



The Pacific Tradewinds Quarterly

The official newsletter of the Schools of the Pacific Rainfall Climate Experiment

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Blue underlined text is clickable in the electronic version of the newsletter.

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Doha climate deal hits middle of everyone's acceptance

December 9, 2012

Beijing- After around-the-clock haggling over the past 13 days in Doha, Qatar, exhausted delegates from 194 countries finally found an agreeable middle course to tackle the pressing issue of climate change.

The president of the climate conference, Abdullah bin Hamad al-Attiyah, sounded his gavel on all of the measures one

by one in the last minutes of the UN session Saturday. That came before they could be dragged into additional fruitless debate. The deal is not perfect but at it's least acceptable.

Developing countries were satisfied with the agreement that urges developed countries to boost their funding for poor countries' climate plans from 30 billion U.S. dollars per year in 2010-2012 to 200 billion

dollars annually in 2013-2020.

The latest UN climate conference extended the Kyoto Protocol, the only internationally binding treaty on cutting emissions of greenhouse gases, to the end of 2020.



In response to a call from poor countries and those most vulnerable to climate change-related damage, delegates from the

developed world gave the go-ahead for the creation of "institutional arrangements" for loss and damage in the next round of climate talks in Warsaw, Poland.

Unfortunately, countries like the United States, Canada, Japan, and New Zealand still stood outside the Kyoto Protocol and refused to commit to any binding agreement to cut CO2 emissions.

Continued on next page

The developing nations also complained that large promises of money from rich donors have not materialized. No agreement or timetable surfaced at the Doha talks on how to bridge the funding gap from next year, with the United States, Europe and other developed nations citing an economic slowdown as the excuse for refusal to provide more.

Another unsolved divergence is that countries like Russia, Belarus, and Poland, with surplus emissions allowances, or "hot air," from the first Kyoto Protocol commitment period, demand banking the credits. Europe, Australia and Japan, however, said they were not buying.

Xie Zhenhua, the head of the Chinese delegation to the Doha talks, said wealthy countries were trying to water down the principle of "common but differentiated responsibilities" (CBDR) in order to evade their historical responsibility for climate change.



Ban Ki-moon said it was time to 'prove wrong' those who still have doubts about global warming

(RTE News/ World Images)

Greenhouse gas emissions, set to rise 2.6 percent this year, are more than 50 percent higher than in 1990.

Global temperatures have already risen by 0.8 Celcius degrees since pre-industrial times. Two degrees is viewed as a threshold to dangerous climate change, including stronger storms, more

heatwaves, droughts, melting icebergs and rising sea levels.



A general view shows the opening ceremony of the 18th United Nations (UN) climate change conference in Doha on November 26, 2012. Nearly 200 world nations launched a new round of talks in Doha to review commitments to cutting climate-altering greenhouse gas emissions. (KARIM JAAFAR/AFP/Getty Images)

The impending danger sounds a big alarm for mankind and tests the collective efforts and wisdom of the world.

It is understandable that different countries of varied levels of development are widely divided on their capabilities to deal with climate change and their goals.

Compromise can bring about positive results. But the world is expecting active engagement and strong commitment of all countries, especially the global leaders, to save the planet.

Scientists 'undiscover' South Pacific island

November 23, 2012

Frances Cha

An international scientific expedition has revealed a South Pacific island roughly the size of Manhattan and clearly marked on online maps and marine charts does not, in fact, exist.

The 'undiscovery' of the island -- which until now was midway between Australia and New Caledonia -- highlights how much there still is to learn about the oceans, scientists say.

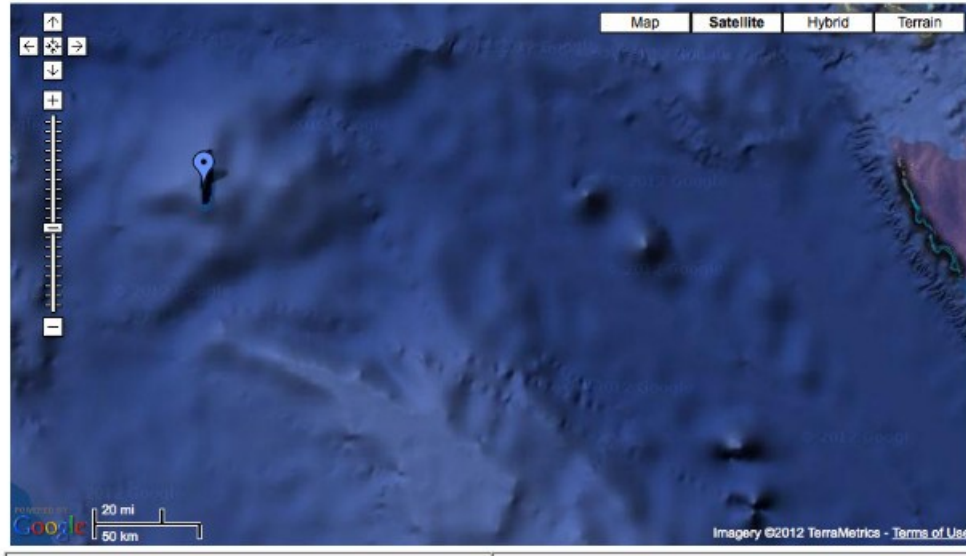
"We saw this mysterious island on all the scientific maps and weather maps but not on this one navigational chart that was on our ship," Ph.D student Sabin Zahirovic, part of the research team on board the RV Southern Surveyor, told CNN. "So we decided to go see if it was actually there."

The island, identified as Sandy Island by Google Maps and Sable Island on others, was supposed to be quite large in size -- 156 square kilometers (60 square miles) -- but the ship sailed right through the area where the island was supposed to be.

"The captain was actually quite nervous because the island was showing up on all the

maps," Zahirovic said.

The undiscovery was made during the ship's voyage this month. Although the team had originally planned to check out the existence of the island during the day, they had arrived at the location of the island at night due to a navigational error.



The 'undiscovery' of the island -- which until now was midway between Australia and New Caledonia -- highlights how much there still is to learn about the oceans, scientists say.

"We were watching all of our depth-sounding equipment. Luckily for us the sea floor turned out to be very deep there," said Zahirovic, who is studying the tectonic evolution of the eastern Coral Sea.

Although the undiscovery of the island was not part of the original research mission of the international team of scientists led by University of Sydney's Dr. Maria Seton, the implications of the wrong maps are significant.

"All the scientific cartography relies on these maps, and numerical simulations of waves and currents depend on size of these land forms," said Zahirovic.

"It just goes to show the oceans are so underexposed. It's actually really shocking that we have not found more islands."

When asked about the Google Maps mistake, a Google spokesperson told CNN that keeping on top of changes is a "never-ending endeavor," and that Google will continuously explore ways to integrate new information from users.

Company Says It Can Make Fuel out of Thin Air

October 23, 2012

Emma O'Connor

A small British company has claimed it can create gasoline out of thin air, and it seems to be for real. According the *Independent*, the company has produced the first batch of “petrol from air” by employing innovative technology that removes carbon dioxide from the atmosphere.

Since August, England-based Air Fuel Synthesis has created five liters—or about 1.32 gallons—of gasoline by combining carbon dioxide extracted from air with hydrogen from water to form a basic hydrocarbon — the essential ingredient of gasoline, the *Independent* reported. The company’s chief executive, Peter Harrison, shared the development at a Friday conference at the Institution of Mechanical Engineers in London.

Fox said to the newspaper that Air Fuel Synthesis has a small pilot plant that “uses well-known and well-established components” to extract carbon dioxide from air, but it is the first one to “put the whole thing together” to make it work.

The *Daily Mail* reported that the company mixes air with sodium hydroxide, then electrolyzes the resulting sodium carbonate. This releases carbon

dioxide, which is then combined with electrolyzed hydrogen from water to create a hydrocarbon solution that can be used as fuel.

The process is, of course, still in its early stages and it relies on electricity from the national grid, *The Independent* noted. Air Fuel Synthesis intends to move to a larger, commercial plant in the coming years, according to the newspaper, and it would like to create eco-friendly aviation fuel. The company said it may be able to forgo electricity in the future and instead rely on renewable power sources, such as wind farms.

The *Independent* describes such an innovation as “the holy grail of the emerging green economy,” as it does not emit the polluting greenhouse gases of traditional oil and coal. Harrison said it could revolutionize contemporary environmental and economic landscapes.

Harrison said his company’s new petroleum product could soon prove helpful to remote or island communities that have renewable electricity sources—such as solar and wind energy—but do not have a way to store it. Right now, however, the prototype system remains too inefficient to operate on a large scale, the *Independent* noted. According to the *Daily Mail*, price is also an issue, as the extraction of one ton of carbon monoxide can currently cost as much as \$650.

Still, technology expenses are expected to decrease significantly, and the *Daily Mail* said experts have praised the Air Fuel Synthesis breakthrough as a possible “game changer.”



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(<http://newsfeed.time.com/2012/10/23/company-says-it-can-make-fuel-out-of-thin-air/>)

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Pacific fisheries meet 'fails to end tuna overfishing'

December 10, 2012

Prime Sarmiento

Manila A five-day meeting on fisheries ended last week amid complaints that big fishing nations have blocked efforts to curb tuna overfishing and ignored scientific advice. The accusations were made following the ninth regular session of the Western and Central Pacific Fisheries Commission, which is the governing body for an international fisheries agreement that seeks to ensure the conservation and sustainable use of highly migratory fish, such as tuna, in parts of the Pacific Ocean.

Nanette Malsol, chair of the Parties to the Nauru Agreement (PNA), a management body for sustainable fisheries that represents eight nations in the Oceania region, said the commission had "failed to take its responsibilities seriously regarding the fate of tuna".

Speaking to *SciDev.Net*, Gerry Leape, the head of the US-based Pew Environment Group's delegation, added: "The commission has ignored the scientific advice that we need to stop overfishing and chose instead to protect its individual interests".

Leape was disappointed that delegates preferred to discuss "how much overfishing to allow, rather than how to end it". Unless overfishing in the tropical seas can be controlled, global tuna stocks will continue to decline, he said.

Malsol said: "The big fishing nations did not make any significant commitments to cut their overfishing of bigeye tuna. It is the big fishing nations of the EU, and the US and Japan that have historically overfished this tuna," noting that the bigeye is fished at 40 per cent above the sustainable level.

Other members agreed to voluntarily cut their

longline catch by ten per cent and two per cent respectively, she said. But this is way below the 30 per cent reduction in the total catch by all methods that the PNA and conservation groups were calling on every country to make.

Every year, thousands of vessels catch more than four million tonnes of tuna, with at least 60 per cent being taken from the western and central Pacific regions, according to Pew.

But overfishing due to growing consumer demand and harmful fishing practices have depleted tuna stocks, according to Pew. The International Union for Conservation of Nature has put yellowfin and albacore tuna in the "near threatened" category and classified bigeye as "vulnerable".

Despite the disappointment over the lack of significant steps to tackle overfishing, Malsol welcomed the commission's decision to tighten controls on illegal fishing and to ban the setting of fishing nets around whale sharks.

The commission also agreed to further limit the use of floating "fish aggregating devices" (FADs) that lure fish to make it easier for ships to haul them in. The period during which these are banned will rise from three to four months of the year. Pew estimates that 47,000 to 105,000 of these devices are put into the world's oceans every year.

Adam Baske, Pew's tuna campaign manager, said the 'purse seine' nets that are used to catch fish attracted by the FADs capture everything around the devices, accidentally killing juvenile tuna and other marine animals such as sharks, stingrays and turtles. The devices are also becoming a marine nuisance, with debris ending up in coral reefs, he said.



Growing consumer demand is hitting tuna stocks
Ali San

Killed-Off Corals Hold Clues to Earthquake Prediction

December 6, 2012

Becky Oskin

Some of the biggest coral die-offs in recorded history happened in 2004 and 2005, after massive earthquakes in Sumatra.

Now, researchers report similar evidence of ancient massive coral kills on Simeulue Island, caused by ancient earthquakes. An analysis of the fossil coral beds provides clues to the history of megaequakes in the region, and could help predict future quakes, researchers said Monday at the annual meeting of the American Geophysical Union.

Simeulue Island lies off the west coast of Sumatra, where the 2004 earthquake stopped and the 2005 shaker began to rip the fault apart. Earthquakes of this size may break a fault for hundreds of miles.

The 2005 magnitude-8.7 earthquake lifted the southern end of Simeulue Island more than 1.5 meters, killing the exposed parts of the large, circular coral "micro atolls," which resemble cinnamon buns.

But the northern part of the island remained stationary during the 2005 earthquake, said Aron Meltzner, a research fellow at the Earth Observatory Institute of Singapore. The reverse holds true for 2004's megaquake, the giant magnitude-9.1 that hit on Dec. 26. That quake stopped just midway through Simeulue Island.

Meltzner found a similar dichotomy stretching as far back as 1394 — none of the major uplifts in northern Simeulue extended into the south.

Sumatra experiences frequent earthquakes because it is the meeting point of two of Earth's tectonic plates. Underneath Indonesia, one plate is

sliding beneath another, forming what's called a subduction zone. The plates don't slide smoothly past one another. They get stuck, and energy builds up until they finally slip past one another, releasing the stored energy as an earthquake.

The coral remains not only record past earthquakes on the subduction zone, they reveal clues as to how energy builds up between earthquakes, a phenomenon called interseismic subsidence.

The coral growing along Sumatra's island coastlines tends to grow outward when sea levels fall. The growth pattern recorded in their fossilized remains resembles tree rings, and reveals clues

to past trauma, such as sudden shifts in sea level from earthquake uplift.

At Nias Island, south of Simeulue, fossil coral shows the land bends down, or subsides, between earthquakes, storing up energy. The island pops up again after a large earthquake, Meltzner said.

"For the 2005 patch of the fault, we know earthquakes smaller than 2005 may occur, but we're starting to believe that the largest earthquakes on the Nias–Southern Simeulue patch of the fault are similar to the earthquake in 2005," he said.

Finding a predictable rupture length, and figuring out how much ground was displaced is a step toward predicting the size of future earthquakes, Meltzner said. "If we can show that a particular portion of a fault behaves consistently in terms of rupture extent and amount of displacement, then we can anticipate that future earthquakes will be similar to past earthquakes," he said.

But north of the Simeulue midpoint, where the deadly 2004 quake struck, the pattern is not at all consistent, he said. "I think there are some processes here that we don't understand, and the corals are beginning to hint at that," Meltzner said, something future study will have to elucidate.



Photo by Aron Meltzner

Greenhouse target 'still achievable', despite a sharp rise in emissions



December 3, 2012

Graham Lloyd

The increased use of natural gas has enabled the United States to cut its carbon emissions by 1.4 per cent a year since 2005.

HISTORY showed it was still possible to reduce carbon dioxide emissions sufficiently to meet a UN target of keeping a global temperature rise to below two degrees Celsius, a new report has said.

This mirrored savings achieved in Europe.

Overall, the latest Global Carbon Project calculations

present a grim picture.

Global cost emissions have increased by 58 per cent since 1990.

The most recent figure is estimated from a 3.3 per cent growth in gross domestic product and a 0.7 per cent improvement in the carbon intensity of the economy.

The study says the growth in emissions has put the planet on track for warming that could breach five degrees Celsius by 2100.

The research compared recent carbon dioxide emissions with emission scenarios used to project climate change by the IPCC.

Dr Pep Canadell said limiting global temperature rise to two degrees Celcius would require "an immediate, large, and sustained global mitigation effort."

However, the report said even though current emissions were tracking the higher scenarios, it was still possible.

"The historical record shows that some countries have reduced CO2 emissions, through a combination of policy intervention and economic adjustments to changing resource scarcity," the report said.

The oil crisis of 1973 led to new policies on energy supply and energy savings, which produced a decrease in the share of fossil fuels in the energy mixes of Belgium, France, and Sweden, with emission reductions of four to five per cent a year sustained over 10 or more years.

A continuous shift to natural gas led to sustained mitigation rates of one to two per cent a year in the UK in the 1970s and the 2000s, and 1.4 per cent a year since 2005 in the USA.

"These examples highlight the practical feasibility of emission reductions through fuel substitution and efficiency improvements," it said.

The report authors said early action was required from the largest emitters, including China and the United States.

Contribute to the Newsletter!

Put Your Story in the SPaRCE Newsletter!

In order to get to know our schools and participants a bit better, please send us items to be published in the SPaRCE newsletter.

Here is a list of ideas:

- ☐ Accounts of extreme weather events
- ☐ School history
- ☐ Pictures of students taking measurements
- ☐ Activities using SPaRCE data
- ☐ Songs or poems about weather
- ☐ Any other interesting facts about your school or culture.

Ask A Meteorologist!

Do You Have Questions?
We Want To Answer Them!

If you or your students have any questions relating to science or weather please send them to us here at SPaRCE. Once we receive a question we will publish the question and an answer in the next newsletter.



Activities Page

Beach Word Search

R R L S E V O L G R L L O
T S K N I T C A P S R W S
I N D S T D L O C S S N E
E A S T M E R F C E O P S
O G K O E I R A L W T A S
T G N O I E T C Z C S R L
B O K B E T I T F Z L K E
S B D Z E C S S E R I A C
P O E E I D K T E N O L I
O T L I L N I E O T S S B
C S A M T S I R H C A G T
S O T C O N N O F T Z K C
S C A R F I G E L I A T S

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http://www.puzzles.ca/wordsearch/kids_beach.html

Sudoku

Complete the grid such that every row, every column, and the nine 3x3 blocks contain the digits from 1 to 9.

8	5							3
			5				1	
6			8	2	3		4	
		3	7	9	5			4
				4				7
	6	7				5		
	1					4	7	
	4			8	1	2		6
5	2	8	4	7				

BLIZZARD ICE
BOOTS ICICLES
CHRISTMAS KNIT CAP
COLD MITTENS
FREEZE PARKA
FROST SCARF
GLOVES



Puzzlers

- You are a treasure hunter, looking for a large sum of gold behind one of four doors. The inscriptions on each door read as follows:

Door A: It's behind B or C
Door B: It's behind A or D
Door C: It's in here
Door D: It's not in here

Your powers of deduction have told you three of the inscriptions are false, and one is true. Behind which door will you find the treasure?

- I can be quick and then I'm deadly,
I am a rock, shell and bone medley.
If I was made into a man, I'd make people dream,
I gather in my millions by ocean, sea and stream.

Look for answers in the next newsletter!

Previous newsletter puzzle answers:

Puzzler Answers

- Throw the ball straight up in the air.
- She was walking.

Sudoku

Word Search

T V P C E S G T V C A R A
T A O B P W O N P D K Z D
R F C E A I D W I N R U
S E S I I M R O T L A A L
D T W V L S A E C U T S S
U N I E M U O I G E E A U
O U M C H I B E N V A E S
L S M B X T F J A N I N O
C O I N Z T R W Y K X T B
F B N R L O U K W A T E R
F G G F V H S I F R A T S
B B E A C H B A L L V P G
N L L L E H S A E S R C J

4	7	6	1	8	9	3	2	5
3	8	2	7	6	5	4	1	9
1	9	5	3	4	2	7	6	8
6	3	1	8	7	4	5	9	2
2	4	9	5	3	6	8	7	1
7	5	8	9	2	1	6	3	4
5	2	7	6	1	8	9	4	3
8	1	3	4	9	7	2	5	6
9	6	4	2	5	3	1	8	7

Puzzles devised by: Livewire Puzzles and Braingle

(<http://www.puzzles.ca/index.html>) (<http://www.braingle.com/Logic.html>)

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Classroom Science Focus: Making Fog in a Jar!

The purpose of this experiment is to observe fog formation.

Fog is a cloud that touches the ground or the surface of a body of water.



Stuff you will need!

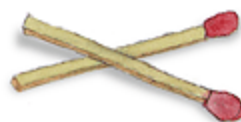
Black paper

Gallon (4 liters) jar

Colored warm water

Matches

Gallon (4 liters) size bag of ice



Make it happen

1. Tape the black paper on the back of the jar, so you can't see through the jar.
2. Fill one third of the jar with colored warm water.
3. Light the match and hold it over the jar opening.
4. After a few seconds, drop the match into the jar and cover the top of the jar with the bag of ice.
5. Record your observations.



What's happening?



Can you see anything happening inside the jar?

You should see a little cloud form. Repeat the experiment until you do.

Why does the cloud form?

The warm water heats the layer of air that it touches. Some of the water evaporates into the air forming water vapor. The warm air containing water vapor rises, and then cools, as it comes in contact with the air cooled by the ice. When the water molecules cool, they slow down and stick together more readily. The particles of smoke act as nuclei for "bunches" of water molecules to collect on. This process is called condensation.

What does this have to do with the weather?

As the atmosphere (air) cools, water vapor suspended in the atmosphere condenses into water droplets around condensation nuclei (tiny particles of dust, ash, pollutants, and even sea salt).

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ENSO Discussion

Issued by the Climate Prediction Center/NCEP, 6 December 2012

ENSO Alert System Status: Not Active

Synopsis: ENSO-neutral is favored for Northern Hemisphere winter 2012-13 and into spring 2013.

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sparce.evac.ou.edu/



photo: wikipedia media/ThumbPress.com



photo: wikipedia media/ThumbPress.com



During November 2012, the Pacific Ocean reflected ENSO-neutral conditions. Equatorial sea surface temperatures (SST) anomalies were slightly positive across all of the tropical Pacific Ocean except for the far eastern portion, as also indicated in the Niño indices. The oceanic heat content (average temperature in the upper 300m of the ocean) was also slightly above average, with largest amplitude in the east-central part of the basin. Despite the subsurface and surface Pacific Ocean being slightly warmer than average, the tropical atmosphere remained in an ENSO-neutral state. Upper-level and lower-level zonal winds were near average, and convection was slightly suppressed over the eastern and central tropical Pacific. Thus, both the atmosphere and ocean indicated ENSO-neutral conditions.

Relative to last month, the SST model predictions increasingly favor ENSO-neutral, with many remaining just slightly above average in the Niño-3.4 region through the Northern Hemisphere winter 2012-13 and into spring 2013. While the tropical atmosphere and especially the ocean suggested borderline ENSO-neutral/ weak El Niño conditions at times from July to September, these signs have now largely dissipated. Therefore, it is considered unlikely that a fully coupled El Niño will develop during the next several months. ENSO-neutral is now favored through the Northern Hemisphere winter 2012-13 and into spring 2013 (see [CPC/IRI consensus forecast](#)).

This discussion is a consolidated effort of the National Oceanic and Atmospheric Administration (NOAA), NOAA's National Weather Service, and their funded institutions. Oceanic and atmospheric conditions are updated weekly on the Climate Prediction Center web site ([El Niño/La Niña Current Conditions and Expert Discussions](#)). Forecasts for the evolution of El Niño/La Niña are updated monthly in the [Forecast Forum](#) section of CPC's Climate Diagnostics Bulletin. The next ENSO Diagnostics Discussion is scheduled for 5 July 2012. To receive an e-mail notification when the monthly ENSO Diagnostic Discussions are released, please send an e-mail message to: ncep.list.ens0-update@noaa.gov.