SCMU Review

(schmoo ri-vyoo) n. items of interest and information from your Santa Cruz Municipal Utilities

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Message from the Water Director

RECENTLY I ATTENDED A BARBEQUE AND MET A YOUNG MAN WHO HAD JUST COMPLETED HIS MASTERS WORK IN CIVIL ENGINEERING FOR A CAREER IN WATER. He is already working for the Department of Water Resources in Sacramento. We were having a delightful conversation, excitedly discussing topics like SGWMA, SGWMP, ASR, BBPs, CECs and BMPs, when I noticed that the rest of the party had discreetly moved indoors to talk about more party-appropriate topics like the *Game of Thrones* finale.

One of my favorite quotes is from H.L. Mencken, who said "For every complex problem there is an answer that is clear, simple, and wrong."

What I find is that most people have no idea how complicated or complex water systems are, and it's challenging to have conversations about many topics in a way that's easy to digest and that "sticks." (This may explain why I don't get invited to a lot of barbeques.) One of those kinds of topics currently in our community is the topic of water transfers.

In this issue of the *SCMU Review,* we are going to do our darnedest to unpack the topic of water transfers and explain them in a way that sticks. We may not be able to whittle the topic down to a bumper sticker, but we will try to keep all of the information simplified to "must know" versus "nice to know." Our dream is that one day soon, water will be THE topic du jour at every barbeque.

— Rosemary Menard, *Water Director*

WHAT'S THE FUSS ABOUT WATER TRANSFERS?

THERE'S BEEN A FAIR AMOUNT OF TALK ABOUT WATER TRANSFERS IN THE LOCAL NEWS LATELY. Those that follow water-related news will know that it's been with regard to a pilot water transfer project between the City of Santa Cruz and Soquel Creek Water District. Those that don't may not know what water transfers are, or what the fuss has been about.

Water transfers as defined by the Department of Water Resources are "proposed and initiated by willing sellers who have legal rights to a supply of water of interest to a potential buyer" (please note the inclusion of "legal rights" in the description — more about that later.)

With that definition as background, here's a quick summary of the water transfers between Santa Cruz and Soquel Creek Water District.

- Santa Cruz gets 95% of its water from surface sources like the San Lorenzo River and North Coast streams. Conversely, 100% of Soquel Creek Water District's water is from aquifers.
- During normal and wet years, Santa Cruz has excess river water during the winter that we have no storage for.

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A WATER TRANSFER PRIMER

Just as there are differences between puppies and kittens, so are there differences in "water transfers." Below is a primer on the correct lingo:

WATER TRANSFERS: Water that is transferred in one direction, without expectation that water will be returned in the future.

WATER EXCHANGE: Surface water that is transferred with the expectation that it will be returned at a future time.

AQUIFER STORAGE AND RECOVERY: Water that is injected into an aquifer with an expectation that some of it can be recovered when needed at a future date.

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- The Mid-County aquifer that provides Soquel Creek Water District's drinking water supply needs to be recharged to protect it against further seawater intrusion.
- So, if Santa Cruz can transfer water to Soquel Creek during the wet season, Soquel Creek can use that water instead, and rest the Mid-County aquifer allowing it to recharge.

Water Directors Rosemary Menard and Ron Duncan celebrate opening the valve for the water transfer pilot project to begin

Sounds pretty straightforward, right? So what's the fuss? Well, it basically comes down to how you interpret data and how open you are to risk. Some in our community interpret the amount of water in the San Lorenzo and north coast streams as the amount of water that can be transferred elsewhere, hence all of the community's water problems can be solved by the volume of water available in Santa Cruz's surface sources. They are also willing to live with the risk that the amount of water Soquel needs to have transferred to protect groundwater resources against seawater intrusion may not be available a significant amount of time that it's needed. When you are responsible for providing reliable drinking water 24/7/365 to all of your customers like we are, it would be irresponsible for either Santa Cruz or Soquel Creek Water District to accept that level of risk. I heard the leader of an air traffic controllers union recently comment on the acceptable level of risk for his workers and it's zero. Water purveyors have a similar tolerance for risk.

Read on to learn more about the pilot water transfer project underway!

THE FUSS

DRIVING BACK FROM THE MOUNTAINS RECENTLY, I LISTENED TO A CALL-IN RADIO PROGRAM ON RELATIONSHIPS. A man called in for advice on his marriage. His wife frequently drank more than he was comfortable with, she had over-drafted the checking account numerous times, and had a long history of being unfaithful. But the man said that when she was sober, when she managed money, and when she was monogamous — she could be a good partner. The radio host pointed out that those were ideal conditions, but that the woman's behavior wasn't reliably ideal. So the question to the husband was whether he was willing to be in a marriage under unreliable conditions, with the understanding that they likely could and would continue to occur.

This got me thinking about water transfers. (You thought I was going to say "relationships," didn't you?) The "fuss" in the community over water transfers really comes down to relying on ideal conditions for water transfers consistently and reliably occurring in perpetuity, versus the factual reality of conditions, which like the wife — are reliably unreliable. There's no doubt that water transfers/ exchanges could have a role in the future of the community's water security, but there are outstanding questions about the size and potential impact of the role they could play. This year's pilot water transfer project between Santa Cruz and the Soquel Creek Water District has helped to begin to answer some of those questions.

CONDITIONS

For water transfers to be most effective and most compelling as a supply solution, they need to be reliable. There's the rub for potential transfer partners, because after we meet our needs in Santa Cruz which include customer demand, state-regulated flows for endangered fish, and keeping our reservoir full, our analyses and modeling tell us that there are many times that we can't reliably transfer water.

Clearly we can't transfer water during dry times or water shortages. But guess what: during heavy storms when you'd think we'd have lots of excess water to transfer, we can't then, either. Why? Because we're unable to treat and use stormy, turbid water. In fact, we're sometimes pressed to have enough water for our own customers during storm events.

Remember how we underscored "legal rights" to water in the prior article? Well, our legal rights to water also come with legal requirements, one being that San Lorenzo River water (our main source) can only be used in our legal "place of use," which is currently only the Santa Cruz service area.

That affects our ability to reliability transfer water, too.

While emergencies are the exception and not the rule (hopefully!) they can also affect our ability to transfer water. Case in point, during the storms in 2017 one of our key water mains broke, significantly affecting our ability to access our water supply and requiring that we cut back customer use during what is normally the City's abundant water season.

With all of that said, there have been no "fatal flaws" thus far to the small-scale water transfer pilot underway. We remain confident that transfers could play a role in how we meet future water shortages. But dismissing factual conditions in favor of ideal scenarios just isn't realistic. For water system managers to rely on an unreliable water supply strategy would be irresponsible. Water is elemental to life, and our job is to provide it. We take our job very seriously. Next time you're taxiing in a plane down a runway, think about how you'd feel if the pilot were relying on an unreliable air traffic control plan.

HOW MUSSELS HANDLE MICROPLASTIC FIBER POLLUTION

NEW RESEARCH SHOWS THAT MUSSELS READILY TAKE IN MICROPLASTIC POLLUTION FIBERS FROM THE OCEAN but quickly flush most of them out again, according to a study by researchers from Bigelow Laboratory for Ocean Sciences. The findings were published in December's *Marine Pollution Bulletin*.

Human-made microplastics exist throughout the global ocean, from busy coastal areas to remote regions far from human habitation. They have myriad impacts: microplastics are eaten by tiny animals called zooplankton, play host to bacterial colonies, and can even change how energy and nutrients flow through ocean ecosystems.

"The big pieces of plastic you find on the beach are in your face, but microplastics are everywhere," said Bigelow Laboratory Senior Research Scientist Paty Matrai, one of the study's authors. "We desperately need ways to accurately and precisely measure their numbers in the ocean."

The most abundant type of microplastics are fibers, which shed readily from materials as common as carpets and fleece clothing, and whose small size makes them edible by marine life as small as zooplankton.

However, few studies to date have focused on this type of ocean pollution. Matrai worked with Bigelow Laboratory Senior Research Scientist David Fields and researchers from the Shaw Institute to learn how marine animals handle fibers, which has important implications for understanding how microplastics move up the food web. Plastic can both directly affect the animals that ingest it and accumulate in the animals that feed on them, including humans.

"We know that microfibers can be consumed by shellfish, but at what rate and how long they are retained by the animals remains unclear," Fields said.

"The degree to which plastic is impacting the food chain is unknown, but as more plastic make its way into the ocean, the number of organisms containing plastics is sure to increase."

Through a series of laboratory experiments, the team found that the mussels quickly rejected most of the fibers they took up by coating them in mucus and expelling them. This method allowed them to efficiently rid themselves of some of the fibers without taking them fully into their bodies. However, the mussels did ingest nearly one in 10 fibers, accumulating them in their body tissues. Moving those mussels to clean water, the scientists found, allowed them to flush most of the accumulated fibers from their bodies.

"Our work with microplastic fibers emphasizes the need for laboratory studies that accurately mimic an organism's natural environment," said Madelyn Woods, marine research coordinator at the Shaw Institute and lead author on the study. "Detailed studies of individual species and their mechanisms for particle selection will be important for understanding how microplastics affect ecosystems on a larger scale."

The primary experiments used for this research placed mussels into water containing fibers at levels equivalent to those in the ocean. However, measuring the effect of those conditions presented the researchers with a major challenge: how to count the tiny plastic fibers. Most other microplastic experiments have used methods that are exceedingly laborious or do not resemble natural conditions, potentially skewing results. Matrai's team used a FlowCam, an optical instrument originally developed at Bigelow Laboratory, to more easily enumerate the particles. Establishing this new method opens the door for future experiments into microplastic fibers.

"Because the ocean is so vast, microplastics aren't actually that concentrated," Matrai said. "But no one knows the full impact they have. The bottom line is, we need data to help us make informed decisions."

REFERENCE

M.N. Woods, M.E. Stack, D.M. Fields, S.D. Shaw, and P.A. Matrai. 2018. "Microplastic fiber uptake, ingestion, and egestion rates in the blue mussel *(Mytilus edulis)*." *Marine Pollution Bulletin* 137:638 DOI: 10.1016/j.marpolbul.2018.10.061.

Photo courtesy of NOAA

SOURCE

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Consumer Confidence Report for 2018

THE CITY OF SANTA CRUZ WATER DEPARTMENT IS PLEASED TO REPORT that your drinking water meets all United States Environmental Protection Agency and State Water Resources Control Board – Division of Drinking Water health standards.

The 2018 Consumer Confidence Report (CCR) is now available; this report contains important information about the source and quality of your drinking water. To view the 2018 Consumer Confidence Report and to learn more about your drinking water, please visit:
www.cityofsantacruz.com/ccr2018

If you would like a paper copy of the 2018 CCR mailed to your mailing address or would like to speak with someone about the report, please call (831) 420-5220.
Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.