

FALL 2008

# Explore

Research at the University of Florida



**Reef Relief**  
**Giving Grouper**  
**Room to Grow**

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FLORIDA



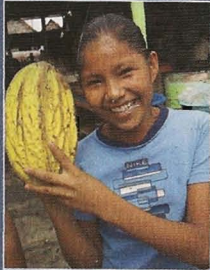
## Explore Fall 2008

**Reef Relief**  
Growing Grouper



**12**

**Cinderella Fruits**  
Bountiful Harvest



**18**

**Vantage Point**  
Charting Change



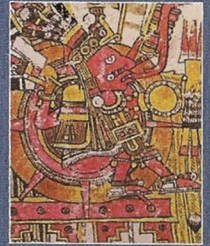
**24**

**Schools Without Walls**  
Cyber Classrooms



**30**

**Codex Moment**  
Art & Astronomy



**36**

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Photography by Nigel Smith



*Nuts of macambo, a relative of cacao, roasting in a street market in Iquitos, Peru. Roasted macambo nuts may one day be found on supermarket shelves next to peanuts, cashews and macadamia (they taste like a blend of all three).*

BY HAYLEY RUTGER

**I**n the rain forests of Peru's remote Pacaya-Samiria National Reserve, mothers don't make kids eat their carrots. Instead, kids munch on aguaje — a crisp, neon-yellow palm fruit covered in maroon scales. It tastes a bit like a carrot, but packs three times the vitamin A punch.

Aguaje is just one of more than a hundred wild and domesticated fruits available to people each year in this 8,000-square-mile chunk of protected Amazon wetland at the confluence of two rivers in northeastern Peru.

And with so much variety and abundance, it's not surprising that these fruits form the centerpiece of the local diet. The reserve's 100,000 residents depend on them for many nutrients — like vitamins, protein and oils — that the rest of us normally get from a variety of other foods, including vegetables and nuts.

Fruits also serve as an important source of income for the residents — especially aguaje. It generates \$4.6 million every year in the markets of Iquitos, the nearest city — more than any other indigenous fruit from the Peruvian Amazon.

While U.S. farmers markets might sell a dozen or two different kinds of fruit in any given week, the Iquitos market boasts nearly 200, with varied tastes, colors, shapes and textures: spiky yellow rinds, crunchy seeds and orange pulp.

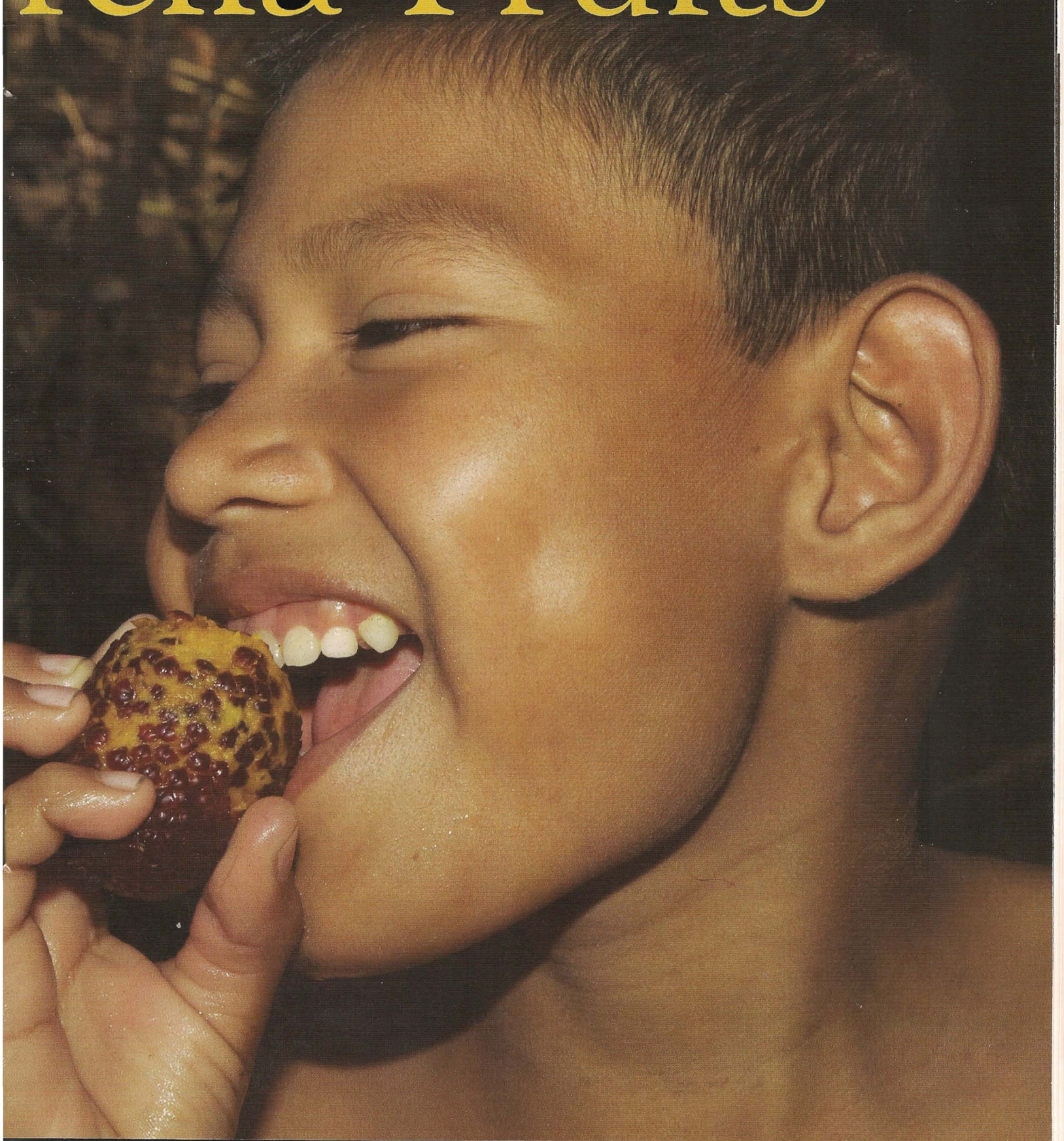
# Cinde

UF GEOGRAPHER NIGEL SMITH  
HAS SPENT HIS CAREER  
RESEARCHING AND PROMOTING  
FRUITS MOST OF US HAVE NEVER  
HEARD OF, BUT WHICH MIGHT  
SOMEDAY BE GROCERY STAPLES

*Fruits of the aguaje palm, known as buriti or miriti in Brazil, are rich in vitamins A and C.*



# rella Fruits







*Açaí palm fruits are rich in antioxidants and the fruit pulp now flavors drinks and ice creams the world over. Many other Amazonian fruits are waiting their turn in the global marketplace.*





*Yumanasa fruits are a welcome treat along rivers in the Amazon.*

But outside the Amazon region, their popularity is limited. Although the Amazon has occasionally yielded commercially valuable fruits — such as the antioxidant-rich açai added to gourmet juices and the caffeine-charged guarana used in energy drinks — international markets have yet to plumb most of the bounty of indigenous fruits growing in lush forests along rivers.

Beyond Peru and parts of Brazil, the aguaje's supercarrot possibilities remain largely unknown.

Could that change? One expert thinks it's possible. Outside the Amazon, few know more about this region's wild and cultivated fruits than Nigel Smith. The Venezuelan-born geographer, a professor at the University of Florida, has devoted much of his four-decade career to the Amazon region.

In recent years he's examined just about every aspect of the obscure fruits that blanket Peru's rich floodplain forests: how, where and why they're grown; who consumes them; their nutritional and cultural value; and, of course, how they taste. (The sweet, "sublime" pulp of wild macambillo, a dull orange fruit, is his favorite.)

Whether it's the aguaje or a tangy-sweet relative of the cacao called the cupuaçu or macambo seeds — a crunchy new alternative to peanuts — Smith has studied them all with an eye toward promoting conservation, boosting sustainable farming in a threatened region and supporting local residents' livelihoods.

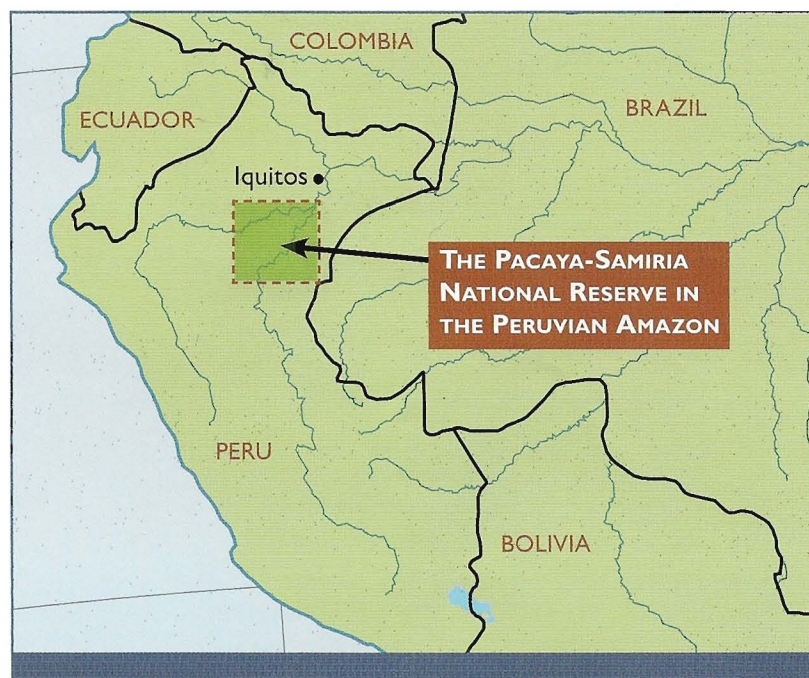
The past three decades have seen unprecedented human migration into the Pacaya-Samiria reserve, part of an area Smith calls the "epicenter of wild-fruit consumption in the Amazon."

Other pressures, like hunting, logging and unsustainable fishing, are on the rise as well. As these pressures grow, Smith believes small farmers hold a key to managing and protecting the region.

With support from the National Geographic Society's Committee for Research and Exploration, the MacArthur Foundation and the Moore Foundation, he and his team, including Peruvian botanist Rodolfo Vazquez, spent six months in Pacaya-Samiria over several years documenting 148 different fruit species.

"I'M INTERESTED IN LANDSCAPES WHERE INDIVIDUAL LANDOWNERS ARE IN CONTROL. I THINK THAT'S THE GREAT FRONTIER FOR AMAZON CONSERVATION."

— NIGEL SMITH



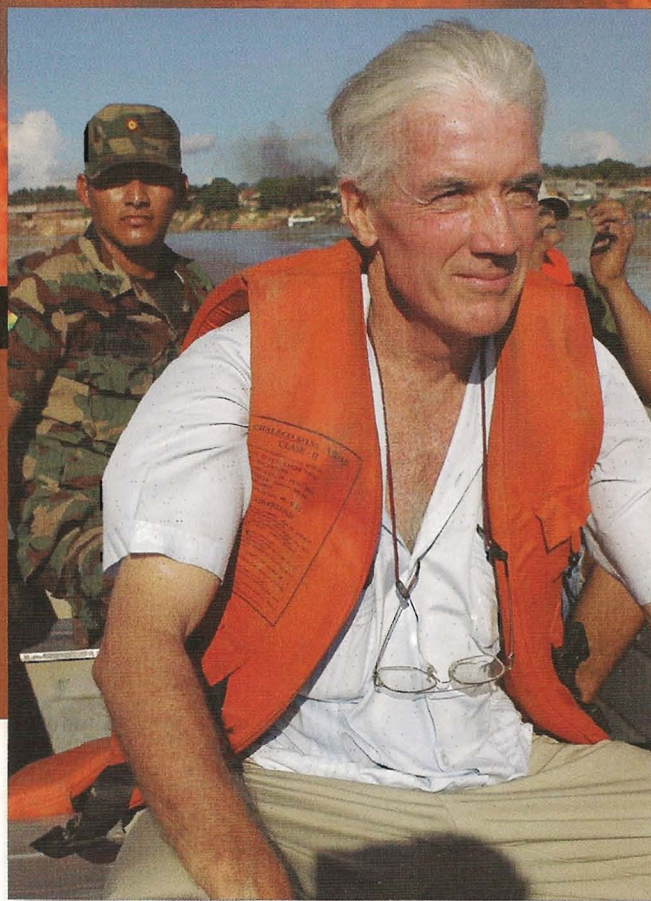
They studied how small landowners in a dozen communities use and depend on these fruits, many of which large-scale farmers ignore.

"I'm interested in landscapes where individual landowners are in control," Smith says. "I think that's the great frontier for Amazon conservation."

Over the years, he notes, small-scale farmers have helped shape the forests where they pick and cultivate fruits by "rearranging the biological furniture" in ways that encourage biodiversity.

These farmers "have retained a biologically diverse landscape that benefits not only wildlife but also their own livelihoods," Smith adds.





*Nigel Smith — whose research has been supported by the National Geographic Society, the MacArthur Foundation and the Moore Foundation — heads down the Beni River in the Bolivian Amazon in search of new fruits.*

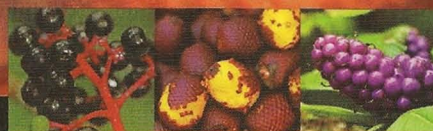
One way Pacaya-Samiria residents have accomplished that is by domesticating potentially valuable wild fruit species, including macambo seeds and vitamin A-rich sapote.

They often plant and grow several at once in diverse forested plots, a strategy known as agroforestry. The combination of crops, both annual and perennial, helps the farmers avert risk.

Should one crop succumb to inclement weather, disease or a pest outbreak, the other crops would likely survive, ensuring that the farmers have both food and income.

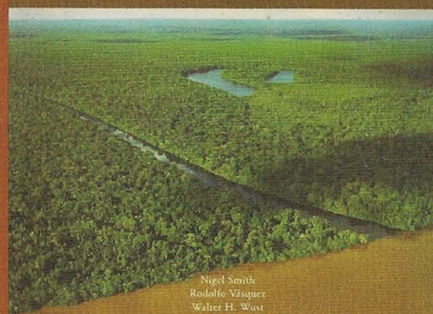
But Amazon experts agree that more needs to be done.

So far the Peruvian Amazon has been spared much of the deforestation caused by the timber trade and cattle ranching in Brazil, yet Smith warns that the “floodplains are going to come under increasing development pressure in the next few decades.”



### AMAZON RIVER FRUITS

FLAVORS FOR CONSERVATION



Nigel Smith,  
Rodolfo Vásquez,  
Walter H. Wust

*Fruits of aguaje palm (above) soaking in order to soften the pulp prior to making juice.*

*In Amazon River Fruits: Flavors for Conservation, Smith and collaborators Rodolfo Vasquez and Walter H. Wust have produced a comprehensive guide to the region's bounty.*

Overharvesting of fruits would threaten trees. And logging is of enormous concern throughout the entire Amazon region, says Douglas C. Daly, an expert on Amazonian botany at the New York Botanical Garden.

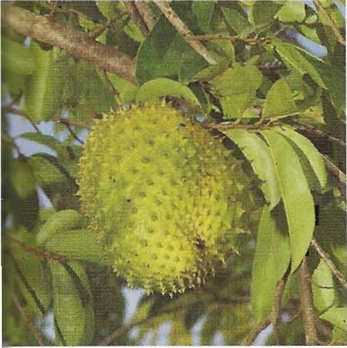
That's one reason Smith's work is important. “If we can educate people about the wealth of diversity, as opposed to just the wealth of timber, we can change things,” Daly says.

This is where native fruits may come in to play. Some of the Amazon's little-known produce has flavor, nutrition or novelty to tempt commercial producers abroad, and Smith hopes that growing international awareness of the dietary importance of fruit could help create a new hit.

His knowledge is helping at least one entrepreneur take steps to market bottled water flavored with Amazon fruits. Jeff Moats, CEO of the Equa Water Corporation in Naples, Fla., plans to begin building a factory next year in Brazil's Amazon region to process fruits local residents can grow sustainably within forests.

But competition from carbonated soft drinks, a \$40-billion industry in the U.S. alone, presents a formidable obstacle to anyone wanting to sell Amazon fruit juices. Entrepreneurs “cannot match the marketing muscle and advertising dollars of the major soda producers,” Smith says.





“THE PRODUCTION OF FRUIT IS VITAL TO THE LIFE OF AN AMAZONIAN PERSON AND IS OF ENORMOUS NUTRITIONAL IMPORTANCE.”

— WALTER WUST  
Peruvian Forester

Beyond this, fruit supplies can be erratic, and the Amazon region is still struggling with the basic issues of hygiene, infrastructure and quality control.

So what are the chances you'll someday see vitamin-rich aguaje in your supermarket's produce section alongside carrots, tomatoes and apples?

It's hard to predict, but Smith is encouraged by the example of the once obscure açai, which was enjoyed in Brazil long before becoming a hit in eco- and nutrition-savvy foreign markets.

He also notes the success in Japan of the camu camu, a sour maroon berry with 30 times the vitamin C of oranges. The aguaje might become what he calls a “Cinderella fruit” because it fits some of the criteria that have made these other two fruits successful: It's already popular and abundant locally, easily incorporated into products like juice and relatively simple to transport.

“The production of fruit is vital to the life of an Amazonian person and is of enormous nutritional importance,” emphasizes Walter Wust, a Peruvian forester and environmental journalist who helped Smith document the Pacaya-Samiria fruits.

If Smith has his way, more of that bounty will someday nourish the rest of the world as well. ✕

*This story originally appeared online in National Geographic News (news.nationalgeographic.com)*



*Removing the pulp from macambo seeds in a street market in Iquitos, Peru.*

**Nigel Smith**

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