Guest Column: Biosphere 2 Celebrates its 10th Year With UA

Dean of the College of Science
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The nearly 10 years since the UA took over Biosphere 2 has been a time of incredible growth and evolution, though many still know Biosphere 2 simply as home to the world-famous, closed-system experiment of the 1990s. That project taught us many things, but for me, the most important takeaway was how little we understand Earth systems and their interconnectedness. It's that frontier that Biosphere 2 has been shedding light on ever since.

Today, Biosphere 2 stands as a global leader in research to better understand our planet and resources. Its seven model ecosystems make up the world's largest living laboratory, providing the formerly missing link between Earth systems theory, experimentation and measurable outcomes. With Biosphere 2's unique size and design, researchers here are doing studies that can be done nowhere else on Earth.

Many of these studies converge on one important super-question: How can we optimize food, water and energy for the long game, protecting while also making use of our amazing planet as its population surges towards 11 billion by the end of the century? I'm the first to say we have a long way to go. But I'm also inspired by the progress we're making, which includes:

- We designed and built the Landscape Evolution Observatory, the world's largest laboratory experiment in the interdisciplinary Earth sciences, so that researchers can ask how physical and biological processes interactively control the amount and quality of water.
- Agriculture experts are using Biosphere 2 as home to a space-bound greenhouse, testing vertical farming technologies for growing nutritious food in artificial light with little water. Biosphere 2 hosted the first National Science Foundation workshop on the food, energy, water nexus and has since worked with the Department of Energy and Tucson Electric Power to make it a premier site for solar innovation.

These are just a few examples of the exciting science happening at Biosphere 2 now. So it's not surprising that we've been the subject of media coverage the world over: National Geographic Channel, the Travel Channel, Discover Magazine and Science Magazine, BBC World Service, The New York Times and National Public Radio among many others, not to mention outstanding work by our own Arizona Public Media.

We're grateful for their attention, which furthers another critical Biosphere 2 mission: expanding science literacy by helping more people understand more about science and why it matters. Biosphere 2 has welcomed nearly a million visitors and 100,000 K-12 students since the UA assumed operations. Importantly, Biosphere 2 is now a place where everyone gets hands-on interaction with active research.

Of course, we haven't accomplished all of this alone. Under UA leadership, Biosphere 2 has
partnered with more than 50 organizations, from research and advocacy groups like the American Association for the Advancement of Science and the National Renewable Energy Laboratory to private industry (Raytheon, IBM, Civic Farms) to colleges and universities around the world—luminaries like Harvard, Cal Poly and the National Autonomous University of Mexico as well as campuses that greatly expand access to higher education, including Pima Community College and Central Arizona College.

It can be difficult to measure the impact of research, outreach and partnerships. Fortunately, there are other data points easily measured. Biosphere 2 research has produced more than 100 peer-reviewed journal articles, and in the past five years pulled in more than $13 million in grants. Our conference center, hosting corporate meetings, science workshops and special events, has grossed $18 million under UA management.

Those numbers matter. A lot. Because it’s Biosphere 2’s financial bottom line that ultimately empowers its more important, much bigger bottom line: finding the answers that will shape and support our children’s and grandchildren’s future, meeting their needs for sustainable and resilient food, water and energy.

When the UA took over Biosphere 2 a decade ago, we had grand ambitions. I'm honored to say that the amazing teams there are delivering on those ambitions every day. Over the next 10 years, our goal is to further grow research opportunities, continue building community and alliances, and deliver an even more vibrant visitor experience.

Biosphere 2 is already a one-of-a-kind living laboratory. I believe we can make it something more: the global benchmark for a new kind of institution, bringing students, scientists, business, government and the public together, teaching and learning from each other, as we work towards the future that all of us want.

Joaquin Ruiz is dean of the College of Science, vice president for innovation and the Thomas R. Brown Chair. He also is director of Biosphere 2, which will celebrate its 10th birthday with a full schedule [3] of special events on April 22. AZPM will livestream the event here [4].

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