Taking Local Action on Climate Change

By Alec MacDonald

If you didn't hear the news, maybe you felt it: 2014 was California's warmest year on record, dating back to 1895. This revelation from the National Oceanic and Atmospheric Administration gave us yet another reason to sweat about our changing climate, following the agency's 2013 announcement that the concentration of heat-trapping carbon dioxide in the atmosphere topped 400 parts per million for the first time in three million years. In explaining the significance of this unfortunate milestone, NOAA's Pieter Tans told The New York Times, “It symbolizes that so far we have failed miserably in tackling this problem.

In the Bay Area, however, many people reject failure as an option, and they have been tackling the problem with vigor. In this undertaking, public policy has served as an indispensable tool. Motivated by recommendation of the California Air Resources Board, jurisdictions across this region have been working to slash their communities' greenhouse gas emissions to keep pace with state reduction targets mandated by the Global Warming Solutions Act of 2006 (Assembly Bill 32). This means that by 2020, emissions must return to where they were in 1990, and by 2050, they must drop an additional 80 percent. It's a tall order, but one that local governments have the power to fulfill.

“Local governments are really uniquely capable of addressing a lot of the main sources of greenhouse gas emissions,” declared Timothy Burroughs, chief resilience officer for the city of Berkeley. “Local governments have land use authority that affects how and where things are built; we develop transportation infrastructure; we develop energy policies; we collect your solid waste and recycling.”

How can jurisdictions leverage these responsibilities in order to cut emissions? Their most comprehensive option is to create a climate action plan. Lengthy documents that necessitate extensive preparation, climate action plans usually contain a few core components: an overview of relevant scientific principles, an inventory of community-wide emissions, a set of reduction targets, and a list of strategies for reaching those targets. Many also feature adaptation sections that propose ways for the community to protect itself from climate change's inescapable impacts, which may strike in the form of sea level rise, drought, wildfire, or severe weather events, depending on the local landscape.

Berkeley began to craft a plan after its voters approved Measure G, a 2006 ballot initiative that codified reduction targets for the city. Of the drafting process that ensued, Burroughs recounted, “We tried to create as many opportunities as possible for our residents and our businesses to engage in development of the plan, because we knew if the plan was to be implemented effectively, it really had to have support from the community.” This participatory endeavor culminated in 2009 with the city council's adoption of the final plan, one of the first instituted in the Bay Area.

Numerous jurisdictions followed suit, and now a total of 58...
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cities and counties — representing 80 percent of the region’s population — have plans in place, according to the Bay Area Air Quality Management District’s Abby Young. Her agency helped jumpstart many of the earlier plans (like Berkeley’s) with a round of grant funding in 2007, and has been guiding local governments through their drafting process.

“We’re really excited and proud that the Bay Area has so many climate action plans,” she remarked of the region’s progress. “Pretty much every single city and county in the Bay Area, if they don’t have one, they’re developing one. So that’s pretty impressive.”

Given the diversity inherent to the region, the evolution of each local government’s plan unfolds differently. Berkeley’s electorate backed Measure G’s reduction targets with 81 percent of the vote, an incredibly forceful public endorsement, even for a city with such a strong reputation for favoring environmentalism. Few other cities begin their climate action planning from such an advantageous position.

Take Pleasanton, for instance. Daniel Smith, the city’s public works director, took the lead on drafting its plan. “I went out and did some research, and looked at other cities, and thought, ‘Well, this couldn’t be that hard to do,’” he recalled. At the time, he imagined the community would freely accept a slate of ordinances, but “that was definitely a little bit naïve.”

After encountering significant stakeholder resistance, he said, “We stepped back and took a different approach.” The city tried to show flexibility and not come across as overbearing regulators, reaching out to business interests in particular. As a result, when the city council adopted the plan in 2012, those parties who had initially raised objection turned out to testify on its behalf.

For example, Smith pointed out how the plan won over the local realtors association by eschewing a residential energy conservation ordinance. Commonly referred to as RECO, this kind of measure typically requires that a home meet certain energy efficiency standards before it can change ownership. Attaining these standards can mean costly renovations, bumping up the price of a home and theoretically driving away buyers. Realtors balked at this, so the city forged an alternative: after a home sale, it would offer the new owners assistance with boosting energy efficiency, familiarizing them with a range of upgrades, rebates, and tax credits for that purpose. The city hammered out similar arrangements regarding commercial properties as well.

“The proactive, collaborative approach so far has done very well for Pleasanton,” Smith attested. The city released an update to the plan 15 months after its adoption, and “we were on track to meet our milestones and reach our 2020 goal.” If future updates indicate slippage, however, he said the city has the discretion to incorporate more regulation into the plan.

Hardline environmentalists might argue for stricter upfront controls, especially when those controls have successful precedent (Berkeley implemented RECO way back in 1987, and its real estate market continues to hum along just fine). However, pragmatic climate action planning accommodates local realities.

“There are a lot of people out there that want to do the right thing for the environment and help us become more sustainable, but there’s also the other side of it where they feel like you’re infringing on their freedoms,” Smith noted about Pleasanton.

Alex Porteshawver, who serves as the city of Benicia’s consulting climate action plan coordinator, understands the value of bridging ideological divides. When attempting to move forward with policies, she suggested jurisdictions should “focus on co-benefits as a way to avoid polarizing the different groups who may have different viewpoints.”

Safeguarding public health represents one objective that few people would oppose. Benicia’s climate action plan underscores authorities’ expectations that harsher heat waves and degrading air quality will exacerbate a range of maladies. The potential for an uptick in asthma rates poses special urgency, since the disease is already alarmingly prevalent among children in the vicinity and across Solano County.

Porteshawver listed financial concerns as another big motivator, and spoke of how Benicia launched a program that allows businesses to trim their bills while reining in emissions.
Soil Storage: Sequestering Carbon Dioxide in Agricultural Land

By Elizabeth Devitt

California’s agricultural industry ships a staggering amount of prized products all over the world: almonds, grapes, and strawberries, to name a few. But in the future, our farms may become even better known for something they’ll keep to themselves: carbon dioxide.

Seven years ago, three farms in Marin County became testing grounds for the Marin Carbon Project. On this acreage, the non-profit coalition of land stewards study management practices designed to pull more carbon dioxide out of the atmosphere and store it in soil. If these “carbon capture” methods gain traction, then Golden State farmers could help slow the growth of greenhouse gas emissions that contribute to global warming—and reap benefits from sowing a local carbon economy.

“The idea of soil as a source for storing carbon is just catching fire,” said Jeff Creque, a rangelands management expert and co-founder of the Marin Carbon Project. “It’s been a gradual awakening for people to see the environmental potential across the agricultural landscape.” If enough “carbon farms” can sequester carbon dioxide from the atmosphere, it could make a positive impact in the fight against climate change.

In the natural carbon cycle on land, plants pull carbon dioxide out of the atmosphere for photosynthesis, a process that creates energy for plants to grow and provides storage space in roots and soil. Eventually, plants decompose, soil erodes, and other processes release carbon dioxide back into the atmosphere. But rising carbon dioxide emissions from burning fossil fuel — coal plants and automobile engines — have unbalanced that cycle. As those additional emissions accumulate in the atmosphere, each molecule of carbon dioxide absorbs radiation and adds more heat to the Earth’s surface. It adds up.

Just a half-inch “dusting” of compost could sequester almost 1,000 pounds of carbon dioxide, per acre, per year, according to research conducted by Dr. Whendee Silver, a biogeochemist at UC Berkeley. Even better, she found that soil moisture improved and plants thrived more, both of which helped draw additional carbon dioxide into the soil. Further studies demonstrated those effects could last for decades. With approximately 38 million acres of grasslands in California, even if only five percent of that land was managed to store more carbon dioxide, it could make an impact, Silver said.

Although some conservationists are concerned that composting grasslands will have adverse effects on native habitats and grasses, Creque noted the idea isn’t to spread compost on all the land available, but to use the method as one of many carbon-storing tools available. The project’s planning protocol also requires consulting with rangeland professionals and regional conservation districts. “There’s a whole team of professionals involved,” Creque said.

The concept of carbon farming isn’t new. For decades, organic farmers have used crop rotation, planting trees, and other methods to move carbon dioxide out of the atmosphere...
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and into plants and soil. The Marin Carbon Project partnered with the USDA’s Natural Resources Conservation Service and Colorado State University to develop a suite of tools that individual farms can use to create customized plans for capturing carbon dioxide. One key part of the project was accounting for the amount of carbon dioxide kept out of the atmosphere. With the ability to calculate carbon “offsets,” the landholders have a potentially bankable way to “sell” the carbon they sequester to industries creating too much carbon to satisfy regulations.

The trio of demonstration farms — Stemple Creek Ranch, Straus Dairy, and the Corda Ranch — just completed their first carbon farming plans. Now, there will be a process of comment and analysis, and new projects are in the works.

In the future, Creque said it would be nice to see a revolving conservation fund, created with carbon farm offsets, to help move new carbon farming projects forward. Although a greenhouse gas exchange is only in the exploratory stage, Creque is optimistic. He noted the governor’s proposed 2015-16 budget includes a commitment to establish long-term goals for carbon levels in all California's agricultural soils.

“I don't know of another government in the world that's set a positive goal for soil carbon increases,” Creque said.

Elizabeth Devitt is a freelance science writer based in Santa Cruz.

Rising Tides Expected to Take Toll on Transportation Infrastructure

By Nate Seltenrich

One of the more significant impacts of climate change on the Bay Area’s built environment will be to transportation infrastructure. Many freeways, tunnels, bridge approaches, and transit corridors around the region are located near or even below current sea level and could be impaired during high tides and storm surges, to say nothing of the long-term implications of sustained sea level rise.

According to findings of the Adapting to Rising Tides (ART) project — a joint effort of the San Francisco Bay Conservation and Development Commission (BCDC) and the National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center — significant national, regional, and local transportation assets are at risk, even within the limited scope of the project’s target area, the Alameda County shoreline.

This extends to BART tracks, stations, and tunnels; street-level access to the Oakland International Airport; the Webster and Posey tubes linking Alameda Island to Oakland; passenger and cargo rail tracks; and sections of interstates 80 and 880.

Most of the ground-transportation assets evaluated by the ART project could be exposed to tidal or storm-event flooding by the end of century — and in some cases much sooner. Today’s occasional floods will be the future’s high tides.

But assessing risk and vulnerability is only the beginning. Planning for adaptation falls to subsequent reports, including two coming from ART later this year. These are preceded by a transportation-specific study released in December by the Metropolitan Transportation Commission (MTC), Caltrans, BART, and BCDC, and funded by the Federal Highway Administration, which also supported the transportation component of the initial ART assessment.

The recent study pushes science and policy efforts one step closer to action through a focus on three areas identified to be both highly vulnerable and poorly understood: the Oakland approach to the Bay Bridge, including the toll plaza and the Transbay Tube entrance; the Hayward approach to the San Mateo Bridge, including the toll plaza, the Bay Trail, and ecological assets; and the Oakland Coliseum area, including the new BART airport connector, the Coliseum BART station, the Amtrak station, and a section of Interstate 880. “We wanted to take a more significant, zoomed-in approach to vulnerability there, and then come up with some adaptation strategies,” said Lindy Lowe, a senior planner at BCDC and the project lead for ART. “We also wanted to see how the process works when you get to the project scale, as opposed to the regional scale.”

The latest document is as much a blueprint for future work as
it is an advance in adaptation efforts for a few at-risk Alameda County locations. The three target areas benefit from the increased scrutiny and serve as case studies for the entire Bay Area. “We are doing the real work, while we’re also watching ourselves do the real work,” Lowe said. “There were a lot of processes that we developed that we think will be helpful moving forward, not only for these projects but for others around the region.”

For example, the agencies developed new criteria to weigh adaptation strategies, verified regional-scale flood maps against ground measurements, and agreed to more formally integrate climate-change considerations into decision-making processes — an outcome that alone could have far-reaching implications, Lowe said. “It was clear that transportation agencies need to have a more systemic approach to this problem than they have, and MTC and BART agreed too.”

Meanwhile, proposed adaptation strategies for the three targeted areas ran the gamut: at the Bay Bridge site, to build both a levee and an offshore breakwater at Radio Beach to protect the toll plaza from flooding and waves; at the San Mateo Bridge site, to conduct a drainage study to better understand existing conditions; and at the more inland Coliseum site, to build a levee around Damon Slough.

“It was quite surprising and alarming what happens at Damon Slough,” Lowe noted. “Flood control channels have to deal with not only the water that’s coming down, but also the new water that’s coming up.”

The City of Oakland plans to redevelop the Coliseum area, offering an opportunity to modify Damon Slough to better protect adjacent transportation assets, but other urbanized waterways throughout the region may not have it so easy, Lowe said. “There’s going to have to be a new water regime in those flood-control channels.”

The Alameda County waterfront isn’t the only place receiving such focused attention; similar adaptation efforts are underway in San Mateo County, Contra Costa County, Benicia, and San Francisco, while regional efforts include the Bay Area Climate and Energy Resilience Project and the nascent Regional Sea Level Rise Adaptation Strategy, both managed by the Joint Policy Committee, of which MTC and BCDC are members.

Nate Seltenrich (Nate-Reports.com) is a Petaluma-based science and environment writer.

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Waste Not, Want Less: Tapping Water Supplies from the Drain

By Robin Meadows

When the big rains drenched us in December, my daughter in Palo Alto called me in Fairfield to see if our drought was finally over. You might think she was right — gutters overflowed and streams that had been dry for years were full again — but most of that water just rushed down storm drains and out to sea.

“It’s an amazing lost opportunity,” said Laura Tam, sustainable development policy director of SPUR, a nonprofit dedicated to urban planning in the Bay Area. “We could do a lot more to capture and use stormwater.”

Most tap water in the Bay Area comes from the Sierra Nevada, and lots of rain here doesn’t necessarily mean lots of snow there. Despite Northern California’s heavier than usual rainfall at the end of last year, on January 20, 2015 the Sierra snowpack was still less than a third of normal, according to the California Department of Water Resources. All of California remains in drought and, while you wouldn’t know it from looking at our green hills, the Bay Area is still categorized as being in extreme drought.

Wet as December was, it was nowhere near enough to make up for the last three exceptionally dry winters.

But the Bay Area could have collected plenty of water from those welcome storms, if only capture systems were in place. We could harvest more than 50 billion gallons of stormwater per year, or 13 percent of our total urban use, according to the Pacific Institute.

Our cities are designed to shed water quickly via streets,
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sidewalks, and other hard surfaces that route rainfall into storm drains. Keeping some of that stormwater entails redirecting it through permeable surfaces and into underground basins and cisterns, and San Francisco allows such stormwater capture for non-potable use in commercial, multi-family, and mixed use buildings.

Likewise, the Bay Area is piloting municipal projects that manage stormwater more naturally, allowing it to soak into the ground and recharge groundwater. These include the San Pablo Avenue Green Stormwater Spine, a series of demonstration projects being installed along San Pablo Avenue from Richmond to Oakland. Led by the San Francisco Estuary Partnership in collaboration with Caltrans, the Bay-Friendly Landscaping and Gardening Coalition, and the seven cities along the corridor, these green infrastructure projects are scheduled to wrap up construction by the end of this year.

Approaches include adding grates along sidewalk edges to let water infiltrate the soil, and planting swales to help filter out contaminants such as automotive fluids, heavy metals, and pesticides. “Now, stormwater is running down roads and that filthy water goes into the Bay,” said Elizabeth Dougherty, founder of Wholly H2O, a Bay Area nonprofit dedicated to sustainable water management.

But the city of Los Angeles goes much further than the Bay Area. “LA is a leader in capturing stormwater and using it for their water supply,” Tam said. While San Francisco facilitates stormwater capture for some types of buildings, Los Angeles requires it for groundwater recharge or on-site use in most new development and redevelopment projects.

Also in the works is an ambitious stormwater capture program by the City of Los Angeles Department of Public Works. Called the Greenways to Rivers Arterial Stormwater System, the program repurposes existing corridors — such as wide streets, utility rights-of-way, and stream-side easements — into a stormwater-harvesting network that stretches clear across the vast city. Today, local sources account for just 12 percent of LA’s water use, which averages roughly 187 billion gallons per year. But the city already funnels nearly 8.8 billion per year of stormwater into its aquifers, and plans to boost that to as much as 91 billion per year by the end of the century.

Another underused source of water is wastewater that goes down the drain in houses and office buildings. “Reuse and recycling are the next best ways to create new water supplies,” Tam said. Graywater from showers, bathroom sinks, and washing machines is now the second most common source of water in Australian households, according to the Australian Bureau of Statistics. This wastewater can be reused directly for landscaping and, when treated, can also be reused in washing machines and toilets.

To spur wider use of graywater in the Bay Area, we could follow the lead of Tucson, Arizona, which requires newly constructed homes to be graywater-ready. Dual plumbing collects graywater separately from the blackwater that comes from kitchen sinks, dishwashers, and toilets. “If it makes sense in Tucson, it makes sense in California,” Dougherty said.

Even blackwater can be reused onsite, as long as it is treated properly. The San Francisco Public Utilities Commission’s headquarters building, which opened in 2012, collects and treats both graywater and blackwater with a system that includes plants and bacteria to break down biowaste. The system treats 5,000 gallons of wastewater a day for non-potable reuse, cutting the building’s per person water use by nearly 60 percent.

And, yucky though it may sound at first, all wastewater can be recycled back into drinking water. “In a way, we’re already doing it,” Tam said. “Anybody who’s drinking water from the Delta gets treated wastewater that was deposited upstream.” The Sacramento-San Joaquin Delta, where the Sacramento and San Joaquin rivers meet, supplies about 30 percent of the Bay Area’s water, according to the 2013 San Francisco Bay Area Integrated Regional Water Management Plan (IRWMP).

Last summer, the Santa Clara Valley Water District opened a new treatment plant in San Jose that makes sewer water pure enough to drink. The concept is not new. Orange County has done it for years, but their process includes pumping the water into percolation basins that feed into groundwater. “This adds a margin of safety,” Tam said. “You can test it before sending it out.”

In contrast, the new San Jose plant sends treated wastewater directly out for reuse — and this is not yet legal for drinking water in California. For now, this ultrapure recycled water...
is used in industrial cooling towers, golf courses, and car washes. But direct potable reuse (DPR) is already happening in the city of Wichita Falls, Texas. Prompted by severe drought, in 2014 the city opened a DPR facility that yields 5 million gallons of water per day, or a third of their demand.

DPR may be coming to California too. As a first step, the State Water Resources Control Board established an expert panel to explore developing regulations for recycling sewer water directly into drinking water. The panel first met last February and is expected to report to the legislature in 2016.

“When the state permits DPR, Santa Clara’s advanced purification facility will be the first,” Tam said. “It’s a leading model for the whole Bay Area.” Today, the Bay Area recycles only about 10 percent of its wastewater, according to the IRWMP. If legalized for drinking water, DPR could meet much more of the Bay Area’s water demand.

“With droughts and climate change, diversifying our water supply is very important,” said Jennifer West, managing director of WateReuse California, a nonprofit that promotes sustainable local water. “We’ll always have our wastewater — it’s drought-proof.”

Robin Meadows (www.robinmeadows.tumblr.com) is the reporting fellow for the 2014-15 Water Education Initiative. Created by the League of Women Voters of the Bay Area Education Fund to promote better understanding of regional water issues, the initiative is underwritten by the Association of Bay Area Governments, Bay Area Biosolids to Energy, the East Bay Municipal Utility District, the League of Women Voters of Marin County, Louise Anderson, the Marin Municipal Water District, Marion Taylor, the San Francisco Public Utilities Commission, the Santa Clara Valley Water District, and the Sonoma County Water Agency.

Bay Area Monitor History, Part III: Expansion Excitement

By Leslie Stewart

By the mid-1980s, the Bay Area was flourishing — but not without consequences. Growing suburbs meant freeways jammed with commuters, jeopardizing progress toward meeting air quality standards. Water management agencies, required to meet the increasing demand, encountered a five-year drought. Onlookers worried that environmental mitigations required by the California Environmental Quality Act weren't adequately enforced.

In reaction to the growth surge, regional parklands were expanding, while the San Francisco Bay Conservation and Development Commission was creating guidelines for waterfront housing developments, commercial fishing, and water-related industry.

The Bay Area Monitor covered all this and more between 1986 and 1995. In mid-1986, a lead article introduced the concept of “jobs-housing balance.” Coverage of transportation corridor plans — Highway 101 North and Interstate 80 — was succeeded by articles on “traffic mitigation” to reduce auto use, and then by reports on congestion management plans.

Air quality coverage expanded from smog to air toxics as new regulations addressed the health aspects of air pollution. As Adelia Sabiston, former president of the League of Women Voters of the Bay Area, noted, “The Bay Area League lobbied the Bay Area Air Quality Management District to take this on, before the federal regulations.” In the Santa Clara Valley, where toxic chemicals from semiconductor industries had contaminated groundwater, the cleanup led to an Integrated Environmental Management Plan covering water, air, and ground.

With a single staff person to cover multiple agencies and topics, the Monitor engaged League of Women Voters members as “monitors” to observe and report on the myriad of meetings involved in the IEMP and other plans.

Several of these observers also wrote for the Monitor. Jo Nugent wrote special editions on ozone, the San Francisco Estuary, and Bay-Delta planning, as well as regular articles about water management. Sabiston observed the Air District for many years, and in addition to regular articles, also wrote a special edition on air quality. She characterized it as “an attempt to draw attention to the topic during quite a long period in which there was no improvement in federal air quality planning.”

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Bay Area Monitor History, Part III (from page 7)

An article on an Association of Bay Area Governments (ABAG) earthquake planning workshop appeared in the July/August 1989 edition; shortly thereafter, the October 1989 Loma Prieta earthquake forced the Monitor to re-locate its office from Oakland to Lafayette. Yvonne San Jule Koshland, who retired in 1987 as an ABAG planner, recently recalled that “ABAG had been studying earthquakes for some time, focusing on preparedness and recovery.” Numerous articles in the years after Loma Prieta looked at earthquake planning, the impacts on park agencies, and seismic retrofits to the Golden Gate Bridge and by the East Bay Municipal Utility District. A 1990 article on fire control in the “urban interface” preceded the 1991 Oakland Hills fire; it was followed by many articles on fire restoration and prevention.

Other themes as the region entered the 1990s included ferries and increased rail service, especially the new Capitol Corridor trains. Ridesharing and employer-based trip reduction programs were primary congestion management strategies. New on the scene were electronic toll collection, BART paratransit services, alternative fuels, the concept of “growth management,” and two residential air quality programs, “Spare the Air” and “Don’t Light Tonight.” Drought impacts and water supply management plans were constant topics. By the mid-1990s, writers were reporting on proposals for intelligent vehicle highway systems, new state requirements for “clean” cars, and accommodating multi-modal freight movement. A shared farecard pilot project called TransLink premiered in 1993, and in 1995 there was a new event called “Bike to Work Day.”

Relationships between agencies — a constant topic in previous years — received attention again when a two-year study by a committee of influential Bay Area decision-makers proposed merging several large regional agencies for more efficient regional planning. The Bay Vision 2020 Plan was summarized in a 1991 Monitor edition. According to Koshland, who was following the process for the League, “It lacked a bit of extra support” in the legislature, and went nowhere. “It was the fate of all those efforts,” she lamented.

When Monitor editor Ernestine DeFalco retired in 1995, she had greatly expanded the publication’s coverage since assuming the role in 1984. Adding Bayshore planning, parks, water and wastewater services, and transit services to the original transportation and air quality planning topics, she also built a group of well-informed observers and writers. MTC honored her with an award for work on her own forte, transportation issues, shortly after her retirement.

Leslie Stewart is the most recent former editor of the Bay Area Monitor.