South Platte River Urban Waters Partnership (SPRUWP)
QUARTERLY MEETING
May 21, 2019, 12:30 PM– 3:30 pm
Metropolitan State University (MSU) of Denver, Denver, CO
Meeting Summary – DRAFT

Attendance: Sarah Anderson, Bill Battaglin, Cindy Chang, Dana Coelho, Amy Conklin, Rachel Crouch, Stacey Eriksen, Elaine Hassinger, Peter Ismert, Mike McHugh, Jordan Parman, Al Polonsky, Donny Roush, Andrea Savage, Mike Smith, Weston Toll, Scott Williamson, and Alison Witheridge

Facilitation: Sam Haas and Dan Myers

ACTION ITEMS

Dana Coelho	• Send information on Metro Denver Nature Alliance's podcast to Sam Haas
Peter Ismert	Send information about the South Platte Forum's annual conference to Sam Haas.
SPRUWP MEMBERS	• Provide Rachel Crouch with local water equipment recommendations. • Volunteer to help MWRD with fish surveys and carp capture. • Send suggestions for future speakers to Peak Facilitation Group

SPRUWP PARTNER UPDATES
SPRUWP partners provided updates on their roles and current work priorities. Their comments are summarized below.

Bill Battaglin-US Geological Survey (USGS)
- USGS is finalizing plans to do a sampling study of orthophosphates in the South Platte River and Cherry Creek, with help from the South Platte Protecting our Urban River Environment (PURE) group and several SPRUWP members.
- USGS is considering holding a community event where volunteers can participate in the sampling process in parallel to the study.

Cindy Chang and Andrea Savage- Groundwork Denver
- Groundwork Denver is working with MSU professors to process many of the samples it took looking for E. coli in Lower Bear Creek. It will reopen the Lower Bear Creek Watershed Plan once it has more information from the samples.
- Groundwork Denver will also complete irrigation and sprinkling audits on Lower Bear Creek this summer and will install rain barrels and rain gardens in that part of that watershed.

Dana Coelho- Metro Denver Nature Alliance (Metro DNA)
- The US Forest Service (USFS) has filled Coelho's vacated position in the Urban and Community Forestry Program. Coelho will introduce the new staff member to SPRUWP.
- Metro DNA is partnering with the Southwest Denver Coalition on its Safe Summer Kickoff event at Garfield Lake Park on Saturday, June 8. Garfield Park will be open to nonmotorized recreation for the first time this year. Nonprofit groups in southwest Denver are encouraged to set up a booth at the festival.

Amy Conklin- Barr-Milton Watershed Association
- The Urban Water Cycle bike tour will be on June 4 this year. More information is available at Water Education Colorado's website.
- The Barr Lake stakeholder tour will be on June 25 (lunch included). Barr Lake Appreciation Day is on July 13, and the Watershed Association will be at the Arapaho County Fair on July 26.

Rachel Crouch-Bluff Lake Nature Center (BLNC)

- BLNC is working with Denver Water and the Colorado Department of Public Health and Environment (CDPHE) to fill Bluff Lake with recycled water.
- BLNC is updating its Lake and Wetland Management Plan in light of the fact that the lake has now been full for two and a half years.
- BLNC is also filling its site manager vacancy, conducting water education programs, and launching a new wetland ecology workstation with water science equipment for community events.

Stacey Eriksen and Peter Ismert- Environmental Protection Agency (EPA)

- Ismert is working with CDPHE to develop a 319 Grant program to fund nonpoint source pollution projects.
- The South Platte Forum will hold its annual conference at the Westin Hotel in Broomfield on October 23 and 24.
- EPA is working with SPRUWP partners to secure funding for the USGS orthophosphate study.
- Eriksen is reviewing Water Education Colorado's "Citizen's Guide to Water Quality."
- Colorado State University (CSU) is hosting the Great Plains Low Impact Development Symposium in Fort Collins from June 24 to June 26. SPRUWP members are encouraged to attend.

Elaine Hassinger- Tri-County Health Department

Tri-County Health has found alkyl substances in alluvial aquifers in Commerce City and is conducting further sampling in private wells. EPA and CDPHE are doing a source assessment for the problem.

Mike McHugh-Aurora Water

- Aurora Water is contributing to the Tennessee Pass rehabilitation process by cutting and thinning trees around Turquoise Lake and is working on fire recovery efforts at Weston Pass.
- Aurora Water is doing its five-year update of its Source Water Protection Plan and has received a grant from the EPA and the Colorado Natural Areas Program to examine wetlands in Aurora.

Jordan Parman- Metro Wastewater Reclamation District (MWRD)

- MWRD is doing construction at the confluence of the South Platte River and Clear Creek to cool the water coming from the South Platte more quickly (which would benefit fish in the river).
- MWRD conducts fish surveys each fall at habitat improvement sites and ongoing monitoring sites along the river. It needs volunteers to help with these surveys.
- MWRD got a permit to kill 10,000 invasive carp in Barr Lake and needs volunteers to do that once a week beginning in late June.

Al Polonsky-Denver Department of Public Health and Environment

Polonsky is convening the Denver Metro Regional Wetlands Stakeholder Group. There may be funding for Peak Facilitation Group to facilitate this group's meetings. SPRUWP members are encouraged to participate.

Donny Roush- Denver Department of Public Works

The Colorado Stormwater Council has created open-use public service announcements on stormwater and pet waste for use in messaging efforts.

Weston Toll- Colorado State Forest Service (CSFS)

- CSFS is working with Denver Water on the Forests to Faucets partnership to restoration forests and reduce wildfire risk in the Upper South Platte watershed and other zones of concern. Those projects will begin as soon as this summer.
- CSFS has also completed a ten-year maintenance plan for Denver Water properties in the Upper South Platte watershed.

Scott Williamson-Water Education Colorado

- In addition to the Urban Waters Cycle Tour on June 4, Water Education Colorado is hosting a symposium on equity and diversity on June 5.
- On June 6, Water Education Colorado is holding an educator training on the Project Water Education for Teachers (WET) curriculum.
- Registration is open for the Water Fluency Bootcamp.
- Water Education Colorado is working on citizen's guides on water quality, groundwater, and water sources.

Alison Witheridge-Denver Water

- Denver Water is conducting water quality assessments of the Upper South Platte, Blue River, and Strontia Springs collection systems. It will share its findings with partners as soon as it can.
- Denver Water interns are participating in the Weston Pass fire recovery process and other USFS efforts.

PRESENTATION: MIKE SMITH, RENEWWEST

Mike Smith, Managing Partner and Founder of RenewWest, presented on his organization's efforts to leverage carbon offsets and reforestation, and the benefits of those efforts to urban water resources. His comments are summarized below, and his presentation slides are attached to this meeting summary.

Background

- Forests have a strong relationship with water quality in the western US. Fires like Colorado's Buffalo Creek and Hayman created serious downstream water quality issues.
- RenewWest plants forests to restore destroyed landscapes. There is a serious need for this: nine million acres burned in the US last year, and approximately ten million acres per year has been the recent norm. RenewWest's partners include landowners with large losses from wildfires, forestry professionals, and carbon offset buyers.
- Carbon offsets have become a critical part of RenewWest's work because of the climate threat. To reach the International Panel on Climate Change (IPCC)'s revised goal of limiting warming to 1.5 °C by 2050, more carbon will have to be pulled out of the atmosphere than is being put in. Carbon capture technology probably will not be adequate to meet that goal. Carbon pricing mechanisms and reforestation will be critical components of efforts to meet the IPCC's goal.
- Two recent studies by employees of The Nature Conservancy and their partners estimated that reaching net negative emissions globally and nationally by 2050 could include offsetting 20% of human carbon-producing activities with natural climate solutions, the foremost of which is reforestation.
- Current carbon markets form a $54 billion global market. In North America, California and Quebec have created a joint Western Climate Initiative valued at $8.4 billion. That number will increase if (as expected) Oregon joins by the end of 2019. The system is politically and legally secure through at least 2030. It works through cap-and-trade, in which tranches of total permissible carbon emissions are priced and sold to companies. The cap will decline over time, reducing the carbon emissions supply and incentivizing companies to find less carbon-intensive ways of doing business. The market will become more valuable as available carbon allowances decrease.
- Within the Western Climate Initiative, allowances can be offset by buying the benefits of an action to improve the climate (e.g., reforestation) conducted by a third party like RenewWest. This is a small portion of the total market: offsets are projected to account for only 6% of the total value by 2026. Offsets also provide secondary environmental benefits (e.g., water quality improvements) and reduce price shocks through substitution. The Western Climate Initiative has a price floor for carbon that will rise over time, which will drive investment in offsets to varying degrees in different emissions scenarios.
- Prominent corporations like Barclays, Toyota, and Coca-Cola are working to reduce their emissions for branding/marketing reasons and to mitigate the threat of regulatory action against

their businesses. For example, most of the aviation industry has signed on to a massive carbon emission offset and reduction scheme that will provide a much larger offsets market than that of the Western Climate Initiative. China will also play a large role when its national climate market begins operations.
- In the US, state and local governments are increasingly adopting their own carbon standards and creating carbon markets because of the lack of action at the federal level. Colorado has a bill awaiting signature to set up a carbon market similar to California's.

RenewWest
- RenewWest develops forest restoration projects, raises funds for them (from carbon offset buyer, landowner, etc.), plants the trees in questions, and measures their growth. The growth over time provides a tranche of carbon offsets that can be sold as credits or as outright possessions to investors.
- RenewWest's lead project is the Collins-Modoc project, which involves replanting a burn scar in California. The timber company that owns the land the project is on will engage in a mixed-stage, selective timber harvest. This allows the creation of tranches of offsets every few years from portions of the timber that are not harvested.
- The large forested areas in the western US and the considerable portion of them that burn each year creates a large need for restoration efforts.
- RenewWest's team includes a former commodities trader, a chief financial officer, fundraising staff, foresters, and a legal specialist in reforestation. Its advisory board includes a former chief executive officer of a carbon offsets firm, an author and carbon consultant, a utility's environmental policy director, a reforestation practitioner, and a carbon market investor.

Clarifying Questions
SPRUWP members asked clarifying questions following Smith's presentation. Questions are indicated in italics.

How is offset measured (canopy cover, timber volume, climax communities, etc.)?
RenewWest measures a tree's diameter at breast height (DBH), estimates timber volume from those measures, and calculates the carbon equivalent using existing knowledge about how much of a tree is elemental carbon and how much of that carbon would turn into carbon dioxide over time.

What species does RenewWest plant in its projects?
RenewWest plants the species that are supposed to be growing in a given forest. That is a company value, but it is also supported by economics: trees that are not suited to a given forest type are less likely to survive long enough to provide a carbon offset. However, RenewWest has seen scientific evidence that suggests that in some cases, species other than that climax species in an area will be better adapted to post-fire restoration and climate change. Additionally, there is a risk of biome-changeover if foresters do not assist with the migration of forest types across elevations in the face of climate change.

Where does RenewWest get the water for its projects?
Just the sky! RenewWest does not use irrigation.

Have there been unintended water quality consequences from using fertilizer to help trees grow faster?
California protocol does not permit the use of broadcast fertilization in forest restoration projects. RenewWest is considering using biochar to help seedlings grow. Planting trees generally reduces runoff, which is good for water quality.

Carol Ekarius (a SPRUWP member) is a RenewWest board member. What role does she play?
Ekarius has been a longtime leader in forest restoration. One of Ekarius's organizations, Coalitions and Collaboratives, Inc., is a great partner for RenewWest as one of the few nonprofits in the business of

mitigating fire risk. The two organizations have applied for and secured funding from a variety of funders to meet shared carbon-focused restoration goals.

What model can be put in place on the Front Range to accelerate the pace and scale of carbon markets? Is there a role for municipal governments to use carbon offset projects as a part of their park systems or something like that?
RenewWest has received funding to locate two such projects in Colorado (more information will be available in the coming months). RenewWest is also part of a team working with the Colorado State Forest Service (CSFS) to update its Forest Action Plan and to broaden its discussion of the role of forest activities in carbon emissions mitigation. Colorado's carbon markets bill (HB 1261) illustrated a need for natural climate solutions like reforestation, and there will be funding for that work. In the water space, upstream water quality enhancement treatments can be increasingly thought of as investments rather than infrastructure or charitable expenditures. Water utilities and forest health collaboratives have a large role to play in improving relationships between rural and environmental interests to manage forests in ways that provide both climate benefits and economic benefits to communities and in demonstrating that climate change is a threat to water interests.

PRESENTATION: SARAH ANDERSON, DENVER PUBLIC WORKS
Sarah Anderson, Green Infrastructure Program Manager for Denver Public Works, presented on Denver's green infrastructure efforts, including its Ultra-Green Infrastructure Guidelines, water quality basin scorecard, and recent project construction. Her comments are summarized below, and her presentation slides are attached to this meeting summary.

The Problem
- Unlike many cities on the East Coast, Denver has a separated storm sewer system, meaning that its stormwater and wastewater are kept apart. Denver's stormwater goes from inlets to water bodies, not to treatment plants. This provides some benefits but does not bring the financial benefits that a unified system can use to spend on green infrastructure.
- Recent estimates are that Denver treats 19-20% (up from 13% in 2013) of its stormwater. The City hopes to improve that figure further.
- Denver spends millions each year to improve water quality, despite successful cleanings of storm pipes, the elimination of potentially contaminating cross-connections with wastewater, etc. None of Denver's streams meet the EPA's recreational standards, but seven of ten meet water quality standards for aquatic life.
- Denver has a growing problem with impervious surfaces (which cover 49% of the city), largely because of infill development and a lack of water quality requirements for smaller buildings. Planning analysis projects the city to consist of 60-67% impervious surfaces by 2040 based on various population growth and development scenarios.
- As the climate changes, increasingly frequent 100°F days will lower the water supply and stress the vegetation that constitutes Denver's current green infrastructure. Denver is currently the third-worst heat island in the country, and variable precipitation rates will make it difficult to plan green infrastructure projects.

Green Infrastructure Planning
- These challenges are spurring Denver to invest more in green infrastructure, with benefits to water quality, carbon sequestration, air quality, flood mitigation, public health, climate resiliency, and more.
- Anderson created a heat map to prioritize capital improvement projects related to green infrastructure. The map is based on data on stormwater quality and quantity, the amount of impervious surface in rights-of-way, the redevelopment potential of each stream basin, park density, tree canopy, heat, etc. The Green Infrastructure Program used this analysis to create an Implementation Strategy document outlining goals and objectives relating to water quality

objectives in each basin. The team also create heat maps for specific concerning pollutants like phosphorus and nitrogen so that best management practices for each of them can be identified and replicated across basins. They identified 11 basins where projects will have the greatest impacts on watershed health (along with special projects in nonpriority basins).

- The oldest parts of the city (developed before the Clean Water Act) typically have the worst green infrastructure scores. These were considered along with private land, a separate scoring system on the need for more formalized engineering in parks from the Parks Department, and the Green Infrastructure Program's criteria for Green Streets (available rights-of-way, opportunities for education, storm drain pipe availability, etc.).
- The Green Infrastructure Program is working with partners like the city's Transportation Director, the Community Planning department, and developers to work jointly on projects that meet multiple priorities. Since the Green Infrastructure Program's publication of the Ultra-Urban Green Infrastructure Guidelines, green infrastructure considerations have become much more integrated within all types of planning efforts in the city.
- The six best management practices in the Guidelines are green gutters, green alleys, streetside stormwater planters, tree pits, tree trenches, and bump pits.
- Denver City Council recently approved a stormwater rate increase (Denver's rate is still one of the lowest in the US.) A portion of that fee goes to water quality interests and funds most green infrastructure projects in the city. The money from the rate increase has been specifically earmarked for use "above and beyond" regulatory commitments, not just compliance.

Projects

- Along Brighton Boulevard from 44th Avenue to the National Western Center, the Green Infrastructure Program has achieved 100% water quality using 100 planters. As infill development continues, many neighborhoods will be like Brighton, where the only green spaces are planters. Businesses along the corridor provided help with maintenance, and Wastewater Operations personnel keeps the planters clean.
- The project at 21st Avenue and Broadway Boulevard was conducted in partnership with the Transportation Division. The crosswalk was dangerous, so the team set out to improve it for bikes and pedestrians. They did so by replacing a portion of the right-of-way with green infrastructure. The project benefited from cost-sharing across departments and featured four of the best management practices from the Guidelines, including the first green gutter in the city and a green alley to separate bikes and pedestrians from traffic. There have been challenges with maintenance because there has been a problem with cigarette butts being flicked into the project's bioretention facility.
- A project was completed at Asbury Avenue and Tejon Street in one of the poorest, least walkable, and most obese areas of the city. The team regraded an old stormwater detention facility and replaced a concrete channel with a constructed wetland so that it was easier to cross the park. They also got a grant to put in education signage and funding to upgrade the outlet structure from MWRD.
- A project at 38th Avenue and Holly Street was completed with an old stormwater detention facility. The team planted vegetation at the bottom of the spillway, brought pipework upstream, and created a soft-bottomed channel.

Future Efforts

- The Green Infrastructure Program is planning more projects to preserve and expand existing green space and reduce impervious surfaces. It aims to avoid impervious surface rates of over 60%, at which point streams probably would not sustain aquatic life.
- A study conducted by the City of Fort Collins suggested that 40% of stormwater needs to be covered by green infrastructure practices before it makes sense to do in-stream work because the water may be too warm, and the upstream infrastructure may be unstable before that point.

Another recent study suggested placing $500 million worth of in-stream improvements in the South Platte River, so the City will consider these factors carefully.
- The Green Infrastructure Program is considering supporting changes in zoning permits so that water quality treatment requirements are stricter.
- New bond funding includes almost $1 billion for bikeways in Denver. The city has 82 miles of streets in bikeway planning, and the Department of Public Works has committed to achieving 25 miles of Green Streets in the next five years.
- The team is updating its "Streetzy" Guide to provide a broader array of options for green infrastructure on-street sites.
- Denver and Boulder may partner on an infrastructure-planning support tool that projects the impacts of climate change on green infrastructure and parks.

Clarifying Questions
SPRUWP members asked several clarifying questions are Anderson's presentation. Questions are indicated in italics.

Is the Green Infrastructure Program hiring?
Yes, the Program is hiring a Senior Engineering Associate (someone with an engineering degree but not necessarily a Professional Engineer certification).

When will the Streetzy Guide be completed?
It is under contract. There will be a framework for it by the end of the year.

Have there been surveys on the willingness of Denver residents to pay for green infrastructure?
As previously mentioned, Denver's stormwater rate is quite low, but there was a lot of public opposition to the rate increase. The city is tracking its green infrastructure spending and corresponding matching funds so that it can demonstrate that it has maximized the rate increase.

Has Denver considered providing incentives for reducing impervious surfaces?
The stormwater fee is so low that there is little incentive for residents and property owners to do so. The Green Infrastructure Program is working with permitting officials to lower the threshold at which property owners must treat for water quality. This effort is based on a "small sites initiative" study that suggested lowering the threshold to 0.2-0.5 acres because properties of that size are contributing to water quality and quantity issues.

NEXT STEPS
- The next SPRUWP meeting will be on August 20 from 12:30-3:30 PM (location TBD). The Institute for Sustainable Communities will lead the group in a series of interactive exercises.
- SPRUWP's Science and Data and Education and Outreach Subcommittees are hard at work and welcoming new members. Interested SPRUWP members should talk to Sam Haas about participating.
- SPRUWP was recently mentioned on Metro DNA's podcast "Nature Narratives." The podcast is one part of a collaboration with students in the University of Colorado's Master of the Environment program on nature, environmental education, and stewardship.