

FROM U·S AIRWAYS MAGAZINE

Small world

By Edie Jarolim

In the Arizona desert, scientists are transforming one of the most ambitious but overhyped ecological projects of the 1990s from a white elephant into a thriving research center.

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Biosphere 2 stayed in the limelight in the months leading up to and during the first two-year mission (1991-1993), thanks in part to the carnival atmosphere created by the inclusion of a cafe, inn, and gift shop for the visitors who toured the mini-world. (Spotting a Biospherian was a special treat.) But controversies such as the unannounced addition of carbon dioxide scrubbers and the use of food not grown in the dome led many to question the validity of the experiment, and the entire Science Advisory Committee, brought on board by the SBV to lend credibility to the project, resigned seven months before the first mission ended. When a second mission in 1994 was shut down after just six months amid legal turmoil and bitter accusations, the facility began to lose public interest. Things were relatively quiet at Biosphere 2 from 1996 to 2003, when it was a western campus and research center for Columbia University, and during the subsequent years it was up for sale.

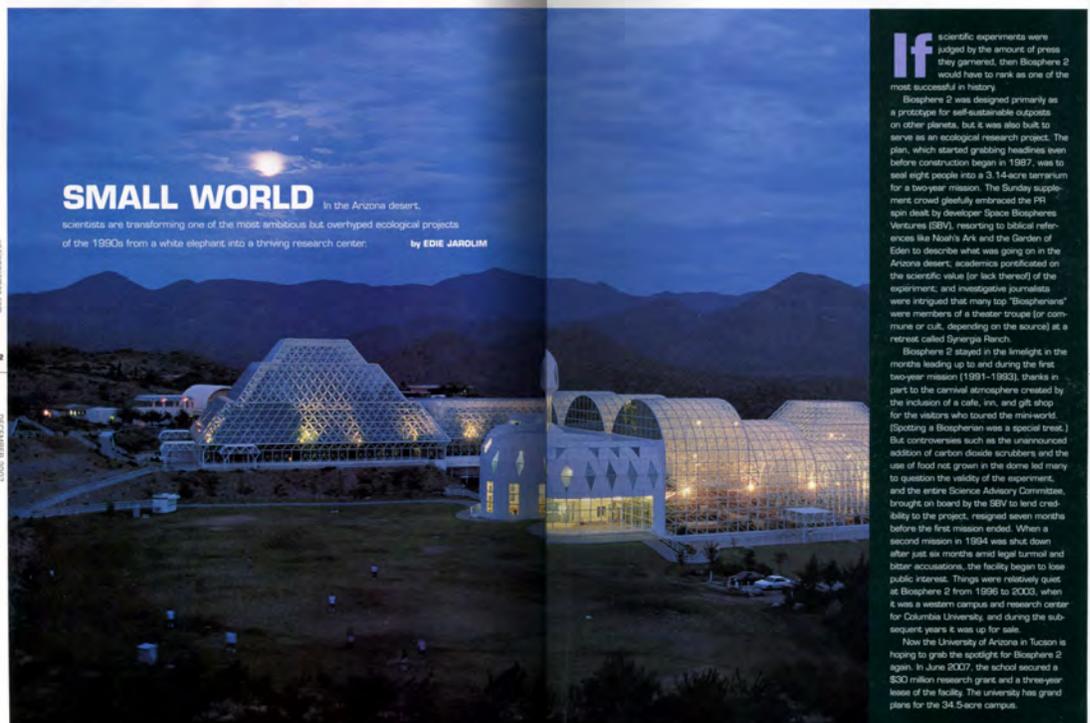
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to grab the spotlight for Biosphere 2 again. In June 2007, the school secured a \$30 million research grant and a three-year lease of the facility. The university has grand plans for the 34.5-acre campus.

For one thing, the school is banking on Biosphere 2's appeal as a tourist destination (over two million people have visited it since 1991) to put a friendlier face on science. Travis Huxman, an associate professor of ecology and evolutionary biology who heads the B2 Earthscience division, says "(Biosphere 2) gives us an opportunity to show people how we ask questions, how we investigate our world." Biosphere 2 may not be as attractive to the media as it was when its researchers lived there 24/7, but it's well worth the trip to Oracle, about 35 miles northeast of Tucson and 115 miles southeast of Phoenix, to view the impressive architecture and to enjoy the setting, an unspoiled swath of Sonoran Desert in the shadows of the Santa Catalinas.

Henry Adams, a doctoral student who is researching the effect of drought on pinyon pines, admits he was taken aback when he learned that he would have to explain his work to tours trooping through his glass-domed laboratory. Now, however, he sees the outreach requirement as an asset "As we become more and more technical, scientists are less able to convey information," Adams says. "Avoiding jargon and communicating to the public are great skills for a new generation to develop, particularly when so much research is publicly funded."

And communicating with the public is particularly crucial when it comes to the Biosphere, which has a dubious past to explain, if not live



SMALL WORLD In the Arizona desert, scientists are transforming one of the most ambitious but overhyped ecological projects of the 1990s from a white elephant into a thriving research center. by EDIE JAROLIM

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down. That past, in fact, is a continuing presence: The source of the \$30 million grant is Edward P. Bass, the Texas billionaire and self-styled “ecopreneur” who bankrolled the building and maintenance of Biosphere 2 at a cost of about \$200 million.

And in 2006, Jane Poynter — a Biospherian notorious for accidentally slicing off the tip of her finger and having to leave the enclosure for a few hours — published *The Human Experiment: Two Years and Twenty Minutes Inside Biosphere 2*. The memoir not only shows why humans were the most problematic of the 4,000 plant and animal species sealed inside the dome, but also clears up many misconceptions about the oft-mocked project. The book doesn’t entirely resolve the questions of whether the Biospherians belonged to a cult or why they aimed to re-create Biosphere 1 (a.k.a. Earth) on Mars, but it makes a convincing case that the legitimate science they conducted was obscured by a fog of secrecy.

When oxygen had to be pumped in to compensate for small air leaks discovered early on, for example, Poynter writes, “No press release was forthcoming, and no explanation of what had been done and why. Finally, weeks after the event and after the news had already leaked out, someone circulated a ten-line engineering specification sheet, which the journalists must have found entirely incomprehensible. Naturally, the headline flashed that the experiment was void because air had been added.”

Columbia University’s subsequent guardianship of Biosphere 2 could have used a bit of sympathetic ink, too. Columbia poured some \$25 to \$30 million into what it called Biosphere 2 Center upon taking over management responsibilities in 1996, creating a state-of-the-art campus and building a telescope for public night-sky viewing, among other improve-



ments. And a great deal of important research was conducted there, including a groundbreaking study using the ocean “biome” — one of the seven simulated habitats in the structure — to demonstrate how increased carbon dioxide levels in the atmosphere are damaging coral reefs.

But these types of successes weren’t widely touted outside the academic community — or even within it. Especially in the beginning, many of the scientists working at the center encountered resistance to their research papers from

journals that couldn’t — or wouldn’t — look past the Biosphere’s tumultuous past. And finally, with the installation of a new top administrator who declared that the facility was a money pit, Columbia decided it was time to pull the plug on the planned expansion of its Arizona campus. Ed Bass’s Decisions Investment Corporation, which owned Biosphere 2, sued for breach of contract, and the relationship was severed in 2003.

Which raises the question: Why does the University of Arizona think it will succeed when Columbia didn’t? Joaquin Ruiz, dean of the College of Science at the University of Arizona, says that Columbia *did succeed*, that the ecological science conducted under its aegis was first rate. But Ruiz, who recommended the university take on the management of Biosphere 2, says that the school won’t face some of the challenges that made Columbia’s task difficult. One problem was the distance between the primary institution and the research facilities: Whereas Columbia is thousands of miles from the B2, the University of Arizona campus is a 45-minute drive away. Another difficulty was the expense Columbia incurred by exerting

strict controls over the atmosphere within the dome. “By attempting to regulate temperature and other conditions, [Columbia] ran up electric bills of about \$1.2 million a year,” Ruiz says. “We’ve tried to figure out experiments that won’t make a small country go broke.”

Travis Huxman, head of B2 Earthscience, elaborates, “Columbia’s system wasn’t completely closed, but we’re relaxing the parameters even more,” he says. “And we’re tuning in to the questions that we feel we’re very good at asking, as well as creating model ecosystems that are much more relevant to the landscape that surrounds the Biosphere.” Some of the pinyon pines that graduate student Henry Adams is studying, for example, will be planted on mountain slopes near B2, providing a control group for those growing inside.

Additionally, Biosphere 2’s location — as well as the stylish casitas, offices, and meeting rooms Columbia built for its Arizona researchers — inspired the creation of the B2 Institute, an interdisciplinary think tank. Pierre Meystre, the Regents’ professor of physics and optical sciences at the University of Arizona who heads the B2 Institute, says that “the desert is ground zero when it comes to questions about solar energy and water management. Alluding to the balkanization of the different disciplines in a typical university, Meystre adds, “It’s very important that we talk to each other if we want to deal with these problems ... Physicists have to talk to computer scientists and hydrologists, and so on. Otherwise, what kind of world will we leave our children?”

According to the group’s Web site, part of the think tank’s mission is “helping the state of Arizona address its emerging challenges of extreme growth and fragile environment.” Thus there’s no small irony in the fact that Biosphere 2 and its campus are at the heart of a 1,658-acre parcel of land that Ed Bass’s Decisions Investment Corporation sold to CDO Ranching & Development for \$50 million in June 2007, the same month the university received its research grant. CDO has been given the green light from Pinal County to build 1,500 homes and a resort hotel on the grounds, with the first lot scheduled to go on the block some time in 2009.

Huxman tries to put a good face on the strange bedfellows situation. “We’re working with the Arizona Department of Commerce to develop a facility for demonstrating sustainable products on the campus,” he says. Their goal is to make the showcased green products appeal to homebuilders. “For example, if we can demonstrate how rainwater harvesting adds value to a property, that makes it a lot easier for a developer to add that component to their planning and market it to the home-buying public.”

Maybe so, but that’s a small bandage to apply to a major gash on the landscape. And the university only has a three-year lease on the unique facility, with no guarantee of renewal. If B2 doesn’t prove to be self-sustaining — this time in a financial sense — the landmark glass structure could end up as a high-profile recreation center for another thirsty, high-end housing complex in the desert. But interest in all things green has never been higher, so there’s at least hope that Biosphere 2’s dual roles as a bona fide tourist attraction and public-education center will keep it squarely in the public eye — and this time for all the right reasons.



Edie Jarolim is a travel journalist who lives in Tucson, Arizona.