

Climate change and public health: in the connection, some solutions

By Pat Nelson

An important nexus connects the seemingly separate issues of climate change, public health, and health equity and offers opportunities to achieve "co-benefits" for health and the environment. This was the upshot of presentations by Drs. Matt Willis and Linda Rudolph, who spoke at the September meeting of MCL's Climate Action Working Group.

Dr. Rudolph is a statewide thought leader in relating climate change with impacts on public health. In her longtime role as the City of Berkeley's health officer and public health director, Rudolph focused on public health equity. She also studied widely and intensively the issue of how pervasively climate affects our health and every other area of life. Following her work in Berkeley, Rudolph went on to serve as Deputy Director for Chronic Disease Prevention and Public Health at the California Department of Public Health. She now directs the

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The holidays: gatherings, gifts, and garbage



Image from the front cover of the Saturday Evening Post, December 13, 1952

Artwork by: Steven Dohanos

By Kate Powers

While holidays conjure up Rockwellian images of celebratory feasts, trimmings, and presents, there is a threatening underside to the holidays -- as consumption swells, waste skyrockets.

At a time when consumerism has reached an all-time high, products are reaching planned obsolescence (a manufacturing philosophy dating from the 1920s and 30s), along with "perceived obsolescence," in increasingly short timespans. New, mostly unneeded, products are rolling out and being purchased by the millions every day. Not surprisingly, global waste generation is at a record high.

During the holidays, Americans throw away 25 percent more trash than at other times during the year. Estimates are that 6 million tons of extra waste are sent to landfills between Thanksgiving and New Year's from added food waste, shopping bags, packaging, wrapping paper, bows and ribbons.

In the film "The Story of Stuff," first released in December 2007, Annie Leonard states that for every one garbage can of waste at the curb, 70 garbage cans of waste were filled "upstream" during

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A Message from the President - The Time is Now

Dear Members and Friends,

Climate change is not news, but the need to rapidly transform the world economy in order to reduce greenhouse gas emissions (GHGs) to zero is in the news and very much on MCL's agenda for action. The [Intergovernmental Panel on Climate Change \(IPCC\) report](#) released on October 1 paints a grim picture of the immediate consequences of climate change. As reported in the New York Times, the report forecasts worsening food shortages, wildfires, rising sea levels, and mass die-off of coral reefs – effects that could be experienced as soon as 2040 with even a 1.5 degree Celsius (2.7 degrees Fahrenheit) rise in global temperatures.

Are there any realistic solutions by collective or individual action to global warming? MCL is working in that direction. In September, MCL participated in the Climate Summit at College of Marin. On the heels of the Global Climate Action Summit in San Francisco, climate experts addressed 700 local climate activists. Christina Figueres, lead architect of the 2015 Paris Agreement on climate change, reviewed the Paris

Accord and Mission 2020, a global initiative seeking to reduce GHG emissions by 2020. She is still optimistic that the world can achieve its GHG reduction goals. While climate change is global, however, the work must be local. It was her call to action for every one of us!

In October, Dr. Karina Nielsen, Director of the Estuary and Ocean Science Center in Tiburon, spoke at MCL's Leaders Circle event. She pointed out that oceans are the earth's great CO2 buffering system, but with rising GHGs, they are experiencing severe chemical and biological consequences of warmer and more acidic waters. [Ocean health](#), land health, and climate are inextricably connected! And she repeated the call for action!

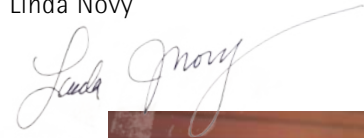
MCL is responding to these calls for action through its Climate Action Working Group (CAWG), which has become a forum for collaborative engagement with other organizations to carry out Marin based solutions. MCL is participating in the Marin Climate Action Network (made up of citizen groups who are active on climate

change issues) and working closely with DRAWDOWN: Marin, a comprehensive, science-based and community-wide campaign to reduce our "carbon footprint."

The time to act is now, and you and I are the people to do it! I invite you to attend a CAWG meeting. Check out DRAWDOWN: Marin (www.drawdownmarin.org) for your road map to action.

In solidarity,

Linda Novy



Status Update

MMWD Azalea Hill Restoration Project

Azalea Hill is one of the gems of the MMWD watershed. Rising from 646 feet at Bull Frog Road to a peak elevation of over 1,200 feet, the 370-acre hill offers spectacular views and is readily accessible from the Bolinas-Fairfax Road. Much of the hill consists of serpentinite (serpentine) that supports rare plant populations. It is also a popular destination for hikers, mountain bikers, and other visitors and over the years has been abused. The parking area and access road are highly eroded. The only trail down to Bull Frog Road is steep and eroded. Dozens of informal "social" trails created over the years by bikers looking for a fast descent and wandering hikers have damaged rare plants and continue to do so.

Restoring Azalea Hill and, at the same time, creating a connection between Bull

Frog Road and the Pine Mountain area has been under consideration by MMWD for many years. MCL has tracked the project for more than eight years. The district studied possible alignments, developed a design concept, and circulated an Initial Study for the project in late 2017. A year later, following public comment and further study, the revised IS/Mitigated Negative Declaration (MND) has been recirculated. Public comments are due by November 8, and the Board plans to act on the project on November 20. MCL is supporting the project, subject, however, to important conditions ("mitigations"), explained below.

The District's 2005 "Mt. Tamalpais Watershed Road and Trail Management Plan" (RTMP) lays out the district's entire road and trail system and details many

erosion control projects. It included future improvements to the hiker-horse trail on Azalea Hill, but did not anticipate the proposed Liberty Gulch multi-use route or the decommissioning of social trails. Therefore it is necessary to amend that plan.

Project goals focus on restoration

The project itself has four parts. An existing 1.1 mile hiker-horse trail that descends from the hilltop to Bull Frog Road would be partially realigned and improved; 4.4-miles of social trails that criss-cross the upper slopes would be decommissioned

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Status Update

Azalea Hill *from page 2*

and native plants restored; a 1.9-mile narrow (4 ft. wide) road would be created by rehabilitating the historic Liberty Gulch Road and widening a shoreline "fisherman's trail"; and the parking area at the top of Azalea Hill would be improved.

Project goals highlight the benefit of correcting erosion to prevent sediment from entering creeks and reservoirs. Also, the project would remove and revegetate the network of social trails across the hill. Thus, the District refers to this as a "restoration project." The project also proposes a new "small vehicle or multi-use route" project that could accommodate district ATVs (for maintenance or search and rescue) as well as mountain bikers, hikers, and equestrians. Mt. bikers have long advocated for bike-able connection between the lakes area and the Pine Mt. area, which currently is connected only by the narrow, winding Bolinas -Fairfax Road.

Trade-off of impacts and benefits

The District's RTMP dating from 2005 clearly acknowledges that ". . . roads and trails can have many undesirable effects on the environment," and this project is no exception. Roughly two thirds of the Liberty Gulch route runs through serpentine plant communities. Disturbance due to improvements to the old road bed would vary from minimal repairs, to disturbing serpentine grassland and chaparral by widening the roadbed, to outright loss of plants that can't be avoided. The project also would expose almost two miles through these relatively undisturbed plant communities to weed invasion and intensified recreational use, with possible long-term impacts.

Several components of the project make environmental sense, however. In a deliberate trade-off of impacts and benefits, the project, in turn, would decommission



From left to right: Tom Boss, Marin County Bicycle Coalition; Carl Sanders, MMWD; Roger Roberts and Arlin Weinberger, MCL; and Robert Eichstaedt, (past-President) Alto Bowl Horseowners Association view possible trail routes on Azalea Hill in 2011.

the social trails that currently fragment the serpentine community across the upper parts of the hill. It would repair many areas of existing erosion and thereby significantly reduce sedimentation in watershed creeks and reservoirs. These areas include the horse-hiker trail and numerous creek and drainage crossings along the Liberty Gulch route. The project also would (attempt to) educate users to the sensitivity of habitats through interpretive signage.

Mitigation and monitoring are key

The recirculated MND lists numerous mitigation measures which, if properly implemented and monitored over time, would avoid or at least minimize impacts to populations of rare and sensitive plant populations in serpentine areas. The success of such mitigation measures as designing and implementing a "rare plant mitigation

and monitoring plan," however, is wholly reliant on the expertise and resources of district staff and its ability to follow through. Measures that call for design features such as logs or rocks along trail margins to discourage encroachment off trail are also critical to protecting plant communities over time.

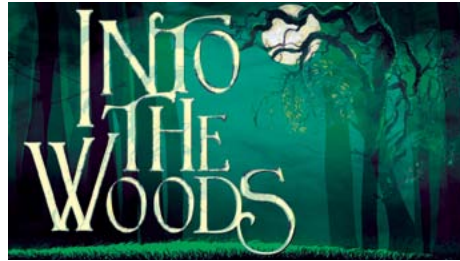
Finally, MCL is relying on the district's past success in applying adaptive management in its "Project Restore" program— a multi-faceted management approach practiced by the district that has included public outreach, stewardship, and education to explain the undesirable effects of illegal trail use, removal and restoration of unsustainable routes, landform restoration, closures where necessary, coupled with focused patrol and monitoring of closed (decommissioned) and restored areas, including issuing of citations. With diligent application of this mitigation approach over the long term, the multiple goals of the Azalea Hill restoration project might be realized with minimal new impacts.

Into the Woods –Science meets Sondheim

On Friday, October 5, 350 people converged in Mill Valley to spend the day either sharing their knowledge or learning more about biological and physical features that make up the complex geography we call "Mt. Tamalpais." It was the third annual science summit hosted by the One Tam partnership in an ongoing effort to keep tabs on the health of Mt. Tam and its inhabitants. This summit was devoted to the forests and woodlands that make up a large portion of the mountain and its surrounding terrain.

Ever since the title of the summit – "Into the Woods" – was announced early this year, I have toyed with how the message of Stephen Sondheim's popular 1980s musical "Into the Woods" might apply to Mt. Tam. The musical opens, as you may recall, with the repeated words "I wish" but concludes on a cautionary note: "Be careful what you wish for!" The complicated story-line weaves together fairy-tale figures like Cinderella, Jack of the beanstalk and his mother, a Baker and his wife, Little Red Riding Hood and grandmother and the wolf, Rapunzel and the witch, and more than one handsome prince. These characters journey into the woods and their lives intermix as the Baker tries to undo the Witch's spell that has left his wife barren. In the course of events, our childhood expectations that everyone will live happily ever after are slowly and completely upended.

Initially, the science summit did bear some resemblance to the musical in its weaving together of Mt. Tam's distinctive characters, such as the unpretentious but ecologically instrumental tanoak and its mycorrhizae, rare plants on serpentine barrens, "queer" hybrid oaks, redwoods, lichens, owls, and a one-eyed mountain lion. Resemblance to the musical began to breakdown at that point, however. Whereas the characters in the musical, through farce and tragedy, become increasingly dysfunctional as they journey into the woods and find and then lose what they treasure, the characters



and connections portrayed by the summit speakers, in contrast, became increasingly recognizable as ecologically functional and necessary to each other.

Some lasting resemblances between Sondheim's musical and the recent science summit do persist, however. Of course there is always a Giant in fairy-tales, and Sondheim's Giant wreaks damage before it is destroyed. But there is also a generally dark spirit that hangs over the fairytale characters as their wishes become thwarted by their own human flaws. Hanging over the future health of Mt. Tam are the dark spirits of climate change and sudden oak death, whose trajectories give no assurance that every character on the mountain will "live happily ever after." The tanoak, persistent victim of SOD, seems likely to be one of those characters. With the future effects of climate change on the forest still largely unknown, other characters may also fall victim.

In spite of the dire forecast, the "I wish" ambitions that introduce the musical also seemed to inspire the science summit. They might be traced back to the prescient words of William Kent, spoken in 1903 when he called together a select group of California politicians and conservationists and proposed that Mt. Tam become the center of a National Park: "The lands should be preserved for all time, as far as possible, in their natural and wild state." As implied by Sondheim's own message, however, it will take more than wishing to achieve a resilient "natural and wild" future for Mt. Tam.

Nona Dennis

Nature's Renewal¹

*Tall oaks downed
California lilac stunted
and once proud manzanita fallen.
White-grey ash
scattered everywhere.*

*Yet irises, yellow buttercups,
milkmaids sprout in the meadow
where fiddlenecks
show off their coiled cymes.
Soaproot heals and opens under
evening skies.*

*A cool breeze teases where once
a hot wind threatened.
In time
new growth comes
from burls of blackened oaks.*

Laura Blatt



*Fire-blackened madrone sprouts
from root crown.*

¹ In commemoration of the North Bay fires that began October 8, 2017, MCL is pleased to publish one of many poems that were written by those who experienced the fires and witnessed the renewal of the landscape in the aftermath. Laura Blatt is a resident of Cotati.

In memoriam

Gail Wilhelm – Environmental activist of North Marin

By Susan Stompe

Gail Wilhelm was born with public service in her blood! She was a faithful participant in the North Marin Unit of Marin Conservation League for decades while she was in good health and will be missed by her colleagues and allies in Novato and beyond. A celebration of her life was held at Novato City Hall on October 14.

Gail and her husband, Don, moved to Novato in the early 60's. Their daughter Linda joined brother Steve in 1962. By the 1970's Gail had already served on the Novato Beautification Committee and then the Planning Commission. In 1972 she was elected to the City Council and in 1978 was elected to the Marin County Board of Supervisors, with the future disposition of Hamilton airfield as her major issue. In addition to her service on governing boards, committees and commissions, and the North Marin Unit of MCL, Gail was also active in the League of Women Voters, American Association of University Women, and Marin Group of the Sierra Club.

Gail was responsible for bringing three landmark sites in Northern Marin to public attention and in helping to set two of

them aside for permanent protection. After an archaeological dig conducted from 1972 to 1976 revealed information about the presence of a Miwok village of the mid-1500s at Olompali, Gail conducted independent research and then applied for and got the site listed on the National Registry of Historic Places as a state and national site of historic significance.

She also convinced the Board of Supervisors that Rush Creek, a large area of tidal marsh east of Highway 101, should be protected from development. She then proceeded to secure a number of grants to place it in public ownership. It is now a valued wetland that adjoins the County's Rush Creek Open Space Preserve and also serves as a much needed flood plain as Novato anticipates sea level rise due to climate change.

A third major accomplishment was in planning the future of Hamilton Air Force Base when the military left. Gail was instrumental in keeping Hamilton from becoming a commercial airport as the planned community that replaced the military use was taking form. The necessary



political decisions took over ten years to complete. Gail served on the steering committee for the planned community and on the Novato Planning Commission again in the 90's to ensure that the plan was incorporated into the General Plan to its completion.

Over the years, Gail worked diligently to protect the history and environment of her community. Among other actions, she wrote a ballot measure that passed overwhelmingly to protect Scottsdale Marsh. She joined others in suing CalTrans for failing to adequately mitigate the removal of hills when Highway 101 was built to bypass downtown Novato. And when a fire burned the building that protected the Miwok adobe at Olompali from the elements, she saved the adobe by covering it.

And much more . . .



Gail Wilhelm was largely responsible for preventing Hamilton air field from becoming a commercial airport.

Events

Leadership Circle meets at Estuary and Ocean Science Center



Photos by Holly Smith

On October 13, forty Leadership Circle supporters of MCL enjoyed luncheon and listened attentively as Dr. Karina Nielson, Executive Director of San Francisco State University's Estuary and Ocean Science Center on Paradise Drive, Tiburon, described the ways in which oceans affect what happens on land and how climate change is altering the physics, chemistry and fauna of the oceans and near shoreline of Marin and the world.



Walkers into Conservation History Visit Site of "Marincello"

Ranger Roxi Farwell, Education Program Manager for Golden Gate Recreation Area (GGNRA), lead 40 hikers up Bobcat Trail to view the site of the planned "Marincello" in Gerbode Valley in the Marin Headlands on September 29. Local attorneys Bob Praetzel, Kentfield, and Doug Ferguson, Mill Valley, joined Ranger Roxi in recounting stories from the five-or-so years spent in resisting and litigating to prevent the development from happening, and in the valley's becoming part of the future GGNRA. Terri Thomas, retired GGNRA natural resource scientist pointed out sites of ecological interest.



Marin State Parks in Transition

Business - Environment Breakfast

State Parks in Marin:
Yesterday, Today, and Tomorrow

Thursday, November 15
7:30 am - 9:00 am

The seven state parks in Marin County hold a special place in the legacy of Marin Conservation League as well as in the hearts of the millions of visitors who come to enjoy them. On Thursday, November 15, 7:30 – 9:00 a.m., at McInnis Park Clubhouse, panelists will link the past and present with a future vision in a forum titled "[Marin's State Parks: "Yesterday, Today, and Tomorrow."](#)

We will hear the different perspectives of three panelists, including newly assigned Superintendent of the Bay District, Maria Mowrey; Executive Director of long-time park champion California State Parks Foundation, Rachel Norton; and veteran local park volunteer, Steve Deering, President of the non-profit Friends of China Camp. It will be an opportunity to introduce new Superintendent Mowrey, who will be overseeing Marin's parks, and learn from the inside the interests and responsibilities of state park non-profit "partners/friends" from both local and state-wide perspectives.

Register: 415-485-6257 or mclstateparks.eventbrite.com
\$15 MCL members, \$20 general public; includes breakfast buffet.

Nature Note

Going underground for forest health

By Nona Dennis

The recent One Tam–hosted science summit "Into the Woods" opened by featuring tanoak (*Notolithocarpus densiflorus*), a frequent but often undervalued member of the mixed evergreen and redwood forests so characteristic of Mt. Tamalpais and the Pacific Slope. In MCL Newsletter (May–June 2018), Andrea Williams, vegetation ecologist with Marin Municipal Water District, described tanoak as central to the life of the forest but easily overlooked except as both victim and culprit in the spread of sudden oak death (SOD).

The tanoak has been described as a "foundation species," a term used in ecology to describe a species that has a strong role in structuring a community. As the dominant hardwood species in Pacific slope redwood and mixed evergreen forests, tanoak provides mid-canopy cover and structure, understory shading, habitat, and is the most important source of acorns for wildlife.

We tend to see only what is above ground, however. A critical component of a healthy forest resides in its soil micro-organisms like bacteria and fungi. A mycorrhiza, literally a fungus (myco) and a root (rhiza), is a root tip growing with a particular fungus in a mutualistic relationship in which the fungus facilitates the transfer of water and nutrients like nitrogen and phosphorus from soil to plant roots, and the plant roots, in turn, supply carbon compounds (sugars) to the fungus. Mycorrhizal fungi have existed since the first plants appeared on dry land more than 450 million years ago. Thousands of species of fungus have been identified living in association with roughly 80 percent of all higher plants.

Tanoak hosts diverse mycorrhizae

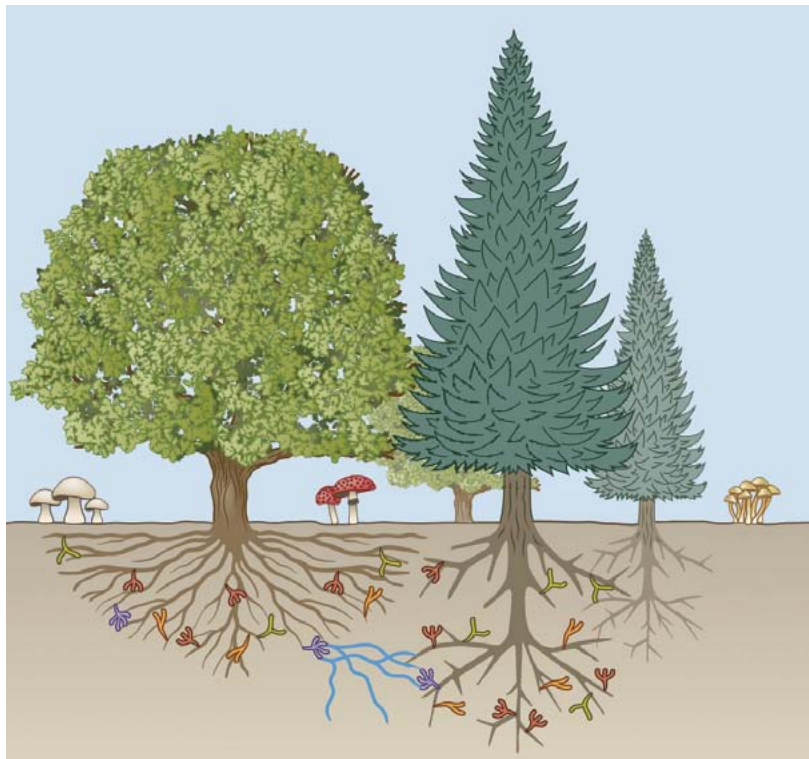
It turns out that the tanoak hosts particularly diverse species of fungus that

live on its roots and form a network among individual trees in a forest. The subset of mycorrhizae associated with tanoak is known as "ectomycorrhiza," a form in which fine threads, or hyphae, form a sheath or mantle covering the root tip and surrounding (but not penetrating) the cells within the root cortex. The fungus produces spores on fruiting bodies recognized as truffles if below ground, and puffballs, mushrooms, and other familiar structures above-ground. The spores are dispersed by air, animals, and other mechanisms. In native plant restoration sites, soils are now commonly inoculated with fungal spores to ensure healthy plant growth.

Ectomycorrhizae are a characteristic feature of all oak species and other members of the beech family (beech, tanoak), as well as the pine and birch families. Mycorrhizal fungi cannot be attached to just any tree roots, however – only those of appropriate host trees. Virtually every root tip of a

tanoak oak is covered with the mantle of many species of mycorrhizal fungus.

In his quick sketch of tanoak mycorrhizae, symposium speaker Dr. Kabir Peay, mycologist from Stanford University, made it clear that the cooperative networks formed by mycorrhizae are vital to sustaining forest health. The hundreds of diverse species of mycorrhizae supported by the modest tanoak helps in maintaining soil structure, water holding capacity, resisting disease, sequestering carbon, and generally promoting resilience to climate change. Losing tanoaks could alter decomposition rates and the chemical and nutrient balance of forest soils that are enabled by this strong association with fungi. The long-term effects on soil health due to the mortality of millions of tanoaks in the region will continue to be a topic of study as sudden oak death spreads. The repercussions on the rest of the forest are still unclear.



Christina Hazard | David Johnson

Mycorrhizae play a key role in transfer of nutrients and water from soil to roots.

Garbage *from page 1*

extraction, production, and distribution of the products consumed and disposed of. In North America, only 1 percent of total materials that flow through a product's lifecycle are still in the product and in use 6 short months after the date of sale; 99 percent have become trash within just 6 months! Our throwaway society and economy are not only filling landfills and wasting scarce natural resources; they're contributing to increasing levels of atmospheric carbon pollution and multiplying the impacts of climate change.

Minimize food waste

At least one third of all food raised or grown globally is not eaten, yet 800 million people worldwide are hungry. According to Paul Hawken's "[Project Drawdown](#)," reducing food waste would be the third most effective solution to global warming.

The largest source of food waste in industrialized countries is from individual consumers, who waste more than grocery stores, restaurants, or any other single component of the supply chain. In the U.S., 60 percent of all food waste is from individual households. A 2011 study estimated that avoidable food waste in the U.S. exceeded 55 million metric tons per year (nearly 30 percent of annual food production), produced 113 metric tons of CO₂ annually (the equivalent of 2 percent of national emissions), and cost Americans \$198 billion.

The best way to reduce waste is to prevent waste from being generated in the first place – that is, to rethink what we buy with waste prevention in mind. Good intentions and good planning matter! By making small shifts, valuable resources used



to produce and distribute food can be prevented from going to waste.

- Buy only what you need and plan a weekly menu.
- Store food types for their maximum freshness.
- Prepare perishables for storage as soon as possible after purchase.
- Eat what needs eating first and place it in easy view in the fridge.
- If you can't eliminate all wasted food, divert it from landfill by composting food scraps.

At 21 percent, disposed food makes up the largest portion of waste streams in American landfills and is a main contributor to total U.S. landfill methane emissions. Methane is 25 times more harmful to the atmosphere than carbon dioxide. Composting, if properly managed, is not a major source of methane.

Eliminate single-use disposable plastics

Plastic pollution is a direct result of a throwaway economy. Plastics, although engineered to last forever, are manufactured for single-use disposable bags and containers, which are used for a couple of minutes then tossed away. Convenient? Maybe. But at what cost? Discarded plastic products are ending up along coastlines worldwide -- in California, along the shores of Texas and New Jersey, the beaches in the Philippines, and the canals of Amsterdam. We've heard or seen video of the huge plastic garbage gyres out at sea. The United Nations now estimates that by 2050 there will be more plastic waste than fish in the ocean. Microplastics in the water column are being ingested by billions of organisms including plankton, small fish and the many other species (including us).



Plastic bags, plastic bottles, styrofoam cups, straws, lids from bottles and cups, to-go containers, single-serve food wrappers, chip bags, beverage pouches, and on and on – 99 percent of these plastic disposables are made from fossil fuels.

While some plastic bottles are recyclable, most plastic pollution results from low-value disposable plastics, which costs more to collect and process than the material is worth post-recycling. Also, many disposables can't be recycled because they contain plastic layers fused with other materials.

With all the world's efforts to recycle plastic, still only an estimated 9 percent ever gets repurposed. China had been importing a majority of the world's discarded plastics, but recently stopped over concerns about the long-term environmental impacts. This has created a global waste crisis. The bad news: millions of tons of plastics are now accumulating in the countries where they were sold. Some are ending up in landfills or being incinerated; some are sent to developing countries that lack the infrastructure to properly manage them. The good news: as a result of the crisis, the "export solution" to trash is under new scrutiny. Responsible management for both generation and disposal of plastics may soon be motivated as much by economic forces as environmental and social forces.

Presents? Bah humbug.

Black Friday, Cyber Monday, holiday sales. Buy. Buy. Buy. According to one national survey, the average American spent over \$900 on gifts during the 2017 holiday season. Yet, a similar study found 60 percent of Americans receive unwanted holiday gifts and 70 percent would

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Garbage *from page 8*

welcome less emphasis on gift giving and spending altogether.

Two types of gifts popular during the holidays are clothing and consumer electronics (phones, computers, cameras). Both could potentially be treated as durable goods, but because of product marketing and design manipulation they are perceived by consumers as disposables.

Intense consumerism is part of the fashion world and so are incredible amounts of waste. American households throw away nearly 70 pounds of clothing per person each year, and nearly 11 million tons of it end up in landfills. According to Alternet, the clothing industry is second only to oil as the largest polluting industry. Pesticides, toxic dyes, resource consumption and carbon footprint are only some of the problems. Clothing production from nylon emits nitrous oxide, a greenhouse gas 300 times worse than CO₂, and it takes a whopping 5,000 gallons of water to make just one t-shirt and a pair of jeans.

Consumer electronics are also continually being replaced and creating waste. About 2 billion phones are sold every year. Between 5 and 7 million tons of eWaste from phones and other electronics is created, exported, and dumped in Asia and Africa annually.



E-waste contains precious metals but recovery can be extremely hazardous. Electronic waste recovery in Ghana and Nigeria has

transformed wildlife paradises into wastelands. Locals, including children, are burning plastics and wires to recover gold, releasing pollutants into the air and soil, causing disease, and killing off all life in nearby bodies of water. Because the world is running out of other recoverable metals, including palladium, copper, lead, nickel, tin, and antimony, a new industry has emerged called urban mining --



Erika Mahoney

A mountain of "recyclables" collected a couple of days after Christmas 2017 by the Monterey Regional Waste Management District.

international companies have begun to buy back disposed electronics and use clean, newer technologies for metal extraction because the economic incentive is now there.

Finally, packaging from deliveries from online shopping is one of our country's largest growing sources of waste. One report estimates 165 billion packages are shipped in the U.S. each year in cardboard packaging made from nearly 1 billion trees. Delivered meal kits from companies like Blue Apron total over 8 million a month. The six-pound freezer packs included with each delivery have become the new landfill waste, estimated at 192,000 tons per year.

A gift for the future? Go to the source.

Consumer recycling and composting alone will never get us out of this mess. It's going to take governments, businesses, and especially consumers -- all generations working together to change the sources of product waste before it can overburden the planet. The good news is that many, many

people are working worldwide on this issue. The barrier to solutions is not innovation; it's economics and applying the true, environmental costs to our consumerism.

In the meantime, reduce, reuse, recycle and compost. But most important, rethink! It's worth repeating: The best way to reduce waste is to prevent waste from being generated in the first place.

May your holidays be filled with family, friends and quality time-off -- three sources of happiness that your consumer dollars just won't buy.

For more info:

"Zero Waste", source:
[Zero Waste Marin](#)

"Composting", source:
[Zero Waste Marin](#), [Stop Food Waste](#)

"Climate Action Resources", source:
[Resilient Neighborhoods](#)

Climate *from page 1*

Center for Climate Change and Health at the Public Health Institute, where she frequently consults with communities.

Like Dr. Rudolf, Dr. Matt Willis arrived at a heightened awareness of the climate-health connection as well as equity issues through his practice. His stint at the Centers for Disease Control and Prevention (CDC) included an assignment to report on disease outbreaks in Haiti after the earthquake. He has practiced internal medicine in diverse venues, including Navajo reservations and Marin community clinics. Willis now serves as Marin County's Public Health Officer.

Climate change has far-reaching effects on health

Dr. Rudolph emphasized in her remarks that heat illness is a worldwide public health problem. Marin, where most people do not have air conditioning, faces an impending increase in average maximum temperature of between 2 and 7 degrees F. Marin will also lose reliably cooler night temperatures that allow the body to recover from daytime heat. The elderly, an expanding demographic, and outdoor workers, of whom Marin has approximately 7,500, are particularly vulnerable.

Wildfire smoke is another likely consequence of climate change. Fires have become more frequent throughout California and the West, and smoke can travel up to 1,000 miles. Particularly vulnerable are children, the elderly, people with asthma, heart disease, or other respiratory diseases. Rudolph offered a surprising statistic: 16 percent of all adults have asthma.

We are already beginning to experience more extreme storms and flooding that are linked to climate change. Storms, floods, and sea level rise endanger the quantity and quality of our water supply, threaten coastal aquifers, cause or worsen sewage spills, and bring sea water intrusion that can render West Marin wells useless. Any event



Nona Dennis

Drs. Linda Rudolph and Matt Willis discuss the impacts of climate on public health with MCL's Climate Action Working Group.

that endangers clean water supply has implications for public health, and often impacts are experienced disproportionately by disadvantaged communities.

Rising temperatures and longer droughts push up food prices and create food and water insecurity, particularly for low-income citizens. Cumulative effects include mental health issues, especially if people are displaced from their homes. Thus, climate-induced impacts disrupt the entire fabric of the community along with its state of health.

Marin residents have climate-related health issues

Dr. Willis stated that although Marin is ranked as the healthiest county in California, not everyone in Marin shares in those health benefits. Health advisories issued by Willis in the past two years tell a story of interrelated climate and health effects. A temperature-related outbreak of Legionella occurred at San Quentin. An outbreak of West Nile virus resulted after the drought-reduced creek flows created puddles of standing water where mosquitoes breed. Citing a recent Zika virus outbreak in Southern California,

Willis warned that previously rare diseases will move north into new latitudes as temperatures increase. Possible future threats include malaria and Dengue fever.

Willis has also issued increasingly frequent heat emergencies and smoke advisories. A shellfish advisory issued by his department last year was prompted by the highest aquatic toxin levels ever recorded in Marin, which, significantly, occurred in the off-season. The toxin is carried in algae and linked to higher water temperature.

Solutions – connecting the dots

Conditions such as those described above are harbingers highlighting the need to continue taking action on the twin fronts of greenhouse gas-reduction and adaptation to the effects of climate change, including sea-level rise. The speakers agreed that a close examination of what we drive, what we eat, and other lifestyle habits will show avenues for change. Land use patterns are part of the problem. A good public transit system coupled with walkable and bikable mixed-use neighborhoods makes it easier for people to get out of their cars. Walking or biking instead of driving improves the

Climate *from page 10*

health of the environment as well as our personal health. Shifting to a more active form of transportation for just 20 minutes a day is a feasible lifestyle change that can reduce cardiovascular incidents by 12 percent, according to Dr. Willis. Most people now engage in "active transportation" for only about 4 minutes per day, he said.

Reducing consumption of red meat (often associated with high GHG emissions), processed foods, and sugar also benefits human health and the environment. Food and agriculture systems are ripe for change; progressive methods of food production in Marin serve as a laboratory. A human-scale, locally grown food economy produces profound co-benefits, including easier access to healthful food, less food waste,

and reduced transportation and packaging. Waste disposal systems should divert GHG-producing organic waste from landfills to use in agriculture. In a different mode, local neighborhood parks can address health and heat-island issues in underserved communities.

In a question-and-answer session, Dr. Rudolph agreed that planetary health is a missing piece in the public health paradigm. People have created an unhealthy planet dependent on extractive industries. Shifting from natural gas to electricity would be one step forward in addressing a broad range of environmental as well as public health issues.

Rudolph and Willis are the latest in a

series of speakers hosted by MCL's Climate Action Working Group. Recent speakers have addressed topics such as waste and recycling, pros and cons of regionalizing the western electrical grid, zero-emission buildings and infrastructure, electric vehicles, and current energy developments at MCE, the Public Utilities Commission, and in the state legislature. Speakers typically share their particular expertise and engage in informal conversation with citizen climate activists. The group also serves as a forum in which representatives from many groups active on climate change can share ideas and plans. Public officials in charge of Marin's town and city sustainability and climate action planning also attend.

[Meetings are open to the public.](#)

November is an important month in MCL's history! It marks the genesis of Marin Conservation League. The first entry in the organization's Minute binders reads: "At a meeting of the Marin Garden Club on Tuesday, November 6, 1934 . . . Mrs. Norman B. (Caroline) Livermore expressed the wish that the Marin Garden Club might do some planting and planning and zoning in Marin County. The (Garden Club) President Mrs. Griffith asked Mrs. Livermore to be the Chairman of a committee. Mrs. John (Portia) Forbes, Mrs. A.J. (Sepha) Evers, and Mrs. (Helen) Van Pelt volunteered to serve on such a committee." These were the "Founding Four" of what was to become the League. Actual work on Marin's first "plan" began almost immediately on November 22 at the first meeting of the committee of women and special guest planning expert Hugh Pomery at the home of Mrs. Livermore. As planning progressed and community interest grew, so did the committee, which became known as the "Marin Planning Survey Committee, chaired by Sepha Evers. But it took until January 14, 1938 for the name "Marin Conservation League" to be formally adopted. As they say: "The rest is history. . ."

HELP MCL CELEBRATE ITS 85TH ANNIVERSARY IN 2019!



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Issue Committee Meeting Schedule
(subject to change—check website)

Land Use and Transportation:
1st Wed. of the month, 1:00 PM—3:00 PM

Parks and Open Space:
2nd Thurs. of the month, 3:00—5:00 PM

Climate Action Working Group: 3rd Fri. of the month, 9:00 AM—11:00 AM

Agricultural Land Use: meets quarterly;
Water and Watersheds, North Marin Unit:
Check website for times and locations

Marin Conservation League was founded in 1934 to preserve, protect and enhance Marin County's natural assets. MCL is a non-profit 501(c)3 organization. All contributions and memberships are tax-deductible to the extent allowed by law.

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