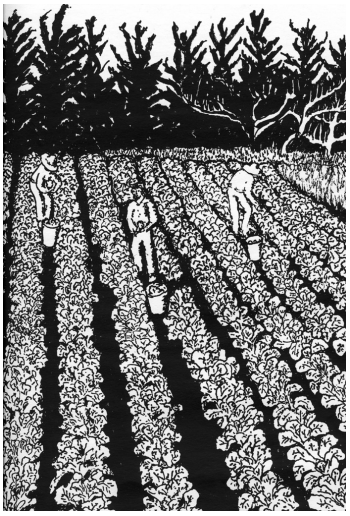


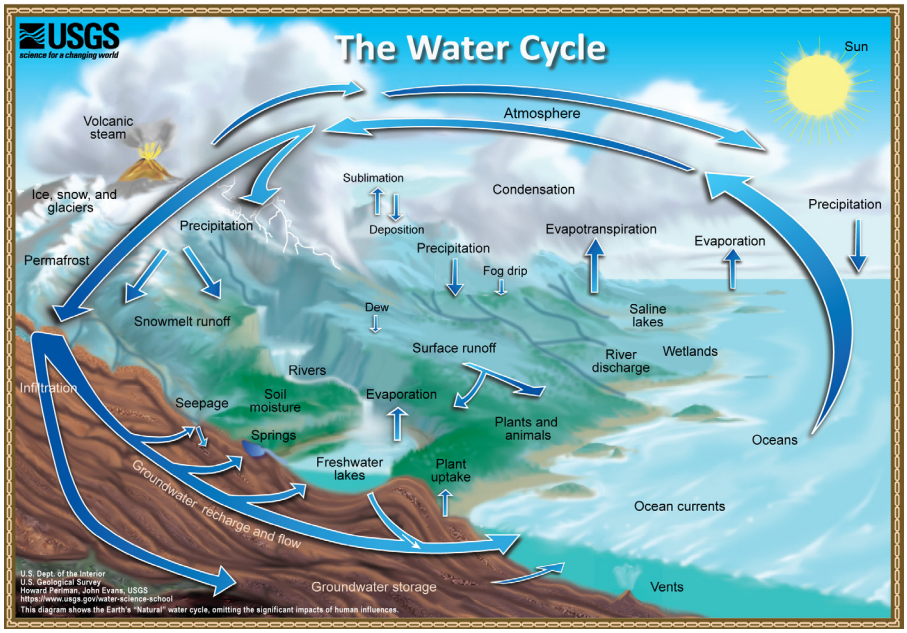
Forrest Cook

News & Notes of the UCSC Farm & Garden

Issue 173, Fall 2022

Water Is the Pulse of the Planet

by Orin Martin



Yes, we are a watery planet (carbony too). By virtue of the 71% of the Earth that is covered by water; we're a 'blue' planet as well. Oceans hold 97% of the planet's water. Water also exists in rivers, streams, and lakes and, of course, much of the Earth's terrestrial water is tied up in glaciers, ice caps, and snowfields. Whoops, that resource seems to be disappearing, slip-sliding away, melting at an alarming rate! Thus making a lie of the phrase "at a glacial pace."

Water is in the air as vapor and it condenses and falls to Earth as rain, snow, sleet, or hail. The human body is 50-60% water. Cells of all manner are mostly water filled. And, of course, water is in the ground as soil moisture. As the Earth is a relatively closed system, the total amount of water on the planet is relatively constant, shifting back and forth between the atmosphere, bodies of water, the water table/aquifer, and, at least for the moment, the aforementioned glaciers, ice caps, and snowfields, and of course, most importantly for gardeners and farmers, the soil.

All life is reliant on the hydrologic cycle; it's simple and yet dynamic. Basically, water evaporates from the land and bodies of water. It rises into the atmosphere, where it is blown around the globe by winds, cools and condenses, and falls back to Earth. It falls on water. It also falls on land and then flows into bodies of water. But some is retained in the soil. It seems water is always on the move and constantly changing forms: liquid, solid, and gaseous vapor. Water is a bit of a "shape shifter."

Water from the sky is a blessing, generally. In some regions, rain is plentiful and watering is only minimally necessary. In other areas, a good watering regime supplements natural rainfall and begets optimal growth and cropping. In semi-arid and arid areas, gardening, farming, and orchards are not possible without a regular and ample supply of water. In almost all circumstances you will need to water—irrigate.

Water flows endlessly / cyclically between oceans and atmosphere, and Earth's water is finite! Meaning that the amount of water on and above our planet neither increases nor decreases. It is then, not a stretch to say, all the water we have is all the water we have ever had and all the water we will ever have going forward. Earth is a 'sort of almost' closed system, but it has no 'waterproof lid.' Most water molecules moving 'spaceward' are eventually recaptured by gravity but a small percentage isn't. Earth is constantly bombarded by meteorites of varying sizes, some of which may contain a bit of water (comets too). And yes, there's probably a mathematical formula to calculate the ratio between H_2O gained and H_2O lost. But alas, I am not aware of it...

continued on page 2

In order to water well, first you must understand the role of water in plant growth and then the way water behaves in the soil. As water travels from the sky or sprinkler into the soil and then via roots and xylem transport tubes on its journey up into and throughout the plant, it picks up dissolved nutrients as "hitch-hikers;" they go along for the ride.

Water and plant growth

The role of water in plant growth is complex. It includes but is not limited to:

- Water is necessary for all life processes (in plants and in the soil, micro-life).
- It sustains and promotes both biological and chemical activity in the soil and plants.
- Water promotes nutrient release from the solid portion of the soil; both the mineral and organic matter components.
- The hydrogen molecule in H_2O is one of the key building blocks for photosynthesis along with CO_2 and sunlight energy. Photosynthesis only happens in an "aqueous solution." There must be adequate water in the leaves. Among the ways you can support photosynthesis is to ensure that when conditions are optimal for photosynthesis (warm, sunny days) your crops are well supplied with water, before the heat of the day.

> "Photosynthesis is foundational. Our only true wealth, without it we devolve. Poor land leads to poverty, hunger, social unrest, cultural deprivation, inhumanity and war so we must wonder why the biological health of the planet is not our number one priority."
>
> -Gretel Erlich, from the introduction to *Cows Save the Planet* by Judith D. Schwartz, 2013

- Water keeps plants turgid, upright. It provides plant support. Think of plants as water balloons; up to 90% of a plant's weight is its water. In a sense, plants are just water encased by cellulose; supported columns of water.
- Water regulates temperature in plants; both internally and externally.
- Water loss via transpiration releases heat from plants, cooling them much the way sweating cools us humans off.
- Water prevents overall plant, tree, and crop stress and allows for optimal function.
- Water activates fertilizer, especially dry fertilizer. So when you fertilize, you water.
- The acids in water (carbonic, humic, fulvic, and weak sulphuric acids) contribute to the slow etching of nutrients from the mineral and organic fractions of the soil. They are then dissolved into the soil solution. The soil solution refers to soil water but the soil solution is not mountain spring water nor is it Perrier… It's a viscous, primordial ooze containing nutrients and microbes, particularly bacteria. And more, it is a dynamic solution. One that, in essence, transports vitality along with "food" (nutrients) for growth throughout plants.
- Water is necessary for all life. It provisions for the soil's microlife / organisms—mostly beneficial. It is the varied "ecological services" of these "critters" that aid in soil aggregation, nutrient availability, minimizing nutrient leaching, and predation of other pathogenic organisms. Without adequate water in the soils they will not flourish.

The craft of watering

Most cultures the world around and throughout time have irrigated their agriculture. Looking back in time, for the 10,000+ years farming has been practiced, farming and watering crops have been the norm. Many cultures devised ingenious methods and systems to do just that. The fertile crescent of the Tigris and Euphrates Rivers, the Yangtse (yellow) River Valley of ancient China, the Nile River, rice production throughout Asia, corn production systems in Central / South America, the Andean terraces of the Incas (and more) being prime examples of the matrix of understanding the role of water in plant growth, designing appropriate water systems, and then monitoring crop soil needs and learning skills related to irrigation. We, too, should take a lesson or two from the pages of history and traditional ecological Indigeneous knowledge and learn the craft of watering, being ever mindful and vigilant of efficient use of this vital resource— water!

In almost all instances, you will need to water your garden, farm, or orchard. In order to provision for your crops, you need to know:

- How to assess soil moisture (thus when to water)
- How much water to apply and when
- What tools/ devices, to use when you apply water (irrigation delivery systems)

Whatever your methods, it is important to wet the soil thoroughly and to apply H_2O out and beyond the root system and then to wait and allow the proper interval (dry down) between irrigations. The oscillation between wet and dry is pivotal, for while water is essential and thus a good thing, there can be too much of a good thing (well, perhaps with the exception of chocolate, good music, and good waves…)

continued on page 7

Calendar of Upcoming Events

Visit https://agroecology.ucsc.edu/news-events/events.html for more information and to register for these events.

Friends of the UCSC Farm & Garden Member Reception

Saturday, October 15, 4pm—7pm at the Hay Barn or online

Members of the Friends of the UCSC Farm & Garden are invited to join us at the Cowell Ranch Hay Barn for an afternoon of fun, food, and drink! This year we're offering several fun and educational activities before the business portion of the meeting.

If you're a new member or haven't been on campus in a while, plan to arrive at 4pm for a guided tour of the farm. Or, if you are interested in gardening, come at 4pm to join a team for horticultural trivia. Learn about gardening while you socialize with other members. There will be prizes! Or just come for excellent organic, farm-grown food and beverages and enjoy sunset from the Hay Barn!

From 5:30 - 6:30 we'll hear from new Executive Director Darryl Wong and other staff who will present updates on Center for Agroecology programs and activities. At the end of the meeting we'll raffle off a 2023 CSA membership; you must be present to win.

This event is for current members and their immediate families only. Please RSVP to let us know you're coming. If you cannot attend in person but want to hear the program updates, please RSVP and we'll send you a Zoom link to attend remotely.

Scan the QR code using the camera app on your smartphone or type https://forms.gle/w3H5upQR1pA1nhZT8 into your internet browser to RSVP!

Farmstand

Wednesdays, 12pm—5pm and Fridays, 11am-3pm at the Hay Barn

Organic vegetables, fruit, herbs and flowers grown at the UCSC Farm & Garden are sold twice weekly at the Farmstand through November 18, 2022. Free parking while you shop!

Seeds of Hope and Habitat: California native plants in gardens and small farms

Saturday, November 5, 10am—12pm at the Hay Barn

Native plant specialist Janice Kuch will speak about the role native plants play in an agricultural context as a host for beneficial native insects and birds and as cover crops. Learn how these plants were used by the Indigenous peoples of the area, and learn how you can incorporate native plants into your landscape or home garden with low effort soil preparation for low water use plantings with beautiful flowers and form. *Cost: $20 in person; $5 suggested donation for Zoom webinar. Members get 10% off with code "10-OFF."*

Fermentation Workshop

Saturday, December 3, 10am—1pm at the UCSC Farm

Get a hands-on lesson in fermenting and preserving the harvest with Brooks Schmitt, Cowell Coffee Shop food supervisor and food processing expert. With instruction from Brooks, you will make your own kimchi and sauerkraut to take home. Participants will also have the opportunity to harvest persimmons to process into hoshigaki. The workshop will be held at the Farm Center on the UCSC Farm. Space is limited. *Cost: $50 (includes $15 materials fee). Members get 10% off with code "10-OFF."*

Winter Poetry in the Hay Barn

Thursday, December 8, 5pm—7pm at the Hay Barn

Four outstanding local poets will read their poetry at this hybrid in-person/virtual event: David Sullivan, Farnaz Fatemi, Kelly Cressio-Moeller, and Aideed Medina. After the readings, enjoy a meet and greet with poets over snacks, with books available for sale and signing by the poets. Plus, enjoy an interview with Orin Martin, manager of the Alan Chadwick Garden at UCSC and author of *Fruit Trees for Every Garden*. Limited seating for 40 attendees *Cost: Attend in person for $5 or watch online for free. Members get 10% off with code "10-OFF."*

Gratitude for Grants & Gifts

We have some exciting grants and gifts to announce that have come in this summer, some that will help sustain our current work and several new ones that will help expand the Center's work and facilitate projects with partners.

An award of $500,000 in California State Organic funds allocated by the California Department of Food & Agriculture (CDFA) will provide four years of matching funds to support Joji Muramoto's position and his research and extension efforts. This funding came about through an innovative proposal put together with the help of partners OFRF, CCOF, and others working with Joji Muramoto and Stacy Philpott over the past year. The new funding provides the 50% match for four years to the 50% ongoing support for the position provided by the Division of Agriculture and Natural Resources (ANR).

A new CDFA Specialty Crop Block grant will provide $309,657 to support the development and piloting of short courses on growing organic specialty crops over the next two and a half years. The funding will support a needs assessment, short course development, piloting of courses, scholarships, videography to support courses, supplies, Spanish translation, and more.

Through a grant partnership with the Resource Conservation District (RCD) of Monterey County, the Center will receive funding from a CDFA Water Efficiency & Nutrient Management grant to produce a series of videos on irrigation, water efficiency and nutrient management. RCD's Aysha Peterson will work with Center for Agroecology Executive Director Darryl Wong and videographer Jim Clark on the series geared to small-scale farmers in the region, which will be translated into Spanish and used by RCD's farm advisors to provide technical assistance to farmers.

Center for Agroecology Faculty Director Stacy Philpott and staff member Damian Parr led a successful multi-campus grant proposal to the USDA Organic Research and Extension Initiative (OREI) entitled "Scaling-up and Integrating Undergraduate Organic Agriculture Education Across UC Flagship Campuses and UC Agriculture and Natural Resources." OREI awarded $749,281 to the Center to carry out a 3-year joint project with UC Berkeley, UC Davis, and the Division of Agriculture & Natural Resources (ANR). An earlier grant of $75,000 from the Clarence E. Heller Charitable Foundation has allowed Damian to get started with the planning phase of this project.

The Center for Information Technology Research in the Interest of Society (CITRIS) UCSC Campus Seed Funding program awarded $40,000 to the Center in partnership with faculty in the School of Engineering to work on "Autonomy for Small Electric Tractor Farming." We will be exploring the utility of this nascent technology to support organic and small farm practices by automating this platform to "see" the plant line and to automatically steer based on this. Part of the work is to interview latinx small growers to understand their interests and concerns.

A new grant through the UCSC Equity in Mental Health Fund will help support a one-year project entitled "The Roots of Traditional Foods and Cultural Practices: Connecting to the Land for Health and Wellness." This grant to the UCSC Office of Diversity and Inclusion (ODEI) includes funding for the Center for Agroecology to help support student involvement and programming in the Black Lives Matter Garden led by Center for Agroecoogy staff members Kellee Matsushita-Tseng and Alex Roth-Dunn with student interns. The Black Lives Matter Garden will be a core site for hosting student programming, events, guest speakers, and activating a connection to the land for BIPOC students through the EMH grant. A key focus will be creating a pathway for students to explore and deepen their own relationship to land as a site for promoting mental health. The BLM Garden will be a site for students to explore healing through building community and learning from the knowledge of Indigenous elders as well as each other.

In addition to funding for new projects, we've received grants and gifts in general support of the Center, including $15,000 from Newman's Own Foundation, $30,000 from an anonymous foundation, and $20,000 from Friends of the UCSC Farm & Garden Lifetime Member Joanna Miller. We also received a $10,000 scholarship gift from Henry Chang, who has provided scholarship funding and other support over the past 12 years to the Center.

The Friends of the UCSC Farm & Garden Board has made a special allocation this year of $25,000 to support much-needed repairs to the Chalet back porch at the Chadwick Garden as well as new fencing for the garden perimeter fence. This welcome gift matches funding we have from the campus for repairs and fencing at the Chadwick Garden, and will allow us to start this work while we launch a broader campaign this fall to raise more facilities funding. To find out more about this fundraising effort for the Garden, please see page 6 or see "Support Our Work" at our website, agroecology.ucsc.edu.

Center Spotlight: Alex Roth-Dunn, Community and Residential Life Coordinator

What brought you to the Center for Agroecology?

I graduated from college and just kind of wanted to start anew. I had gone into a career field that I wasn't enjoying too much, and just felt I wasn't making the impact that I thought I was going to make post-college and so I dipped out of Kentucky and was bopping around California for a while, and more recently I was working at a environmental education school that focuses on social and emotional learning. That's when I really started to fall in love with nature and fruits and vegetables, and before I had come out to California I had never put my fingers in a garden. I didn't really know how food got to my table. I grew up in poverty and marginalized folks oftentimes don't have access to fresh fruits and veggies. Even though I loved aspects of the work, I was ready for something different and that's when I came to the Center for Agroecology.

Can you describe your role at the Center?

As the community and residential life coordinator for the Apprenticeship Program this last summer, I was meeting with apprentices to check in. I was ordering and purchasing all of the food and I was helping create meal schedules. I was coordinating and facilitating team bonding activities. I was just keeping a pulse on the culture and the climate of the residential cohort, and ensuring all was good, resolving conflict when that would arise. Program management is basically what I was doing in all aspects. The on-the-ground, day-to-day stuff: checking in, building relationships with these people, providing support was my main role. As the Social Justice Advocacy Committee (SJAC) chair, I am a leader and facilitator of the committee, which works to incorporate equity into the Center's culture and programming. I am facilitating the monthly meetings, I'm keeping a pulse on committee members' work toward our operational goals for the year, and I'm keeping a pulse on staff's equity commitments. So I'm trying to strive towards those goals and make sure those are happening.

What do you enjoy most about your work?

Something that I'm excited about is working with students in the Black Lives Matter Garden and really propelling and pushing some of our equity-driven programming forward. I think it's hard, sometimes, working for a historically white institution. That's just a fact. And there are a lot of awesome and brilliant and joyful things that come from being

in this space. I really love connecting with people. I think we're on earth for who knows how long. And that's just something that's really important to me is making connections and harnessing those connections and empowering people, primarily people of color, but all people, specifically at a predominantly white space in a predominantly white city. It can be a hard place for Black and Brown students to thrive, to feel included, and to feel accepted. And so I enjoy uplifting and empowering marginalized and historically and currently oppressed students. Black lives matter, Indigenous lives matter.

Take Action to Protect Juristac

We invite you to stand with the Amah Mutsun Tribal Band in saying NO to sand and gravel mining at Juristac. A public comment period for the proposed mining project is now open. Submit a comment letter by the November 7 deadline and help protect these sacred grounds. Visit www.protectjuristac.org/deir/ for more information.

Farm and Garden Happenings

The changing of seasons from summer to fall brings lots of action and excitement to the UCSC Farm and Alan Chadwick Garden. The Harvest Festival, which took place September 25 at the UCSC Farm, saw approximately 2,000 visitors to the farm including students, Friends members, on- and off-campus partners, and the community. It was so lovely to have everyone back on the farm for the first in-person Harvest Festival for the community since 2019. It's almost hard to believe that only two years ago the Farm and Garden were closed to the public during the worst of the COVID-19 pandemic. We are so grateful that we are able to gather together again.

Tractor rides were a popular activity for all ages at this year's Harvest Festival. Photo: Jim Clark

The Farm and Garden, along with the Cowell Coffee Shop and Produce Pop-Up, are welcoming in-person interns again this fall. The sites will also see students in agroecology classes gaining agricultural knowledge and skills with guidance from Center for Agroecology staff and student staff.

Students in an agroecology class get a lesson from student staff on the UCSC Farm. Photo: Damian Parr

You can help us improve learning spaces and infrastructure at the Chadwick Garden by donating and sharing our campaigin on Giving Day, November 2nd.

UC Santa Cruz's Giving Day is November 2nd this year and the Center for Agroecology will be raising funds for repairs to the Chadwick Garden chalet and other garden facilities including the perimeter fence. The money raised on Giving Day will add to the generous allocation of $25,000 from the Friends board toward these repairs. You can help us raise more funds for the upkeep of this beloved site by donating and sharing our campaign on November 2nd. Don't want to wait until November 2nd? You can donate to the fund today at agroecology.ucsc.edu/support/chadwick-garden-fund.html or email Jessica Lenth (jlenth@ucsc.edu) if you would like to donate a matching gift. Thank you for your support!

Friends Board Update

We will be voting in new board officers soon! Meet the current officers and 2023 nominees at the Friends member reception on October 15.

Board President Delise Weir will be stepping down from her role after serving for two years. We have so much gratitude for Delise for her leadership and are happy she will continue to serve on the board in other capacities. Current vice president, Sandra Morishige, has been nominated for the role. Other nominees include Cathy Murphy for another term as secretary, Patti Barnett for another term as treasurer, and Johno Turner for vice president.

Are you interested in serving on the Friends board or know of someone who would be a good candidate? Email farmandg@ucsc.edu for more information on becoming a board member.

Water Is the Pulse of the Planet (from page 2)
Plants have four basic requirements for good growth:

- Sunlight ('fiat lux,' let there be light)
- Nutrients
- Water
- Air (N_2 +O_2)

In fact, these basics are requisite for all life on the planet, not just your garden crops. And while water in the soil is good, so too is the presence of air with its vital supply of oxygen. Oxygen fuels the aerobic activities of both root growth and microbial life; The microbial 'community' in the soil. Efforts to support such robust populations in the soil is an example of harnessing biology (and thus alignment with agroecology) to work on our behalf. Tend the microbial community in the soil, tend it well, as your cropping success is at stake. And by extension, all that stands between us and starvation / extinction is several feet of biologically 'animated' top soil. The water and the air in your soil reside in the pore space, that is, as the soil scientists like to intone, the interstitial spaces between the solids (mineral / organic matter) in the soil.

Plants grow best when the soil pores are equally occupied by air and water. This is a dynamic situation and also a fleeting one. The soil's moisture is constantly oscillating between saturated (wet) and dry (50% of field capacity).

When you pick up a handful of soil, only half of that volume is solid material. The other half is air in the pore space, the interstitial spaces between the solids. It is in these pore spaces that both water and air reside. The ideal air / water ratio is 1:1, or, 50% of the pore spaces are filled with air and 50% with water. This is the dynamic situation when plants actually grow. When you water, you fill up all the pore spaces in the soil. This is called saturation and it is your goal. This squeezes all the air out of the soil, but only temporarily. As the soil begins to dry down within 24-72 hours after saturation, air reenters the soil. This is the byproduct of a passive process, diffusion. Simply, the movement of air from an area of high concentration (the atmosphere) to an area of low concentration (the soil); physics in "action." In nature, it seems systems are always seeking equilibrium; may we too.

You can facilitate the diffusion process by having an open, permeable soil surface and a soil with good structure and aggregation. A loose, crumbly soil (you want a "crumbly" soil, not a "crummy" soil) is your goal. Surface permeability is fostered by cumulative good cultivation, tillage practices, and the frequent addition of organic matter and mulches. These things impart "breathability" to soils. Permeability yields good infiltration of water and eliminates puddling, crusting, and erosion. When air and water occupy the soil pores equally, the soil is said to be at field capacity, or 100% of field capacity. Roots grow, microbes prosper and life is good for the gardener, farmer, orchardist. Water is readily available to the roots when the soil is at 60-100% of field capacity. As the soil continues to dry down to 50-60% of field capacity, water availability is restricted. The water is there but held tightly in thin films on the edges of soil particles—virtually useless to plants. In fact, a dry down to 50% field capacity is potentially dangerous. Use 60% field capacity as a minimum threshold. At that point, it's time to water again and continue the oscillation between wet and dry. Do it!

Assessing soil moisture
In order to water in a timely manner, you must be able to assess soil moisture properly. There are two principal means to do this: qualitatively and quantitatively. Most large scale farming operations assess soil moisture quantitatively using instrumentation: tensiometers, lysimeters, and such. And this is well and good, certainly accurate. But most home growers and smaller-scale farmers use qualitative means to assess soil moisture. This approach can be as accurate as the quantitative approach.

You can find the Natural Resources Conservation Service's "Estimating soil moisture by feel and appearance" tip sheet online by entering the title into the search bar at https://www.nrcs.usda.gov. But here's a simpler method (this assumes a medium textured soil, an improved clay or a silty loam):

- Grab a handful of soil from 6-8" deep
- Hold the sample in the palm of your hand
- Firmly, but gently squeeze it into a ball. Don't squash it!
- Ask and answer one easy question: Does it ball up and remain intact? If the answer is no, you are in trouble. Your soil is dangerously dry. Drop everything, apply water post haste! Don't let this happen again. If the ball stays together and there is a slight moisture stain on your palm and when the ball is tossed lightly in your palm it succumbs to slight thumb or finger pressure and crumbles easily but not to a single grain particles, you are at what an agronomist would call 60-80% of field capacity. A good gardener would call this the lower end of "good growing" moisture. No need to water, but get ready, a couple to three days down the line…
- Kicking things up a notch, if the soil ball sticks together when tossed, if the oil stain on your hand is dark and oily and the external surface of the ball feels moist, you are probably at 80-100% of field capacity. This is definitely good growing moisture. That is, the dynamic sweet spot where air and water fill the soil pores equally; plants grow!!
- If your soil is much wetter than this, you are at saturation. Yes, this is your goal when you water, but if you apply more water it cannot infiltrate the soil. It puddles, crusts, and runs off—BAD! Stop! Don't go there.

continued on page 8

#119
University of California Santa Cruz
Center for Agroecology
1156 High St.
Santa Cruz, CA 95064

Nonprofit Org.
U.S. POSTAGE
PAID
Santa Cruz, CA
Permit No. 109

Water Is the Pulse of the Planet *(continued from page 7)*

- How much to water? This assessment of soil moisture and the application of water will likely be patterned with predictable regularity.

We do field feel tests 2-3 times per week and we apply water on a standard system based on evapotranspiration (E.T.). Evaporation is simply the loss of water from plants and soil surfaces. Transpiration is the use and loss of water by a plant. By assessing such websites as C.I.M.I.S. (California Information Management Information System) you can find out daily and weekly evapotranspiration rates. And then simply water to replace that amount. Here along California's Central Coast with its cool Mediterranean climate, we lose about 1" of water a week. So, we regularly apply 1" a week. This is basically replacement water, applied moderately but at a frequent rate. We get good results. While the interval between waterings will vary from place to place, it will have a predictable periodicity. I suggest monitoring your soil every 4-7 days. With watering and other gardening skills, developing horticultural sensibilities and interpretive skills are essential. Good luck. Keep in touch…

Post Script: An easy and reasonably accurate way to determine "How much is 1" water applied?" Simply put a cylindrical container (mason jars work well) under one or two of your drip emitters and turn on the water; how long does it take for 1" to accumulate in the container? That's how long you apply water to get 1." With sprinklers and micro sprinklers it proves easier to invert the sprinkler in a 5 gallon bucket.

CODA: These are certainly "interesting" climate and weather times we live in. And yes, that statement is more than a bit euphemistic. What is it the climate scientists are now telling us? That we can expect erratic weather patterns with periodic catastrophic events? Lovely… That much of this havoc is induced by humans and that which we call civilization brings to mind the phrase regarding weather and climate and our culpability as a species, "Sometimes the future shows up early and with startling news about our past behavior."

So regarding farming and climate change, I'm reminded of a verse from the song, "King Harvest" by Robbie Robertson and the Band (the band that coined the term, Americana music):

"Corn in the fields
Listen to the rice when the wind blows cross the water
Dry summer, then comes fall
Which I depend on most of all
Hey, rainmaker, can you hear my call?
Please make these crops grow tall…"

Friends Membership Renewals

Need to renew your Friends of the UCSC Farm & Garden membership? You can find renewal information and a secure donation link online at connect.ucsc.edu/joinffg. Contact us at agroecology@ucsc.edu with any questions. Thank you for your support!!