

the Wire

SWCA

News from SWCA Environmental Consultants

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FOCUS: COMEBACK STORIES

By John Thomas, CEO



It's human to love comeback stories: whether it's a species brought back from the brink of extinction, our favorite sports team coming from behind to win, or a town recovering from disaster. The past few months have brought more than their fair share of misfortune, including devastating hurricanes, rampant wildfires, and destructive floods. We're all ready for the comeback story to begin.

In this issue of *The Wire*, we want to offer some hope and a few examples of how we can help with recovery efforts. We begin with the story of the Jordan River in Utah (see "Reviving the Jordan," page 3), which many once considered too polluted to survive. A team from SWCA worked with the state to develop an innovative, interactive story map as part of a comprehensive management plan to sustain the river for generations to come. We also take a closer look at natural disasters and the ways they impact the environment (see "After the Storm," page 6), as well as ways we can work with government and private clients to help restore what's been damaged (and also plan for future disasters).

Finally, we wanted to highlight some of the creative ways our staff have been using drones across the country (see "The Sky's the Limit," page 8). This evolving technology will prove useful in ways we can't even imagine yet. Our dedicated drone team is happy to discuss ideas for your next project.

No matter what environmental challenges you face, we're here and willing to partner with you to provide Sound Science and Creative Solutions. ■

REVIVING THE JORDAN: HOW ONE MAP IS CHANGING THE STORY FOR UTAH'S JORDAN RIVER

By Gina Wagner

For years it was nicknamed "the invisible river." At best, the Jordan River was known as being neglected, its banks overgrown, its water polluted. At worst, it had a reputation for being a place no one wanted to touch – a river full of old shopping carts, trash, wastewater, and the occasional car or even dead body. For decades, managers of the river have faced a problem that's twofold: 1) How do we improve the ecological condition of the river? and 2) How do we make this a place that people actually want to visit and enjoy?

Stretching 51 miles from its headwaters at Utah Lake, the Jordan River flows north through four of the state's largest cities (Sandy, West Jordan, West Valley City, and Salt Lake City) before emptying into the Great Salt Lake. In the 1970s, the state began development of a 40-mile-long linear park along the river called the Jordan Parkway. Despite its close proximity to major population centers, many residents complained that they were afraid to recreate along the Jordan Parkway for fear of the pollution and crime.

Even so, some other residents envisioned a different story for the Jordan. Over the years, grassroots organizations and government agencies have rallied behind the river, proposing cleanups and better trail systems and easier access for canoes and kayaks and fishing. The U.S. EPA designated Superfund sites to clean up areas adjacent to the river.

In 2003, a nonprofit called Scenic America named the Jordan to its list of "Last Chance Landscapes," places that are so at risk of losing their scenic beauty that drastic action is required. The Department of the Interior, in its 2011 America's Great Outdoors 50-State Report, listed completing the Jordan River Parkway as one of its goals. Federal agencies made plans to partner with state and local governments and other stakeholders on a shared conservation and recreation agenda.

Finally, in 2014, the Utah Division of Forestry, Fire & State Lands (FFSL) contracted SWCA to facilitate the development of a comprehensive management plan for the Jordan River. It was the first time the state has ever commissioned a river plan, and the resulting work has led to the development of additional river plans across the state. Rather than just compile an unwieldy document, project staff and our GIS experts decided to develop an interactive story map that everyone – from government officials to local residents – could use to understand the proposed vision and uses for the river.

In 2017, SWCA along with the FFSL won "Best Interactive Web Mapping Application" at the UGIC Conference for the Jordan River Comprehensive Management Plan Story Map.

see page 4 for more on the story map



Photo credit: Ivan Makarov Photography

JORDAN RIVER COMPREHENSIVE MANAGEMENT PLAN

We recently connected with **Brian Nicholson** and **Gretchen Semerad**, two leaders in the development of the **Jordan River Comprehensive Management Plan**. Here's what they have to say about the river and the innovative story map:

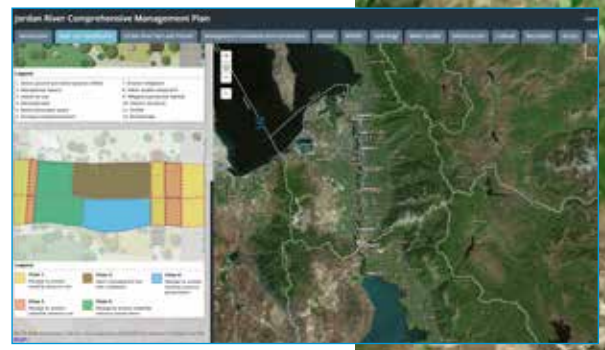
The Wire I understand this was the first time the state of Utah has ever done a river plan. What prompted them to do so?

The state is mandated to develop management plans for all sovereign lands. The Utah legislature defines sovereign lands as "those lands lying below the ordinary high water mark of navigable bodies of water at the date of statehood and owned by the state by virtue of its sovereignty." Past management efforts have focused on the beds of large lakes: Great Salt Lake, Utah Lake, and the Utah portion of Bear Lake. Now that they have developed plans for these areas, they had the time and money to focus on the beds and banks of rivers that are considered sovereign lands. The Jordan River was the first given current pressure from development and the very active Jordan River Commission, a mix of governmental and non-governmental representatives working together to enhance, preserve, protect, and responsibly develop the river corridor.



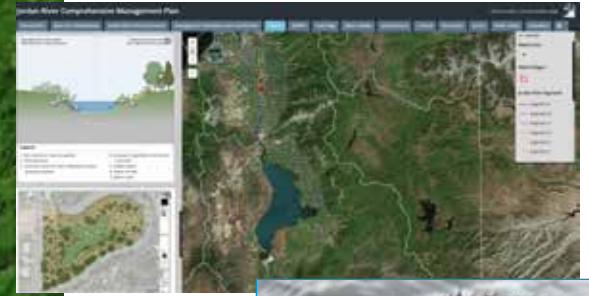
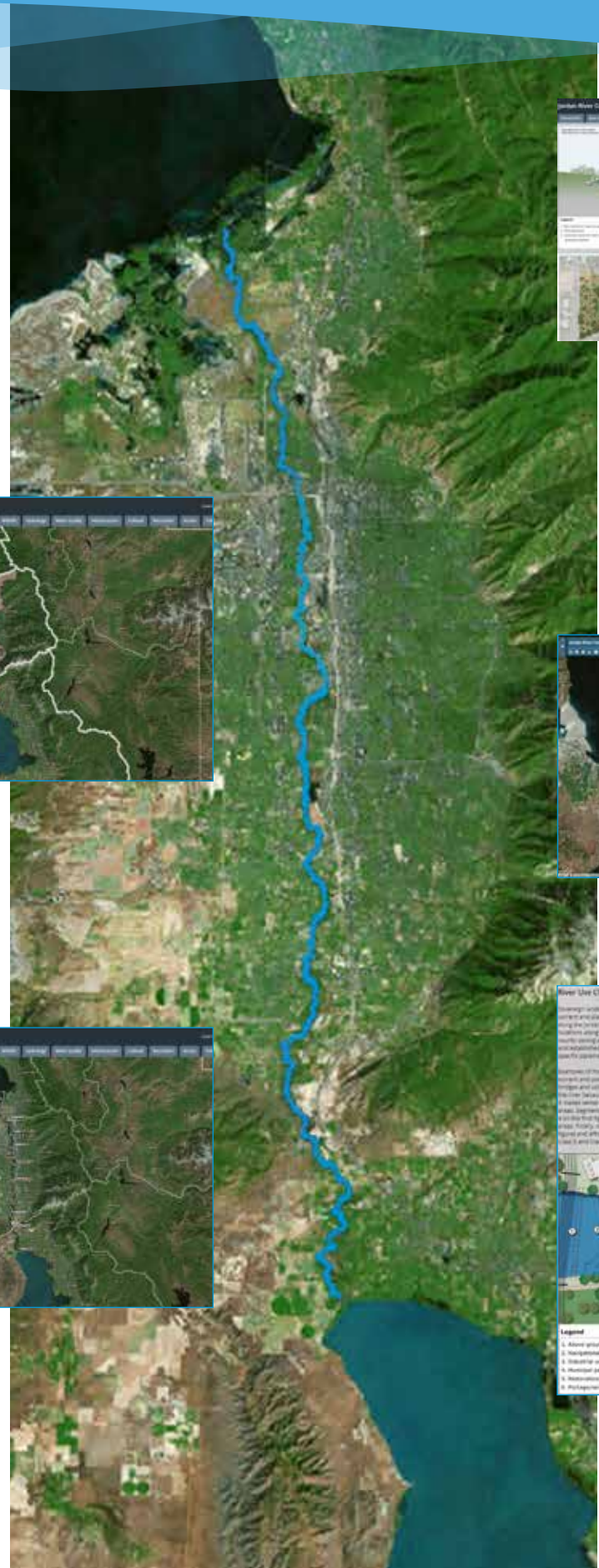
The Wire Tell me a little more about the importance of this river – to people, wildlife, industry, the ecosystem?

The Jordan River is the focal point for many communities along the Wasatch Front. It is a natural area that provides multiple opportunities for recreation and is home to wildlife species such as mule deer, red fox, North American beaver, little brown bat, Woodhouse's toad, and a wide variety of bird species. However, given its proximity to major urban areas, it has seen its share of abuse -- from channel straightening and dewatering for flood control purposes to dumping, to invasive species, to transient populations living along the shore. There is a movement to restore the river and reinvent it as a community resource.



The Wire Were there competing interests along the river? How did that come into play?

The river runs through three counties and 15 municipalities, and multiple agencies have management responsibilities on the river in addition to FFSL (e.g., Utah Division of Wildlife Resources, Utah Division of State Parks and Rec, Utah Division of Water Rights). One of the goals of the Comprehensive Management Plan (CMP) was improved



The Wire How does the plan prevent future damage to the river?

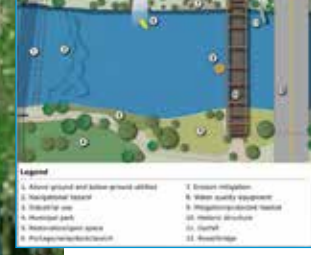
For all intents and purposes, the damage to the river had been done. What the management plan tries to do is prioritize preservation of high quality habitat, identify restoration opportunities, note recreation and access needs, and focus development in areas that have already been impacted. In addition, the plan outlines best management practices to avoid and minimize future impacts.

As part of the stakeholder process, we worked to incorporate information and points of view from the public and all involved governments or managing entities. FFSL hopes to better coordinate with all stakeholders through implementation of the plan. The planning process itself helped raise awareness of the need for better coordination to manage the river as a whole.



The Wire At what point did you guys realize the interactive story map would be a good solution for this plan?

From the very beginning. This is a linear resource with a lot of data and information about it. We knew that to make an effective plan we had to create a document that was visually and graphically rich. We could not get all information into one document, because it would be too long and cumbersome. We knew it needed to take multiple forms, hence the story map and GIS data viewer. The story map provides open access for all users of the plan. Anyone can view it, interact with it, and better understand FFSL's vision for the river.



The Wire What was your favorite part of working on this project?

We really enjoyed working with stakeholders to better understand current conditions of the river and working with FFSL to develop management goals and objectives that guide management toward a better future for the river.

The Wire Anything else interesting / significant about this project that readers should know?

One thing we found interesting was that the river is very different as it flows through natural, agricultural, residential, and industrial areas. In many places the river is pretty beat up, but one is still surprised by the wildlife and solitude you'll find in such close proximity to the city. There's so much potential here for bringing this river back to life.

For more information about this project or our planning services, contact: **Brian Nicholson** at bnicholson@swca.com.

To see a bonus video on this story, visit www.swca.com.

AFTER THE STORM: THE ENVIRONMENTAL IMPACTS OF NATURAL DISASTERS

By Gina Wagner

The end of a disaster is often just the beginning. Once the storm abates, the smoke clears, and the dust settles, the recovery process begins. In addition to the billions of dollars in property loss and the deep personal loss that many people endure, there are often unseen environmental impacts that have to be mitigated.

As we witnessed this fall, hurricanes can be among the most devastating natural disasters. According to the USGS Coastal and Marine Geology Program, hurricanes account for two thirds of property losses nationwide. But beyond property, natural habitats take a significant beating. In August, Hurricane Harvey dumped an estimated 27 trillion gallons of rain over Texas and Louisiana during a six-day period, according to WeatherBELL, a meteorological analytics company. Harvey also set a record for the most rainfall ever from a tropical storm in the continental US, at 51 inches. On Harvey's heels came Hurricane Irma, which wreaked havoc across the Caribbean and into Florida and the Southeast, then Hurricane Maria, which caused nearly everyone in Puerto Rico and the US Virgin Islands to lose power for weeks. Each of these storms greatly upset the natural ecosystem, significantly disrupting coastal native shellfish, fish, insect, bird, and mammal habitat. Pollutants from flooded industrial sites caused hazardous chemicals to enter untreated into project sites, groundwater, watersheds, and the oceans.

Other disasters such as wildfires, floods, and tornadoes can completely defoliate forests and cause other types of structural changes to ecosystems. Wildlife can be killed by the force of the disaster or impacted indirectly through changes in habitat and

food availability. Endangered species are especially vulnerable when habitat is destroyed. Water quality is impacted when sewage treatment facilities flood or debris enters reservoirs and waterways. Beaches move and change shape due to storm surges. Riverbanks erode during flash flood events.

In the urban landscape, natural disasters can impact historic structures, leading to the need for restoration and preservation work. Infrastructure such as bridges, roads, transmission lines, and oil and gas pipelines may need new permits, assessment, and repair. Home and commercial building repairs may first require the identification of asbestos, mold, or lead hazards.

The good news? With smart, responsive recovery efforts, environmental planning, and mitigation, adverse impacts can be minimized, ecosystems can recover, and infrastructure can be repaired and improved to withstand future storms.

We know disaster recovery is possible, because we've seen it in action. Many of our Houston office staff recently implemented it personally after Hurricane Harvey. In the past, SWCA has helped clients restore historic buildings after devastating storms, finding replacement materials that meet historic preservation requirements. We've developed fire recovery plans and led reforestation and wetland restoration efforts. And we've overseen permitting and clean-up support following floods.

We can also help in the planning stage to minimize impacts before disaster strikes. Visit SWCA.com to learn more or contact us at info@swca.com. ■



SWCA'S DISASTER RECOVERY SUPPORT SERVICES

There's no need to face disasters alone. With hundreds of consultants spread across 30 offices nationwide, we're able to mobilize quickly and offer our services wherever the needs are greatest.

Our specialists include wetland, water, and stream restoration scientists; threatened species specialists; ecologists; NEPA planners; archaeologists; and architectural historians. We provide on-the-ground and regulatory support for individuals, private companies, non-profits, and municipal agencies – anyone needing studies that will enable them to move forward in their disaster recovery. SWCA experts have managed environmental support for the federal Stafford Act, FEMA, and HUD-funded Community Development Block Grant disaster recovery programs. Our services include:

- High Water Mark and Preliminary Damage Assessments
- Wetland and Waters Assessments
- Drone and Aerial Photography
- Threatened and Endangered Species Evaluations
- Preliminary Environmental Hazard Inspections
- Tier I and Tier II Environmental Reviews
- GIS Stream Modeling, Design, and Reconstruction
- Agency and Programmatic Agreement Negotiation
- Archaeological Site Identification and Monitoring
- Historic Building Repairs and Reconstruction
- Demolition Monitoring
- Wildfire Planning and Recovery Service

THE SKY'S THE LIMIT: 5 WAYS SWCA IS USING DRONES TO SOLVE CLIENT PROBLEMS

By Brad Smith and Kevin Howen

Most of us are now familiar with the sound: a high-pitched whir that grabs your attention and makes you crane your neck toward the sky. Whether it's your neighbor kid's toy, a photographer at a sporting event, or a professional on a job site – there's no denying the power of drones. According to the Federal Aviation Administration (FAA), more than 770,000 drone registrations have been filed in the past 15 months – and more are added daily. On a commercial level, drones are being used for everything from real estate photography to avalanche control at ski areas. Their biggest benefit? The ability to go where humans can't (at least not easily).

It's not surprising that drones have made their way into environmental consulting projects as well. Over the past year, SWCA has seen its list of certified Unmanned Aerial System (UAS) pilots grow from one to nearly a dozen nationwide. Curious how drones have come into play for our industry, we recently took inventory of all the projects that have benefited from their use. Here, we offer a few of the most creative applications we found.

1 ENVIRONMENTAL ANALYSIS / CAYUCOS, CALIFORNIA

SWCA has long provided expert environmental support to San Luis Obispo County's Planning Department on multiple projects throughout the Central Coast, and in 2015 our staff began work on an environmental analysis for a proposed private road extension in the small community of Cayucos. The work was conducted to support preparation of an Environmental Impact Report required for the proposed Gilbert Avenue Road Extension Project to move forward in the design, permitting, and construction phases.

One of the key issues identified at the outset of the project was the site's geology. The project site is in an area with steep slopes and landslide potential. The hillsides above Cayucos are within a designated Geologic Study Area (GSA) and due to the landslide risk, the team prepared and used aerial drone imagery during a real-time survey on site. "We used the drone images to provide 3D aerial imagery and a vantage point of the hillsides the geologists wouldn't have had otherwise," said Emily Creel, SWCA's San Luis Obispo Planning Team Leader.



2 BATS AND DRONES IN THE MIDWEST

The Chicago office is working to incorporate drones into wildlife telemetry, specifically for use in tracking threatened and endangered bat species. Bats are difficult to track due to their small size. Larger transmitters that emit a stronger signal are unsafe for such small animals, so bat biologists must use small transmitters with a correspondingly weak signal. The radio signal can be degraded or completely blocked by trees, topography, buildings, and any other obstruction.

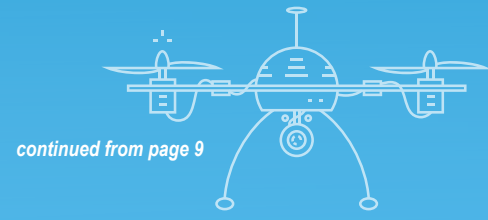
Biologist Drew Carson hopes to rise above these obstacles by mounting a radio-signal receiver and antenna to a drone. Currently, economically available drones have a limited carrying capacity, so Drew has designed an antenna using a carbon fiber mast and light-weight, 3D-printed components in order to safely and effectively get this project off the ground. Proof of concept testing is scheduled for this fall, with field deployment on projects during the 2018 bat survey season.



3 IDENTIFYING POTENTIAL HAZARDS BEFORE THEY BECOME A PROBLEM

One of our tasks for our oil and gas clients is to assist with pipeline inspections and also monitor any inadvertent returns of drilling mud that make their way into surface water, such as streams. Using drones equipped with high-resolution cameras, we can identify these areas of concern much sooner than on foot, allowing the client to respond quickly. Similarly, drones can be used on development projects, mining sites, or anywhere monitoring is required.

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AERIAL PHOTOGRAPHY AND VIDEO FOR REPORTS AND MATERIALS

The most simple and sought after drone product has been beautiful photographs and panoramas of the project site, for clients to use in their proposals, marketing materials, and reports. The images are great for before-and-after exhibits and public education, as they provide a “wow” factor that resonates with stakeholders. Flyover videos can also provide a large amount of information about the project space or natural and cultural resources that are being studied. In some cases, drones can replace the use of helicopters or people on foot capturing imagery and data.



CONTOUR MAPS

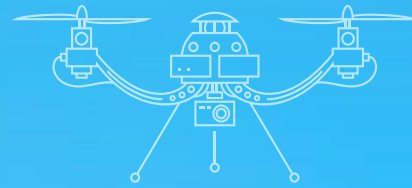
Contour maps (also known as topographic maps) have been used for hundreds of years, by everyone from explorers and recreational hikers to land developers, land management agencies, the mining industry, water quality experts, biologists, and cultural resource scientists.

But, historically, the process for collecting and generating accurate and high-level contours has been tedious and expensive. “Drones capture imagery at only a couple hundred feet above ground level, and so the ground sample distance, or the effective resolution, is extremely high. This provides imagery with more detail than aerial products used by most GIS systems,” says Kevin Howen, one of SWCA’s certified drone pilots. “The imagery is also available within just a few days, allowing for analysis and planning based on very recent conditions. Drones also provide a perspective on the project area that you couldn’t get from ground level.”

THE DRONE ADVANTAGE

Using drones is cost-effective compared with manned aerial photography, in terms of acquisition costs, pilot training, and expenses per flight hour; there are also operational advantages. Along with photographs, drone imagery can be used for a variety of other products:

- Drones can help produce 3D models with imagery (or other layers) overlaid on the model.
- They allow people in an office or offsite to “fly” around a contoured project site and conceptualize planning ideas from different perspectives.
- Drones allow planning and visualizing of property and land space at a detail that used to only be provided by expensive aircraft image capture.
- Slope analysis is great for analyzing areas that might be risks for landslide, avalanches, or high erosion.
- They can help with initial planning around low risk and high risk areas for development, recovery, and mitigation areas.
- They can help identify “viewsheds,” planning where you can put a watch tower that will have the maximum amount of vision in an area. Also figuring out the landscape someone might see from a certain location.
- Used to capture the change in landscapes. Drones can be used to map and monitor changes in natural, disturbed, and managed environments, especially in areas where reclamation work has occurred.



NEWS BRIEFS

By Alexis Kuhbander

Scientific Achievement Award Winner



Danielle Frohlich, lead botanist in Honolulu, was selected as SWCA’s Lawrence S. Semo Scientific Achievement Award winner for the third quarter of 2017. Danielle has been recognized in Hawaii and internationally for her expertise in invasive species. She was invited to join the European Union’s European and Mediterranean Plant Protection Organization (EPPO) because of her knowledge of two potential

threats, *Lygogium japonicum* (Japanese climbing fern) and *Andropogon virginicus* (broomsedge). Danielle has also contributed to several projects in Hawaii, such as large-scale transportation, renewable energy, and land development projects. The quarterly Semo Award rewards individuals within SWCA for demonstrating passion, creativity, and scientific excellence.

Turnstone is Now SWCA

Turnstone Consulting, an environmental consulting firm in San Francisco, California, has officially transitioned into SWCA Environmental Consultants. Acquired in 2014, the San Francisco team focuses on environmental planning, review, and permitting services under the California Environmental Quality Act (CEQA), as well as public outreach, urban planning, and transportation planning services. This acquisition has expanded SWCA’s market

presence in Northern and Central California and furthers the company’s position as one of the largest environmental compliance firms in the United States. Chuck Katz became the Northern California Principal

in 2016 and is responsible for operations and growth of SWCA’s Northern California offices, including San Francisco and Half Moon Bay.



SWCA Celebrates Anniversaries Around the Nation



In 2017, many of SWCA’s locations have celebrated landmark anniversaries. The Phoenix office, which also serves as corporate headquarters, was established in 1992, marking 25 years. Also with 25 years to celebrate, is the Salt Lake City office in Utah. In 2002, the Las Vegas office opened, marking 15 years of SWCA in

Nevada. On the east coast, the Pittsburgh office celebrates 5 years as a part of SWCA. Over the years, all of these offices have been dedicated to preserving natural and cultural resources for tomorrow while enabling projects that benefit people today. **Happy Anniversaries, SWCA!**

The Phoenix Office is Moving On Up

SWCA’s corporate headquarters is moving a block away from its current location, to a more modern and comfortable office space. Located on the 17th floor, the office will have a 360 degree view of downtown

Phoenix. Local restaurants, museums, and more surround the new spot. The Phoenix team is excited to move into their new space at the end of the year.



Want to discuss how drones could benefit your project? Contact: drone-operations@swca.com.

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NEWS BRIEFS (CONTINUED FROM PAGE 11)

Recent Promotions



Mike Crow has been promoted to the position of Gulf Coast Principal for the Houston and Baton Rouge offices. Mike joined SWCA in 2006. He first served in technical and project management roles, eventually moving into the Cultural Resources Director role. In early 2017, Mike took responsibility of both the Cultural and Natural Resources programs in Houston.



Josh Perry has been promoted to the role of Director of Arlington and Tulsa. Over the past 5 years, Josh has excelled as Natural Resources Lead in Arlington, adeptly managing clients, mentoring staff, and growing the Arlington and Tulsa operations. Josh will take over the day-to-day operations, building our team in both offices and making strategic hires.



Micah Chambers has been named Director of Business Development for North Texas / Oklahoma. Micah brings significant experience and strengths in business development and will focus on diversification across the region. Micah will work closely with the Texas Gulf Coast management team and SWCA Business Development Group.



John Dietler has been promoted to the position of Southern California Principal. John joined SWCA in 2008, and has been instrumental in growing our Pasadena office. John first served as Principal Investigator, eventually moving into the Cultural Resources Director role in 2010. In August 2017, John took responsibility for both the Cultural and Natural Resources programs in Pasadena.