



SOUTH AMERICA ENVIRONMENT, SCIENCE, TECHNOLOGY, AND HEALTH NEWSLETTER

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PERU: Conference on Agroforestry by ECPA Senior Envoy Fellow

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Next events:

- **May 31, 2012**
World No Tobacco Day.
- **June 5, 2012**
World Environment Day
- **June 20-22, 2012**
Rio+20 Earth Summit, Brazil
- **July 30-August 3, 2012**
2012 Winter International Scientific Encounter
<http://www.encuentrocientificointernacional.org/>
- **October, 2012**
COBER

The South America Environment, Science, Technology and Health Office (REO) worked with the Public Affairs Section (PAS) at the U.S. Embassy in Lima, to bring ECPA (Energy and Climate Partnership of the Americas) Senior Envoy Fellow Florencia Montagnini to Lima and Ucayali in Peru. Dr. Montagnini is Director of the Yale Institute for Sustainable Forestry and an expert in sustainable forestry and Agroforestry Systems. Dr. Montagnini delivered a keynote address at a conference organized by the Regional Government of Ucayali on May 3, 2012 to more than 60 people from the government, private sector, and civil society.

Dr. Montagnini said that Agroforestry systems began in the 1980's as an idea to harmonize agricultural practices with forest conservation. Today, agroforestry provides a wide variety of environmental services including carbon capture mechanisms, climate change adaptation practices, biodiversity protection, REDD+ schemes, and many others. Montagnini also mentioned that Agroforestry systems are not the panacea, and that a combined forestry systems strategy tailored to local realities should be contemplated as optimal for forest sustainability.

Agroforestry Systems is a priority for the Yale Institute for Sustainable Forestry, which includes focus in biodiversity conservation, carbon capture, payment for environmental services (PES), ecosystem forest conservation, native species reforestation, and climate change adaptation and mitigation. The Institute has projects in Mexico, Central America, Colombia, Brazil, Paraguay, Argentina, and Uruguay. Dr. Montagnini said that PES schemes under agroforestry practices seek to compensate farmers for trees taking up land used for agricultural expansion and resulting in a loss of agricultural productivity.

Dr. Montagnini mentioned that REDD projects usually do not allow an increase in the agricultural frontier and Agroforestry Systems offer a viable alternative for sustainable agricultural practices within a REDD framework. REDD projects in Latin America are available currently in Colombia, Ecuador, Peru, Brazil, Bolivia, Uruguay, and Paraguay. Brazil has the largest number in the region. Peru is considered a leader its unique biodiversity systems and the particular methodologies used for their conservation. It is considered as one of the countries with potential for the highest emissions reductions with lower cost per ton of CO2. There are a total of 35 REDD projects in Peru (the majority in the design phase), most of them located in Madre de Dios. Ucayali has 7 projects. The four largest REDD projects cover an area of 2.5 million hectares.

Since 2005, Ucayali has been using Agroforestry systems for cacao growth in the Padre Abad area. A farmers' association, with technical support from ICRAFF, is currently using this mechanism to seek additional income from the carbon capture and sequestration. As for African Palm, which is one of the major crops developed in Ucayali, Montagnini said that it has been developed with black pepper and cassava crops in Brazil (Bahia) with some level of success. Yet, this method has only been applied at initial stages of the agroforestry system cycle as it tends to create excessive shelter impeding the successful development of other agricultural crops.



Dr. Florencia Montagnini, ECPA Senior Envoy, during conference on Agroforestry at the Regional Government of Ucayali.

The information contained herein was gathered from news sources from across the region, and the views expressed below do not necessarily reflect those of the Regional Environmental HUB Office or of our constituent posts.

Addressees interested in sharing any ESTH-related events of USG interest are welcome to do so. For questions or comments, please contact us at quevedoa@state.gov.

** Free translation prepared by REO staff.*

SCIENCE: A New Process to Produce Electric Energy in Nuclear Plants is being tested*

Princeton University has announced breakthrough research developed by the university's Dr. Delgado-Aparicio and Dr. Gates on how to secure an endless, safe, and clean energy source. The finding would enable development of fusion as a source of low cost electric energy worldwide.

The fusion process reverses nuclear energy by joining hydrogen particles rather than dividing them until they turn into helium under temperatures that can reach 150 million degrees (the same work that the Sun undergoes to keep shining). Recreating this process on Earth is extremely complicated, given the need to keep these high temperatures.

Dr. Delgado-Aparicio and Dr. Gates from the Plasma Physics Lab at Princeton University discovered unclean bubbles during the fusion process that seem to prevent reactors from working efficiently.

The theory represents a new approach for density limits, known as the Greenwald Limit. The scientists are now testing whether injecting energy into the bubbles would create more density and help future reactors achieve the 100 million degrees required by fusion. Fusion energy then might become the main energy source in the future as it would be practically endless. Nevertheless, it is not yet economically viable due to its high costs. "We expect to confirm our hypothesis in the next 10 or 12 months" said Peruvian Delgado-Aparicio. "This adventure has been exciting, as both David Gates and myself are experimental physicists, and although the theoretical frame developed seems irrefutable, we must go through rigorous scientific testing. There is no better proof than the experimental" he added.

What would happen if they are able to demonstrate that fusion is easier by bubble manipulation? It would be one of the most important findings in recent years, as it would remarkably reduce fusion production costs.

Read more at: <http://noticias.universia.edu.pe/en-portada/noticia/2012/05/03/926958/fisico-peruano-realiza-gran-hallazgo.html>



Photo by Henning Leweke. Under Creative Commons License.

SCIENCE: Artificial Leaf Makes Fuel from Sunlight

By David L. Chandler

Solar cell bonded to recently developed catalyst can harness the sun, splitting water into hydrogen and oxygen.

Researchers led by MIT professor Daniel Nocera have produced something they're calling an "artificial leaf": Like living leaves, the device can turn the energy of sunlight directly into a chemical fuel that can be stored and used later as an energy source. The artificial leaf — a silicon solar cell with different catalytic materials bonded onto its two sides — needs no external wires or control circuits to operate. Simply placed in a container of water and exposed to sunlight, it quickly begins to generate streams of bubbles: oxygen bubbles from one side and hydrogen bubbles from the other. If placed in a container that has a barrier to separate the two sides, the two streams of bubbles can be collected and stored, and used later to deliver power: for example, by feeding them into a fuel cell that combines them once again into water while delivering an electric current.

The creation of the device is described in a paper published Sept. 30 in the journal *Science*. Nocera, the Henry Dreyfus Professor of Energy and professor of chemistry at MIT, is the senior author; the paper was co-authored by his former student Steven Reece PhD '07 (who now works at Sun Catalytix, a company started by Nocera to commercialize his solar-energy inventions), along with five other researchers from Sun Catalytix and MIT. The device, Nocera explains, is made entirely of earth-abundant, inexpensive materials — mostly silicon, cobalt and nickel — and works in ordinary water. Other attempts to produce devices that could use sunlight to split water have relied on corrosive solutions or on relatively rare and expensive materials such as platinum.

The artificial leaf is a thin sheet of semiconducting silicon — the material most solar cells are made of — which turns the energy of sunlight into a flow of wireless electricity within the sheet. Bound onto the silicon is a layer of a cobalt-based catalyst, which releases oxygen, a material whose potential for generating fuel from sunlight was discovered by Nocera and his co-authors in 2008. The other side of the silicon sheet is coated with a layer of a nickel-molybdenum-zinc alloy, which releases hydrogen from the water molecules.

Read full article at: <http://web.mit.edu/newsoffice/2011/artificial-leaf-0930.html>



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SCIENCE: Sixth Taste Theory Gets Support from New Study

Growing up, many of us were taught that the tongue could detect four essential tastes: sweet, salty, sour and bitter. Everything else, we were told, was a product of aroma and texture. But it always seemed like those four weren't enough to explain the whole range of tastes... could it really be that the only taste behind the deliciousness of a butter-doused morel mushroom, or a perfectly grilled steak, was salty?

The wide acceptance of umami, or savoriness, as the fifth taste helped some. (It was originally discovered by Japanese researchers at the dawn of the 20th century, but it's only been universally approved in the past couple decades.) Still, though, what about croissants? French fries? Are they really so delicious just because of their texture and smell?



Photo by Edsel Little. Under Creative Commons

Some researchers think not. An increasingly vocal group of food scientists believe that "fatty" represents a sixth taste entirely.

A widely-reported study supporting the idea of "fatty" as the sixth taste was published in March of 2010, by Russel Keast of Deakin University in Australia. And yet another came to light just this week. Both the studies predicate fatty's status as the sixth taste on the ability of some people to correctly identify 'fattiness' in the absence of the telltale signs of fatty foods. The theory goes that, if people can pick out fatty acids in foods that aren't luscious or crispy, and don't smell like rendering fat, that must mean that the tongue can respond to "fattiness" in the same way, or at least a similar way, to salt or sugar.

For the new study, researchers at Washington University in St. Louis asked 21 individuals with BMIs over 30 to taste three different solutions with the same texture. One of those solutions contained a small amount of fatty oil. The researchers asked the subjects to identify which of the solutions tasted fatty.

What they found was that some people were very adept at picking out the fatty solution and others were not. And many of those most able to identify "fattiness" shared high levels of the protein CD36, which suggests a genetic, biological basis for the taste sensation, rather than just a learned affinity.

Pretty soon, then, you might see a "fatty" condiment on your table right next to the salt and sugar. Oh wait: that's just olive oil or butter. Bring it on!

Read more: http://www.huffingtonpost.com/2012/01/13/fatty-sixth-taste_n_1204200.html

HEALTH: Scientists Hunt Ways to Stall Alzheimer's Earlier

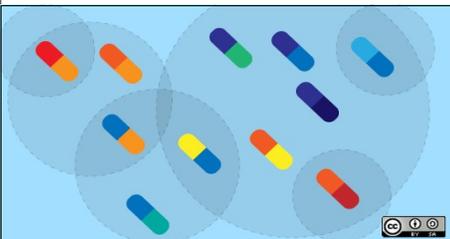
By Lauran Neergaard

Look for a fundamental shift in how scientists hunt ways to ward off the devastation of Alzheimer's disease — by testing possible therapies in people who don't yet show many symptoms, before too much of the brain is destroyed.

The most ambitious attempt: An international study announced Tuesday will track whether an experimental drug can stall the disease in people who appear healthy but are genetically destined to get a type of Alzheimer's that runs in the family. If so, it would be exciting evidence that maybe regular Alzheimer's is preventable too.

A second study will test whether a nasal spray that sends insulin to the brain helps people with very early memory problems, based on separate research linking diabetes to an increased risk of Alzheimer's.

The new focus emerges as the Obama administration adopts the first national strategy to fight the worsening Alzheimer's epidemic — a plan that sets the clock ticking toward finally having effective treatments by 2025. But a meeting of the world's top Alzheimer's scientists this week made clear that meeting the 2025 deadline will require developing a mix of treatments to attack the different ways that Alzheimer's damages the brain — much like it can take a cocktail of drugs to treat high blood pressure or the AIDS virus.



Perhaps more importantly, it will require testing possible drugs before full-blown Alzheimer's sets in, when it may be too late to do much good. After all, Alzheimer's starts ravaging the brain at least a decade before memory problems appear. And doctors don't wait until the worst symptoms appear before treating heart disease, cancer or diabetes, noted Dr. Reisa Sperling of Harvard Medical School.

Click on each tag to see the document signed that year: <http://news.yahoo.com/scientists-hunt-ways-stall-alzheimers-earlier-212003139.html>

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ENVIRONMENT: A Timeline of Environmental Treaties

During the past half century, we learned we share a fragile biosphere. Our view of life on Earth, whether through a microscope or from a space station, is colored by the knowledge that everyday human activities can threaten our future.

This list of key environmental treaties shows how nations are working together, politically and scientifically, to safeguard our planet and respond to a global threat. The United States, whose pollution control laws serve as models for other nations, remains a leader in identifying, mitigating and remediating environmental hazards. It is a party to nearly all these international pacts.

This list of key environmental treaties shows how nations are working together, politically and scientifically, to safeguard our planet and respond to a global threat.

Click on each tag to see the document signed that year: <http://iipdigital.usembassy.gov/st/english/gallery/2012/02/2012021711105.html#ixzz1usCPicpk>



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WATER: Women and the Environment

By Cate Owen



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“The world’s women are the key to sustainable development, peace and security,” U.N. Secretary-General Ban Ki-moon told participants at the Earth Institute’s State of the Planet meeting at Columbia University, in New York City, in March 2010. Because women are the chief resource managers for their families in many parts of the world, their engagement in remedies for and adaptation to climate change is essential.

Across the regions and cultures of the world, women play critical roles in relation to their natural environment. Often deeply dependent on available natural resources for food, fuel and shelter, women can be particularly vulnerable to environmental changes or threats. Because women’s workload is often centered on managing natural resources, biodiversity and ecosystems, their experiences and perspectives are essential to sustainable development policymaking and actions at every level, for a healthy planet for generations to come.

Resource Managers. Women in the developing world are predominantly responsible for management and conservation of resources for their families. Women spend vast amounts of time collecting and storing water, securing sources of fuel, food and fodder, and managing land — be it forest, wetlands or agricultural terrain. As women are primary caregivers to children, the elderly and the sick, whole communities rely on them. Their traditional and generational knowledge of biodiversity, for example, supplies communities with medicines, nutritional balance and crop rotation methods. When drought, erratic rainfall or severe storms affect access to these basic resources, women’s lives — and their families’ lives — can be intensely affected. In fact, studies have shown that natural disasters disproportionately hit women, lowering female life expectancy rates and killing more women than men, especially where levels of gender equality are low.

International Agreements. International agreements have made crucial links between women and the environment; the challenge is to take action. The Convention on the Elimination of All Forms of Discrimination against Women (1979), an international “bill of rights” for women, addresses a host of environmental issues. Likewise, the Beijing Platform for Action, an outcome of the Fourth World Conference on Women (1995), includes an entire chapter on women and the environment. It foreshadowed the different impacts global warming would have on women and men, which are now evident across the globe.

Major sustainable development treaties, also, have acknowledged the specific need for women’s participation and for a mainstreamed gender perspective. The 1992 United Nations Earth Summit (UNCED) produced two key Conventions — on biological diversity and on combating desertification — that have served as guides for implementation of environmental actions from a gender perspective. The overall UNCED document, Agenda 21, included a specific chapter on gender, which highlighted the important role women play in industrialized countries as sustainable consumers. Indeed, the links between women and environment are not solely concentrated in the global South (i.e., developing countries). Studies have shown that women in the North (i.e., developed countries) have a smaller carbon footprint than men, making the majority of “greener” decisions at the household level and for travel (government of Sweden, 2007).

Read more: <http://iipdigital.usembassy.gov/st/english/publication/2012/02/20120228122819ael0.8032582.html#ixzz1usGx4M9o>

CONSERVATION: U.S. Awards Wildlife Conservation Grants for 60 Countries



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Partners in 60 countries in six regions will share nearly \$15.5 million in wildlife conservation grants from a U.S. agency to protect endangered wildlife.

The U.S. Fish and Wildlife Service (USFWS) is awarding the grants through its Wildlife Without Borders program. “These grants provide crucial assistance in the effort to prevent extinction by reducing threats to species survival and increasing the capacity of communities to value, conserve, and manage their wildlife,” said USFWS Director Dan Ashe. “The Service’s Wildlife Without Borders program funding is vital to saving some of our fastest disappearing and most treasured species, empowering people to help conserve key habitats, and form innovative conservation partnerships worldwide.”

The \$15,484,700 in grant funding will leverage more than \$22 million in matching funds through partnerships with more than 170 nonprofit organizations, government agencies, universities and community groups. Of the \$15.5 million total, \$12.5 million will conserve tigers, elephants, rhinos, apes, marine turtles, amphibians and other critically endangered species through Wildlife Without Borders-Species grants.

Wildlife Without Borders-Regional grants will provide \$2.9 million in support for capacity building and technical assistance in Africa, Latin America and the Caribbean, Mexico, and Russia and East Asia. The Wildlife Without Borders-Global program will also provide \$100,000 for migratory species conservation through the Western Hemisphere Migratory Species Initiative.

Funding will support a full range of priority conservation activities, USFWS said, including antipoaching, law enforcement, capacity building, community outreach, habitat restoration, disease research and mitigation of human-wildlife conflict. For example, in South Africa, CapeNature, a governmental organization, will control invasive pine trees to reduce the risk of catastrophic fire in rough moss frog habitat. In Colombia, Fundación Proyecto Titi will aid rural communities with sustainable development projects to reduce deforestation in cotton-top tamarin habitat.

The Wildlife Without Borders program is based on the fact that species do not recognize artificial boundaries — political or otherwise. USFWS says that too often political boundaries cut through specific ranges, fragmenting habitats and species conservation efforts. Further complicating the issue, according to USFWS, is that countries with the most diverse and ecologically significant wildlife often are those with the fewest resources for wildlife conservation. The result, USFWS says, is that species survival is related directly to their worth to local communities. Therefore, the Wildlife Without Borders program focuses on people by addressing grass-roots problems from a broad landscape perspective using capacity building and strengthening institutions as primary tools.

The three subprograms of Wildlife Without Borders — Species, Regional and Global — have supported more than 1,000 conservation projects in 80 countries from 2004 to 2008.

Read more: <http://iipdigital.usembassy.gov/st/english/article/2012/02/20120221131032su0.6999737.html#ixzz1usFhbL6O>

Brazil: Multipurpose Reactor will Guarantee Nuclear Independence*

The first Brazilian large-scale multipurpose nuclear reactor project (RMB according to its initials in Portuguese), established in 2007 as one of the goals in the Action Plan of the Ministry of Science, Technology and Innovation, is becoming a reality. The equipment has a value of US\$426 million.

The reactor will be able to produce radioisotopes for use in nuclear medicine, such as cancer tests and treatments, and will also be used for research in nuclear technology, energy, agriculture, industry, material science, and environment.

In Brazil, close to 1.5 million radiopharmaceutical procedures are performed every year. More than 80% of them use technetium-99, an isotope derived from molybdenum-99 which is not being produced in the country. This isotope and other radioactive elements currently being used in the health system and not produced by smaller local reactors, add up to imports of more than US\$15 million per year. The Multipurpose reactor will be ready by 2017 and will have a useful life of 50 years. It is estimated that radioisotope production alone will be enough to cover the investment in 20 years. RMB will also allow Brazil to enter the radioisotope market currently dominated by Canada, South Africa, Belgium, and France.



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Read more: <http://oglobo.globo.com/ciencia/reator-multi-proposito-vai-garantir-independencia-nuclear-do-brasil-3903559>