

# CLIMATE CHANGE: WATER



<http://sierraclub.org/arizona>

Grand Canyon Chapter

Summer 2017

## Climate Change: Another Threat to Arizona's Rivers

By Gary Beverly



Since Arizona's statehood, groundwater pumping and surface water diversions have severely impacted major groundwater basins and have seriously degraded five of Arizona's major perennial rivers: the Colorado, Gila, Salt, Santa Cruz, and much of the San Pedro. Perennial flow in the Verde River is diminished, and future base flow of the upper Verde River is deeply threatened.

For decades, the Grand Canyon Chapter has struggled to protect our surviving rivers and to restore our degraded rivers. This extremely difficult project is now made even more arduous by the growing impacts of climate change. Climate scientists have previously projected that the Colorado Plateau will become increasingly hotter and drier with erratic and intense storms. Three recent studies provide more details on how climate change will degrade our rivers – a synergistic triple whammy.

Researchers determined that the western mountain snowpack has supplied about two-thirds of the region's water, and within the next three decades increasing greenhouse gas emissions may cause the snowpack to shrink by 60%, melt earlier, and substantially reduce future river flows ([http://bit.ly/CORiver\\_future](http://bit.ly/CORiver_future)).

Other researchers discovered that warmer-than-normal temperatures are responsible for about a third of the observed 20% decline in Colorado River flow from 2000–2014 ([http://bit.ly/snowpack\\_loss](http://bit.ly/snowpack_loss)). The

upper Colorado River basin is 1.6°F warmer now than during the 1900s, so more water is lost to the atmosphere through evaporation from soil, streams, and other water bodies. Plants also use more water when it's hot because daily water needs increase and the growing season is longer.

A third study found that "...during dry periods, water users pump more even as natural recharge diminishes, leading to rapid drawdowns in aquifers...dry wells, land subsidence, ecological damage..." ([http://bit.ly/climate\\_groundwater](http://bit.ly/climate_groundwater)).

So how does this affect Arizona rivers? Rivers that depend on snowpack and mountain springs (the Colorado, Gila, Salt, and lower Verde) may show peak flow earlier in the spring, but the total annual flow will be reduced. Summer flows will be reduced, perhaps creating dry spots. Further, intense and irregular rainstorms may create flood runoff leading to erosion and sedimentation. In response, water managers may propose new flood control and storage dams.

The base flow of the San Pedro, Santa Cruz, and upper Verde rivers is groundwater released through springs and seeps, not snowpack. Hotter and drier conditions will reduce soil moisture and aquifer recharge. Increased groundwater pumping for growing cities and agriculture will lower the water table and reduce the base flow of these

See AZ Rivers on p. 4.



### Be a Leader!

#### Chapter and Group Nominations

Are you interested in becoming more involved with Sierra Club? Are you interested in helping create a vision, make policy, execute plans to protect and preserve our environment, and have fun while doing it? If not you, do you know someone else who might be? Submit a nomination for a chapter or group leadership position! See p. 3 for details.



Artwork created during the Tucson People's Climate March. Artist unknown.

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Grand Canyon Chapter

# Arizona Chapter Action Directory

## Canyon Echo

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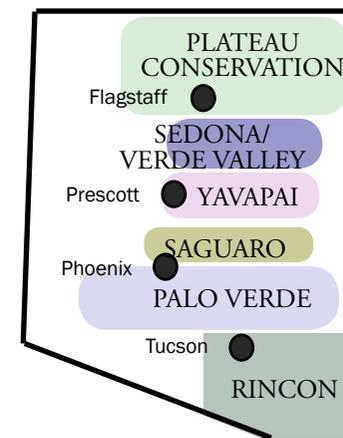
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### 2017 Group Voting Representatives to Chapter Ex-Com (see p. 14 for contact information):

<b>Palo Verde:</b> Don Steuter	<b>Rincon:</b> Meg Weesner	<b>Yavapai:</b> Tom Slaback
<b>Saguaro:</b> Jim Wilkey	<b>Sedona/Verde Valley:</b> Brian Myers	

## Chapter Announcements

**JUL 5, AUG 2, SEP 6 (WED) 6:30 p.m. Political Committee meetings.** Help us elect more environmentally-friendly candidates! If you are interested in helping improve the political climate in Arizona, consider being part of our Political Committee! All Sierra Club members are welcome to participate. For information, contact Dale Volz at 480-892-5102 or dvolz@earthlink.net.

**AUG 2 (WED) 5:30 p.m. Publications Committee meeting.** Have an idea? Help plan future issues of *Canyon Echo*! Contact Meg Weesner at 520-576-2083 or mweesner@att.net or Tiffany Sprague at 602-253-9140 or tiffany.sprague@sierraclub.org.

**AUG 9 (WED) 6:30 p.m. Wildlife Activist Group meeting.** Are you interested in learning about the wildlife that calls our state home and in working for species' protection? Join us to learn more about what's happening with Arizona's wildlife, upcoming projects and opportunities, and how you can get involved. For more information, contact Cyndi Tuell at 520-272-2454 or cctuell@hotmail.com.

**AUG 22, SEP 26 (TUE) 6:30 p.m. Energy Team meetings.** Discussions, programs, and field trips encompass renewable energy and energy efficiency campaigns nationally and locally. Everyone is invited to participate, no matter how much or how little you know about energy issues. For more information, please contact Harry Lumley at 480-474-4993 or lumleyhw@gmail.com.

**SEP 1 (FRI) Copy deadline for Fall 2017 Canyon Echo.** Articles, art, photographs, poetry, essays, and brief epiphanies are welcome. Contact the editor before submitting at 602-253-9140 or tiffany.sprague@sierraclub.org to discuss word count, photos to include, licensing, issue topics, and to request submission guidelines.

**SEP 27 (WED) Times TBD. Canyon Echo Mailing Party.** Volunteers save the Chapter hundreds of dollars by preparing *Canyon Echo* for mailing. Thank you! The job is easy to learn, and we all have a great time. Any amount of time that you're available is appreciated. Contact Jerry Nelson at 602-279-4668 or peakbagger2@gmail.com for details.

**SEP 30 - OCT 1 (SAT-SUN) Chapter Conservation (SAT) and Executive Committee (SUN) meetings.** Club leaders meet to consider matters related to statewide conservation efforts, share experiences across groups, and coordinate strategy to align our Chapter mission and goals with that of national Sierra Club. For more information, contact Don Steuter at 602-956-5057 or dsteuter@hotmail.com or Keith Bagwell at 520-623-0269 or kbagwell50@gmail.com. Meetings will be held in Flagstaff.

# Grand Canyon Chapter – What’s Going On?



Photo by Sandy Bahr.

## WE NEED YOU! You ARE SIERRA CLUB

Volunteer leadership positions within the Grand Canyon Chapter are an ideal way to deepen your involvement in the issues important to you. Your club needs committed people who will give their time and energy to further its mission to explore, enjoy, and protect the planet.

Become a candidate to serve on your group or chapter executive committee! No experience is necessary. If you want to help create a vision, make policy, execute plans to protect and preserve our environment, and have fun while doing it, please nominate yourself. If you know of another good person, let us know.

If you would like to learn more about what would be involved, please contact one of the following leaders: Nominations Chair Oscar Medina at 520-903-8005 or [oscardedinagomez@gmail.com](mailto:oscardedinagomez@gmail.com), Chapter Chair Keith Bagwell at 520-623-0269 or [kbagwell50@gmail.com](mailto:kbagwell50@gmail.com), or your group chair (see p. 14).

Guidelines for chapter and group executive committee elections:

1) To be listed on the ballot, candidates must submit their names and membership numbers. If you aren't sure what your membership number is, see your *Canyon Echo* label or contact the chapter office at 602-253-9140. Be sure to include contact information along with your submission.

2) Submit a candidate statement (recommended but not required), indicating the chapter or group executive committee for which you are running to the Nominations Committee at [oscardedinagomez@gmail.com](mailto:oscardedinagomez@gmail.com) by **no later than August 15, 2017**. Candidate statements are limited to 200 words and must be submitted by email. You will receive acknowledgement within a few days of submission. (Because much of the executive committee's business is done by email, candidates must have email capability.)

The official ballot will appear in the Fall 2017 *Canyon Echo*. So, go ahead, nominate yourself or someone else you think would be a good leader.

Thank you for stepping forward!

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Not everyone can make a large gift to protect the environment during their lifetime, but you can preserve the environment for generations to come by remembering Sierra Club in your will.

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Help save resources and money by signing up for the electronic newsletter! Send an email with your full name and membership ID (8-digit number on your mailing label) to [CanyonEchoESub@gmail.com](mailto:CanyonEchoESub@gmail.com) or fill out the short form at [http://bit.ly/e\\_echo](http://bit.ly/e_echo). You will receive an email when issues are available online.



### National Drive Electric Week September 9–17



National Drive Electric Week is a nationwide celebration to heighten awareness of today's widespread availability of plug-in vehicles and to highlight the benefits of all-electric and plug-in hybrid-electric vehicles. Events will be held across the nation, including right here in Arizona!

To find a celebration near you, please visit <https://driveelectricweek.org>.

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## Cast of Characters

### Jenny Cobb Adventurous Advocate



Jenny Cobb. Photo by Tom Slaback.

Before Jenny Cobb joined the Yavapai Group Executive Committee (ExCom), our meetings were kind of heavy with gobs of environmental issues to discuss and counteract. Since Jenny joined, we have the same slate of issues, but we're having a lot more fun with our struggles. She's a testament to the power of fun, food, and fellowship, and we are better off for her presence.

Jenny got involved in conservation work through Great Old Broads for Wilderness, and she now serves as a regional Broadband Leader. She has participated in dozens of volunteer work parties all over the Southwest from trails in New Mexico to road obliteration in Arizona Joshua Tree Forest.

After helping the Water Sentinels monitor the upper Verde for years, we finally talked her into joining the ExCom. She helps Yavapai Group evaluate and write comments on grazing permits and restora-

tion projects in the Prescott National Forest. Also, Jenny is part of our team working to protect wildlife habitat from fragmentation due to local road construction. All of these projects require a lot of field time, and that is a joy to Jenny – she loves the outdoors and works to protect public lands and wildlife.

The Bears Ears National Monument proposal called up her favorite thing: cooking. Jenny is an accomplished cook and cooking teacher, so she loaded up her truck with food and a kitchen, drove to Utah, then fed 80 Broads at a Bears Ears campout. I hear that there were some epic bridge and poker games, but she won't say how much she won.

Jenny does all this with a huge smile, a lot of jokes, and boundless energy. She's always ready to GO! She's helping us make a difference. Thanks, Jenny!

personal, regional, and national action. We must modernize Arizona's water law by emphasizing conservation, reuse, and the environment instead of robbing water from our rivers. Vote for the rivers!

Gary is Chair of the Yavapai Group.

## The Water Flows, but for How Long?

By Joshua Knight

The rising temperatures over the years in the U.S. are an undoubtable fact – a fact that has many consequences, especially for Arizona. Arizona water is taking a hit every year due to the increase in temperatures, meaning less snowfall at higher elevations, more evaporation, and less flow into rivers. The catastrophic consequences of rivers getting too low will cause great harm to aquatic wildlife and make them much less attractive to people, resulting in negative economic consequences such as reduced tourism.

The hotter and drier conditions coupled with increases in demand for water for everything from electric power production to agriculture and landscape irrigation will stress already stressed systems. Having less water is no joke for Arizona because we are already a dry place. We could be facing serious problems with Arizona water as we are pumping



Fossil Springs. Photo by Jennifer Martin.

more groundwater than is being replenished and our rivers are already overstressed. So we should protect our waters and make sure that we respect the climate and try to work hard and benefit it because once the water is gone, so are the people. Let's keep Arizona alive and let's make sure that the water is still here for our future generations.

Joshua is a former Sierra Club intern and a recent graduate of Bioscience High School.

## Climate Change and Water in Phoenix

By Alicia Flores

As of 2017, Phoenix, Arizona, is one of the fastest growing cities in the U.S. With this rapid expansion of population comes benefits and drawbacks. Speaking from an environmental standpoint, there are several pros and cons to expansion; nevertheless, the cons do outweigh the projected advantages.

For instance, with the growth in population comes the direct parallel of the need to increase manufacturing of goods. This, in turn, releases air toxins, exhausts fossil fuels, and depletes natural land due to expansion. The consumption of resources like water and land is another example of how population growth is detrimental to the ecosystem's wellbeing.

No matter how much some people like to deny the concept of climate change, there is tons of evidence that supports it, and population growth is one of the leading factors. With climate change comes an increasing need for an essential factor of life: water. The changing climate will amplify the need for

water but will successively reduce the supply. Speaking from a scientific standpoint, the rise in temperature increases the rate at which water evaporates, extracting it from soil, plants, and vast areas of surface waters.

By putting more people into an already unbalanced system, the demand becomes greater than the output, and the fragile system will eventually collapse. In Arizona, people typically depend on winter precipitation and the monsoon season to revitalize dry lands and make up for the water lost due to evaporation and consumption. Annual precipitation has diminished in Arizona over the last century, and it is predicted that the amount of rain will continue to dwindle. Soils will become drier, there will be an increasing need for water with no promise for delivery, and time spans without rain will make droughts last longer and have harsher impacts on every facet of an ecosystem.

Alicia is a former Sierra Club intern and a recent graduate of Bioscience High School.

### AZ Rivers continued from p. 1.

threatened rivers. Arizona's intermittent streams (the Little Colorado, Agua Fria, Babocomari, and others) are similarly endangered.

Let us work to protect and restore our rivers and to mitigate climate change by

## Water Sentinels and Climate Change

By Jennifer Martin 

Although there is no question about the fact of climate change, that fact spawns an endless stream of questions about the implications for functioning ecosystems in Arizona and across the globe. Evidence of climate change has outpaced predictions. From reduction in ice caps and associated sea level rise, to increasing evaporation of fresh water due to temperature increase in the lower atmosphere, to prevalence of drought with an increase in violent and unpredictable storms, trends are more rapid than models predicted. Because of uncertainty – not about the existence of the climate change crisis but about what the impacts will be and when we will experience them – monitoring programs to track changes in ecosystem health and function are more critical now than ever.

The Arizona Water Sentinels Program of Sierra Club's Grand Canyon Chapter has been collecting water quality, flow, and depth to groundwater data on the Verde River since 2006 and the San Pedro River since 2011. These long-term datasets are invaluable in tracking changes to our rivers and can help identify impacts to our riparian systems resulting from industrial pollution, overuse of our water supply, and even climate change.

As global temperatures rise, increased evaporation of fresh water is an inescapable reality. While monitoring our rivers can show us if flow and depth to groundwater are declining, stable, or increasing, it is more difficult to separate the impacts of diversion and groundwater pumping from increasing evaporation due to rising temperatures. One thing is certain: these factors exacerbate one another.

Declining water in both the Verde and San Pedro rivers has been well documented. Although this is likely almost entirely due to diversion and groundwater pumping, the degree to which the problem is compounded by climate change is likely to rise along with temperatures. Does this have implications for water quality as well? Logic would dictate that as the volume of water decreases, concentration of pollutants as well as water temperature would increase. Increases in water temperature would also be



Get involved with the Water Sentinels! Photo by Sandy Bahr.

likely to increase water-borne diseases. Our data demonstrates that the warmest months correlate with spikes in *E. coli* in our rivers.

As we continue to collect both water quality and temperature data, we will be able to track whether and how much our rivers are warming and if there is an associated increase in the presence and concentration of *E. coli*.

The Water Sentinels Program is volunteer-based. You can help track changes to our rivers by participating in citizen science and helping gather data. No special knowledge or equipment is needed. Sierra Club provides training and equipment as it coordinates three teams on the Verde River and four teams on the San Pedro River. Whether you are able to come regularly or only occasionally, your participation would be welcome and valuable.

*Jennifer is the Arizona Water Sentinels Program Coordinator.*

### ***Get Involved!***

To learn more and get connected with the Arizona Water Sentinels, contact Jennifer Martin at 602-254-8362 or [jennifer.martin@sierraclub.org](mailto:jennifer.martin@sierraclub.org). You can also follow us on our Arizona Water Sentinels page on Facebook at [http://bit.ly/azsentinels\\_fb](http://bit.ly/azsentinels_fb).

## Wet-Dry Monitoring of the Agua Fria River

By Tim Flood

A stream gage measures streamflow over time, but only for one location. In contrast, Wet-Dry (W/D) monitoring simultaneously assesses the absence or presence of surface water on many miles of a stream.

For nine years, Friends of Agua Fria National Monument (FAFNM) has organized one weekend each year to monitor the W/D status of the Agua Fria River and key tributaries. To document the “base flow,” we monitor during the third weekend of June, prior to the monsoon rain. Biologists call this the “pinch point” because it is



Agua Fria Wet-Dry Mapping. Photo by Jennifer Martin.

when stream-dependent animals are most vulnerable to dry-up of streams. Reduction of streamflow diminishes water quality, degrades aquatic and riparian ecosystems, and

deters the public's interaction with streams.

We are increasingly alarmed by declining surface flow in the Agua Fria as we watch the dropping hydrograph of the nearby U.S. Geological Survey stream gage each June (see [http://bit.ly/USGS\\_af](http://bit.ly/USGS_af)). Climate change may alter the streamflow patterns in our state. By monitoring the trend of wet and dry reaches, we are positioned to detect climatic impacts to streams. Of more immediate use, we now can spot promising locations for fish reintroductions.

W/D mapping measures the length and location of wet segments. The “total

wetted length” is expressed as a percentage of the monitored stream. Mapping the wet locations reflects the input from local water sources. For example, we notice that wet mainstem segments often are found immediately downstream of tributaries.

This citizen-science cooperative project involves mostly volunteers from FAFNM, Upper Agua Fria Watershed Partnership, Bureau of Land Management (BLM), Audubon Society groups, and local residents. The W/D protocol for Agua Fria was first developed in conjunction with a University of Arizona project called Non-point-source Education for Municipal Officials (NEMO) and with the BLM for use on the San Pe-

*See Wet-Dry on p. 7.*

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NOTE: These lists include donations received  
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thanks and very much appreciates  
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for its support of our energy efficiency  
work. Mil gracias!

### Wet-Dry continued from p. 5.

dro River and Cienega Creek, now with 18 and 11 years of W/D data, respectively. In Arizona, no agency assures we maintain healthy flowing streams. Streamflow monitoring to benefit wildlife is conveniently ignored by the water consumption sectors, and water laws strongly disfavor in-stream flow.

Volunteers from Sierra Club's Water Sentinels program have participated several times in W/D monitoring, including this year on June 24. One week prior, FAFNM and the BLM held orientation and safety training, during which we covered the logistics of using the GPS units and completing the data

forms. We also discussed volunteer safety and preparation required for hiking in the heat. Tips include knowing the start and stop points; taking preparatory hikes; hydrating; pre-arranging shuttles and keys; and starting on time. The 35 miles of stream were divided into 18 segments of varying difficulty. Teams of 2-4 persons hiked along the river channel 1-5 miles, generally starting around dawn. Most teams finished by mid-morning.

Interested in participating next year? Keep an eye on our calendar and sign up at <http://www.aguafriafriends.org>.

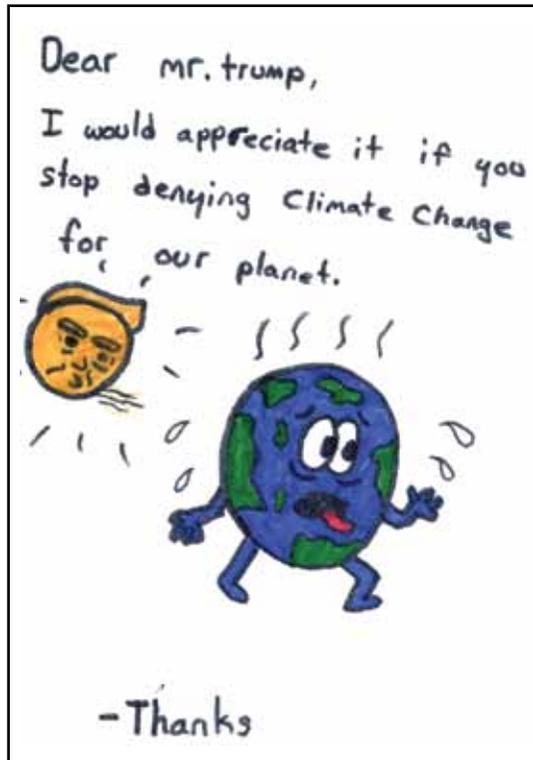
*Tim is a board member of Friends of Agua Fria National Monument.*

## Marching into Action

Thank you to everyone who helped plan, implement, and participate in the People’s Climate Marches in Arizona. On April 29, millions of people around the world, including thousands of Arizonans across the state, came out to support action on climate change. On Earth Day, large numbers of people also turned out to speak up for science at the Marches for Science. Many also marched for immigrants on May 1. We know that is a lot of marches in a short period of time, so thanks for making them happen and for continuing to work for climate justice, clean energy, and using science to inform our actions. Continued action on these issues is essential. Let’s all plan for “marches” to the polls in the next 18 months to elect people who understand and prioritize these issues at the local, state, and national level!

For more information and to help with planning future events and activities, please contact Sandy Bahr at 602-253-8633 or [sandy.bahr@sierraclub.org](mailto:sandy.bahr@sierraclub.org).

### Tucson



Artwork created during the Tucson rally. Artist unknown.

An estimated 3,000 activists gathered in downtown Tucson on April 29. After rousing speeches from local politicians, activists from a variety of organizations, and Congressman Raúl Grijalva, the sign-carrying crowd took off on a half-mile march through downtown Tucson. A Native drumming circle welcomed them back to El Presidio Plaza, where more than 30 organizations had set up tables to advocate action on climate change. Five middle school students from Paulo Freire School stole the show with their poetry and prose, telling their perspectives and urging immediate action on climate change. Professor and acclaimed climate researcher Jonathan Overpeck highlighted the post-march program. Participants created artistic messages about climate change to send to elected officials at the federal and state levels.

—Meg Weesner

### Phoenix



Phoenix Climate March. Photo by Mike Brady.

More than 2,000 people participated in our Phoenix People’s Climate March and Rally – people from diverse backgrounds and of all ages. We had a strong planning team with participation from a broad range of groups, including Sierra Club, Stronger Together Arizona, Kids Climate Action Network, Arizona Interfaith Power and Light, Arizona Faith Network – Earth Care Commission, Chispa AZ – League of Conservation Voters, 350.org Phoenix, Communication Workers of America, Arizona Stands, Great Old Broads For Wilderness – Phoenix and Middle Gila Broadbands, Phoenix Lobos-Rising Pactivist Group, Franciscan Renewal Center, Center for Biological Diversity, Tonatierra, and Havasupai Tribe, as well as many more.

We had a great rally with a steel drum band and a strong set of speakers, including

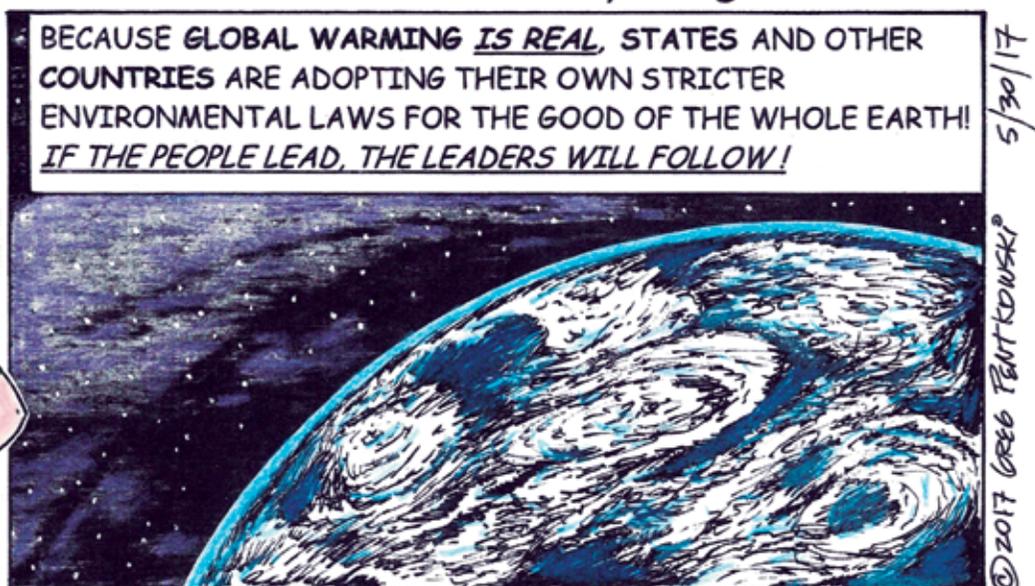
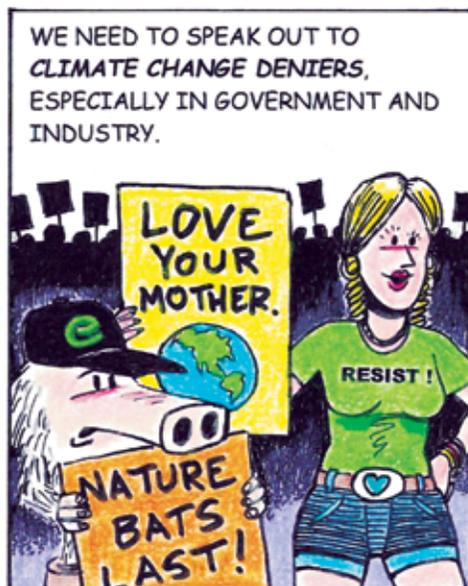
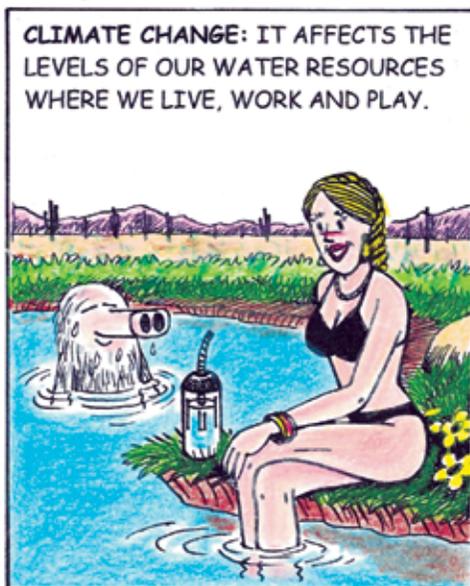
several students, a scientist, a faith leader, a veteran, a state senator, and many more. The march was led by drummers, several members of the Havasupai tribe, and Tonatierra, an indigenous rights organization. Marchers circled the state capitol before returning to the Senate lawn to sign postcards asking Arizona’s Congressional delegation to act on climate. Havasupai leaders also invited people to join them in a spontaneous circle dance! Watch a video of the march at <http://bit.ly/PhxMarchVideo>.

—Sandy Bahr

## Beyond the Slab

-- CELEBRATING OVER 30 YEARS OF PUBLISHED ECO-AWARENESS !

By Greg Pentkowski



© 2017 GREG PENTKOWSKI 5/30/17

## Marching into Action

### Flagstaff



Flagstaff Climate March. Photo by Joe Shannon.

chanted to vehicles passing by. Once the Sambatuque drum troupe had a quorum, we gathered around the flag pole. Two marchers with a big ol' American flag and a large women power/persist fist flag started us down the sidewalk with drummers close behind. Soon, we turned into the residential Old Town part of Flagstaff, with many people coming out of

their homes to cheer us on!

We arrived back to the south lawn. The speakers gathered, our American Sign Language interpreters arrived, and it looked like we had nearly 500 marchers to listen to our diverse group of speakers. All in all a wonderful three hours of climate and social activism on a beautiful Saturday afternoon.

The Flagstaff event was organized by Sierra Club's Plateau Conservation Committee, Together We Will Northern Arizona, and Center for Biological Diversity.

—Joe Shannon

After several weeks of planning (permits, speakers, music, gathering tablers, etc.), the morning of April 29 dawned blustery – 40s and windy. Typical pre-climate change April day in Flagstaff after a very warm month. I arrived at Flagstaff City Hall around 1 p.m. to get the tabling area set up, and energized resistors were already coming by to check things out. Luckily, we had a table with art supplies to make signs, and they got to work on their climate resistance messages.

We assembled on the south lawn of Flagstaff City Hall. Many marchers lined up along the busy Sante Fe – Rt 66 road and

### Prescott



Prescott Climate March. Photo by Gary Beverly.

Although Prescott is arguably the most conservative area in the state, an impressive showing of progressive citizens regularly marches and demonstrates in actions co-sponsored by Sierra Club, Indivisible, Great Old Broads for Wilderness, and the faith community. Our weekly Tuesday

Resist! actions draw dozens of sign-waving protesters to major intersections. Marches are popular: 400 for Martin Luther King Day, 1,200 for the Women's March, 350 at the March for Science. The public reaction has been encouraging, with more honks and waves than fingers. The marchers have a great time chatting and meeting new progressive friends ("I thought I was the only one in town!").

For the People's Climate March on April 29, we were unable to hold a rally because

the Yavapai County Courthouse square was tied up with a huge mountain bike race. Tense negotiations with City officials finally cleared a march route. About 200 fired-up locals marched around downtown Prescott chanting and waving signs. We filled out 170 postcards and had fun.

We will happily persevere because we are making a difference.

—Gary Beverly

## Overcoming Alternative Facts in a Post-Truth Climate

By Tyler Kokjohn



All of us sense the new political atmosphere, but few can make much sense of it. Our current post-truth environment features "alternative facts" and political leaders who lie without shame or consequence. When facts don't seem to matter and arguments grounded in scientific information are dismissed summarily by opponents as fake news, we do appear to have crossed into a modern dark age.

The assumption that arguments over mitigating climate change threats would be settled by amassing enough data and facts may be erroneous. Most people are not climate experts, and it is possible to mislead the public with alternative facts concocted by cherry-picking



Sign at Phoenix Climate March. Photo by Tiffany Sprague.

data or taking information out of context. Climate communications fellow John Cook asserts that alternative facts do more than

just compete for influence with scientifically-established information. He suggests that persons uncertain about which contradictory fact to believe may end up accepting neither. Cook illustrates the impact using the analogy of matter colliding with antimatter: for some people, the presence of alternative facts essentially annihilates actual facts (read more at [http://bit.ly/alt\\_facts](http://bit.ly/alt_facts)).

The good news for grassroots activists is that there is a way to counter alternative-fact annihilation schemes. Cook describes research suggesting it is possible

to weaken the impact of alternative facts by discussing them and pointing out explicitly how people are being misled. For example, do alternative fact promoters have hidden conflicts of interest? Have data been taken out of context or unfairly selected to bolster a false claim? People shown how they are being manipulated tend to be less susceptible to misinformation.

Vested interests have thwarted attaining political consensus on global climate change in part by annihilating valid information with alternative facts. Systematically exposing this ruse to manipulate the public may be a potent countermeasure against this fundamentally arrogant strategy.

Tyler is a Publications Committee member and a wilderness/wildlife activist.

## Legislature Attacks Direct Democracy

By Sandy Bahr



The backdrop for the 2017 legislative session included efforts to weaken and eliminate environmental protections at the federal level. Anti-environmental legislators were heartened by rhetoric and executive orders by the Trump administration, plus knew that Congress was less-than-friendly to landmark environmental laws such as the Clean Air Act, Clean Water Act, and Endangered Species Act.



These laws have provided a floor of protection for Arizona's air, water, and wildlife, but now that floor may buckle due to actions in Washington, DC. These federal-level threats may explain why Arizona legislators introduced fewer bills aimed at weakening local environmental programs.

Legislators, at the direction of the Arizona Chamber of Commerce, prioritized eroding the people's rights to initiate laws and to stop bad laws via ballot measures. Having already erected a few roadblocks previously, this legislature attacked citizen rights with a vengeance by introducing eight measures to make it extremely difficult to put a measure on the ballot and to keep those that pass intact. Two of those measures landed on the Governor's desk and he signed them, so they will become law unless the legal challenges or referenda that have been mounted are successful.

Although many of the bills to advance an anti-conservation agenda didn't make it to the Governor, a harmful water bill was signed into law. It advantages certain livestock interests to the detriment of tribes and federal public lands and may be used to rob precious flows from the San Pedro River. Likewise, the Governor signed a bill to discourage Pima County from protecting lands via its Sonoran Desert Conservation Plan.

On the plus side, thanks to the Arizona Senate, the State Parks Board will be around for another year to help steward our

state parks and our state parks system. This is the second year that the Governor, the state parks director, and the majority in the House of Representatives attempted to push through a bill to eliminate this important board. We are hoping this is the last of it, but...

Also defeated by the Senate was a bill that authorized use of "snake shot" in urban areas. We were concerned it would be used to declare open season on snakes, small mammals, and even birds in our urban areas, plus it would have created additional public safety issues.

Legislators sent an excess of bad messages to Congress and the administration in Washington, DC, asking for weakening of health-based standards for air quality, replacement of the Clean Power Plan with a coal-friendly alternative, and repeal or weakening of the Antiquities Act so that larger monuments could not be established.

Once again, the Legislature passed no bills to significantly advance environmental protection. Even a bill to re-enact tax credits for rainwater harvesting was quashed. Legislators did continue the waste tire program and a couple of councils, including for outdoor recreation and archaeology.

Overall, it was a lackluster session resulting in the majority of legislators failing to make the grade on environmental protection.

*Sandy is Chapter Director.*

You can view the full report card at <http://bit.ly/2017SCreportcard>.

	SENATE	HOUSE
<b>A+</b>	Farley (LD 9), Hobbs (LD 24), Mendez (LD 26), Peshlakai (LD 7), Quezada (LD 29)	Alston (LD 24), Andrade (LD 29), Blanc (LD 26), Bolding (LD 27), Butler (LD 28), Clark (LD 24), Engel (LD 10), Epstein (LD 18), Espinoza (LD 19), Fernandez (LD 4), Friese (LD 9), Gabaldón (LD 2), Gonzales (LD 3), Martínez (LD 30), Navarrete (LD 30), Powers Hannley (LD 9), Saldate (LD 3)
<b>A</b>	Cajero Bedford (LD 3), Contreras (LD 19), Dalessandro (LD 2)	Chávez (LD 29), Descheenie (LD 7), Hernandez (LD 2), Rubalcava (LD 4), Salman (LD 26)
<b>B</b>	Bowie (LD 18), Bradley (LD 10), Meza (LD 30), Miranda (LD 27), Otondo (LD 4)	Benally (LD 7), Cardenas (LD 19), Rios (LD 27)
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<b>I*</b>		Lovas (LD 22), Toma (LD 22)
<b>F</b>	Governor Ducey	

\*This seat was vacant for a portion of the legislature, resulting in an incomplete voting record.

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## An Open Letter to Senator Worsley

February 15, 2017

Dear Senator Worsley,

My daughter Anna Rose and I have met with you for the last three years on Environmental Day, asking for your sponsorship or support of policies that favor clean air, clean water, and conservation of Arizona's natural places. Anna wrote you an open letter in the Summer 2016 issue of Sierra Club's *Canyon Echo*, asking why you received an "F" on the Sierra Club voting record report card. I personally mailed you a copy of the newspaper and a photo of Anna in a "chubby suit," and Anna pointed out to you how many of your constituents are members of Sierra Club. I was disappointed that you did not respond to Anna's request to help her understand your voting record. I was further disappointed that you did not recognize Anna on Environmental Day, nor did you give the Earth Club Anna was instrumental in bringing to the event more than handshakes in a hallway. The Earth Club attended with the intention of learning about the legislative

process, as well as to express their environmental concerns.

I am certain you love Arizona as much as I do. I recognize that you could do whatever you want with your life given the fortune you amassed as a businessman and that you chose public service. I respect you for your work. As someone who shares my appreciation for our state, I am certain you recognize that clean air, ample water, good health, salubrious food, and beauty are the birthright of Arizona's great-great grandchildren.

Anna, who is 14 years old, has been working at finding the solution for environmental degradation, which has been heartbreaking and frightening to her since she was in the second grade. Anna wants to know why you scored so poorly on the Sierra Club voting report card. Please give her concern consideration and a response.

Respectfully yours,  
Kathy Mohr-Almeida, Ph.D.  
Anna Rose's mom

## Nogales Wash and Climate Change

By Ben Lomeli



Every storm that hits Nogales, Arizona, puts pressure on the deteriorating sewage pipe that carries 14 million gallons of sewage daily, mostly from Mexico, right through the small city of Nogales to the Nogales International Wastewater Treatment Plant (NIWTP) in Rio Rico.

This pipe, the International Outfall Interceptor (IOI), was constructed in 1971. Its path to the NIWTP lies mostly under Nogales Wash. The pipe is protected from erosive flood flows by the concrete-lined floor of the wash and several feet of dirt.

Because of upstream urbanization and its deteriorated condition, the IOI is in danger every year of becoming exposed and bursting during heavy summer monsoon flood flows in Nogales Wash. Additionally, the IOI continues to leak raw sewage into the groundwater aquifer system that pro-

vides drinking water for most of the community.

Nogales Wash is located in a desert landscape within the Upper Santa Cruz River Basin. There are two major precipitation periods in the typical southeastern Arizona water year. The first and most dramatic is



Nogales Wash emerging from a tunnel in Nogales, AZ. Photo by Hans Huth.

the summer monsoon (July–September), during which 50% of annual precipitation occurs. A secondary wet season in the fall and winter months is caused by Pacific frontal storm movement.

Potential climate-change-related impacts are of concern for Nogales Wash and the IOI because all credible predictions are for warmer and drier conditions overall – but with less frequent, more intense storms.

Detention basins constructed in Mexico are too few and too small (they appear to be designed for about a 25-year storm) and have quickly filled with sediment. Many more are needed, and all need to be regularly maintained. Watershed improvements are also needed to stabilize eroding soils and thus reduce excessive sediment flows. Revegetation of bare soils, water harvesting, erosion control, retrofitting of stormwater Best

Management Practices and Low Impact Development approaches would all help reduce stormwater peak flows and excessive sediment transport.

Therefore, as long as the contributing watershed in Mexico continues to produce abrasive sediment-laden peak flows that far exceed the conveyance capacities of Nogales Wash, all our local stormwater infrastructure remains at risk. As long as the IOI remains underneath the deteriorated, unstable, and undersized Nogales Wash, the threat of IOI ruptures remains a reality that will most likely be increased by climate change.

Friends of the Santa Cruz River commissioned a short video documenting the IOI problem to inform as many people as possible and to create a unified voice to urge federal decision makers to fund a proper repair for this failing infrastructure complex. This film can be viewed on the Friends of the Santa Cruz Facebook page or website (<http://friendsofsantacruzriver.org>).

Ben is a hydrologist and floodplain manager with BLM.

## I Can Remember



I can remember when air was unseen  
When clouds were white, when grass was green  
Water running, not gulping, down a sewer  
Distinguishing the older trees from the newer  
Catching and eating fish from the rivers  
Condemning the takers and praising the givers  
Drawing the water and seeing thru the glass  
Thinking individually – not groups en masse  
Watching the sun set beside the blue ocean  
Before the black oil had crippled its motion  
Remember the forests, the towering pines

Now they're vertical planks on assembly lines  
Those babbling brooks only nature creates  
Are clogging and choking on all our phosphates  
With DDT and all of its users  
Insects survive, only birds are the losers  
The sum of activities, the dreary conclusion  
Cannot be ignored with utopic delusion  
Do not disregard – the destruction must halt  
And we needn't discuss who is at fault  
Stop killing this world – don't take it for granted  
Lest the universe remember when earth was a planet



–Andrea McCoy

## Border Walls in the Budget Deal

By Scott Nicol



Congress recently passed legislation that averted a government shutdown, keeping the federal lights on through October. Democrats successfully removed funding for border walls in new locations and should be commended for doing so.

But there are hundreds of millions of dollars in the bill that will pay for border wall construction: “\$341,200,000 to replace approximately 40 miles of existing primary pedestrian and vehicle border fencing along the southwest border using previously deployed and operationally effective designs, such as currently deployed steel bollard designs, that prioritize agent safety; and to add gates to existing barriers.”

A document that Republicans posted online gives more of a breakdown. It has three line items that fit this description, and together they add up to the amount that was approved: 1) \$146,000,000 for “[r]eplacement of primary pedestrian fencing in high priority areas – 20 miles,” 2) \$146,000,000 for “[r]eplacement of vehicle fencing with primary pedestrian fencing in high priority areas – 20 miles,” and 3) \$49,200,000 for “[g]ates for existing barriers – 35 gates.”

The first 20 miles in this list involve removing some of the earliest walls that were built along the border in California and Arizona, made of corrugated steel panels that had originally been used as helicopter landing mats in the Vietnam War, and replacing them with bollard walls.

The next 20 miles refer to vehicle barriers that are typically six feet tall and were erected in Arizona and New Mexico to stop jeeps and ATVs from driving across the border in roadless areas. These are places where pedestrian walls were seen by the Border Patrol as pointless, as a person on foot may take a week to reach a road.

Because of their design – shorter and with wider gaps between posts – vehicle barriers typically allow wildlife and water to pass through them, so they are less damaging to the environment than bollard border walls.



Left: Deer trapped at bollard wall. *Photographer anonymous.* Right: Deer passing under vehicle barrier. *Courtesy of USFWS.*

That is not to say that they are environmentally harmless, but replacing them with the bollard design will inflict a great deal of damage on fragile ecosystems.

In 2008, just a few months after vehicle barriers in Organ Pipe Cactus National Monument were replaced with pedestrian border walls, seasonal monsoon rains washed through the area. Debris clogged the walls, and they acted as dams, causing serious erosion. Three years later, when a similar event occurred, the force of the water blew out a wide section of the border wall and swept it away.

Pedestrian border walls also pose greater barriers to the movement of wildlife. Sonoran pronghorn, jaguar, and many other endangered species that inhabit southern Arizona rely upon connection with populations in Mexico in order to remain genetically viable.

It is important that Sierrans speak out against these new pedestrian border walls. If built, the walls will inflict terrible damage upon precious ecosystems, and they are likely to be just the first, not the last, border walls proposed for our borderlands.

*Scott is Co-Chair of Sierra Club Borderlands Team.*

## Does Scottsdale Need a Center to Discover the Desert?

By Scott Vineberg



Does teaching tourists about preservation and sustainability justify turning acres of land in the country’s largest urban nature preserve into an “edutainment” complex? “No,” say Scottsdale activists opposing the city’s plan to locate a “Desert Discovery Center” (DDC) inside the city’s more than 30,000-acre McDowell Sonoran Preserve.

Grassroots volunteers with groups No DDC and Protect Our Preserve are working to compel a public vote on future development in the Preserve. After the Scottsdale City Council’s controversial decision in January 2016 to greenlight a preconstruction study, these volunteer groups coalesced to fight the planned location at the Preserve’s Gateway Trailhead.



*Photo by Scott Vineberg.*

Located in North Scottsdale, the Gateway is the most popular access point in the Preserve, welcoming more than 300,000 hikers, bikers, runners, climbers, birdwatchers, photographers, and equestrians annually. A quick glance at the visitor log shows that

guests come from all over Arizona, the U.S., and the world. They express amazement for the natural beauty and gratitude for the forward-thinking citizens who inspired and maintain the Sonoran Desert landscape.

Citizen-led efforts beginning in the mid-1990s culminated with Scottsdale voters approving sales tax increases in 1998 and 2004 to fund the acquisition of land and construction of trails and trailheads for the Preserve. By the time these taxes expire in 2034, Scottsdale residents and visitors may have paid upwards of \$1.6 billion.

These efforts also spawned the non-profit organization McDowell Sonoran Conservancy. The Conservancy trains and

organizes more than 650 volunteer “Stewards,” who conduct education, outreach, and research – including a citizen scientist program – and maintain the Preserve’s trails. This has allowed the City of Scottsdale to commit minimal funds to upkeep and administration of the Preserve and testifies to the widespread support the Preserve enjoys.

In fact, a survey conducted by O’Neil Associates in 1998, after the first Preserve tax increase, showed that 95% of surveyed Scottsdale voters believed it was at least “somewhat important” to protect “natural desert area from development,” with 83% considering it “very important.”

While DDC advocates argue that without the development, citizens will forget why they created the Preserve, activists con-

*See DDC on p. 14.*

## Arizona's Future Water-Carbon Footprint

By W. Mark Day



Given that our carbon footprint is tied to climate change, we should consider how much electric power is used in water movement, treatment, and delivery in Arizona. California's water sector is estimated to use 20% of state electricity. Arizona probably uses a lower percentage because it doesn't have as much agriculture, but, even at 10%, Arizona would use more than 7 terawatt-hours (TWh) of power for water uses annually. Water weighs 8.36 pounds per gallon, so it takes a lot of energy to move it uphill. The Central Arizona Project (CAP) canal, the largest energy user in Arizona at 2.8 TWh per year, uses almost 4% of Arizona's total electric power to deliver 21% of its supplies. Currently, it uses about 25% of the output of Navajo Generating Station (NGS), a gigantic coal-fired plant. That's equal to nearly a third of the power Tucson Electric Power serves to a city of one million people. CAP requires



Navajo Generating Station from Lake Powell. Photo by Malcolm Surgenor.

power 24/7, so intermittent renewables present some problems, although battery storage is promising.

Interest in replacing NGS power with lower cost sources (and also to reduce CAP's carbon footprint) is prominent now. Reduction of carbon with gas-fired power is debatable due to unverified methane releases from

fracking operations. Potential cost and stack emissions reductions are immediate considerations, along with potential impacts on tribal economies. CAP officials estimate that switching from NGS to market power could save at least \$25 million a year, but its closure would also mean the loss of more than 600 tribal jobs.

Considering water is a substantial share of our energy use, we should certainly consider how we can use less of it to keep our carbon footprint as small as possible. Historically, water use has decreased with price increases – sometimes dramatically. Tucson's residential water use has been modest for decades compared to Phoenix. Price and rate increases occurred

in the 1970s, but, prior to that, metered use was virtually the same.

Our best future water source is conservation, but some basins may require desalination of briny groundwater, inter-basin transfers, or extending the CAP to places like Prescott or Wilcox and Bowie, which are at much higher elevations than Tucson. Generally, conservation is most readily driven by price increases, which make it financially attractive. If new supplies are sought, as with the Governor's Water Augmentation Council, prices will certainly increase, assuming costs are not passed on to the tax base. If users pay per-unit prices, conservation is inevitable with expensive projects. Thus, such projects may be unaffordable and unnecessary.

Conservation is the best answer because it directly reduces the carbon-energy requirements ([http://bit.ly/energy\\_water](http://bit.ly/energy_water)). Future water sources are more energy intensive than current sources. What kind of water-energy-carbon path do we want to send our children and grandchildren down?

*Mark is a water economics advocate and member of the Rincon Group.*

## Salt River Wilderness Report

By Jim Vaaler



From March 8–10, Dave Mowry and I went on a Salt River raft trip, starting from the river right put-in about 0.5 mile downstream from the US60 bridge on the White Mountain Apache tribal lands and ending 52 miles later at the river left boat ramp just below the State Route 288 bridge in Tonto National Forest. We purchased two permits for this raft trip.

My previous trip on this river took place almost five years ago, and many changes were evident. Over the past five years, there has been a continuous drought over the watershed. Thus, no large spring or summer rainy-season floods have removed vegetation from the river corridor. As a result, there has been an unchecked growth of tamarisk and cane, both non-native, in the river corridor. Extended drought is one of the predictions made by climate change scientists. This streamside growth has had a negative effect upon the availability and quality of river

camp for the recreational river runner. Although campsites were once numerous and easy to find, they are now few and far between as almost all are now choked with an impenetrable biomass of tamarisk and cane. This biomass has, in many places, altered or narrowed the course of the Salt River. You find yourself rowing through "cane narrows." At Blackjack Wash, the course of the river has been pushed to the right and no longer flows among the "shark's teeth" on river left. The Blackjack camp is virtually unusable. Cliffhanger Rapid can no longer really be considered a rapid as a large channel has been cut to the left, rendering this an easy run.

There is some unverified evidence that Quartzite Falls (now Quartzite Rapid) may have also changed. On previous trips, I



Jim Vaaler rows past the Salt Banks. Photo by Dave Mowry.

have simply rowed to the top of this rapid, made a final correction with the oars, and had a successful run. On this trip, however, I rowed up on the rapid, and the river took over, pushing the raft up against a huge river right boulder, dumping me into the river and nearly flipping the 15.5-foot raft. After

going through the "spin cycle" in the rapid, I surfaced, only to find no Dave and no boat. Dave had also fallen out of the raft, but, against all odds, he somehow got back in the boat. Then the boat somehow executed a 90° right turn and ended up in a "rock pen" where we used to line the boats before Taz Stoner illegally altered Quartzite Falls. I had to be rescued by another party on the island below the rapid. It seems possible that a large underwater boulder has been moving downstream along the left wall.

Lesson learned: 1) No more single raft trips – always take at least two rafts. 2) In rowing as in politics, when in doubt, go left. Especially at Quartzite Falls.

*Jim is a longtime Sierra Club member and public lands activist.*

# Happenings Around the State

Five groups and one regional conservation committee make up the Grand Canyon Chapter. All events and meetings listed below are open to members interested in learning more about Sierra Club. You can find out more at <http://www.sierraclub.org/arizona/events-activities>. Schedules are subject to change. (x) Group ExCom members

## Palo Verde Group (Phoenix)

<http://sierraclub.org/arizona/palo-verde>

<b>Chair/Membership:</b>	Kathy Mohr-Almeida (x)	480-329-8503	kathlynn626@yahoo.com
<b>Vice-Chair/Programs:</b>	Michael Brady (x)	480-990-9165	az.brady@gmail.com
<b>Secretary:</b>	Bettina Bickel (x)		bbickel08@gmail.com
<b>Treasurer:</b>	Jerry Nelson (x)	602-279-4668	peakbagger2@gmail.com
<b>Conservation:</b>	Don Steuter (x)	602-956-5057	dsteuter@hotmail.com
<b>Outings/Wilderness:</b>	Jim Vaaler (x)	602-553-8208	jimvaaler@msn.com
<b>ICO:</b>	Lisa Vaaler	602-468-4158	lvaaler1@gmail.com
<b>Ex-Com (At-Large):</b>	Fareed Abou-Haidar (x)	480-345-1779	fdadlion@cox.net
	Gary Kraemer (x)	602-373-6301	drrealitycheck@gmail.com
	Blair McLaughlin (x)	480-515-3850	blair.mclaughlin@cox.net

**JUL 20, AUG 17, SEP 21 (THU) 6:30 p.m. Free monthly programs.** Open to the public. Location TBD. Visit <http://sierraclub.org/arizona/palo-verde> or call 480-990-9165 for more information.

**SEP 7 (THU) 6:30 p.m. Conservation Committee meeting.** Contact Don Steuter. Location TBD.

**SEP 14 (THU) 6:30 p.m. Executive Committee meeting.** Contact Kathy Mohr-Almeida. Located at Burton Barr Library, 1221 N. Central Ave., Phoenix.

## Saguaro Group (North Maricopa County)

<http://sierraclub.org/arizona/saguaro>

<b>Chair/Website:</b>	Harry Lumley (x)	480-474-4993	lumleyhw@gmail.com
<b>Vice-Chair:</b>	Doug Murphy (x)	602-329-3690	dbmurphy@cox.net
<b>Secretary:</b>	Sally Howland (x)	602-663-2889	sally_howland@yahoo.com
<b>Treasurer:</b>	Ehrick Howland	602-663-4479	ehrick3@hotmail.com
<b>Conservation:</b>	Jo Sylvester	602-595-6170	stitchinjo@yahoo.com
<b>Membership:</b>	Bev Full (x)	480-221-2554	bfull@cox.net
<b>Outings:</b>	Peter Weinelt (x)	623-388-2209	vitalpaw@yahoo.com
<b>Service Projects:</b>	Urb Weidner	602-595-3301	northwoods@cox.net
<b>Political:</b>	Jim Wilkey (x)	480-649-2836	nrgvup@gmail.com
<b>Ex-Com (At-Large):</b>	Dianne Leis (x)	480-432-9181	dianne.leis@gmail.com

For information about activities in northern Maricopa County, contact Harry Lumley.

DDC continued from p. 12.

tend that the Scottsdale City Charter and governing Preserve Ordinance forbids many of the activities considered for the development, such as a gift shop, a café serving alcohol, nighttime operations, and amplified sound/music. They worry about the DDC's impact on wildlife and recreational visitors; increased vehicle traffic, including tour buses; and Arizona State University's planned research complex at the DDC site. And they contend that the natural landscape itself teaches more about the value of preservation than any building, exhibit, or film.

No DDC and Protect Our Preserve are supporting a petition campaign – “Save Our Preserve” – to ensure proposed future development in the Preserve gets a public vote first. They recently served a Notice of Claim to Scottsdale City Council that, without a commitment to a citizen vote on the DDC, the groups are prepared to take their challenge to court. You can learn more and get involved with either group through their Facebook pages.

*Note: The Palo Verde Group opposes the center.*

*Scott is active with Protect Our Preserve and a member of No DDC.*

## Rincon Group (Tucson)

<http://sierraclub.org/arizona/rincon>

<b>Chair:</b>	Meg Weesner (x)	520-576-2083	mweesner@att.net
<b>Secretary:</b>	Catalina Ross (x)		cross@email.arizona.edu
<b>Treasurer:</b>	Ken Bierman	520-882-2708	kbierman1@gmail.com
<b>Communications:</b>	Cyndi Tuell (x)		cctuell@hotmail.com
<b>Conservation:</b>	Keith Bagwell (x)	520-623-0269	kbagwell50@gmail.com
<b>Energy:</b>	Russell Lowes (x)	520-321-3670	russlowes@gmail.com
<b>Membership:</b>	Thomas Hatfield (x)		thomas.hatfield@gmail.com
<b>Outings:</b>	Mitch Stevens	520-991-1199	mitchstevens@stevensloydgroup.com
<b>ICO:</b>	Kyle Kacerek		kyle.kacerek@gmail.com
<b>Political:</b>	Lee Oler	520-791-9246	cloler@cox.net
<b>Ex-Com (At-Large):</b>	Diego Martinez-Lugo (x)		dmartinezlugo@email.arizona.edu

**AUG 24, SEP 28 (THU) Conservation Committee (6 p.m.) and Executive Committee (7:15 p.m.) meetings.** The meetings are open to the public. Sierra Club members, in particular, are urged to attend and to participate. Please join us! Located in the first floor conference room of the Historic YWCA, 738 N. Fifth Ave., Tucson.

*The following program will be held at Tucson City Council Ward 3 office, 1510 E. Grant Rd., Tucson. Free and open to the public. Refreshments served. For more information, contact Keith Bagwell.*

**SEP 14 (THU) 7 p.m. The 2017 Arizona Legislature - What did it do and what can we do?** Come learn more about the Arizona Legislature, the process, and what happened this past session. Find out how you can get involved in advocacy at or outside the Capitol. Arizona legislators considered fewer bills to weaken local environmental programs this session. The legislative leaders were, instead, looking to Congress and the White House to deliver on an anti-environmental agenda. However, our Legislature did engage in an all-out assault on Arizona's direct democracy. Chapter Director Sandy Bahr will present on these topics and more.

## Sedona/Verde Valley Group

<http://www.reliablescribe.com/svvg>

<b>Chair:</b>	Brian Myers (x)	928-300-7734	ibisalliance@gmail.com
<b>Vice-Chair:</b>	Anne Crosman (x)	928-284-9252	annecrosma@aol.com
<b>Secretary:</b>	Tina Myers (x)	928-300-7733	ibisalliance@gmail.com
<b>Treasurer:</b>	Paul Rauch (x)	928-821-4215	sequoia.tree55@gmail.com
<b>Webmaster:</b>	John Sheffield	928-204-1517	jsheffield40@gmail.com

For information about activities in the Sedona/Verde Valley area, contact Brian Myers.

## Yavapai Group (Prescott)

<http://sierraclub.org/arizona/yavapai>

<b>Chair/Outings/Web:</b>	Gary Beverly (x)	928-308-1003	gbverde@cableone.net
<b>Vice-Chair/Conservation:</b>	Tom Slaback (x)	928-778-4233	theprescottkid@cableone.net
<b>Secretary:</b>	Jenny Cobb (x)	928-541-9746	cobbstrun@msn.com
<b>Treasurer:</b>	Michael Adcock (x)	928-237-9143	michaelthemt@cableone.net
<b>Ex-Com (At-Large):</b>	Doug Treadway (x)	928-899-5409	douglastreadway@yahoo.com

**JUL 7, AUG 2, SEP 6 (WED) 6 p.m. Executive Committee meetings.** Members are welcome and urged to attend and participate in our monthly Executive Committee meetings. These are where we choose the issues we are involved with and do our strategic planning. Located at Yavapai Title Conference Room, 1235 E. Gurley St., Prescott.

# Explore and Enjoy Arizona

Find more events and opportunities on our online calendar at <http://www.sierraclub.org/arizona/outings>.

**JUL 8 (SAT) Southwest Wildlife Conservation Center.** This unique facility is dedicated to preservation of our native Arizona wildlife. Limit of 12 participants, and a donation is welcome. Tour starts at 10 a.m. Contact Bev Full at 480-221-2554 or [bfull@cox.net](mailto:bfull@cox.net). **Phoenix**

**JUL 12 (WED) Boyce Thompson Arboretum Tour and Oak Flat Campground Picnic.** Carpool about 35 mi. for arboretum tour and to learn about the history and environmental damages being done to Oak Flat due to extensive mining operations. Bring lunch to share. Admission to arboretum is \$12.50. Contact Bev Full at 480-221-2554 or [bfull@cox.net](mailto:bfull@cox.net). **Phoenix**

**JUL 30–AUG 4 (SUN–FRI) Raft the Green River from Flaming Gorge to Gates of Lodore.** Camp 6 nights. Cost: \$350, includes raft rentals and shuttle service, campground fees, and meals in camp. We are traversing through Browns Park National Wildlife Refuge and areas proposed for wilderness status. Contact Bev Full at 480-221-2554 or [bfull@cox.net](mailto:bfull@cox.net).

**AUG 9 (WED) Tour and Hike at Desert Discovery Center, McDowell Sonoran Preserve.** Bring lunch to share. Learn about the development planned for this area by

the City of Scottsdale. Contact Bev Full at 480-221-2554 or [bfull@cox.net](mailto:bfull@cox.net). **Phoenix**

**AUG 18–20 (FRI–SUN) “B” Backpack in the Santa Ritas** (14–16 mi.). We’ll take Gardner Canyon Trail, traverse Baldy Saddle, and camp near Florida Saddle Friday night. Saturday, we’ll hike to seldom-visited McCleary Peak, experience great views and discuss geology and fauna, then descend to Cave Creek to camp and wade/swim in pools if conditions allow. Sunday will bring a short exit hike. This may be a good entry-level trip for those interested in trying backpacking. We may encounter wild turkey on Cave Canyon Trail. Limit 10. Contact Eric Morrison at 520-248-5149 or [ericlmorrison@gmail.com](mailto:ericlmorrison@gmail.com) or Mitch Stevens at 520-991-1199 or [mitchstevens@stevensloydgroup.com](mailto:mitchstevens@stevensloydgroup.com). **Tucson**

**AUG 27 (SUN) “C” Hike Tubac Presidio State Historic Park** (2–8 mi., little EC). This is the first in a series of outings to Arizona’s state parks, celebrating the 60th anniversary of the Arizona State Park System. We will visit the park and, as weather permits, walk 2–8 mi. on the Anza National Historic Trail along the Santa Cruz River and riparian corridor. Entry fee of about \$5 per person. Limit 15. Contact Meg Weesner at 520-290-1723 or [mweesner@att.net](mailto:mweesner@att.net). **Tucson**



Tucson ICO outing at Devil’s Bridge. Photo by Al Bellavia.

**SEP 1–9 (FRI–SAT) “A” Backpacking the San Juan Mountains.** Join us for an adventurous week at Colorado’s breathtaking San Juan Mountains. We’ll board the Silverton-Durango Train and backpack to Chicago Basin, a high alpine meadow. We’ll set up base camp and day-hike to several fourteeners, high country lakes, and wildflower-strewn meadows. Windom Peak is the easiest fourteener, with moderate exposure. There are other more difficult peaks with more exposure. There are pleasant creek rambles above and below Chicago Basin for those who prefer mellow but still gorgeous hikes. Contact Mitch Stevens at 520-991-1199 or [mitchstevens@stevensloydgroup.com](mailto:mitchstevens@stevensloydgroup.com). **Tucson**

**SEP 15 (FRI) “C” Hike Patagonia Lake State Park** (5 mi., 500’ EC). This is the sec-

ond in a series of outings to Arizona’s state parks, celebrating the 60th anniversary of the Arizona State Park System. We will explore hiking trails around the lake and in neighboring Sonoita Creek State Natural Area. Entry fee of about \$5 per person. Limit 10. Contact Meg Weesner at 520-290-1723 or [mweesner@att.net](mailto:mweesner@att.net). **Tucson**

**SEP 29–OCT 6 (FRI–FRI) Annual Canoe/Kayak through Labyrinth Canyon on the Green River.** Also tour through the new and politically-endangered Bear’s Ears National Monument. Two days exploring and camping in Bears Ears (Sep. 29–30) and 5 days camping and canoeing on the Green River (Oct. 2–6). Cost: \$350, includes canoe rentals, shuttles, meals in camp, and other fees. Contact Bev Full at 480-221-2554 or [bfull@cox.net](mailto:bfull@cox.net).

**OCT 14 (SAT) “B+” Fortuna Peak** (10 mi., 1300’ EC). This peakbag will take us up to the 5260’-high summit of Fortuna Peak in the mountains north of Superior. Although much of the hike will be on dirt roads, the off-trail route will involve slippery slopes and thick, spiny, and brushy vegetation (leather gloves recommended). Views will be excellent. Drive 70 mi. from Tempe. Call Ken McGinty at 602-265-2854. **Phoenix**

## Plateau Conservation Committee (Flagstaff)

<http://sierraclub.org/arizona/plateau>

<b>Chair:</b>	Joe Shannon	928-380-9537	<a href="mailto:jshannon278@gmail.com">jshannon278@gmail.com</a>
<b>Public Land Recreation:</b>	Mike Popejoy	982-707-1419	<a href="mailto:m.a.popejoy@gmail.com">m.a.popejoy@gmail.com</a>
<b>Soundscape Activist:</b>	Dick Hingson	928-699-8366	<a href="mailto:dhingson@infowest.com">dhingson@infowest.com</a>
<b>Volunteer Coordinator:</b>	Lindsey Jones	602-478-5795	<a href="mailto:lulu56765@gmail.com">lulu56765@gmail.com</a>
<b>Water Conservation:</b>	Ian Harrison	928-266-0154	<a href="mailto:harrisonianj@gmail.com">harrisonianj@gmail.com</a>

The following programs are held at Joe C. Montoya Community Center, 245 N. Thorpe Rd., Flagstaff. Contact Joe Shannon for more information.

**JUL 13 (THU) 6 p.m. Film screening: Before the Flood.** Leonardo DiCaprio and his team travel across the globe to witness firsthand the devastating effects of climate change and what can be done to stop them. DiCaprio meets with the world’s top climate scientists, energy experts, government leaders, and visionary entrepreneurs to learn about the reality of climate change and what can be done to solve it.

**SEP 14 (THU) 6 p.m. The Climate Reality Project and the Colorado River.** Dr. Christian Komor and Patty McCredie will discuss The Climate Reality Project, a diverse group of passionate individuals committed to building a better future together. The Climate Reality Project was founded by former Vice President Al Gore to move the climate change conversation forward and to turn awareness into action. We will learn about technology to capture CO<sub>2</sub> to reduce greenhouse gases already in the atmosphere.

## Hiking Guidelines

The Sierra Club is a nationwide organization with active local outings for members and non-members. Please join us as we make friends and explore life-enriching interests. Simply find an outing by date and contact the leader for directions, reservations, time, and additional information. **RESTRICTIONS: NO FIREARMS, RADIOS, OR PETS** (unless noted otherwise). Outings are by reservation. Call early (group limit 20). Each hike is rated for degree of difficulty and risk by the leader.

<b>“A”</b>	>16 miles or >3,000 ft. elevation change (EC)		
<b>“B”</b>	8–16 miles and 1,500–3,000 ft. EC		
<b>“C”</b>	3–8 miles, 500–1,500 ft. EC	<b>RT</b>	Round Trip
<b>“D”</b>	<3 miles and 500 ft. EC	<b>OW</b>	One Way

The trip leader has absolute authority to question trip participants as to their equipment, conditioning, and experience before and during the trip. All participants on Sierra Club outings are required to sign a standard liability waiver. If you would like to read the liability waiver before you choose to participate in an outing, please go to <http://content.sierraclub.org/outings/local-outdoors/resources> or contact the National Outings Dept. at 415-977-5528 for a printed version. Sierra Club liability covers leaders only. Each person is responsible for his/her own first aid equipment. If you are injured, notify the leader immediately. If you leave the trip, with our without the leader’s permission, you are considered to be on your own until you rejoin the group. Hikers are encouraged to carpool and share the driver’s fuel expense. Donations are accepted from all participants at \$1 (member) and \$3 (nonmember). Money is collected by the leader and deposited with the group treasurer. For more information, contact Bev Full at 480-221-2554. Hikes and outings are also listed online and in the Sierra Singles newsletters. CST 2087766-40. Registration as a seller of travel does not constitute approval by the State of California.

# Sierra Service Opportunities

Get involved and make a difference! Join us for these exciting service outings!

## Water Sentinels Monitoring

**Verde River: Saturday, July 8, August 12, September 9**

**San Pedro River: Monday, July 10, August 14, September 11**

Contact: Jennifer Martin, 602-254-8362, [jennifer.martin@sierraclub.org](mailto:jennifer.martin@sierraclub.org)

Get your feet muddy and your hands wet with the Arizona Water Sentinels! These are great opportunities to help protect our important rivers. Volunteers are needed to take water samples and to make field observations. A group also monitors shallow groundwater levels in wells in the Murray Springs Clovis Site and near the San Pedro River near Sierra Vista. These data help track impacts to the rivers and to advocate for their protection. What could be better than spending a day in gorgeous scenery while working to make a difference?

## Lower Verde Water Monitoring

**Saturday, July 8, August 12, September 9**

Contact: Doug Murphy, 602 329-3690, [dbmurphy@cox.net](mailto:dbmurphy@cox.net)

Join the Saguaro Group and Arizona Water Sentinels as we monitor water quality on the Lower Verde River. We will be sampling water quality, recording data, documenting the river's condition, taking samples for analysis, and picking up trash at Needle Rock beach on the Lower Verde, just minutes from north Scottsdale. This is a great opportunity for children and families to learn about the river. Call for carpool information.

## Pueblo High School Engages with Nature

By Al Bellavia



I awoke at 4 a.m. on March 20 at Mather Campground in Grand Canyon National Park. Today was to be the highlight of the trip for 12 high schoolers who had earned their way to Grand Canyon for spring break. The morning was crisp, quiet, and magical. The group packed



Pueblo High School students at Grand Canyon. Photo by Josie Rincon.

meals into day packs and then set out to Bright Angel Trail, headed toward Plateau Point overlooking the Colorado River.

When we arrived at the rim, light was just showing its face against the canyon walls in many colors, shapes, and forms. To witness the inner excitement among these fine young adults was as exciting as witnessing the ever-changing patterns in light, color, temperature, and wind as the hike progressed.

It was a day of beauty, challenges, and personal rewards for the 12 students and 6 adults. This trip began at 4:30 a.m. on March 18 in Tucson and ended very late on March 21. The planning stage for such an outing took two months. Tucson Inspiring Connections Outdoors (ICO) supplied transportation, tents, sleeping bags, coolers, kitchen stove, etc. Pueblo High School supplied food (through its state tax credit fund) and cookware.

## Rio Salado Habitat Restoration

**Sunday, July 9, September 10**

Contact: Jennifer Martin, 602-254-8362, [jennifer.martin@sierraclub.org](mailto:jennifer.martin@sierraclub.org)

Help us restore habitat! Join us for an invasive weed pull and clean-up at the Rio Salado Habitat Restoration Area, just south of downtown Phoenix. Once a dump site, the area is now a lush riparian corridor that supports a variety of wildlife and recreation opportunities. We need help removing trash and buffelgrass, a non-native, invasive species that alters habitat and increases fire risk. In April, we'll also be planting native cottonwood trees! Snacks, drinks, gloves, and tools provided.



Water Sentinels remove trash from Needle Rock. Photo by Dianne Leis.

Pueblo High School, an inner-city school in Tucson, is comprised of students who rarely get beyond the continuous concrete and asphalt of city life. Ernesto Somoza, a teacher at Pueblo, formed a Hiking Club and invited students to participate in monthly hikes. Tucson ICO and Ernesto joined forces in August 2016 to provide quality hikes for these students. Meadows Trail in the Santa Catalina Mountains, Boggs Springs Trail in the Santa Rita Mountains, and Picacho Peak Summit Trail at Picacho Peak State Park are a few of the hikes accomplished during the season. The final two outings for the Hiking Club were overnight camping trips: Grand Canyon in March and a trip to Sedona on May 13–14, during which Cathedral Rock Trail and Devil's Bridge Trail were hiked. Nineteen Pueblo High Schoolers were served during the two overnight trips. More than 40 Pueblo High Schoolers contributed to the monthly hikes throughout the school year.

The students had varied hiking levels and abilities. Fortunately, there were enough ICO and school volunteers on each hike to accommodate those levels. How did we accommodate those varied levels of hiking abilities and physical challenges associated with hiking in the Canyon? Ernesto and I had planned to split up the group: one group hiking down to Plateau Point and the other group doing a relatively flat "rim" hike. To our amazement, every student wanted to hike into the Canyon on that mystical morning of March 20. When reaching the "rim" of Bright Angel Trail that early evening, each student arrived physically and mentally challenged by the exertion of the trail with a sense of accomplishment and contentment.

Many thanks to Ernesto Somoza, all the agency/teacher volunteers from Pueblo High School, and all the wonderful ICO leaders and volunteers that made this 2016/2017 hiking season a memorable experience.

Al is a Tucson ICO leader.