



*UPDATES*

*on*

*SMITHSONIAN  
INSTITUTION  
RESEARCH*

**From top:**

### **Smithsonian Institution Launches Amphibian Rescue Center in Panama/ Smithsonian Conservation Biology Institute and Smithsonian Tropical Research Institute**

Scientists from the Smithsonian Institution (“Smithsonian”) Conservation Biology Institute (“SCBI”) and Smithsonian Tropical Research Institute (“STRI”), working together as part of the Panama Amphibian Rescue and Conservation Project, opened a new safe haven for endangered amphibians on April 8. The state-of-the-art, \$1.2 million amphibian center at STRI’s Gamboa field station expands on the capacity of the El Valle Panama amphibian conservation center to implement a national strategy to conserve Panama’s amphibian biodiversity by creating captive assurance populations. Together, these initiatives form the largest dedicated facility for amphibian conservation in Latin America. The center features a working lab for scientists, a quarantine space for frogs collected from the wild, and amphibian rescue pods capable of holding up to 10 species of frogs. In the working lab, SCBI scientists will continue research focusing on things like a cure for the chytrid fungus. Seven amphibian rescue pods house the amphibian collection and colonies of insects needed to feed them.

The new rescue lab will be crucial to ongoing breeding efforts and breakthroughs, such as the recent successful hatching of the endangered Poison Dart Frog [*Andinobates geminisae*] by SCBI and STRI scientists. A study by scientists at the SCBI, which was published in March in the *Proceedings of the Royal Society*, found unique communities of skin bacteria on Panamanian golden frogs that survived chytridiomycosis infections. Chytridiomycosis is an amphibian fungal disease that has wiped out populations of many frog species around the world.

[Image: Untitled/ Brian Gratwicke/ Panama’s Golden Frog, a national icon now only found in human care, has also been successfully raised in captivity.]

### **Center for Earth and Planetary Studies Conducts Second of Three Radar Mappings of the Moon/National Air and Space Museum**

Much of the Moon is blanketed by a thick layer of dust, built up from the rocky surface over billions of years by the impacts of small meteorites. Hidden beneath the dust is evidence of ancient geologic activity – great volcanic eruptions, tectonic shifts in the crust, and vast deposits of once-molten material hurled outward during the formation of the giant impact basins. Smithsonian scientists, using the world’s two largest radio telescopes, bounce radar signals off the Moon to map these geologic features up to 30 meters below the surface. Radio signals have a much longer wavelength than visible light, so they penetrate far into the dry lunar dust and reflect back from boulders and rugged surfaces beneath. The radar maps are created by measuring with great precision the round-trip time of the echoes and the shifts in frequency created by the slow spin of the Moon. These images look like photographs, complete with shadows cast by the lunar mountains, but the illumination is provided entirely by the transmitted signal. As a result, radar can “see” into craters near the Moon’s poles that are

never lit by the Sun, which are of great interest as traps for icy material delivered to the surface by comets.

[Image: Untitled /Bruce Campbell/ The image provided captures the Moon as seen by radar at a 70 centimeter wavelength, with the North Pole at bottom center. The dark circular pattern comes from the shape of the beam created by the transmitting system. Younger craters with rugged floors and rims are very bright.]

### **Smithsonian Helps Discover New Species of Dwarf Dragons/National Museum of Natural History**

Three new species of dragon-esque woodlizards have been discovered in the Andean cloud forests of Peru and Ecuador. The new species differ from their closest relatives in scale, features, color, and DNA. A paper describing and naming the creatures was published on April 6, 2015, in the open access journal *ZooKeys* by Omar Torres-Carvajal of the Museo de Zoología QCAZ, Ecuador; Kevin de Queiroz of the Smithsonian's National Museum of Natural History, and Pablo Venegas, CORBIDI, Peru.

Finding three new species of woodlizards is unusual given that these reptiles are among the largest and most colorful lizards in South American forests. Woodlizards (*Enyalioides*) are diurnal and live in lowland tropical rainforests, such as the Chocó and western Amazon basin, as well as cloudforests on both sides of the Andes. The new species described by Torres-Carvajal et al. increases the number of species of woodlizards to 15. Nearly 40 percent of the total number of known woodlizard species have been discovered in the last seven years.

[Image: Untitled / Luis A. Coloma / Adult male of the newly discovered woodlizard “*Enyalioides altotambo*,” found in the Chocóan rainforests of northwestern Ecuador. Not including its tail, this specimen is 119 millimeters (4.68 inches) long.]

### **2015 Smithsonian Folklife Festival to Focus on Perú/Center for Folklife and Cultural Heritage**

The 2015 Smithsonian Folklife Festival (“Festival”) will present the culture of Peru on the national mall June 24-28 and July 1-4. Using a case study approach, the *Perú: Pachamama* curatorial team traveled to Perú to inquire into and document the distinct relationships between the Peruvian people, the physical environment, and the challenges of industrialization and globalization. On these trips, curators Olivia Cadaval and Cristina Díaz-Carrera collaborated with Peruvian co-curator Rafael Varón Gabai and local researchers to identify 100 traditional practitioners around 12 case studies, whose work would show cultural persistence and creative reformulation of traditions. The case study approach provided multifaceted and holistic views of 12 groups for presentation at the Festival. The cultural practitioners will demonstrate and talk about their work at the Festival and the research performed enabled the curators to select participants whose narratives would effectively express to Festival visitors how they are able to sustain their values and ways of life. In addition to the Festival, this research will become the

basis of extensive web-based outreach, including approximately 30 videos, before being archived as a resource for future scholars.

[Image: Untitled / Joshua Eli Cogan / Sisters Katya and Blanca Canto, gourd engravers from Huancayo, have carried on the traditional family craft.]

### **Great Inka Road Exhibition Project/National Museum of the American Indian**

Cusco, capital of Tawantinsuyu and center of the Inka universe, remains effective as a living nucleus of Inka heritage. During the Inka State, Cusco maintained schools and training centers, led by experienced teachers brought in from various regions of the empire. Cusco was the center of political power, knowledge, and wisdom existing at that time. As such, Cusco is the ideal location for any research related to the Inka culture. It is the region known as the "heart" of the Inka Empire, where the language, beliefs, customs, and material culture remain firmly conserved. The project organized a cross-disciplinary team of archaeologists, architects, engineers, historians and anthropologists, including scholars from the Municipality of Cusco, all of whom generated voluminous new information that made possible the first scientific approximation on the actual dimensions and layout of Cusco, particularly terracing, at the moment of contact with the Spanish. The work involved an exacting topographical study of archaeological remains, comparison with other examples of Inka architecture in the region, study of specialized literature, examination of colonial textual sources, and comparison with the information provided in historical archives. Additional architectural information was provided by the Gerencia de Gestión del Centro Histórico of the City of Cusco. The integration of all these sources of information in scientific discussion allowed us to produce the rigorous plans necessary to draw a new and innovative virtual model of the ancient Inka capital. As a result of the research the team was able to reconstruct the three-dimensional layout of Cusco and the surrounding valley. The information gathered was used in the creation of the exhibition devoted to the Great Inka Road.

[Image: Cusco Valley Overview / Ricardo Mar, J.A. Beltrán-Caballero / This diagram shows the topography of the Cusco Valley, agricultural terraces, and the Inka city.]