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Pacific Southwest Region



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From the Regional Administrator

Dear Readers,

With the change in Presidential administrations coming in January 2009, most people here at EPA's Pacific Southwest Regional Office are aware that this will be my last year as Regional Administrator. In recent weeks, I have been reflecting on what our regional managers and staff have accomplished during my seven years here, and the challenges still ahead.

While many of the environmental issues before us will take years to resolve, we have made remarkable improvements thanks to new approaches and the relentless efforts of dedicated professionals and concerned citizens.

It has been a privilege to work with the managers and staff here at the regional office. Their commitment to protecting the environment and public health is awe-inspiring. Together, and in concert with our partners in other federal agencies, states, tribes and local governments, we have accomplished a great deal even with tighter budgets. This report summarizes some of our challenges and major gains of the past year.

But what keeps these successes coming year after year? As I look back over our past Progress Reports, I recognize some common threads.

First is leadership—our managers and staff look for opportunities to make headway even on seemingly intractable challenges such as air pollution from rapidly-expanding Southern California ports or illegal dumping on tribal reservations. We cannot solve these problems alone, but we have found that when we lead the way, others follow.

The second is innovation—the willingness to think creatively, to try new technologies and new approaches, which is key in our fast-changing world. Our Cleanup Clean Air Initiative is a great example of this. We're using solar power, biodiesel, even molasses and whey to clean up contaminated sites—and getting the job done faster, cheaper and cleaner.

Third is partnerships—not only with our traditional partners, the states, local governments and tribes, but with foreign governments as well, such as Mexico and China. With trade, commerce and pollution crossing all geographical boundaries, these relationships are key to protecting the environment. And our combined efforts, such as the West Coast Diesel Collaborative, are achieving results that no single agency could hope to accomplish.

Finally, there is perseverance and a focus on results. We keep our eyes on long-term goals, and keep working not just year after year but decade after decade. We measure the results, and adjust our efforts. Our long struggle for clean air in our major cities and clean water in our rivers and lakes has largely been successful, but only because we have never been discouraged by the scope of the problem.

These are qualities that will make EPA and its partner agencies successful in the next decade and beyond. I look forward to seeing continuing success in EPA's Pacific Southwest Region and am proud to be a part of it.



Wayne Natri
Regional Administrator
EPA Pacific Southwest Region





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Clean air is a simple concept, but keeping it clean is not so simple. The tremendous diversity of topography and weather in the Pacific Southwest dictates that air will nearly always be healthy in some places, but not in others. It's a long way from the breezy Hawaiian islands to the sun-baked valleys of California.

But the biggest factor is the human one. Of all the things we do, energy use is the biggest determinant of how clean the air will be and which pollutants will be a problem. In California, a large percentage of the air pollution results from burning fuel for transportation—cars, trucks, buses, ships and trains. In Nevada and Arizona, with smaller populations and fewer vehicles, a greater proportion comes from fossil-fuel-burning electric power plants.

Global climate change has added a new dimension to air concerns—greenhouse gases, such as carbon dioxide

and methane. But in the end, the key to both ensuring healthy air and reducing greenhouse gases is tackling the energy issue.

In 2007, EPA's regional office was active on several fronts: taking enforcement actions against fossil-fuel power plants that exceeded permitted emissions limits, holding a scientific conference on the air quality impacts of anticipated climate change, unveiling a bus and package delivery truck powered by innovative drive systems, and putting together a strategy to coordinate energy-related activities.

Trends

New Tools Allow Web Users to Map Air Quality Information

The quality of the air we breathe varies day to day. In the past, finding out if poor air quality was a hazard to one's health meant waiting for a weather forecaster on TV or radio to announce it. Detailed information was hard to get, and air quality often wasn't mentioned until it became hazardous for everyone, leaving sensitive populations like asthmatics gasping for breath.

Since then, air quality has improved dramatically in most urban areas, and so has the availability of accurate air quality data. EPA made a major advance a few years ago with the AIRNow Web site, making air quality data available online. Last November, AIRNow data became even more useful when EPA released a dynamic data layer on Google Earth, allowing anyone to combine detailed mapping with air quality information that's updated hourly.

This combining of different types of data—often referred to as a “mashup”—gives the user a distinct new look at information. In this case, EPA's Air Quality Index (AQI), based on real-time monitoring data, is merged with the cartographic imagery of Google Earth. This information can benefit everyone, particularly people with asthma, the elderly, and other sensitive populations who can use accurate pollution conditions to make daily decisions about their activity levels or exposure to outdoor air.

For instance, parents of a child with asthma can decide if it's safe to allow their child to play soccer. TV weather forecasters can combine the AQI layer with other information they display to viewers. Individual users can also decide which data to combine based on their own needs:

Home buyers could “mash up” the AQI with real estate listings to inform their decision-making. Community activists may choose to overlay the AQI on a map showing the location of industrial facilities.

During air quality emergencies like wildfires, where smoke conditions can change quickly, the AQI layer can be crucial for early response teams or fire departments. By using AQI on Google Earth, they can see where the pollution is worst and overlay other information such as the locations of schools, hospitals, airports and roads. Being able to layer such crucial information can help inform decision makers.

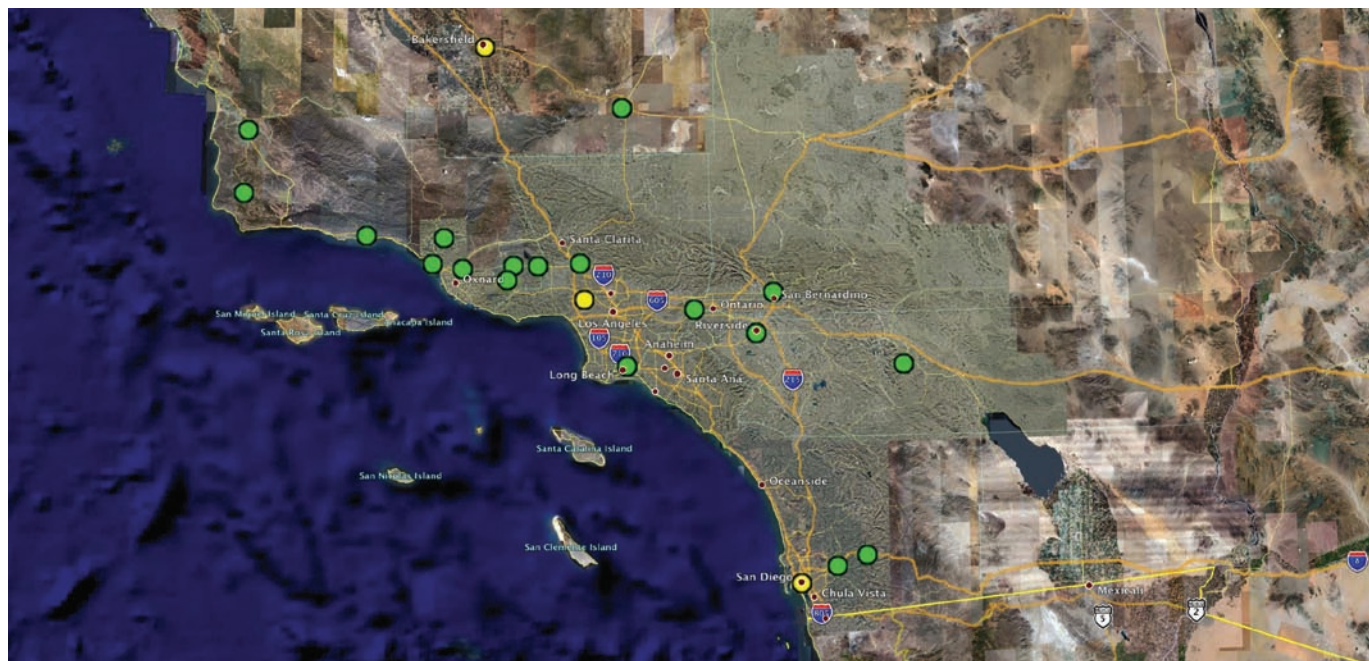
The AQI is a color-coded numeric system that rates air quality according to six divisions that express conditions: 0-50 is healthy, 51-100 moderate, 101 to 150 unhealthy for sensitive

Real-time data can help parents decide if it's safe for their children with asthma to play outside.

groups, 151-200 unhealthy, 201 to 300 very unhealthy, and 301-500 hazardous.

With this information visually displayed on Google Earth, it's easy to assess local air quality conditions wherever you happen to be—and to customize the experience with an intuitive mapping tool. Just visit AIRNow.gov and select “AQI in Google Earth” under Resources.

For air quality conditions and projections:
www.airnow.gov



The dots on this map represent air quality at monitoring stations—green is good, yellow is moderate, orange is unhealthy for sensitive groups.

Primer

Energy and Climate Change

The national dialogue on climate change reached a new level in 2007 as scientists, policy makers, leaders of industry and individuals focused on the latest findings of climate researchers and weighed the most effective approaches to mitigation.

Assessing the Problem

Throughout the year, the United Nations Intergovernmental Panel on Climate Change (IPCC) issued a series of reports that raised awareness and concern about climate science, environmental impacts, and mitigation options. The IPCC stated that “Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level.”

In its findings, the panel noted that it is very likely (>90% probability) that human influence has caused warming over the past 50 years. The IPCC also said that if greenhouse gas emissions are left unchecked, global temperatures would likely increase between 2.0 and 11.5° F, potentially causing greater sea level rise and extreme weather, impacting human health, ecosystems, and food and water availability.

In the Pacific Southwest, the State of California has also assessed potential impacts from climate change. California found that medium warming assumptions, in drier scenarios, caused the Sierra Nevada spring snowpack to be reduced by 80%. With those same assumptions, there would be a 55% increase in wild-fire frequency, and 75 to 85% more days when ozone (smog) could form in Los Angeles and San Joaquin Valley.

**The Role of Energy**

The energy we use to power our homes, businesses and transportation system is the source of nearly 90% of the greenhouse gas emissions in the U.S. Increasing the efficiency of the energy we burn, reducing emissions from traditional energy sources, and aggressively seeking new sources of energy that put less carbon into the atmosphere are all important strategies in reducing greenhouse gas emissions.

In prioritizing opportunities to reduce emissions, it is important to understand their source. In California, the transportation sector has received particular focus because it accounts for a larger share of greenhouse gas emissions than in the U.S. as a whole—39% vs. 28%—accounting for more of California’s greenhouse gas inventory than the electric power industry.

Evaluating Needs, Taking Action

At the national level, EPA has begun evaluating options for regulating greenhouse gases following the U.S. Supreme Court’s ruling that the agency has authority to do so under the Clean Air Act. Late in the year, the President signed H.R. 6, the Energy Independence and Security Act of 2007, which increases renewable fuel mandates, sets more aggressive vehicle fuel efficiency standards, and promotes investment in energy efficiency.

Left: Wind power is one of California’s renewable energy sources.

Above right: The coal-fired Navajo Generating Station near Page, Ariz.



In the Pacific Southwest, EPA's office in San Francisco is working with the region's state, tribal and local governments as they take an active role in evaluating their needs related to climate change.

With its large population and powerful economy, California's total greenhouse gas emissions dwarf those of its neighbors (as shown in Fig. 1). However, the state has long been a national leader in addressing emissions and energy efficiency, with by far the lowest per-capita greenhouse gas emissions of states in the region.

California's extensive energy and climate change policies and regulations include AB32 (the Global Warming Solutions Act of 2006), SB1368 (Global Warming Emissions Standard for Electricity Generation) and the Low Carbon Fuel Standard. The Governor's office is directing implementation of the state's Climate Action Plan. The state has completed extensive analyses of energy and climate change issues, with projections and recommendations detailed in a Climate Action Team Report to the Governor and Legislature, and the state Energy Commission's Integrated Energy Policy Report.

Arizona has developed a Climate Change Action Plan that includes a greenhouse gas inventory and recommendations for various energy-related sectors. Hawaii is completing an update to their Energy Strategy, last completed in 2000. In 2007, the state adopted legislation similar to California's AB32.

Nevada in 2007 adopted legislation requiring greenhouse gas emissions inventories and a Climate Change Advisory Committee. The state recently completed an Energy Status Report and a Renewable Energy and Energy Efficiency Report for the Governor and Legislature.

At the regional level, EPA's Pacific Southwest Regional Office is working to improve coordina-

tion of its own activities related to energy and climate change (the list to the right provides a small sampling). Evaluating opportunities across all environmental programs—from waste management to air quality to water infrastructure—will also facilitate increased support of other federal, state, local and industry efforts.

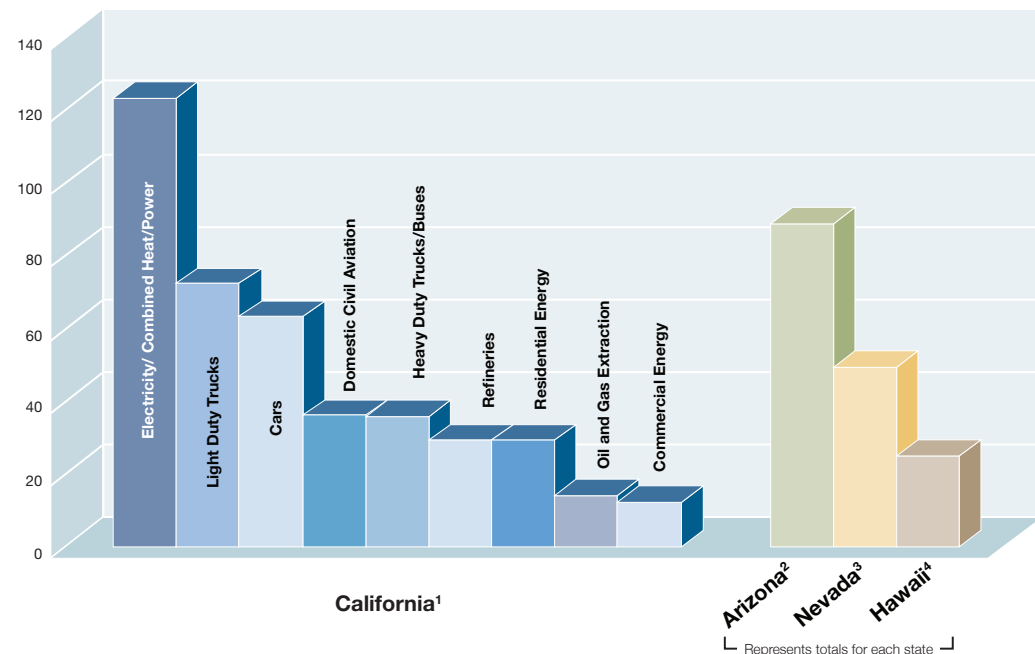
An example of regional leadership has been EPA's convening of the West Coast Diesel Collaborative, which has brought a concentrated focus to the issue of goods movement—from ships to the huge network of trains and trucks that move goods from ports to store shelves. EPA has brought together regional officials from across the U.S. to discuss solutions for port-related pollution. These efforts, together with EPA's core role in setting national emissions standards, will continue to ensure progress in improving public health in these areas.

EPA is working with state, local and nongovernment partners across the Pacific Southwest to tackle issues involving energy use and its impact on our climate.

This report describes several of these efforts, from local measures to new technology development to advances in global science.

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Figure 1: California Greenhouse Gas Emissions
(in Million Metric Tons CO₂ Equivalents)



Science

Conference Addresses Impacts of Climate Change on Air Quality

In October 2007, some of the nation's leading climate change scientists gathered with EPA, state, local and tribal air quality regulators for a conference in San Francisco to address the predicted impacts of climate change on air quality. The scientists shared the results of their current research and participated in discussions with regulators on integrating science with policy and on priorities for future research.

Among the distinguished speakers was Stanford University's Dr. Stephen Schneider, who shared the 2007 Nobel Peace Prize with fellow members of the United Nations Intergovernmental Panel on Climate Change and former Vice President Al Gore.

The conference was organized by EPA's Pacific Southwest Air Division, in conjunction with EPA's national Office of Research and Development (ORD), which leads EPA's efforts to con-

duct, fund and communicate climate change research.

Studies cited at the conference indicated that rising temperatures associated with climate change will produce a "climate penalty" of worsening ozone (smog) levels. Areas that now barely attain federal ozone standards could become non-attainment areas, and existing non-attainment areas will need more time and pollution controls to meet the standard. If nothing is done to further strengthen pollution controls, rising smog levels will result in increased mortality among the elderly, sick, or frail, one scientist predicted.

Studies on the impact of climate change on particulate pollution indicated varying results, depending on the chemical composition of the particles. Smoke particles will become an increasing problem if rising temperatures

cause more and bigger wildfires. Scientists and air quality regulators agreed on the need for more research on how climate change affects particulates.

Government air quality managers called for more information to help them understand the benefits and trade-offs of energy and climate change policy, as well as the prospects for carbon sequestration and cleaner coal combustion. One climate change mitigation strategy—energy efficiency—was predicted to provide triple benefits: cleaner air, better health, and cost savings.

Some of the state, local and tribal air quality managers voiced their interest in further collaborating with EPA on climate change and using EPA's climate modeling tools and research. EPA's Office of Research and Development plans to publish in 2008 a synthesis of results from EPA-funded research on the impacts of climate change on air quality.

The October workshop generated a list of future research themes and collaboration opportunities to help guide upcoming activities. For example, EPA's regional office is organizing a series of meetings with local scientists working on air quality and climate change issues. In addition, the regional office will participate in helping ORD set future research priorities on adapting to the impacts of climate change on air quality.

EPA's Global Change Research Program:
www.epa.gov/ord/npd/globalresearch-intro.htm

Stanford University's Dr. Stephen Schneider is one of the world's foremost experts on climate change science.



Innovation

New Hybrid Technologies Bring Cleaner Trucks and Buses

Diesel trucks and buses more than 10 years old are the dirtiest vehicles still on the streets. Since they generally last 20 years, they won't disappear overnight. But when they do, they may be replaced by fleets of trucks and buses far cleaner and more energy-efficient, thanks to new hybrid technology developed by EPA and several partner organizations. In fact, these new drive systems may also be used in light trucks, SUVs and vans.

In August 2007, EPA joined the Bay Area Air Quality Management District, Pacific Gas & Electric Co., and Advanced Energy officials to award a total of \$215,843 in grants to the Napa Valley Unified School District to fund California's first plug-in electric hybrid school bus. The bus has the potential to double fuel efficiency and reduce emissions by up to 90%.

Meanwhile, EPA's laboratory in Ann Arbor, Michigan, has patented an innovative hydraulic hybrid drive system for delivery trucks that's now being road-tested. The demonstration model, a 12-ton UPS delivery vehicle, stopped in at the South Coast Air Quality Management District offices in Diamond Bar, Calif., in December 2007. In lab tests, the truck slashed fuel use by an amazing 60 to 70%, and reduced smog-forming hydrocarbon emissions by 50% and particulate emissions by 60%, compared to conventional trucks.

Trucks that operate in urban stop-and-go traffic—such as delivery vehicles—contribute significantly to pollution and fuel consumption. “If every truck adopted this technology, it would

make a big difference for air quality,” said Matt Haber, deputy director of EPA's regional Air Division.

The hydraulic hybrid drive system costs more to build, but would pay for itself within three years by cutting fuel costs, ultimately saving \$50,000 over a truck's 20-year lifespan, based on a fuel price of \$2.75 per gallon. As fuel prices continue to increase, lifetime savings would be even greater.

The unique UPS delivery vehicle features EPA-patented hydraulic hybrid technology. It uses hydraulic pumps and hydraulic storage tanks to store energy that is normally lost in braking. When the vehicle accelerates, it uses that energy. The engine is also more efficient and can shut off when stopped or decelerating.



The truck was designed with the support of UPS, Eaton Corporation-Fluid Power, International Truck and Engine Corporation, the U.S. Army, Morgan-Olson, the University of Wisconsin, the University of Michigan, and Michigan State University. FEV Engine Technology Inc., and Southwest Research Institute built the vehicle under contract to EPA.

More info and video on this new technology:
www.epa.gov/region9/air/hydraulic-hybrid



Upper right: California's first plug-in electric hybrid school bus is now in use in the Napa Valley.

Lower right: EPA developed the energy-saving hydraulic hybrid drive system now being road-tested in this delivery truck.

Places

Reducing Emissions from Las Vegas Power Plants

It takes lots of energy to power the glittering lights and laboring air conditioners of Las Vegas' famous "Strip," as well as the city's fast-growing suburbs in Clark County, Nevada. Most residents never see the fossil-fuel-burning power plants that supply most of the area's electricity, but they'll soon breathe cleaner air thanks to two legal settlements with local utility Nevada Power that will sharply reduce smoke-stack emissions.

In the first case, the Nevada Department of Environmental Protection (NDEP) spent two years investigating alleged Clean Air Act violations at Nevada Power's Reid-Gardner coal-fired generating plant 50 miles northeast of Las Vegas.

The NDEP carefully assembled evidence, then issued 56 violation notices to Nevada Power for exceeding limits on particulate matter emissions at the facility. Some of the violations included faulty record-keeping, which made it difficult to measure the extent of the illegal emissions.

Nevada Power and NDEP called for EPA's assistance to help resolve the case. After two years of negotiating, EPA, NDEP and the company reached a settlement with multiple benefits. First, Nevada Power agreed to spend \$85 million on pollution control equipment to reduce the plant's particulate emissions by more than 300 tons per year, and reduce nitrogen oxide (NOx) emissions by at least 282 tons per year.



The company also agreed to set up an Environmental Management System to ensure that future compliance will be verified.

Secondly, the company agreed to fund more than \$4 million in energy conservation projects for the Clark County School District over the next seven years, saving the schools at least \$500,000 per year in energy costs, as well as reducing air pollution by cutting fuel consumption. And finally, the company agreed to pay \$1.11 million in penalties to the state and federal governments.

The other case involved Nevada Power's natural gas-burning Clark Generating Station. While natural gas is cleaner than coal, older gas-fired plants emit far more NOx than newer ones using the Best Available Control Technology (BACT). That's why the Clean Air Act's New Source Review rule requires BACT whenever fuel-burning power plants are substantially modified.

EPA found that the company had made major changes at Clark that increased NOx emissions without installing the required pollution controls. In the settlement, the company agreed to reduce the plant's NOx emissions by about 2,300 tons per year, a dramatic 86% reduction, at a cost of about \$60 million. The company also agreed to fund a \$400,000 photovoltaic solar power array on the roof of a building housing a local nonprofit organization. In addition, Nevada Power will pay a \$300,000 penalty.

Left: Las Vegas and its suburbs continue to grow rapidly.

Above: Nevada Power's coal-fired Reid-Gardner Generating Station. Photo: Nevada DEP



People

Steve Frey: Enforcing the Clean Air Act

When Steve Frey talks about his 32-year career at EPA as an environmental engineer involved in Clean Air Act enforcement, what's striking are the large numbers: Thanks to cases Steve worked on, the coal-fired Navajo Generating Station reduced its sulfur dioxide (SO₂) emissions by 65,000 tons per year in the 1990s. The Four Corners Power Plant, another coal-burner on the Navajo Nation, more recently slashed its SO₂ emissions by 88% for a 20,000 ton-per-year reduction. Nevada gold mines reduced mercury emissions by more than 16,000 pounds per year.

Of course, Steve didn't do it alone. At the Four Corners Power Plant, the reductions were the result of a partnership between the Navajo Nation, the Arizona Public Service Corp., the National Park Service, Environmental Defense, Western Resource Advocates, and New Mexico Citizens for Clean Air and Water. Nevertheless, as an expert in monitoring air pollutants and testing pollution control equipment, his role was crucial to ensuring that the agreed-upon reductions were achievable, and provable.

Steve grew up in the Philadelphia area, and began studying chemical engineering at Pennsylvania State University in the early 1970s. After the Energy Crisis of 1973-74, he switched his focus to air pollution control engineering, and after graduation took a job with EPA's regional office in New York City. He traveled throughout the state of New York inspecting power plants, chemical plants, cement plants, and other pollution sources. He also helped the state write permits for such facilities, providing the techni-

cal expertise needed to ensure they minimize emissions.

Always an avid skier, Steve was drawn to the West by the skiing. The best powder snow, he says, is in the Rockies, so in 1980 he moved to EPA's office in Denver. There, he tested smoke-control devices on wood-burning stoves to help develop Colorado's wood stove pollution standards. Steve was also heavily involved in a federal court case aimed at two plants in Colorado making waferboard—wood panels manufactured using wood chips and glue. These plants were part of a new industry that had underestimated their emissions and built without major new source construction permits required by the Clean Air Act.

Inspecting facilities and enforcing permits help reduce air pollution by tens of thousands of tons each year.

Steve transferred to EPA's regional office in San Francisco in 1988, where he was assigned to Clean Air Act enforcement. Here, one of his early cases involved another wood products industry case which was concluded as part of a national settlement involving the two major waferboard companies in the U.S. for more than 20 of their plants that they built without the proper permits. Ultimately, EPA required all such facilities to install pollution control equipment to



limit emissions of smog-forming volatile organic compounds (VOCs).

For the past decade, Steve has worked on enforcement cases involving some of the Pacific Southwest's biggest coal-burning power plants—thus the big numbers. In some of these instances, like the Four Corners Power Plant, EPA works with the owner and other stakeholders to negotiate voluntary but binding agreements for pollution reductions, which can take effect faster than traditional enforcement actions, which may involve protracted litigation.

One recent negotiation with the Arizona Public Service Co., regarding the coal-burning Cholla Power Plant east of Flagstaff, produced an agreement in which the company is spending \$300 million on equipment to reduce SO₂ emissions by more than 70%, particulate emissions by 50%, and smog-forming nitrogen oxides (NO_x) by 40%.

Steve is planning to retire in 2008, but his work will be carried on by his colleagues in the regional Air Division's enforcement office, under the leadership of office chief Doug McDaniel.

Clean Water



The Pacific Southwest Region is a varied water landscape, from the Pacific Ocean and its tropical islands to the austere beauty of its arid inland deserts. The challenges of supplying drinking water and keeping waterways clean similarly vary across the region.

Along the U.S.-Mexico Border, infrastructure needs have lagged far behind explosive population and industrial growth. But with EPA's assistance and binational cooperation, the New River, once known as the dirtiest in the West, is becoming significantly cleaner.

In urban areas that get slightly more rain, winter downpours dump huge amounts of litter from the streets into storm drains, creeks and beaches. Los Angeles has taken action to address this problem, and the San Francisco Bay Area is next.

In California's less-populated far north, the Klamath River has been an area of enduring controversy between competing users dependent on its waters for food, jobs and energy. But over the last couple of years, cooperation among water users has made progress toward resolving the Klamath's issues possible.

Even issues that once seemed intractable, such as the disposal of dredged materials from San Francisco Bay, have been resolved through such cooperation. The mud is still mud, but it's no longer unwanted—it's now a resource being used to restore tidal wetlands.

Trends

Wastewater Treatment Cleans Up Border Waterways

Throughout the United States, water quality improved dramatically in the 1970s and 1980s as a result of the Clean Water Act of 1972 and the wastewater infrastructure improvements built to comply with it. But waters polluted by sewage continued to flow into the U.S. along the U.S.-Mexico Border, and as the Mexican border cities' populations grew explosively in recent decades, the problem worsened. EPA and Mexican government agencies have been co-operating since 1995 to fund and build wastewater improvements, and the results have been dramatic.

These wastewater projects have benefited more than 635,000 people in Mexicali, Mexico.

The New River, flowing from Mexicali, Mexico, to California's Salton Sea, is a case in point. It's called the "New" River because it didn't exist until the Colorado River broke a levee in 1905 and sent a stream of water into Mexico that turned north into the Imperial Valley, creating the Salton Sea. The levee breach was repaired, temporarily drying up this "river," but later the channel was re-watered by sewage and irrigation runoff from Mexico. As Mexicali's population exploded from 6,200 in 1920 to more than 850,000 today, the city's wastewater infrastructure did not keep up, and, consequently, pollution in the New River continued to increase.

Work began in 1996 on renovation and repairs to Mexicali's existing sewage pipes and treatment facilities, funded jointly by the U.S. and Mexico. The binational cooperation continued, upgrading and expanding the city's treatment capacity over the next few years. While these efforts resulted in significant improvements, 10% of the New River's flows still consisted of raw sewage.

In 2007, a new wastewater treatment plant located in the south of Mexicali was completed. The estimated 15 million gallons per day of sewage that once flowed untreated into the New River is now treated, disinfected and discharged into a series of irrigation canals that flow southward into the Rio Hardy, which is a tributary to the Colorado River Delta in Mexico.

The removal of this untreated sewage from the New River has resulted in significant drops in bacteria levels as well as increased dissolved oxygen. Phosphates in the New River, which contribute to water quality impairments in the Salton Sea, have dropped by 25%.

Overall, EPA has contributed nearly half the \$98.6 million cost of the Mexicali wastewater projects, with the Mexican government contributing the remaining funds. Already, these projects have benefited an estimated 635,000 people in Mexicali, and have resulted in the treatment of approximately 40 million gallons per day of sewage.

Construction is underway on similar projects elsewhere, such as the Nogales International Wastewater Treatment Plant, due for completion in 2009. Not only do these investments result in improved water quality, they also create



wastewater utilities in Mexico with the capacity to finance and construct future infrastructure projects. It's a welcome trend for millions of people on both sides of the border.

More info on U.S.-Mexico efforts:
www.epa.gov/border2012



Upper right: New sewer pipe is installed near the U.S.-Mexico border.

Lower right: EPA Administrator Stephen Johnson (right) and Regional Administrator Wayne Nastri (facing) visit the New River.

Primer

Keeping Trash Out of Waterways: LA Water Board Leads the Way

In urban areas of the Pacific Southwest, millions of pounds of litter accumulate in streets and parking lots during the long dry season, then are flushed into storm drains by the first major rainstorm. Storm drains empty into streams, bays and harbors, and onto beaches, depositing loads of trash that are not just unsightly, but a serious health hazard to people, wildlife and fish.

Trash harms birds and marine life who consume small pieces, mistaking them for food. Some of the waste contains pathogens that sicken swimmers and surfers.

Last year, the Los Angeles Regional Water Quality Control Board adopted a Total Maximum Daily Load (TMDL) for trash in the LA River Watershed. This landmark TMDL was originally adopted by the Regional Board in 2001 and EPA-approved in 2002, but litigation required the TMDL to be set aside until it was re-adopted in 2007. Following its full adoption through the water quality standards approval process, the wasteload allocations will be brought into the Los Angeles County stormwater permit.

In its support of the Los Angeles Regional Board, EPA made it clear that preparation of this TMDL, the nation's first to regulate trash as a pollutant, was a key action to address this serious problem. Under the TMDL, cities, Los Angeles County and CalTrans prevent trash from reaching storm drains and fouling waterways and beaches. They are reducing trash discharges incrementally over nine years, with a goal of zero by 2016. The Regional Board documented the huge amounts of trash involved—more than 4.5 million pounds per year, which costs downstream cities hundreds of thousands of dollars each year to remove from their harbors and beaches.

Some cities in the Los Angeles area have already implemented the necessary measures, including what are known as ‘full capture systems’—devices that trap all particles retained by a 5 mm mesh screen and have a design treatment capacity of not less than the peak flow rate resulting from a one-year, one-hour storm in the subdrainage area. The Regional Board has certified various full-capture devices proposed by five cities, the County of Los An-

Total Maximum Daily Loads (TMDLs)

The TMDL process provides an assessment and planning framework for pollutant load reductions or other actions needed to attain water quality standards that protect aquatic life, drinking water, and other designated uses. TMDLs address all significant pollutants in a water body identified by the state as impaired.

geles, and Caltrans that local governments can use to achieve compliance.

These devices are most effective when not overwhelmed with trash and debris. We all do our part by keeping trash and other waste off the streets as cities continue public outreach, provide receptacles for trash, and routinely sweep streets and clean catch basins.

Meanwhile, the San Francisco Bay Regional Water Quality Control Board has held hearings on a proposal to include similar limits in its region-wide discharge permit for cities that discharge storm water (and trash) into the bay. Local environmental groups have documented the problem of trash-covered creeks that drain to the bay.

The regional water boards in Los Angeles and San Francisco Bay Area have recognized that voluntary measures aren't enough to keep trash out of the waterways. It's a serious water pollution problem, and EPA supports the Regional Boards' regulatory actions to make sure that every local jurisdiction participates in solving it.

During every heavy rainstorm in urban areas, trash from streets and parking lots gets washed into storm drains that empty into creeks, bays and shorelines.
Photo: Rick Loomis, LA Times



Partnership

Wetland Restoration Underway Through SF Bay Harbor Dredging

In the 1990s, federal and state agencies struggled to find a better solution to disposing of mud dredged from San Francisco Bay to keep the navigation channels open. Disposing of the dredged materials elsewhere in the Bay had raised public concerns about impacts on water quality, fishing, and even navigation.

Environmental groups, ports, state agencies, EPA and the Army Corps of Engineers developed a Long-Term Management Strategy (LTMS) for dredged materials to both reduce in-Bay disposal and encourage beneficial reuse of marine sediments to restore wetlands. Today this strategy is being implemented, as millions of tons of material from Oakland dredging recently began flowing through a pipeline that deposits it on 1,000 acres of Hamilton Field, a former military base in Marin County.

As the Hamilton wetland restoration began, there were already two other privately-operated projects making beneficial use of dredged materials. The Montezuma Wetlands project is restoring a large wetland adjacent to Suisun Bay, and Carneros River Ranch is piping dredged material from a small harbor on San Pablo Bay onto nearly a square mile of fields to grow crops.

Dozens of square miles of hayfields in the North Bay were originally sea-level salt marshes. Salt marshes are critical to maintaining a healthy ecosystem for fish, migrating birds and other wildlife. During more than a century of being diked, dried and cultivated, the land surface sank. Breaching the dikes alone would simply create a saltwater pond too deep for wetland

vegetation to grow. So dredged material—millions of tons of it—is being deposited to raise the level of these areas as part of an overall restoration plan.

Oakland is now deepening its harbor to 50 feet to handle larger ships, removing 12 million cubic yards of dredged materials in the process. One quarter of that is being piped now to Hamilton Field, another three million has been deposited at the Montezuma Wetlands, and the remaining six million was used to create better fish and bird habitat in the bay close to Oakland.

These projects are just the beginning for beneficial reuse of dredged material. The LTMS agencies are considering options to further reduce in-Bay disposal by getting materials to Hamilton

Field faster and cheaper. EPA and other agencies are also working on using dredged materials to build up levees in the Sacramento-San Joaquin Delta. Maintaining this levee system is critical—if the levees break, salt water from the Bay will rush into the Delta, harming habitat for sensitive fish species. Further, salt water would intrude into the state and federal aqueducts, making the water undrinkable—a disaster for the more than 20 million Californians who depend on imported water supplies.

In the 1990s, the question was how to get rid of dredged materials. Today, it's a valued resource for restoring wetlands and protecting Delta farms and water quality.



A bulldozer spreads dredged mud at the Hamilton Field wetland restoration site in Marin County, California.

Places

Klamath River Tribes, Anglers, Farmers, Agencies Work Together

Many Californians may not be familiar with the beautiful Klamath River in northern California and southern Oregon. But for those who live in the forested Klamath Basin, the river and its tributaries are all-important in providing the essentials of life: water, food and jobs. The Yurok, Karuk and Hoopa Valley Tribes have thrived on the river's salmon for thousands of years. Upstream farmers depend on the Klamath's water for their livelihoods, and PacifiCorp's Klamath Hydroelectric Project dams have generated electric power in the region since the 1950s.

With competing demands on the river's water, and varying amounts of snowmelt feeding it each year, it's not easy to find the delicate balance that meets the needs of fish, farms, people and energy demand. In 2001, farms went dry when water diversions were stopped to protect endangered fish. The following year, crops were irrigated, but the river flow fell to such a low level it triggered a massive die-off of

salmon from heat and disease. Contentious arguments took place between farmers and fishermen, with both sides seeing water allocation as a paramount issue to resolve.

After the salmon die-off, the Yurok, Karuk and Hoopa Valley Tribes called for greater EPA involvement in restoring the river's water quality and fisheries. Since 2002, EPA has been working with Klamath Basin tribes, as well as other Klamath water users and state and federal agencies. One key strategy EPA has led is the coordinated development of Total Maximum Daily Loads (TMDLs; see box on p. 12) to ensure the Klamath meets each state's water quality standards for temperature, dissolved oxygen, and nutrients.

These analyses are interlinked and crucial to fish. When temperature and nutrients get too high, algae blooms; once algae dies, dissolved oxygen plummets, killing fish. Oregon and California are expected to issue their TMDLs for the Klamath in 2008 and 2009, respectively. In addition, the Hoopa Valley Tribe adopted, and EPA recently approved, tribal water quality standards for the Klamath River. Though the tribe's reservation includes just a short stretch of the river, the standards help protect fish and water quality both upstream and downstream.

Temperature is particularly important in the Klamath, where a toxic strain of cyanobacteria (blue-green algae) grows. It's virulent enough to cause liver failure and death if a person or animal drinks enough water tainted by it. Touching it can cause rashes. EPA has worked with state, local and tribal entities to warn people to avoid



contact with the water around the Iron Gate and Copco Reservoirs during the algae bloom season in summer.

Meanwhile, EPA grants are supporting improved water monitoring and watershed restoration work. A \$275,000 EPA grant to California is funding the Klamath Watershed Institute's effort to develop a strategic and coordinated water quality monitoring program for the river, and to make the data accessible. A \$900,000 EPA grant is funding watershed restoration efforts by Trinity County, the Yurok Tribe, and a local resource conservation district.

A sign of progress on water use issues is the January 2008 Restoration Agreement between the Yurok and Karuk Tribes, the Klamath Tribes of Oregon, fishermen, farmers, counties and resource agencies regarding basin restoration, water allocation and the removal of four hydroelectric dams which block migrating fish. That agreement is contingent on reaching agreement with PacifiCorp on removal of their four lower dams on the Klamath, which are being considered for relicensing by the Federal Energy Regulatory Commission.

The level of cooperation among Klamath River stakeholders over the last three years is unprecedented. There's great long-term potential for cooperative water use, water quality improvements, and restoring salmon and steelhead trout to this beautiful watershed.

More info on Klamath toxic algae:
www.waterboards.ca.gov/bluegreenalgae

Upper right: EPA's Gail Louis and a Karuk Tribe team take samples of blue-green algae at Iron Gate Reservoir on the Klamath River.

Left: The Klamath River Watershed



People

Catherine Kuhlman: Protecting California Waters

Catherine Kuhlman is retiring—but not really. After more than 25 years of federal service, she is leaving EPA, but continuing to serve the environment. In April 2008, she becomes Executive Officer of the North Coast Regional Water Quality Control Board, a state agency based in Santa Rosa, Calif.

How she got there is an interesting story. Catherine “Cat” Kuhlman grew up in Laguna Beach, Orange County, Calif., where she spent entire summers at the beach, playing volleyball, swimming, surfing, skim-boarding, snorkeling, scuba diving and, at her mother’s insistence, reading a large pile of classic books. “I am a water animal,” she says, “grew up at the beach—pulled by the lure and mystery of water.”

Inspired leadership at the federal and state levels helps ensure cleaner inland waters.

She came to Northern California to study biology at Sonoma State University, just a few miles from Santa Rosa. After graduating in the late 1970s, she took a job as a secretary in EPA’s Water Division—because that was the only job open at EPA’s regional office at the time.

Cat’s abilities were soon recognized, and she was promoted to Environmental Scientist, and then manager. She found her mission in “policy work, figuring out how to apply the Clean Water Act to arid environments, working with the states and tribes to restore and protect watersheds.”

Over the years, Cat had a chance to work on all of EPA’s major water programs. One of her biggest successes was helping California adopt water quality criteria for toxic pollutants in the 1990s. The state of California had just had its criteria stricken down in court—a critical blow to protecting water quality. The criteria were the basis for the state’s Inland Surface Waters Plan, a set of policies and standards for applying the Clean Water Act in every river and stream in California.

The State Water Resources Control Board asked for EPA’s assistance, and Cat’s branch of the Water Division was tasked with coming up with a set of federal criteria that could replace the state’s plan. Working with EPA colleagues Diane Fleck, Matt Mitchell, Phil Woods and Ann Nutt over several years, they developed the criteria, which are still used as the basis for discharge permits on California’s inland waters.

Cat was also instrumental in developing policies to implement the Clean Water Act with regard to ephemeral streams and washes—waterways in vast expanses of the western states that are dry most of the year, flowing only after rains. These EPA policies, still in effect, held the line against critics who wanted to amend the Clean Water Act to exempt such waterways entirely.

Five years ago, Cat took an IPA (Intergovernmental Personnel Assignment) as Executive Officer of the North Coast Regional Board, which does the ground-level work of enforcing the federal Clean Water Act and a similar state law. She found it to be “an intriguing set of challenges” where she was able to apply lessons learned at EPA, working with states, tribes and others.



The North Coast is California’s wettest area, with rivers like the Russian, Smith, Eel, Mad, Trinity, Klamath and Van Duzen. Most of it is covered with redwoods and other forests. Logging is a major industry here, with heavy impacts on these rivers and their tributaries—primarily, sedimentation from heavily-logged slopes and unmaintained roads. She counts as one for her great achievements issuing the first water quality permit for timber harvesting in the West, and issuing a pair of very controversial permits to Pacific Lumber Company that have slowed the rate at which they were cutting redwood trees in the Elk River and Freshwater Creek watersheds.

“It’s amazing and humbling to drive north, crossing rivers and streams, knowing it is your job to protect and restore them,” says Kuhlman. “When the rivers look dirty, it’s like a punch in the stomach. When they are clean, I am elated.”

“My time at EPA has been great, but now it’s on to more complex adventures beyond the ‘Redwood Curtain,’” she says. For a water animal, it’s natural habitat.

Clean Land



The job of cleaning up contaminated land in the Pacific Southwest often rests with EPA's Waste and Superfund Divisions. From complex sites requiring comprehensive cleanup to emergency responses and homeland security, EPA is prepared to respond.

In addition to cleaning up some of the nation's most contaminated sites, EPA's Pacific Southwest Region has been at the forefront of utilizing innovative techniques and approaches. Many cleanups involve transporting large amounts of contaminated soil or pumping large volumes of groundwater. Recent innovations are reducing the environmental "footprint" of these operations by using biodiesel-powered equipment, solar power for pumps, and new methods that leave soil and groundwater in place.

Another first in the Pacific Southwest is an innovative partnership between EPA, the Department of Defense (DOD)

and a private developer planning to concurrently clean up and redevelop a portion of the closed McClellan Air Force Base near Sacramento, with DOD funding and EPA oversight.

EPA emergency responders were busy in 2007, with a major national terrorist attack simulation, Southern California's most destructive wildfire season, and a major oil spill in San Francisco Bay. In addition to participating in frequent drills and unplanned disasters, responders like Harry Allen are working to clean up urgent health threats like radioactive soil from uranium mining on Navajo lands.

Trends

Cleaner Cleanups Reduce Local, Global Impacts

Cleaning up toxic sites takes energy, often requiring equipment like diesel trucks and bulldozers, which can add pollutants to the air even as contaminated soil and groundwater are being removed or cleaned. Groundwater treatment systems require electric power, adding to the environmental impact.

In 2007, however, EPA's Pacific Southwest Region launched the Cleanup Clean Air initiative, a pilot project to demonstrate ways to reduce air emissions at cleanup sites. Results thus far show promise for these techniques to be used on a broad scale.

Cleanup Clean Air encourages diesel emission and greenhouse gas reduction technologies, emphasizing:

- Clean diesel equipment
- Alternative fuels
- Energy efficiency
- Renewable energy, such as solar and wind power, and methane from waste
- Carbon sequestration, such as trees planted in parks

At the Pemaco Superfund site at Maywood in Southern California, photovoltaic solar panels were installed to provide power to run vacuum pumps that draw contaminants out of the soil and groundwater. The electricity is also used to heat the soil and vaporize contaminants, making them easier to collect and treat.

The solar panels produce about 4,500 kilowatt-hours of electricity annually. If this power had come from a fossil-fuel-burning power plant,

it would have accounted for 4,311 lbs. of CO₂ emissions.

At Camp Pendleton, a Marine Corps base between San Diego and Los Angeles, cleanup crews are using clean diesel technologies, construction equipment retrofitted with pollution controls, ultra low-sulfur diesel fuel, and biofuels in six vehicles that are removing 120,000 cubic yards of contaminated soil. By using cleaner vehicles and fuels, the Marine Corps and Naval Facilities Engineering Command Southwest are

At the Pemaco Superfund site in Southern California, solar panels help power vacuum pumps that draw contaminants out of the soil and groundwater.

reducing particulate emissions from the cleanup by 27%. In addition, most of the soil will be hauled out by train, keeping 6,250 trucks off Southern California freeways—saving energy, reducing diesel emissions, and reducing traffic.

At the Romic hazardous waste facility in East Palo Alto, Calif., soil and groundwater are contaminated with volatile organic compounds like dry cleaning solvents, paint thinners, and chemicals used in making computer chips. Here, an innovative treatment involving cheese whey and molasses is showing promise. The molasses and whey are pumped into the subsurface, allowing natural bacteria to proliferate by provid-



ing a food source. The bacteria break down as much as 99% of the contamination into CO₂, water and salt—using very little energy. EPA has proposed using this method for the entire site.

A similar in-situ bioremediation method has already been successful at the Selma Superfund site near Fresno, Calif. There, EPA greatly reduced the chromium contamination in groundwater by injecting molasses into the ground. In the most heavily contaminated area, chromium levels dropped from 80,000 parts per billion to undetectable levels in just three weeks. Molasses injection elsewhere on the site is expected to speed up the groundwater cleanup from 75 years to just five.

By replacing the traditional treatment system, EPA will save an estimated \$32 million, while cutting chemical use by a third, transportation for off-site disposal by half, and electricity use by 215,000 kilowatt-hours annually, preventing 368,000 pounds of CO₂ emissions into the air each year for 75 years.

For more on Cleanup Clean Air, visit:

www.epa.gov/region9/cleanup-clean-air

More info and video on Romic cleanup:

www.epa.gov/region9/waste/features/romic-paloalto

Above right: Excavator retrofitted with a diesel particulate filter and burning a biodiesel blend significantly reduces air emissions at Camp Pendleton cleanup.

Primer

Emergency Response Put to the Test in 2007

In October 2007, EPA's Emergency Response teams in the Pacific Southwest and Northwest Regions played a central role in "TOPOFF 4," a simulated national emergency involving the intentional release of radiation from "dirty bombs" in Phoenix, the island of Guam, and Portland, Ore. Close to 15,000 people from federal, state and local agencies participated, including 90 from EPA's Pacific Southwest Regional Office.

The exercise proved timely. Two days after it ended, many of the same people were called into action at the biggest outbreak of wildfires in Southern California history. And before the post-fire cleanups were finished, a major oil spill occurred in San Francisco Bay, not far from EPA's regional office in downtown San Francisco.

These back-to-back crises proved the value of preparedness exercises like TOPOFF 4. In emergencies, people from many different agencies must be prepared to work together under a unified command structure. For nearly a week during TOPOFF 4, EPA's regional Emergency

Operations Center was staffed around the clock, constantly updating field crews and EPA managers, and coordinating EPA's efforts with other agencies.

The exercise simulated how EPA emergency response personnel would work with federal, state and local responders in assessing the type, extent and danger of radiological contamination. The data collected would inform decisions about risk to the general public, evacuation decisions and decontamination.

"It's just like in sports—you have to practice if you want to be good at it," says Steve Calanog, EPA's regional chief of Emergency Response. Thanks to exercises like TOPOFF 4, he says, government agencies responded well to the Southern California fires, including the evacuation of about 1.5 million people from the San Diego area, the second-largest peacetime evacuation in U.S. history (Hurricane Katrina caused the largest in 2005).

In any emergency, local agencies—fire departments and police forces—are the first responders. State and federal agencies like EPA are the "second responders," called in by local agencies if needed. EPA's approach to these kinds of emergencies is spelled out in the National Response Framework. In case of a major natural disaster, EPA would respond as called upon by the Federal Emergency Management Agency, often addressing hazardous debris and impacts on water infrastructure.

Responding to Wildfires

In the Southern California fires, EPA's early role was primarily to help other agencies monitor air pollutants from the fires. An EPA aircraft known as ASPECT, which has infrared monitoring equipment that can detect air pollutants remotely, was brought in to survey the wildfire areas and measure and map airborne contaminants. After the fires passed through an area, EPA staff and contractors collected and disposed of household hazardous waste in the ruins, including paint, propane tanks, solvents,

In three weeks, EPA cleared 2,700 properties of hazardous waste in the wake of the Southern California fires.



Left: In an emergency simulation, rescue workers wearing protective gear practice setting up a decontamination unit.



cleaners, pesticides, and unknowns—such as chemical containers and aerosol cans whose labels had been burned off in the fires.

EPA personnel and partners responding to the fires included 110 people, about one-fourth of them EPA employees, and the rest cleanup contractors and members of the U.S. Coast Guard's Pacific Strike Team. They found that some chemicals were incinerated by high temperatures or transformed into less toxic gases like CO₂. In three weeks, they cleared 2,700 properties of hazardous waste.



Assisting Oil Spill Response

On November 7, while the post-fire cleanup was still in progress, a container ship hit a support structure of the Bay Bridge in San Francisco Bay and leaked 58,000 gallons of bunker fuel oil. For spills in open water, the U.S. Coast Guard is the first responder.

However, when the Coast Guard called for assistance, EPA responded. All together, 30 EPA employees helped with the cleanup, from On-Scene Coordinator Harry Allen IV (see story, p. 23)—who developed a plan for enlisting, training and deploying volunteers for beach cleanups—to Jim Vreeland, an EPA congressional liaison who was deployed for nearly six weeks as incident liaison officer.

EPA's emergency responders must be ready to go on a moment's notice, and willing to put in 12- to 16-hour days for weeks at a time. In its

biggest response ever, EPA sent hundreds of individuals to assist in the aftermath of Hurricanes Katrina and Rita in 2005, including nearly 10% of regional staff in the Pacific Southwest.

One of the likeliest scenarios for the next major natural disaster in the region is an earthquake. Seismologists predict a major quake will occur by 2030 on the Hayward Fault, which runs through several cities on the east side of San Francisco Bay. In a 2006 exercise simulating a major earthquake on the fault, EPA and other agencies practiced dealing with myriad simultaneous emergencies like fires at chemical plants, fuel pipeline breaks, leaks at oil refineries, and sewage treatment plant breakdowns.

Whether it will be an earthquake or other disaster, emergency responders from all across the region will be ready.

Left: Household hazardous waste is recovered after Southern California's October 2007 fires.

Above: The container ship Cosco Busan hit San Francisco's Bay Bridge, tearing a hole in the ship's hull and spilling about 58,000 gallons of oil.



Places

Halaco Cleanup Underway Alongside Ormond Beach Lagoon

The juxtaposition is startling: A sunny Southern California beach, an extensive tidal wetland teeming with wildlife, and an abandoned smelter with a huge pile of toxic waste. EPA took action to stabilize the site and limit its impacts on people and wildlife even before officially putting the Halaco site in Oxnard, Calif., on the Superfund National Priorities List in September 2007.

Halaco Engineering Co. operated a low-tech smelter on the beachfront site from 1965 to 2004, melting down scrap metal to recover valuable aluminum, magnesium and zinc. Over the years, Halaco generated a 26-acre pile of waste and contaminated the soil, sediments, surface water and groundwater in and around the site with toxic metals and hazardous chemicals.

The Ormond Beach Lagoon adjacent to the site is one of the largest remaining tidal wetlands along California's South Coast. The region's coastal wetlands are the focus of a major land acquisition and wetlands restoration effort and home to several endangered or threatened species, including birds like the western snowy plover and the California least tern. EPA is working with the California Coastal Conservancy and local activists to coordinate cleanup and restoration efforts. Soil and sediment samples from the site show contamination from barium, beryllium, copper, chromium and radioactive thorium.

In 2006, EPA worked with one of the site owners to remove drums of hazardous chemicals that were left on the site after the bankrupt smelter shut down. Last year, EPA stabilized the massive waste pile to prevent rain and wind from scattering its toxic material into the wetland and adjacent properties. EPA also removed waste that was already in the wetland and improved security at the smelter site to discourage people from entering the hazardous property.

In September 2007, EPA held a community meeting in Oxnard to update city residents on the contaminants present at the site, the risks, and EPA's progress on developing a comprehensive cleanup plan. Sites like this can sometimes take years to clean up, but EPA is expeditiously moving forward, ensuring the protection of this unique coastal area.

More info on the Halaco cleanup:
www.epa.gov/region9/waste/features/halaco

Opposite: Defunct scrap-metal smelter at Halaco Superfund site in Oxnard, Calif.

Right: Aerial photo of Halaco Superfund site shows beach and wetland alongside smelter and waste piles.



Partnerships

Revitalizing McClellan and Fort Ord Superfund Sites

EPA, the Department of Defense, and local interests have begun cleaning up portions of the McClellan Air Force Base and Fort Ord Superfund sites, through unique partnerships that accelerate cleanup and redevelopment. These two “privatized cleanups” of military Superfund sites are the first of their kind in the nation.

The Defense Department is funding the work at McClellan in Sacramento County and Fort Ord in Monterey County in California. But local interests are conducting the work in order to coordinate cleanup and redevelopment.

In Sacramento County, developer McClellan Business Park is using \$11.2 million from the U.S. Air Force to clean up a 62-acre parcel that is slated for redevelopment expected to bring in 1,200 new jobs and \$600,000 in new tax revenues annually. The agreement allowing this novel arrangement was approved in August 2007 by EPA, the state Department of Toxic Substances Control (DTSC), the Regional Water Quality Control Board, Sacramento County and McClellan Business Park.

“The framework of this project serves as a model for similar revitalization projects at closing military bases across the nation,” says Keith Takata, director of EPA’s regional Superfund Division. “Combining redevelopment needs with cleanup efforts will help move these properties back into productive reuse.”

The first step in cleaning up the 62-acre section of McClellan is a thorough investigation of soil contamination, which is now underway. Next, EPA will draft a preferred cleanup option for public review and comment and select the final remedy. The developer will carry out the selected remedy with EPA and state oversight.

The 62 acres is part of the 3,000-acre former base, which has more than 300 sites contaminated with solvents, metals and other hazardous wastes resulting from aircraft maintenance and other industrial activities in decades past. The base closed in 2001. The Air Force has groundwater cleanup underway already, using a network of more than 600 extraction and monitoring wells.



At Fort Ord, on the California Coast near Monterey, it’s a similar story. The base, which was placed on the Superfund National Priorities List in 1990, was closed in 1994. In the 1990s the Army, in consultation with EPA and Cal/EPA, was successful in addressing a wide range of environmental contamination, including fuel spills, disposal sites such as a 150-acre landfill, small arms ranges in sand dunes near the beach, and several contaminated groundwater plumes. However, approximately 6,000 acres, used for firing ranges in the center of the base, remain heavily contaminated with unexploded ordnance. The Army will be responsible for cleaning up this acreage.

In May 2007, EPA, the Army and Cal/EPA agreed to transfer about 3,500 acres of the roughly 28,000-acre base to the Fort Ord Reuse Authority (FORA) under the privatization plan. As part of the plan, the Army provides FORA approximately \$100 million to conduct additional investigations to ensure that the area has no contamination or unexploded ordnance remaining.

Current info on redevelopment projects:

www.epa.gov/region9/waste/sfund/mcclellan
www.fortordcleanup.com

Above: McClellan Air Force Base Museum

Left: McClellan Air Force Base in the 1990s



People

Harry Allen IV: Cleanup Is a Family Tradition

Harry Allen IV and his father hold a unique distinction: They're both EPA emergency responders. Harry Allen III, who works in EPA's Environmental Response Team office in New Jersey, worked on the cleanup of the Exxon Valdez oil disaster in Alaska in 1989. Harry IV has been working in the Pacific Southwest Region since 2002.

Over the past few years, the father-and-son team has been collaborating on bioremediation—the use of bacteria to break down toxic contaminants in the environment. Dad provides the recipe, and son mixes it up and applies it to site cleanups.

This technique works well on cleaning up soil contamination from hydrocarbon-based pesticides like toxaphene, which was used extensively to kill fleas on sheep on the Navajo Nation decades ago, leaving the soil contaminated.

Back in 1994, when Harry IV was a first-year environmental science student at New Jersey's Rutgers University, Harry III took him along on a trip to the Navajo Nation to supervise bioremediation of toxaphene-contaminated sites. Harry IV met the Navajo Nation EPA staff, learned about the field work firsthand, and decided to follow in his father's footsteps.

After graduation, he got a job with Weston Solutions, a contractor that provides support for Superfund cleanups nationwide. For three years he worked on EPA Superfund cleanups in New York, New Jersey, and Puerto Rico. The company transferred him to California in 2001, and in 2002 he joined the Pacific Southwest Region as an EPA employee.

Today, he's working with EPA colleague Andy Bain and some of the same Navajo Nation EPA staff on removing radioactive waste rock from abandoned uranium mines that has been dumped around homes on Navajo land. Elsewhere, Harry has been using compost from biosolids (sewage sludge) to stabilize heavy metals in mine waste.

If it sounds contradictory to use one potential pollutant to clean up another, Harry has the scientific explanation to prove that it works. Put simply, the organic materials in the compost absorb the metals, decreasing their solubility, and effectively detoxifying them. Meanwhile the compost is an effective plant fertilizer, which helps to grow plants on slopes consisting of abandoned mine waste, helping to prevent erosion. If the mine waste is acidic, as it usually is, Harry adds limestone, which is alkaline, to balance the pH. Then water can't leach acidic metals out of the rocks and pollute streams. If it contains lead, he adds phosphates, a mineral fertilizer that binds with lead.

Recently, Harry co-authored an EPA scientific paper on this topic titled "Use of Soil Amendments for Remediation, Revitalization and Re-use." The technique was originally developed to clean up acid mine drainage from coal mines in the Eastern U.S., and has also been used in the Rocky Mountains. The paper outlined additional environmental benefits of amending soils to treat contamination. On-site treatment of waste rock from mines doesn't require excavating and transporting huge amounts of heavy material, which saves energy and prevents air

pollution and greenhouse gas emissions. In another industrial setting, the technique even helps to safely get rid of an unwanted byproduct of sugar beet processing—lime.

In addition to working on Superfund cleanups, Harry took classes to obtain a Master's degree in Environmental Management at the University of San Francisco. Today, he teaches two classes in the same program: Soil Science Treatment and Technology, and Environmental Statistics. Why take on the extra work? "Sharing my knowledge is fun," he says.

More on this father/son team:

www.epa.gov/superfund/accomp/news/father.htm



**Right: Harry Allen IV working with
air monitoring equipment at the
Amco Superfund site in Oakland, Calif.**

Communities and Ecosystems



EPA's Pacific Southwest Region stretches from the arid Navajo lands of northwest New Mexico to the remote tropical Pacific Islands of Guam and Saipan. Within that vast expanse are thousands of unique communities and ecosystems, each with its own character and environmental conditions.

Many EPA programs work with communities to improve environmental conditions. The Tribal Program, for instance, works with more than 140 Indian tribes in the Pacific Southwest. This chapter includes the story of how EPA and other agencies helped the Torres Martinez tribe shut down illegal trash dumps on its lands in California's Coachella Valley. Two experts, David Taylor and Jean Gamache, explain their work with tribes throughout the region.

EPA's Environmental Justice Program works with tribal, Pacific islander and urban communities to address their

specific environmental challenges. One such community is the Los Angeles-area Hispanic neighborhood of Pacoima, which is taking steps to reduce the effects of air pollution on its residents.

Agricultural communities have their own environmental challenges, such as the ongoing effort to reduce the use of toxic pesticides without reducing crop yields. EPA also looks at communities in a broad sense—such as children, who face greater risks from toxics due to their metabolism and habits.

Trends

Transitioning to Sustainable Agriculture

Moving toward sustainable agriculture depends on widespread adoption of farming practices that reduce reliance on chemicals. Recent statistics from California indicate that this is already happening: The most current data show that farm pesticide use fell 6% from 2005 to 2006, a decrease of 10 million pounds. It was also the third straight year of reductions in farm use of the most hazardous pesticides, those linked to cancer, reproductive or neurological problems.

Use of the highly toxic soil fumigant methyl bromide bucked this trend, increasing in 2006 due to the expanding acreage of strawberry fields where it's used. Still, the 2006 total for methyl bromide was lower than 2004.

Reducing Pesticide Use

EPA supports two approaches to encourage the transition to less harmful pesticides: funding demonstration projects of agricultural best practices, and promoting programs that certify environmental performance. Both can raise yields and farm income in addition to their environmental benefits. Demonstration projects help extend new techniques to additional growers. Certification programs use market mechanisms to promote strong environmental practices by growers and help farmers prosper by doing the right thing for the environment.

For example, EPA funded a project in Hawaii to minimize pesticide risks for small farming communities threatened by the melon fly. Through field trials and crop demonstrations, Oahu growers learned how to reduce their use of highly toxic organophosphate pesticides by 40%. Some crops reported a 30% increase in yields and higher income per acre. The adop-

tion of less-toxic integrated pest management to combat the melon fly also improved produce quality, and extended harvest periods.

In 2007 there was continued progress on reducing use of high-risk pesticides in California fruit orchards. In the Kings River watershed, use of sonic sensing and precision spraying technology has reduced application of organophosphate pesticides by 20% in older orchards and by 40% in younger orchards.

In just one year, farm pesticide use in California fell 6%—a decrease of 10 million pounds.

Reducing Air Pollution

Spraying of liquid pesticides doesn't just affect pests. It also releases volatile organic compounds (VOCs)—the same type of chemicals that evaporate from gasoline and contribute to ozone pollution, or smog. That's why pesticides used on grapes are a serious problem in California's San Joaquin Valley, which has some of the nation's highest smog levels. In 2007 EPA funded a project to help growers reduce high-risk, VOC-emitting pesticides on 94% of California's 85,000 acres of table grapes.

The trend toward reductions in pesticide use is already benefiting millions of people who live in the state's agricultural valleys, as well as fish and wildlife. To ensure further progress, EPA will continue its efforts to promote sustainable agricultural practices.



Primer

Environmental Justice: Healthier Environments for all Communities

In 1994, the President's Executive Order 12898 required EPA to address environmental justice in low-income and minority communities. Under this mandate, EPA has worked toward a fundamental goal—that all communities and people enjoy the same degree of protection from environmental and health hazards, and equal access to the decision-making process that secures a healthy environment in which to live and work.

EPA's Pacific Southwest Regional Office has not only focused a great deal of work in specific low-income minority communities, but also has considered environmental justice as a guiding principle in all agency actions. EPA is commit-

ted to working on the biggest environmental challenges facing the most vulnerable communities bearing disproportionate impacts from pollution and toxics.

The Pacific Southwest Region is as diverse in demographics as it is in terrain. Specific areas that face unique challenges include the ports of Los Angeles, Long Beach, and Oakland, the U.S.-Mexico border, Pacific islands, tribal lands, and California's Central Valley. EPA works with these communities and helps address their environmental challenges by funding and creating collaborative projects, ensuring industry compliance, providing technical assistance, and ensuring meaningful community involvement.

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies.

In Los Angeles County, fully 90% of EPA's enforcement actions last year were in low-income and minority communities. EPA has made an effort to target these areas in part as a result of environmental justice concerns. Pacoima is one such community where high-impact local operations such as metal platers have been targeted for inspection and successful enforcement.

Pacoima, in the northeast section of California's San Fernando Valley, is a Los Angeles community with a mostly Latino and African American population. Residents are affected by pollution from freeways, a railroad line, an airport and more than 300 industrial facilities. Pacoima added 243 homes to its newly created Lead-Free Homes registry and enlisted 205 residents to identify and reduce local toxics with the support of an Environmental Justice Collaborative Problem Solving grant from EPA. The grant recipient, the nonprofit Pacoima Beautiful, partnered with and received aid from the Los Angeles Neighborhood Housing Services to conduct lead remediation at 18 homes.

Pacoima Beautiful also convened more than 320 community residents, partners and stake-

An EPA grant supports training of promotoras—neighborhood health advocates—in Pacoima, a Hispanic community in Los Angeles.



holders to review data and information on toxic sources in the community with an EPA Community Action for a Renewed Environment (CARE) grant. As a result, the community secured a second CARE grant for \$300,000 in 2007 to address two of the identified community priorities: small pollution sources in a targeted area of Pacoima, and diesel emissions from trucks and school buses throughout the community.

Tribal Lands and Pacific Islands

The Pacific Southwest is also home to 146 Indian tribes, many of whom live in areas where meeting basic needs is a challenge. For example, 19% of the region's tribal households lack access to safe running water, and more than 1,000 open dumps scar tribal lands. EPA has directed funding and other resources to tackle these unacceptable threats to human health and welfare. As a result, in the last five years tribes have closed nearly 400 open dumps, built more than 130 tribal government environmental protection programs, provided safer drinking water to more than 22,000 tribal homes, improved sanitation for more than 21,000 tribal homes, cleaned up more than 40 leaking underground fuel tanks, and installed more than 50 air monitors.

The island territories in the Pacific Ocean—American Samoa, Commonwealth of the Northern Mariana Islands (CNMI), and Guam—face disproportionately severe environmental infrastructure problems. Saipan is the only U.S. community of its size without 24-hour access to safe running water. In American Samoa, 17% of residents have been exposed to *Leptospiro-*

sis—a bacterial disease—as a consequence of piggeries contaminating water. In the past, raw sewage contaminated island drinking water wells and surface waters. With EPA's help, American Samoa is using outreach, compliance

Pacoima secured a \$300,000 EPA grant to address two community priorities: diesel emissions and small pollution sources.

assistance, enforcement, and a polluted runoff prevention program to address water contamination from small piggeries. On Guam, raw sewage overflows have been reduced by 99%.

EPA is using environmental justice and geographic information systems (GIS) tools to target enforcement, grants and other resources to the communities most heavily impacted and most vulnerable. The agency is also using grants, technical assistance, and collaborative approaches to support community-based leadership in solving environmental problems.

Collaborating with these diverse communities, EPA has focused resources and formed partnerships to make real public health and environmental improvements. These communities, in turn, help EPA integrate environmental justice priorities into the agency's everyday work. The goal is to ensure that all communities have meaningful involvement in decisions that affect them, and that all people have clean air, water and land where they live, work and play.



San Fernando Road, Pacoima

Places

Torres Martinez Collaborative Combats Illegal Dumps

Two years ago, illegal dumping on the Torres Martinez Desert Cahuilla Indian Reservation in California's rapidly growing Coachella Valley reached crisis levels as unscrupulous waste haulers used the open desert land as a dumping ground outside the reach of state regulatory agencies. Illegal dump operators burned massive amounts of waste, creating plumes of smoke that clouded the skies and forced schools to close. New dumpsites appeared overnight on remote reservation roads. Despite persistent efforts, the tribe's staff were unable to stem the tide of trash.

To combat the dumpers, EPA, the Bureau of Indian Affairs (BIA) and the tribe formed an alliance with 24 federal, state and local agencies and nonprofits in April 2006: The Torres Martinez Solid Waste Collaborative. Members of the collaborative energetically pooled the talents and resources of the various agencies, combining public education, outreach, enforcement and direct action.

In less than two years, the collaborative has achieved impressive results. All illegal dumps on the reservation have been shut down. For the past year, no new dump sites have appeared. The collaborative has cleaned up more than 20 dumps and installed gates, fences and other access controls. Open burning has been almost entirely eliminated. Outreach and public education have redirected haulers to legal disposal and recycling facilities. No single agency could have done it alone. Each success involved the cooperation and participation of multiple agencies.

Collaborative members pooled their talents, combining public education, outreach, enforcement and direct action.

At the notorious Torlaw illegal dump, where fires created constant smoke, a lawsuit by EPA and BIA ended in victory: The U.S. District Court ordered the operators to shut down and vacate the property. The court also ordered them to pay up to \$42.8 million in cleanup costs, plus more than \$2.3 million in penalties. After the dump closed, the Riverside County Fire Department and the California Integrated Waste Management Board (CIWMB) chipped and mulched 17,000 cubic yards of green waste to prevent fires.

Above right: The AuClair dump site on the Torres Martinez Reservation, before cleanup.

Left: A former dump site at the Torres Martinez Reservation, after cleanup.



At the illegal, 25-acre Auclair Dump, EPA removed hazardous waste to a permitted land-fill, including 1,400 tons of ash, 400 pounds of asbestos-cement pipes, 1,600 pounds of waste oil and sludge, and 100 cubic yards of discarded wooden grape stakes treated with toxic chromated copper arsenate (CCA). The California Integrated Waste Management Board (CIWMB) finished the cleanup, removing 1,700 tons of debris, 35 tons of metal, and 22 lead-acid batteries.

At another site, just 200 yards from a school in Thermal, the state Department of Toxic Substances Control (DTSC) worked with the tribe and Riverside County Waste Management to remove 100 tons of CCA-treated grape stakes. Elsewhere, EPA took enforcement actions against two mobile home park operators for illegally dumping residents' trash, securing enforceable commitments to provide trash pickup for the residents and improve waste management.

The California Highway Patrol and the Riverside County Sheriff's Office have contributed to the effort with aerial monitoring to keep track of the dumpsites and find any new ones. EPA is now working with the tribe and BIA to assess former dumpsites' potential for reuse.

For updates on the collaborative and a list of its members, visit:

www.torresmartinez.org/collaborative
www.epa.gov/region9/indian/torres-martinez



Advances

Protecting Children from Toxics and Pesticides

Children are our future, and protecting them from toxics in the environment is a high priority. Children are more vulnerable to toxics than adults—their bodies are small and still developing, and exposure to toxins in this critical period can permanently alter the way the child's biological system operates. They're also more likely to play on lawns and floors, where pesticides and toxics can get on their hands, and then into their mouths.

Lead in paint, toys or even candy poses a threat, as do household pesticides, or pesticides brought into the home on the clothes of farmworker parents. Some products pose multiple, different threats—an unregistered disinfectant, for example, might be packaged in a bottle that resembles a soft drink, resulting in the poisoning of a child who drinks it. A similar product, if used in a hospital, could allow diseases to spread.

Reducing Risks of Pesticide Use

By enforcing pesticide regulations, EPA ensures that products are properly registered and labeled, minimizing risks to children, workers and other members of the public by providing directions for proper use and disposal, and preventing false or misleading claims. Last year, EPA's Pacific Southwest Office brought 31 enforcement actions against violators of federal pesticide regulations, collecting \$1.2 million in penalties.

EPA took four enforcement actions against companies selling pesticides with chlorpyrifos and diazinon, which were cancelled for house-

hold use in 2001 and 2004 respectively, due to exposure risks to children.

Under the terms of a legal settlement with EPA, one company paid a penalty and spent an additional \$200,000 to produce a DVD and brochure on “Do's and Don'ts of Retailing Pesticides,” and present it to retail industry audiences. The video provides an overview of EPA rules on household pesticides, which stem from the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).

Children's bodies are still developing, and they can take in toxins more quickly.

Six companies were cited for selling unregistered pesticides, including “Fabuloso Energia Naranja” (Fabulous Orange Energy) an import from Mexico that was sold in clear plastic bottles and looked like soda pop, even though it was sold as a disinfectant. In another case, EPA took action against a company for distributing in the U.S. an unregistered and mislabeled disinfectant bleach intended for sale in Asia.

Farm workers and their children can be harmed by pesticides if employers don't comply with regulations. In Hawaii, a company was fined \$24,640 for several instances of pesticide misuse, including failure to notify workers of pesticide applications, and failure to protect workers from exposure to pesticide drift.

Prevalence of Lead in Candy Studied

The discovery that numerous imported toys contain lead has caused widespread alarm and prompted several product recalls. Lead poisoning in young children can trigger learning disabilities, hyperactivity, hearing loss, and brain damage.

EPA has helped advance investigation into another possible source of childhood lead poisoning—imported candy.

The extent to which lead contaminates imported candy is unknown, but state and local health departments in California and Arizona have estimated that it may account for 5% of childhood lead poisoning cases. Last October, EPA awarded a grant of \$96,798 to the University of Nevada, Las Vegas, to develop a cost-effective method of screening imported candy for lead content.



Some pesticides have been cancelled for home use due to risks to children.

People

**Jean Gamache:
From Alaska to the Southwest Tribes**

Jean Gamache, manager of EPA's regional Tribal Program Office for the past year, is a member of the Central Council of the Tlingit and Haida Indian Tribes of Alaska. Jean holds a law degree and in the 1990s worked with a firm representing Alaska Natives seeking recompense for damages to subsistence food resources from the 1989 Exxon Valdez oil spill. Before 2005, when she came to EPA's regional office in San Francisco, Jean had lived nearly all her life in Alaska, working on environmental issues as well as fishing commercially for salmon in Bristol Bay each summer for more than 20 years.

From 1997 to 2005, Jean worked in EPA's Alaska Operations Office, leading the team that worked with the 229 federally-recognized tribes in Alaska. Since moving to the Pacific Southwest Regional Office in San Francisco, she has been adjusting to the extreme differences in population density. Alaska has four times the land area of California but only 1/50th as many people.

Most tribal communities in Alaska can be reached only by plane or boat, so transportation issues affect tribal environmental efforts. Abandoned vehicles have to be hauled out—by barge. Hazardous waste such as asbestos must be removed from abandoned buildings built decades ago for schools, hospitals, or military bases. Typically, removal is possible only during the summer, when barges can travel the waterways and take the waste to a landfill.

Another major difference between Alaska and the Pacific Southwest, Jean says, is temperature. She recalled one training course for tribal

environmental staff at a town on the Yukon River in central Alaska during the middle of winter. Travel to the community was by small plane, and the temperature when she arrived was 20 degrees below zero. Over the next few days, it got even colder. Once the temperature goes below -50 degrees, planes stop flying. Jean caught the last plane out before flights were cancelled for several days waiting for the weather to “warm up” to above -50 degrees.

Tribal goals, however, are much the same in both regions: close open dumps, improve drinking water and wastewater infrastructure, improve substandard living conditions, build tribal capacity through EPA Indian Environmental General Assistance Program (GAP) funding. Tribes use GAP funding for their environmental agencies, and build on it to achieve environmental goals. In 2007, for example, tribes in the Pacific Southwest closed 82 open dumps.

Jean is responsible for overseeing the region's tribal program, which provides more than \$15



Jean Gamache

million each year to support the tribes' own environmental programs, and maintains productive relationships between EPA and more than 140 tribal leaders. Jean's staff of 12 provides grants and hands-on assistance to tribal environmental directors.

David Taylor: Assuring Quality of Environmental Data

An ancient Greek philosopher asked the question, "How do we know what we know?" Answering that question is basic to the work of protecting human health and the environment. EPA and other environmental agencies need reliable, verifiable data about pollutant levels in air, water, land and living things to make sound environmental decisions. With 50 state governments and thousands of local and tribal governments overseeing a multitude of data collection efforts, ensuring data quality can be a daunting task. In EPA's Pacific Southwest Quality Assurance (QA) Office, a dozen people are dedicated to the task; senior among them is Dr. David Taylor.

A Ph.D. chemist by training, Dave reviews the plans that describe how environmental agencies and laboratories ensure the reliability of data from samples of air, water, soil or living tissue. All EPA grantees and contractors must prepare Quality Management Plans, Quality Assurance Program Plans, Quality Assurance Project Plans or Sampling and Analysis Plans before they may collect environmental data. Dave reviews the plans with the authors to make sure

"I feel very fortunate," Jean says, "that I've been able to work with so many different tribes in some of the most extreme environments in North America, to make a difference in protecting the environment in Indian Country."

they have adequately described the proposed data collection effort to meet their program or project objectives.

Over the years, Dave has worked his QA magic with all EPA programs as well as state and tribal environmental agencies. He has come up with novel ways to assist tribal governments that may have little prior knowledge of QA issues. Dave designed a two-day training and a template for tribal pesticide enforcement inspectors giving them a head-start in writing a QA plan. Collaborating with EPA's New England Region, he produced a QA reference tool for tribal water monitoring programs in a CD-ROM format. The CD has been distributed to more than 700 Indian tribes and communities nationwide. In recognition of this work, Dave was named San Francisco Bay Area Federal Employee of the Year in the Professional Category in 2005.

Dave reviews QA management and program plans that cover state-wide data collection activities. This year he worked with the California State Water Resources Control Board to describe an integrated quality system in a Quality Management Plan for the state and its nine Re-



gional Water Quality Control Boards. While EPA has published guidance for the highest level of QA (the Quality Management Plan), and for specific projects (the QA Project Plan), Dave saw the need for a QA document that describes the activities of state programs. The result was a Quality Assurance Program Plan guidance that Pacific Southwest states are now using. Other regions are also asking for this guidance.

Dave first worked with EPA on QA projects as a contractor in 1980, supporting Office of Research and Development laboratories in North Carolina, Cincinnati and Las Vegas. He audited laboratories and wrote national QA guidance. Eventually, he led 43 audits of EPA program offices and organizations that worked with environmental data, including seven of EPA's 10 regions.

When Dave joined EPA as a federal employee in 1994, his reputation as a valued QA resource preceded him. Since then he has become a master builder of QA bridges to all EPA and EPA-funded programs in the Pacific Southwest Region that collect and use environmental data.

Compliance and Stewardship



Compliance with environmental laws and regulations is the objective of EPA's enforcement program. Compliance is just a starting point toward the ultimate goal of voluntary engagement that goes beyond the requirements and toward a culture of sustainability and stewardship.

In 2007, EPA's Pacific Southwest Region and its many federal, state, local and tribal partners had notable successes in both respects. EPA enforcement actions in the region secured about \$1.5 billion for cleanups and pollution prevention. In this chapter, Hawaii provides examples of enforcement and incentives clearing the way for redevelopment of formerly contaminated properties.

Voluntary stewardship initiatives showcase the creativity and inventiveness of people tackling a broad range of environmental issues. The Lifecycle Building Challenge, orga-

nized by EPA's Pacific Southwest Regional Waste Division, engaged architects and students all across America in a competition to design buildings for adaptability to avoid landfilling valuable building materials.

California celebrated its success in an ongoing effort to divert more than 50% of its solid waste from landfills. The East Bay Municipal Utility District pioneered a new technique for turning food waste into usable energy. Even nail and hair salons are involved in collaborative efforts to reduce the toxicity of their products.

Trends

Environmental Enforcement Brings Record Results Across U.S.

"You can print all the laws you want, but it's just paper without enforcement," says Granta Nakayama, EPA's Assistant Administrator for Enforcement and Compliance Assurance. Nationally, EPA law enforcement efforts resulted in a record \$10.6 billion in environmental improvements in fiscal 2007—meaning alleged violators are now legally committed to spend that amount for specific cleanups and pollution prevention projects.

EPA's Pacific Southwest Region last year led the nation in contaminated soil cleanups, with commitments to remove or restore nearly 66 million cubic yards of soil. The region also had the highest total value of supplemental environmental projects, in which a responsible party agrees to go beyond paying penalties and undertakes a project to benefit public health or the environment.

Wastewater Infrastructure

After several years of work, EPA settled two major wastewater cases that commit the cities of San Diego and Honolulu to spend a total of \$1.3 billion on improvements to their sewage collection systems to prevent sewage spills. San Diego will spend about \$1 billion over the next several years to replace aging and inadequate sewer pipes. The city had experienced hundreds of sewage spills and overflows prior to EPA's enforcement efforts.

Last May, EPA reached an interim settlement with the city of Honolulu that commits the city to making \$300 million worth of improvements to its sewage system. In 2006, Waikiki Beach was closed for a week due to a 50 million-gallon

sewage spill into the nearby Ala Wai Canal. The settlement requires Honolulu to make a number of short-term fixes to its sewage collection system. Meanwhile, EPA continues to work with the city to ensure long-term solutions.

San Diego and Honolulu will invest in infrastructure to prevent sewage spills as a result of EPA enforcement efforts.

Airborne and Underground

In a major Clean Air Act case settlement, the Evergreen Pulp Inc. mill near Eureka, Calif., installed pollution controls on its lime kiln to reduce emissions of particulates and hazardous air pollutants by 340 tons per year. Meanwhile, Nevada Power will reduce emissions at two of its power plants near Las Vegas by about 2,900 tons per year (see story, p. 8).

Less visible is the work being done to prevent fuel leaks from 50,000 underground storage tanks from polluting soil and groundwater in the Pacific Southwest. More than 14,000 inspections were carried out by EPA and state, tribal and territorial agencies in fiscal 2007. These tanks, with an estimated combined capacity of more than 250 million gallons, present an "invisible risk" to the environment since releases would occur underground.



Spill and Dump Cleanups

Fuel spills were at issue in a settlement involving the pipeline company Kinder, Morgan, which had three pipeline breaks resulting in serious oil spills in California in 2004 and 2005. EPA estimated the volume of the spills at 124,000 gallons in April 2004 at Suisun Marsh in Solano County, 77,000 gallons in February 2005 at Oakland Inner Harbor in Alameda, and 300 gallons in April 2005 into a creek in the Donner Lake watershed in the Sierra Nevada. Kinder Morgan Energy Partners LP and SFPP LP agreed to pay nearly \$5.3 million to resolve their liability under the federal Clean Water Act, Oil Pollution Act, Endangered Species Act, and California laws regulating oil and water pollution.

Not all EPA enforcement cases, however, end in settlements. Operators of the illegal Torlaw dump on the Torres Martinez Desert Cahuilla Indian Reservation chose to ignore EPA and Bureau of Indian Affairs enforcement efforts, forcing the agencies to go to federal court. The court ordered the operators to shut down, vacate the property, and pay up to \$42.8 million in cleanup costs, plus more than \$2.3 million in penalties (see p. 28).

Above: Improvements to sewage collection systems mean fewer spills.

Primer

EPA Spurs Green Building with Lifecycle Building Challenge, Grants

EPA's involvement with green building—designing buildings to reduce waste and conserve energy—is nothing new, but now it's coinciding with an unprecedented wave of interest. “An architect today who designs a high-profile building has to take the environment into account,” says San Francisco Chronicle architecture critic John King. “Not just because it's the right thing to do, but also because other architects and clients are making the effort. If you don't, you're behind the times.”

In 2007, EPA's Pacific Southwest Regional Office spurred innovation in this growing sector by launching the Lifecycle Building Challenge, a nationwide competition for architects, builders and students that pushed the envelope of Green Building to include designing buildings for deconstruction and reuse.

The event generated interest all across the U.S., garnering coverage in 30 trade publications, including a top story in the prestigious

American Institute of Architects' (AIA) newsletter, more than 2.5 million hits on the competition's Web site, and lots of attention on other Web sites, online publications, and blogs. EPA collaborated with three strategic partners: The 80,000-member AIA, the Building Materials Reuse Association (BMRA), and West Coast Green, the nation's largest residential green building conference.

The competition asked participants to reduce a building's environmental impacts over its entire lifecycle, from the manufacture of building materials to the reuse or transportation of demolition waste. Potential savings of materials and energy are huge. Each year more than 100 million tons of construction and demolition debris are landfilled in the U.S.—equivalent to a ton of waste for every person in the U.S. every three years! Buildings account for 60% of the nation's raw materials consumption (not counting food and fuel), 40% of electricity use, and 25% of all energy consumption. And beyond that, manufacturing materials like steel and concrete is energy intensive. Reuse also cuts greenhouse gas emissions.

The best way to “green” a building over its entire lifecycle is to design it from the start to promote adaptability, local building materials reuse, and recycling. For example, entries in the contest included open source modular buildings that can be changed over time as family space needs change, and a multi-family project that can easily be converted from one-bedroom units to two-bedroom units to commercial office space.

Inspiration for the event came from a 2005 EPA grant to the Chartwell School in Seaside, Calif., to design the school's deconstruction strategies. There, EHDD Architects created techniques that allow building components to be easily disassembled and reused. Adaptations can be made easily. Exposed utility raceways facilitate updates to wiring and technology. Concrete blocks are bonded so each can be

The Lifecycle Building Challenge asked participants to design a building to reduce its environmental impacts over its entire lifecycle.

lifted out and reused. Nail-free paneling can be easily removed and reused. The design preserves the parts of the building with the most embodied energy, such as concrete and steel components.

If one architecture firm could come up with so many green innovations, imagine what a nationwide competition could do, reasoned EPA's Lifecycle Building Challenge Team leaders Timonie Hood and Eileen Sheehan. Together with team members Saskia van Gendt and Pamela Swingle, they devised the criteria and guidelines, recruited a distinguished judging panel, helped develop the Web site, and worked with



Pavilion in the Park, Seattle—one of the winning entries in the Lifecycle Building Challenge.
(David Miller, The Miller|Hull Partnership)

Lifecycle Building Challenge:
www.lifecyclebuilding.org

Watch the video:
www.epa.gov/region9/video/lifecycle

a wide range of organizations to promote the competition.

In all, 90 entries were submitted from across the nation. On September 20, 2007, EPA Assistant Administrator Susan Bodine joined Pacific Southwest Regional Administrator Wayne Natri, AIA President RK Stewart, and BMRA President Brad Guy to announce the nine winners, who hailed from nine of EPA's 10 regions.

The Lifecycle Building Challenge was such a success that EPA and its partners are sponsoring it again this year.

Energy-Saving New Homes, Healthier Hospitals

The watchword of the green building industry is LEED—the U.S. Green Building Council's Leadership in Energy and Environmental Design Rating System. EPA's Pacific Southwest Office has partnered with a local council affiliate to test the workability of its draft LEED-H standard for home building combined with EPA's new Indoor Air Package, a series of recommendations for indoor air quality. In 2007, an EPA grant provided technical assistance to large-scale builders who constructed 53 new homes meeting both standards. EPA is expanding the project with the goal of adding 500 new green homes by 2010.

Another 2007 EPA grant helped the city of Fresno, Calif., collaborate with the U.S. Department of Housing and Urban Development to incorporate Green Building in an affordable housing project of eight new homes. Green features include pervious concrete outdoors,

photovoltaic panels, cool roofs, passive solar, and high-efficiency windows. In just the first two homes, builders reduced construction waste by six tons.

Many California hospitals will soon be getting upgrades to meet new state seismic standards, so in 2007 EPA's Wendi Shafir led a collaborative effort among healthcare organizations, hospitals, and Green Building experts to create a series of fact sheets on the "Top 5 Green Building Strategies for Hospitals." The strategies reduce heating and cooling energy use by up to 50%, conserve water, and improve indoor environmental conditions for patients and hospital workers.



Above: EPA's Timonie Hood and Saskia van Gendt

Download 'Top 5 Green Building Strategies for Hospitals':

www.epa.gov/region9/waste/p2/greenbldg.html

U.S. Green Building Council:

www.usgbc.org



Right: Transformative Multi-Family Housing proposed for Oakland, Calif. (Saida + Sullivan Design Partners, San Francisco)

Places

Land Revitalization in Hawaii and the Pacific Islands

Cleaning up contaminated land for redevelopment is a priority for all of EPA's cleanup programs. In Hawaii and the Pacific Islands, where land is at a premium, land revitalization is even more crucial. Several projects in Hawaii and the Commonwealth of the Northern Mariana Islands (CNMI) illustrate how EPA works with state and local governments to clean up and reuse contaminated land.

In Hilo on the island of Hawaii, contaminated soil was found in a portion of the city's Bayfront Recreation Area that had earlier been an oil gasification plant. The U.S. Army Corps of Engineers excavated the soil and wrapped it in a huge plastic liner resembling a burrito. But this was only a temporary solution. In 2004, EPA worked with the Hawaii Department of Health (HDOH), the Corps, and the County of Hawaii to remove 7,900 tons of soil to a hazardous

waste landfill. The site is again part of the park, with two new soccer fields.

In Honolulu, the former site of a bakery was found to be contaminated by oil, diesel and gasoline from abandoned underground storage tanks (USTs). EPA and HDOH oversaw the removal of three USTs, on-site treatment of 2,500 cubic yards of contaminated soil and 1,200

From pesticide spills to abandoned artillery shells, health hazards are being cleaned up so that island lands can be returned to productive use.

cubic yards of coral (used as fill), and contaminated groundwater. Today, the site is being redeveloped as a Safeway Shopping Center with a grocery store and shops.

Elsewhere on Oahu, part of the 400-acre East Kapolei Redevelopment Area had been used to load, mix and store pesticides and chemical fertilizers, which contaminated the soil. EPA Brownfields grants funded environmental assessments which pinpointed the contaminated areas and allowed cleanup costs to be determined. State agencies and community groups are evaluating cleanup alternatives, and plan to redevelop the site with 2,500 units of affordable housing for native Hawaiians.

At the Del Monte Superfund site, a former pineapple farm in Kunia, West Oahu, soil and groundwater are polluted with the pesticides EDB and DBCP from spills. In 2005, EPA negotiated a consent decree requiring Del Monte to clean up the soil and groundwater, at a cost of about \$13 million. Deep groundwater is now being treated with air stripping (which evaporates pollutants) and carbon filtration. Contaminated soil will be treated with soil vapor extraction, then capped. Redevelopment plans are being analyzed by the local government.

In CNMI, World War II left piles of unused bombs, bullets and artillery shells abandoned throughout the islands, as well as randomly buried "duds" that failed to explode—all known as "UXO," for "unexploded ordnance." The trouble is, sometimes UXO does explode when disturbed, so areas with UXO are off-limits for redevelopment.

In 2007, EPA and the CNMI Department of Public Safety finalized a unique agreement that gives CNMI authority to safely store and dispose of this hazardous waste on a routine basis at the Marpi Point Open Detonation Area. EPA also awarded two Brownfields assessment grants to CNMI to speed the removal of UXO at sites such as the Marpi Village Homestead, where 500 new homes are planned for indigent families.



Groundwater treatment system at the Del Monte Superfund site, Kunia, Hawaii.

'From Bomb Fields to Brownfields':
www.epa.gov/region9/waste/features/ordnance

More info on Hawaii land revitalization:
www.epa.gov/region9/waste/features/land-revitalize-hi

Places

California Surpasses 50% Waste Diversion Goal

California's Integrated Waste Management Board received an award from EPA last year for an amazing achievement: The nation's most populous state surpassed its own goal of diverting 50% of the state's waste from landfills. Some local jurisdictions even surpassed 70%.

That's good news, because a high diversion rate does more than save trees and reduce the size and number of landfills. Most of the diversion comes from recycling, which replaces virgin material production and reduces energy use and greenhouse gas emissions.

"We at EPA want to thank the cities, counties, businesses, nonprofits, and all Californians," said Jeff Scott, director of EPA's regional Waste Division, upon presenting the award. "Their continuing efforts have made this notable achievement possible."

The latest numbers show that California is diverting more than a ton of waste per person each year. California diverts 46 million tons of municipal solid waste per year, and with 35 million people, the state is diverting 52% of the 88 million tons of waste generated.

This success was no accident. The effort started back in 1989, when then-State Senator Byron Sher of Palo Alto sponsored the Integrated Waste Management Act, requiring all local governments to divert 50% of their trash by 2000. The bill took effect in 1990. It set an ambitious goal. At that time, only 10% of the state's waste was being recycled.

Over the next decade, the law spurred most of the state's local governments to start curbside

recycling and other programs to recycle their garden and landscaping waste; construction and demolition waste; and food waste. EPA assisted with voluntary partnerships like Waste-Wise, which has more than 200 industry and government partners in California—more than double the number in the next leading state.

Municipalities that failed to make the 2000 deadline but were making a good-faith effort were given an extension until 2005. Nearly all succeeded. Those that didn't had to start paying fines, as required by the 1989 law.

Today, the state is working toward a goal of zero waste by promoting markets for recycled materials, supporting recycled product procurement and purchasing, continuing to look for new recycling opportunities, and reducing household

hazardous waste going to municipal landfills. For example, the state has banned discarded Compact Fluorescent Lights (CFLs) from landfills because they contain small amounts of mercury, which could be released into the environment. The state now treats CFLs from businesses and residents as hazardous waste.

Because California measures diversion rather than just recycling, it's not clear whether Californians are the nation's number one recyclers. However, California has clearly been an innovator in reducing the environmental impacts of trash.

More info on EPA's WasteWise Program:

www.epa.gov/wastewise

California recycling success stories:

www.bottlesandcans.com/local_success.php

Visit www.bottlesandcans.com or call 1-800-RECYCLE. ©2004 California Department of Conservation



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sends a strong message to reduce waste.**

Recycle.

Innovation

East Bay MUD Hits “Environmental Home Run” With Food Waste

California’s East Bay Municipal Utility District (EBMUD) has won many environmental awards over the years for forward-thinking operation of its huge wastewater treatment plant in Oakland. So it’s not surprising that they’ve come up with an innovation that has quadruple environmental benefits: Reducing greenhouse gas emissions, generating renewable electric power, producing compost, and diverting and recycling the largest single component of urban trash: food waste.

How do they do it? By processing 40 tons of food waste per day in anaerobic digesters that were built to break down sewage sludge. Last year, EPA issued a \$50,000 grant to EBMUD for a small-scale controlled test of the system using different types of organic waste, varying time periods and other parameters. Results are now being used to encourage other cities to follow EBMUD’s lead.

EBMUD is planning to scale up its food waste inputs in the future using food waste from San Francisco restaurants and grocery stores. San Francisco’s Mayor Gavin Newsom has committed the city to an ultimate goal of reducing waste and recycling all remaining waste—a big step beyond the state standard of diverting 50% of its waste from landfills, which San Francisco reached eight years ago.

Here’s how the process has been working in Oakland: EBMUD’s wastewater treatment plant has several anaerobic digesters, more than needed to treat all the sludge, or “biosolids,” removed from wastewater. They’ve installed a food waste grinder and storage tank next to one of the digesters, to feed it food waste in addition to biosolids.

Anaerobic bacteria flourish in the digesters, generating methane gas which is captured and burned to generate electricity that runs

the wastewater treatment plant. This reduces greenhouse gases, because the food waste would otherwise have gone into a landfill, where its decomposition would have generated methane that would be emitted into the atmosphere.

Every day, 40 tons of food waste are being turned to energy.

Methane emitted into the air also adds to smog, so keeping it in the digesters and burning it to generate electricity also benefits air quality. After the food waste is processed in the digesters, the end product has less weight and volume. It’s sent to a composting facility to be mixed with other organic materials such as yard waste for further decomposition. The resulting compost is a high-quality fertilizer used to grow organic crops, such as wine grapes in Sonoma and Napa Counties’ famous wine country.

The system does all this at minimal cost, because its most expensive infrastructure—the digesters—are already paid for, and 32% of digester capacity at wastewater treatment plants, on average, is unused. Dave Jones and Cara Peck of the EPA Pacific Southwest Waste Division recently received the results of the EPA grant-funded project at EBMUD, and they’re spreading the good news: Food waste processing can be an environmental home run for any city.

A truck off loads food waste on its way to EBMUD’s dome-shaped anaerobic digester.



People

Jessica Counts: Protecting Health in Unlikely Places

Jessica Counts has worked in several federal agencies in the past 23 years. In 1997 she came to EPA's regional office in San Francisco looking for "a more challenging career." She got it. Since 2003, Jessica has been a pollution prevention specialist in the regional Waste Division, where she now works to reduce exposure to toxics in nail and hair salons, and helps tribal casinos adopt greener, healthier practices.

There are more than 80 tribal gambling casinos in the Pacific Southwest, and more on the way, since California voters in February 2008 approved statewide propositions allowing four tribes to open bigger, Las Vegas-style casinos. There are hundreds of nail and hair salons using chemicals that may endanger the health of thousands of workers, their children, and customers. Salon workers often report respiratory problems and headaches, and their risk of can-

cer, birth defects and asthma is similar to that of industrial workers.

Last year, Jessica helped organize the Greening Tribal Casinos Conference in Sacramento, where casino managers learned about conserving energy and water, composting and recycling, and even using biodiesel made from grease in their restaurants to fuel their vehicles. Jessica worked with a contractor to develop a pollution prevention checklist for casinos that includes best management practices like replacing slot machine lights with energy-saving LEDs. Jessica is currently working with tribal casinos to identify pollution prevention opportunities in their operations to reduce their environmental footprint.

Toxics in Nail and Hair Salons

Jessica also works with the California Healthy Nail Salon Collaborative, a coalition of nail salon businesses, workers, health activists, and non-profits working to address health issues in nail salons, which typically use nail polish and polish remover that contain volatile organic compounds, and toxic chemicals that bond artificial nails to real nails. In this capacity, Jessica oversaw the translation and publication of a revised EPA brochure on nail salon chemicals into Vietnamese and Korean.

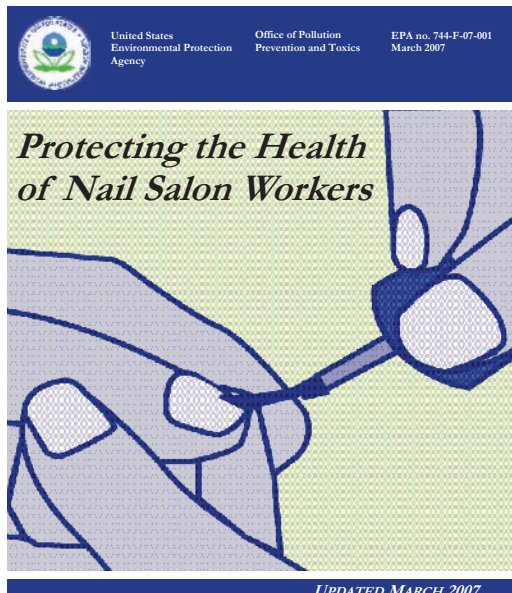
Also last year, Jessica convened an African American Hair Salon Roundtable in Oakland, Calif., where participants listened to speakers presenting studies on the health impacts of products used in African-American hair salons. Studies indicate that some hair products used

by African-Americans contain estrogenic chemicals that can cause premature puberty in girls and may also be linked to breast cancer. Even when products list ingredients, Jessica says, other toxic chemicals may be hidden under the term "fragrance."

So what can be done? In the long term, products should be reformulated without the problematic chemicals. Jessica says that more research is needed to address the full scope of environmental health issues related to the use of chemicals in personal-care products. Meanwhile, salon owners and workers can lower their risk by learning more about the content of the products they use.

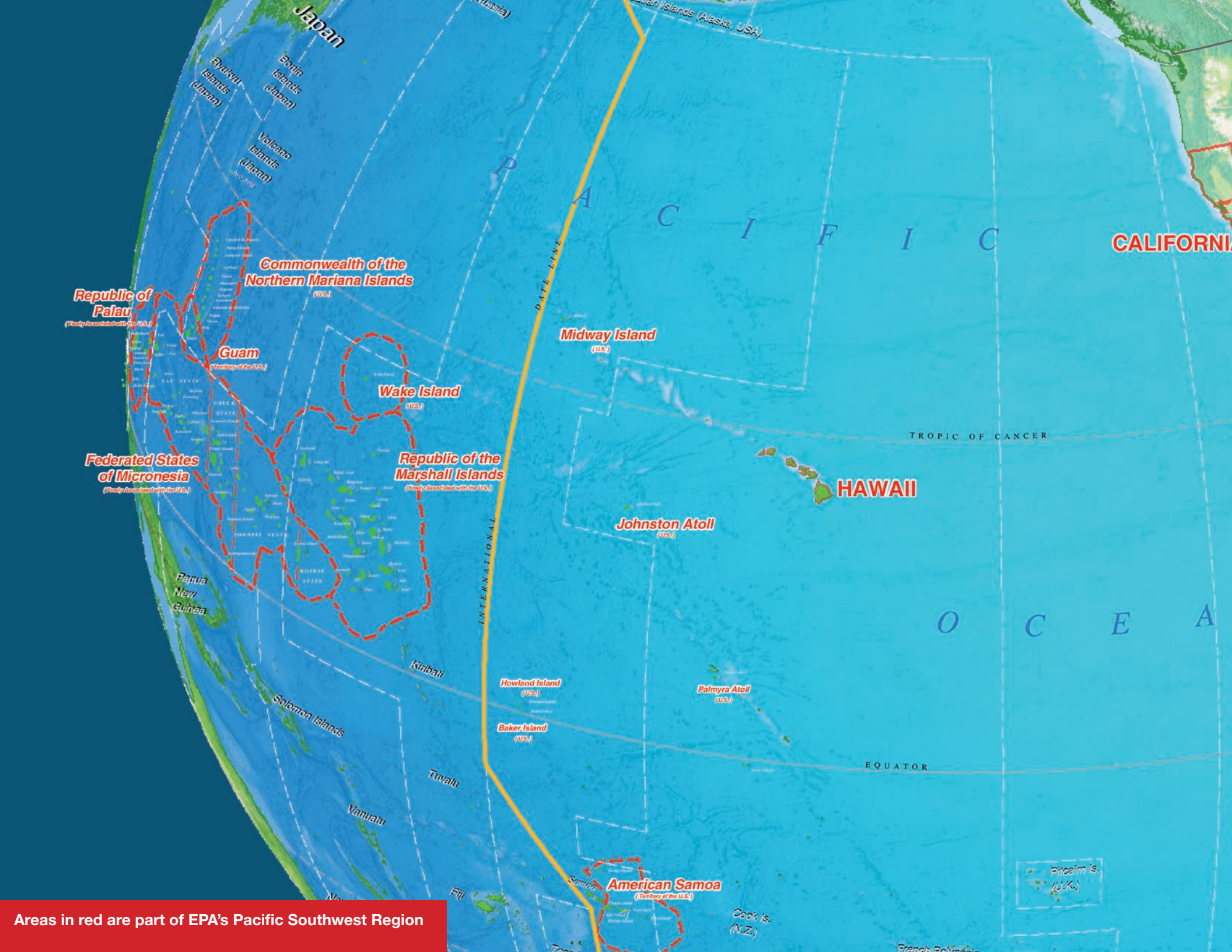
California Safe Cosmetics Program:
www.dhs.ca.gov/ohb/cosmetics

Download
'Protecting the Health of Nail Salon Workers':
www.epa.gov/dfe/pubs/projects/salon/nailsalonguide.pdf



Left: This EPA publication is now available in Korean and Vietnamese.





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EPA Pacific Southwest/Region 9

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