004 tsunami and should recover in less than 10 years, though much will depend on local government's protecting marine ecosystems, according to a report released Monday.

The report, compiled by Global Coral Reef Monitoring Network, found that reefs in Indonesia, Sri Lanka, India and Thailand were hardest hit, with damage reaching up to 30 percent in some places. But much like earlier studies, it found that human activities like illegal fishing and climate change pose the greatest risk to the future of these reefs.

"Most coral reefs will recover from these stresses in five to 10 years, provided that there are no other major stresses," according to the report released in the Thai resort island of Phuket, which was damaged by the tsunami.

"The tsunami caused some localized damage, but ongoing human stresses pose a far greater threat to the survival of Indian Ocean coral reefs and mangrove forests," the report found, adding "stronger conservation and protection of coral reefs and other coastal resources" is needed to enhance their resistance to future disasters.

The Dec. 26, 2004, Indian Ocean tsunami devastated mostly rural, coastal communities in 12 countries, leaving at least 216,000 people dead or missing and more than a million homeless.



Coral Reef

<http://www.diveasia.com/reef-guide/sponges.htm>

Bleaching from warm waters

The coastal ecosystems were spared some of the worst damage, partly because they have been so badly damaged over the years by dynamite fishing, coastal runoff and development. Some reefs also had suffered bleaching in 1998 from warming ocean waters, and had barely begun to recover when the tsunami hit.

The hardest hit animals were turtles, which lost nesting sites in Thailand and India's Andaman and Nicobar islands, said Clive Wilkinson, the report's lead author. "There were at least two key nesting sites lost in the Andaman's but now we're seeing these turtles just go to other beaches and find new nesting sites," he said.

The report called on tsunami-devastated nations to proclaim exclusion zones to protect people from future tsunamis and storm surges, and to adopt government policies that better protect the reefs. It also called for the development of alternative livelihoods for coastal villagers so they put

"Coral damage reached 30 percent in some locations," Msnbc.

Msnbc: msnbc.com.

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Msnbc: msnbc.com.



Map of 2004 Tsunami

<http://www.nanoblog.com/past/2004/12/tsunami.htm>

less stress on the marine ecosystems.

The report also called for relief agencies to ensure that rebuilding supplies are not taken from coastal forest or the reefs, noting that sand and rock have been dredged from some coral reefs, and that construction is occurring in vulnerable areas.

"These practices could lead to future damage including landslides in the forests, sediments flooding onto reefs, and coral reefs with reduced potential to protect shorelines from storm surges," the report said.

January 21, 2006.

msnbc.com

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PNG's AITAPE LOSING GROUND TO SEA

Thursday, January 19, 2006

PORT MORESBY, PNG – Waves of up to two meters are threatening the little township of Aitape as well as nearby villages.

Since last month, massive amounts of sand and soil have been washed away from the town's waterfront.

Villages along the coastline have fared no better with the waves threatening to destroy homes and other buildings.

People living at the Ali-Sissano camp were the worst affected because the waves have eroded a large part of the land. They now fear that their homes may be destroyed.

The local people blame the change in the tide and wave on-

slaught on the existence of a ramp used for barges. They are calling on authorities to look into the matter before they become homeless.

"I'm really scared that my house might fall down during the night when I'm asleep," said Rebecca Pailal. "I have already talked to the authorities to relocate my home."

She said by Monday, there were only 14 meters of soil left between her house and the beach and even that was eroding fast.

A primary school located near the beach was also seriously threatened by the waves and erosion.

January 19, 2006

www.postcourier.com.pg/

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"The report called on tsunami-devastated nations...to adopt government policies that better protect the reef," Msnbc.

Msnbc: msnbc.com.

"...massive amounts of sand and soil have been washed away..." Post-Courier Press: www.postcourier.com.pg/

GREENLAND GLACIER DUMPING ICE INTO ATLANTIC AT FASTER PACE

Thursday, February 16, 2006

ST. LOUIS, Missouri (AP) - Greenland's southern glaciers have accelerated their march to the Atlantic Ocean over the past decade and now contribute more to the global rise in sea levels than previously estimated, researchers say.

Those faster-moving glaciers, along with increased melting, could account for nearly 17 percent of the estimated one-tenth of an inch annual rise in global sea levels, or twice what was previously believed, said Eric Rignot of NASA's Jet Propulsion Laboratory in Pasadena, California.

An increase in surface air temperatures appears to be causing the glaciers to flow faster, albeit at the still-glacial pace of eight miles to nine miles a year at their fastest clip, and dump increased volumes of ice into the Atlantic.

That stepped-up flow accounted for about two-thirds of the net 54 cubic miles of ice Greenland lost in 2005. That compares with 22 cubic miles in 1996, Rignot said.

Rignot and his study co-author, Pannir Kanagaratnam of the University of Kansas, said their report is the first to include measurements of recent changes in glacier velocity in the estimates of how much ice most of Greenland is losing.

"The behavior of the glaciers that dump ice into the sea is the most important aspect of understanding how an ice sheet will evolve

"It takes a long time to build and melt an ice sheet, but glaciers can react quickly to temperature changes," said Rignot.

Cnn:
<http://www.cnn.com/2006/TECH/science/02/16/greenland.glaciers.ap/index.html>



Many bergs are calved each year from the Kangerdlugssuaq glacier in East Greenland.

<http://www.cnn.com/2006/TECH/science/02/>

in a changing climate," Rignot said.

"It takes a long time to build and melt an ice sheet, but glaciers can react quickly to temperature changes."

Details of the study were being presented Thursday at the annual meeting of the American Association for the Advancement of Science. The study appears Friday in the journal Science.

The researchers believe warmer temperatures boost the amount of melt water that reaches where the glaciers flow over rock.

That extra water lubricates the rivers of ice and eases their downhill movement toward the Atlantic. They tracked the speeds of the glaciers from space, using satellite data collected between 1996 and 2005.

If warmer temperatures spread to northern Greenland, the glaciers



Map of Greenland

<http://www.sciencedaily.com/encyclopedia/greenland>

there too should pick up their pace, Rignot and Kanagaratnam wrote.

The only way to stem the loss of ice would be for Greenland to receive increased amounts of snowfall, according to Julian Dowdeswell of the University of Cambridge, who wrote an accompanying article.

Thursday, February 16, 2006

CNN

<http://www.cnn.com/2006/TECH/science/02/16/greenland.glaciers.ap/index.html>

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The Kangerdlugssuaq glacier is moving nearly three times faster than in the past.

<http://www.cnn.com/2006/TECH/science/02/16/greenland.glaciers.ap/index.html>

"The only way to stem the loss of ice would be for Greenland to receive increased amounts of snowfall," said Dowdeswell.

Cnn:

<http://www.cnn.com/2006/TECH/science/02/16/greenland.glaciers.ap/index.html>

SCIENTISTS RECORD PACIFIC SEA LEVEL RISE

Tuesday, February 21, 2006

MELBOURNE, Australia – The sea level around Tonga appears to have risen by about 10 cm in the past 13 years, according to the latest data from the South Pacific Sea Level and Climate Monitoring Project.

The Australian-funded project has been in operation since late 1992, and each month the latest figures from the 12 monitoring stations around the Pacific are published. The latest Monthly Data Report shows that for the stations that have been monitored for more than 10 years, the sea level rise trend is highest in Tonga with a rise of 8.4 mm a year.

The Cook Islands station is showing a rising trend less than one eighth of that in Tonga. At Tuvalu, the trend in sea level rise over the past 13 years has been 5.7 mm a year, a cumulative rise

of about seven cm.

The project coordinators urge that caution be exercised in interpreting any of the trend data because they say longer term recordings are needed. Meantime, scientists have warned that climate change could happen more abruptly than first thought.

Professor Schelinhuber says there are weak links in the global weather system that could spark catastrophic change. "So we could have in the next 20 years the destabilization of the monsoon, we may have in 50 years permanent El Nino and in a few hundred from now we could have the collapse of ice sheets - so we would simply go down the road of various catastrophes if you like," he said.

February 22, 2006

Radio Australia: www.abc.net.au/ra

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"...the sea level rise trend is highest in Tonga with a rise of 8.4 millimetres a year," Radio Australia.

Radio Australia:
www.abc.net.au/ra

WORLD SKYDIVING TEAM CLAIM WORLD RECORD

Wednesday, February 8, 2006

By Alisa Tang

AP Associated Press

UDON THANI, Thailand - Skydivers from 31 countries say they have set a new world record of 400 people holding hands in a midair free-fall formation.

The record was certified by judges from the Switzerland-based Federation Aeronautique Internationale at the scene, announced the World Team '06, the informal association of international skydivers who made the attempt over an airfield in north-eastern Thailand.

According to World Team skydive director B.J. Worth, in order to set the record, "100 percent of the people in the air have to be holding hands, even if only for a split second."

The group had failed to completely link up for a measurable amount of time in two earlier jumps Wednesday.

They had made three attempts a day for two days before succeeding in their attempt.

The previous record, of 357 skydivers over Takhli, Thailand, in February 2004, had also been set by the World Team.

"It was beautiful. It was one of my absolute favorite dives of my life," said Worth.

Appearing first as tiny specks in the sky, the divers suddenly grasped hands and drifted down as a circular formation for a few seconds.



World Record 400-way

The World Team: <http://theworldteam.com/>

They then broke off and hundreds of parachuting skydivers rained to the ground, their fists in the air and their legs kicking in triumph.

The formation jump was one of two record attempts by the group: a 960-person mass drop into Bangkok's yet-to-be-opened new international airport is supposed to take place Saturday. The World Team also holds a mass free-fall jump record of 672 unlinked skydivers over Bangkok in January 2004.

Wednesday, February 8, 2006

Forbes Magazine

<http://www.forbes.com>

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World Record 400-way

The World Team: <http://theworldteam.com/>

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Forbes Magazine:

<http://www.forbes.com>

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Forbes Magazine:

<http://www.forbes.com>



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 start out simple and progressively increase in difficulty with the arrival of your workbooks.

- 1) Which of the following is **NOT** a type of cloud:
 - a) Cumulus
 - b) Cirrus
 - c) Tropus
 - d) Stratus
- 2) True or False: All cyclones spin in the same direction.
- 3) Thunderstorms can produce which of the following (more than one answer):
 - a) Hail
 - b) Lightning
 - c) Wind
 - d) Tornadoes
- 4) When the sky is covered entirely by clouds, it is called:
 - a) Scattered
 - b) Overcast
 - c) Few
 - d) Clear
- 5) Which is a type of air mass:
 - a) Ocean
 - b) Desert
 - c) Polar
 - d) Mountain
- 6) Which of the following is **NOT** an atmospheric occurrence?
 - a) Green Flash
 - b) Sundogs
 - c) Coronas
 - d) Shimmers
- 7) These are all types of precipitation **except**:
 - a) Freezing Sleet
 - b) Virga
 - c) Freezing Drizzle
 - d) Hail
- 8) Which type of weather event usually covers the greatest in area:
 - a) Tornado
 - b) Dust devil
 - c) Hurricane
 - d) Waterspout
- 9) True or False: Pressure is measured by an instrument called a barometer.
- 10) True or False: The South Pacific is the only place in the World affected by El Nino and La Nina



Tornado

<http://www.letterealdiretore.it/fourm/testo/topic/3694-18.html>

- Answers:
- 1) c. Tropus
 - 2) False: Northern Hemisphere spin counter-clockwise, Southern Hemisphere spin clockwise
 - 3) a. Hail, b. Lightning, c. Wind, d. Tornadoes
 - 4) b. Overcast
 - 5) c. Polar
 - 6) d. Shimmers
 - 7) a. Freezing Sleet
 - 8) c. Hurricane
 - 9) True
 - 10) False: El Nino and La Nina affect the World but in different ways.

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ENSO Diagnostic Discussion

Thursday, February 9, 2006 – *Synopsis: La Nina conditions are expected to continue during the next 3-6 months.* Over the past several months most of the statistical and coupled model forecasts have trended towards cooler conditions in the tropical Pacific through mid-2006. The spread of the most recent statistical and coupled model forecasts (weak La Nina to ENSO-neutral) indicates some uncertainty in the outlooks. However, current conditions (stronger-than-average easterly winds over the central equatorial Pacific) and recent cooling trends in observed oceanic conditions support continuation of La Nina conditions in the tropical Pacific during the next 3-6 months.

Climate Prediction Center
http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/index.html

Get to Know: Michael Klatt



Captain Mike on Lake Michigan manning a 34-footer.

Hi, my name is Mike Klatt, and I am the database manager for PACRAIN/SPaRCE. I also have other duties around the EVAC office. I graduated with a B.S. in Meteorology from the University of Oklahoma (OU) in 1997, and I have been working at EVAC on various projects since then. I really like working here because it's not a typical office job. I get to do a variety of different things, and every day is different. My job requires both meteorology and computer skills, which is a combination I enjoy.

I lived in several US states before coming to Oklahoma. I was born in Wisconsin, then my family moved to Iowa, and finally to Texas. I graduated from high school in Texas, and still consider Texas home in many ways. My parents and my younger sister live in Dallas, Texas now.



Mike on Lake Thunderbird with Hadley Jerman, an OU sailing club member

I have a few hobbies that keep me busy when I'm not at work. Sailing in particular keeps me very busy. I am involved with OU's sailing club as well as other Norman-area sailing organizations. I really enjoy teaching people to sail, and I became a certified sailing instructor last year. My other passion is flying. I earned a pilot certificate while I was a student at OU, but I don't get to fly as often as I'd like--sailing is a lot less expensive than