

The **warnings** are out.
The **tide** is rising.

So are **temps**
and **carbon**
levels.

In San
Diego,
the **heat**
is on.

Can Linda Pratt **save** us?

In the face of this century's inevitable global warming, she may be our best hope. Linda Giannelli Pratt spearheads San Diego's Sustainable Community Program for the city's Environmental Services Department. And what might have seemed a fairly esoteric job a few years ago now thrusts her center stage. Her task? To awaken the city before the world's rising ocean waters start lapping along Broadway, no ifs, ands, or boats.

So okay, the waters aren't rising that fast. But experts like Pratt see themselves as the Paula Reveres of our age, city-level experts trying to warn citizens of what's to come. They have joined together in a grouping called "Cities for Climate Protection" to create action from the bottom up, a job all the more important because Washington appears determined to sit pat on its hands in a miasma of industry-financed funk. Rome may not be burning, but overheating? No doubt about it.

Let's frighten ourselves a little: The seven warmest years ever measured have all occurred in the 1990s. The '90s were the warmest decade in a thousand years. The 20th century was the fastest-warming of the millennium. And scientists say 1998 was the hottest year on record, period.

The United Nations' Intergovernmental Panel on Climate Change (IPCC) projects an increase in global mean surface temperatures by the end of this century of from 2.5 degrees to 10.4 degrees Fahrenheit, leading to an increase in sea level between 6 and 37 inches. Compare that to the rise in temperatures since the depths of the last ice age, 18,000 to 20,000 years ago. In that time it has gone up between 5 and 9 degrees.

Warming could bring deaths

"It now seems probable that warming will accompany changes in regional weather," reported Dr. Thomas Karl, senior scientist of the National Oceanic and Atmospheric Administration's National Climatic Data Center recently. "For example, longer and more intense heat waves would result in public health threats and even unprecedented levels of mortality."

World Meteorological Organization Secretary General Godwin Obasi projects that by 2020 there could be 3,000 to 4,000 heat-related deaths annually in the U.S. alone.

The warnings are directed especially at cities, which become "heat islands"



RICHARD L. HAYS

on hot summer days, soaring up to 8 degrees Fahrenheit hotter than their suburban and rural surroundings. (Blame all those searingly hot bitumen-paved roads, parking lots and school playgrounds, not to mention dark-colored roofs. They all absorb and magnify, rather than deflect, the sun's heat.)

Then there are the greenhouse carbon emissions. The world sends about 6 billion tons of carbon into the atmosphere each year. Yet the IPCC has estimated that Mother Earth can't handle more than 2 billion tons a year and maintain stable atmospheric conditions. In a bizarre symmetry, there are 6 billion of us humans running around the planet, while environmentalists such as the late Donella Meadows calculate that long-term, our planet can only sustain 2 billion of us.

How do our numbers relate to the heating up of the world? On average, each of us puts one metric ton of carbon emissions into the atmosphere each year. But here's the kicker: That one ton is just the world average. The average United States citizen disgorges between five and six tons each year. The U.S., with only 5 percent of the world's population, debouches 25 percent of mankind's greenhouse gases. (Meadows reckoned if everybody on Earth lived to U.S. levels, it would take the resources of three

Earths to sustain us all.)

Californians, to their credit, emit only around 3 tons of carbon dioxide per person per year. That's half the national average, but still three times the world's average.

For Linda Pratt and the city's leaders, including Richard L. Hays, director of the city's Environmental Services Department, that's still way too much. If nothing else, self-interest is a big factor. In an atmosphere of general denial among national politicians, cities — especially coastal cities like Portland, Los Angeles and New York and, yes, lakeside Chicago — are taking matters into their own hands.

And with Hays' and Pratt's drive, San Diego is among these leading go-it-aloners. They're trying to turn San Diego from a wasteful, gas-guzzling, sprawl-wracked, freeway-strung county that's part of the problem, to a town that sets the standards for sustainability — and perhaps reduces the coming heat and lives better with it.

Pratt, who has a master's degree in environmental science and joined the city government after launching similar but smaller projects with the San Diego Natural History Museum, arrived just at a time when the city was seriously questioning what the effects of global warming might be.

It was Hays' vision to look beyond the collection of solid waste as the department's main focus. That change in direction already has resulted in a number of innovative projects to reduce energy use and air emissions.

"How can we afford not to do it," Hays says. "It is not just sustainability that is at issue. We are talking about the survivability of our communities, our countries and our world."

Where will we be safe?

What areas will be safe? Will the Amtrak's seacliff route be viable in 10 years? What of coastal housing, of piers? And how should it respond to becoming a hotter town?

"We have two options," says Pratt.

“We have a do-nothing option, ‘Ozone, schmozone, let’s party!’ Or you have the option to try to do what you can. Hopefully set examples that other people will follow. If enough people follow the examples, we’ll make a huge difference.”

She already is making a huge difference. With the help of experts from Scripps Institution of Oceanography, she first has obtained the information, then she’s acted.

First, she needed to know the threat was real. Scripps scientists laid out the next 100 years.

“For heat, we’re going to see an increase, worldwide, of about 3 degrees centigrade (4.6 degrees Fahrenheit),” she says, summing up her baseline information. “But that could mean lower temperatures in one region and 10 degrees higher in San Diego. Hotter, drier. Precipitation may be about 5 percent less. Though the rainfall question is less certain.”

A few degrees may not sound like much, but don’t be fooled, she says.

“That’s the misleading thing. People go, ‘Big deal. Who cares.’ But it is a big deal. Because we’re going to get more extremes: more colder days, more hotter days and more violent weather. I don’t think we’ll drown (from rising ocean levels), but the Scripps guys said they really couldn’t predict. They just don’t know. I wanted them to show me what San Diego was going to look like in 2050. Where should we buy property? But they just didn’t know.”

So Pratt’s aim is nothing less than to get San Diego to do whatever it takes to slow this phenomenon down by eliminating greenhouse carbon dioxide gas production here as much as possible. Some call her mission quixotic, but the gains already have been remarkable.

“We decided to set a goal for 2010,” she says. “We have a baseline of 1990. Whatever the emissions were in 1990, we want to reduce those by 15 percent by the year 2010.”

She has started “facilitating and coordinating” — and that’s all it is, she insists — the work of many motivated city departments. It’s nuts-and-bolts stuff that produces the results. First they looked at the city’s own operations.

Solar panels effective

“At our Miramar operations center we recently installed photovoltaic — solar — panels so all of the energy that they need for that huge commercial building is from renewable energy,” she says. “That one act reduced carbon dioxide emissions equal to taking 6,000 cars off the road, or the same amount of carbon dioxide that would be absorbed by almost 8,700 acres of trees.”

“We convert our landfill gas to electricity. And sewage (methane gases). The mayor lovingly refers to that as his ‘poop-to-power’ plant. We have a huge composting operation at the landfill. The thing that’s so exciting is (that these are) sites usually associated with waste, like a sewage-treatment plant and a landfill where we’re generating a lot of renewable energy. So you look at that not as a waste site but as a treasure trove.”

By adopting the use of Global Positioning System (GPS) satellite navigation to improve the efficiency of refuse haulers and optimize routes, the city has prevented the burning up of 46,000 gallons of diesel fuel annually — which otherwise would end up as 490 tons of carbon dioxide — and saves nearly \$60,000 a year. Installing 103 refuse-hauling trucks with “dual fuel” liquid natural gas (LNG) capabilities has saved 2,312 tons of carbon dioxide from entering the atmosphere. Pratt says more than 50 percent of the city’s refuse-collection vehicles now are run by alternative fuels.

But that’s only the first step.

“We’re also evaluating the performance of hybrid vehicles from Toyota and Honda. We’re just trying to sample different things to see what works.”

Other programs like “residential

greens collection” save 82,483 tons of carbon dioxide from being flung into the firmament. Landfill gas recovery cuts a whopping 737,985 tons of carbon from the atmosphere.

Retrofits, efficient lighting, the use of LEDs in traffic lights. The savings are starting to add up impressively.

“Actions taken within city operations between 1994 and 2001 have saved more than 133 million kilowatts, and have reduced costs by more than \$15 million.”

That’s the thing the city is discovering, says Pratt.

“Environmental protection and cost efficiencies are not mutually exclusive. When you talk about all the things that we have done to reduce gas emissions, we also have reduced cost.”

Trees: Good or bad?

Perhaps surprisingly, trees are not Pratt’s favored weapons, even though the mayor has them on his top 10 “must-do” list (he has ordered that 5,000 carbon-munching trees be planted throughout the city each year for 20 years — 100,000 total).

“From my perspective, I think trees are wonderful. There are some clear advantages to planting trees in terms of shading homes and mitigation, but we have a water problem here. So I think the whole balancing thing between (the benefit of) trees and (how much water they use) is really critical. It’s much easier for places that get a lot more rain to do the urban forestry.”

As if to back her, a recent study by more than two dozen scientists, including Scripps Institution of Oceanography research marine physicist Tim Barnett, concludes that global warming will have a devastating effect on water availability in the western United States.

The report predicted water supplies would fall far short of future demands by cities, farms and wildlife, even though overall rain levels won’t drop dramatically.

The difference will be that because

Alison Whitelaw: Green Prophet



ALISON WHITELAW in an energy-efficient addition she designed for a Solana Beach home.

San Diego architect Alison Whitelaw wants to cool California with ancient ideas. Her firm, Platt/Whitelaw Architects, Inc., specializes in sustainable buildings. That is, buildings that use less of the earth's resources to create, and less to maintain, and yet will be ready to help us cope with the coming heat.

How to do it? Look to past civilizations, she says. Like the 13th-century cliff dwellings of the Anasazi at Navajo National Monument.

"They chose south-facing locations and placed their buildings beneath the natural rock overhang, so low-arc rays of the winter sun shone in, but not those of the high, hot, summer sun. They built thick, high-mass walls, also, to slow down the transfer of heat and cold from the outside."

Now, says Whitelaw, is the time to revisit these ideas after a century in which Western society thought it could defy the natural environment — "conquer" nature — with air-conditioning, glass, and piped utilities, cost-free. No longer.

"Energy costs, environmental damage and health concerns tell us today that this is not a cost-free strategy," says Whitelaw. "Unlike any other time in our history, Americans spend 90 percent of their time indoors."

It's a pattern likely to increase if the weather gets hotter.

"That makes us vulnerable, in an age where regulations demand air-tight buildings, to off-gassing of chemicals in petroleum-based carpets and furniture, as well as toxic maintenance materials," she says.

The evidence is already in. "From 1980 to 1994, the incidence of asthma in the U.S. increased 75 percent."

Not only that, but buildings are actually a cause of the coming heat.

"Buildings in the Western world produce almost 50 percent of the emissions that create global warming," she says.

Not to mention gobbling up vast, often unrenovable, resources.

"Since 1940, (humans) have used as much of the earth's mineral resources as all of humanity's previous generations combined," she says.

And lack of recycling habits means that "136 million tons of building construction debris is created yearly in the U.S. alone."

So how does Whitelaw walk the walk? First, she talks the talk. She lectures in sustainable design at San Diego's NewSchool of Architecture and Design. And she tries to live the ideals through real-world architecture.

"We made a decision at our company that we would practice sustainable architecture even if it meant narrowing the profit margin," she says. "So far we're still in business, and we have plenty of orders."

That's partly because she has evolved the art of demonstrating how building green can actually save money.

"A green building always delivers energy incentives," she says.

Self-sufficiency in energy should pay back an owner in three years. But especially when you're a business that intends to occupy your building for a long time, the benefits start multiplying. Remember sick-building syndrome? When you include displacement ventilation, which delivers fresh air to every employee's feet, rather than force-blowing piped cool air down through the collected hot air in the ceiling, when you make sure that all new materials do not off-gas VOCs (volatile organic compounds), you are creating a workplace that is pleasant, aerated and healthy.

"That means fewer sick days, better productivity, happier people. And in any business the biggest cost is people. Maximizing their productivity is paramount."

The principles of green building are simple, Whitelaw says.

"It's the implementation that can be complex."

Mainly that means trying to adapt the relationship between architect, engineers, builders and all the other trades involved in putting a building up.

"For instance, it slows down the system to ask installers to wait while adhesives and sealants off-gas before installing drapes and furniture," she says.

That's the thing, she says, when designing green. "You can't just draw up plans and hand off. You have to be involved all the way."

And her firm, Platt/Whitelaw, is practicing what it preaches.

"We're moving to new offices in a narrow storefront building. It has no side ventilation, so we're borrowing an idea from Islamabad, Pakistan, for dealing with hot weather."

It's a sort of "wind tower," involving air scoops on the roof that rotate to face the prevailing breeze. Ducting takes cool air to displacement vents at floor level.

"And once it's up," she says, "it's free."

Who are her greenest clients? No question.

"Public agencies, like the City of San Diego," she says. "They operate their own buildings, and they have been quick to recognize the payback benefits. But the corporate world is catching up, especially now, when the bottom line counts so much."

But she doesn't want self-interest alone to drive this movement. "We're trying to get colleagues and clients to think like the Iroquois tribes. Their philosophy was simple and profound: 'Every decision you make should be based on what is good for the seventh generation to come after you.'"

of warmer temperatures, what would have fallen as snow instead will come down as rain.

Currently, the snowpack acts a natural reservoir, storing water through the winter so it will melt and be released during the spring and summer when demand spikes. But if that precipitation falls as winter rain, it will fill rivers and streams at a time of year when demand is low.

What to do? Some ideas

So what should the city be doing to prepare for hotter, tropical times? Try to make life as comfortable as possible. That requires rethinking in town planning, architecture and cultural inspiration. Many ideas come from the South, and from tropical countries like India. Here are a few for consideration:

- Require awnings over city sidewalks
- Encourage verandas on new houses
- Encourage construction of Arabic-style “wind towers” to draw air down, like chimneys in reverse, and naturally cool breezes coming inside
- Plan new streets facing the prevailing breeze
- Plant trees for shade and transpiration
- Encourage seabreezeways rather than wall the town off from the coast
- Encourage roof gardens, and sleeping out on them, Borrego style
- Dig up schools’ tarmac playgrounds
- Mandate light-colored concrete for streets rather than bitumen
- Mandate 50-percent tree cover in all parking lots
- Dig canals through downtown to cool it down (as the Thais did through Bangkok)
- Outlaw dark-colored cars
- Copy Arizona bus stops (with a variation of their big shade and effective swamp coolers)
- Encourage outside “mistlers” — fine-spray cooling air curtains as demonstrated at Claire de Lune Cafe in North Park
- Encourage Aztec house design — V-

shaped, toward the prevailing breeze, with ponds to cool incoming breezes

- Adopt more flexible working hours
- Discourage private transportation
- Learn from Kumeyaay traditional use of live oaks and slow dams, to encourage year-round streams
- Replace concrete cladding of rivers, canalize them as much as possible
- Require all houses to be built with breezeway hallways
- Encourage stilt houses to allow breezes up through flooring planks and on up through cone holes in ceilings/roofs — bonus: you get space for a garden underneath
- Encourage floating cities using Scripps “FLIP” buoy foundations
- Compulsory use of straw/adobe walls for insulation to keep interiors cool
- Compulsory photovoltaics
- Underground shopping
- Mandate south-facing houses to cut energy consumption
- Encourage widespread use of private and public fountains
- Use “sea scoops” to suck cold ocean-surface air into the city
- Encourage “company towns,” where corporations build accommodations around their business/factory to eliminate long commutes
- Create town squares to let the city “breathe”
- Encourage rotating houses to chase shade
- Establish cool refuges for the aged

The main culprit: freeway traffic

Even Pratt, for all her department’s success, admits that stopping global warming in its tracks is a long shot. She just has to listen to any morning commute radio to tell her where the enemy is. That daily freeway traffic jam creates 30 percent of all San Diego’s greenhouse gases, the largest single cause of it.

And the figure is projected to rise to 45 percent by 2010.

“That’s the tough part,” she says.

She cites a Texas A&M study on

traffic congestion in which engineers found that drivers wasted 598 million gallons of gas annually while sitting in heavy traffic in Los Angeles and New York City alone. This translates to about 7.5 million tons of carbon dioxide emitted annually into the air.

“We’re almost halfway to our goal of cutting 15 percent of emissions from 1990 figures,” she says. “But now the hard part comes. You can’t put a wall around San Diego. Maybe the elephant sitting in the room here is (the lack of) affordable housing near work. I’m no expert in town planning, but we have to address density, and affordability.”

It’s a cry that San Diego and Chula Vista, which works just as hard to reduce its greenhouse gases, probably will hear more and more, as the population of people and cars skyrockets in Southern California in the next decades.

But don’t despair for Linda Giannelli Pratt. Last year she was invited to show the Environmental Protection Agency in Washington (at a conference on state and local climate change) just what all the buzz was about San Diego’s single-town efforts to set an example in the uphill battle.

Washington was impressed. And now, with her ambitious Action Plan which she has presented to the City Council likely to get the green light (partly because it shows how being “green” saves money), she won’t have time to think.

One of the favorite parts of her job is teaching kids how to do an “energy audit” of their classroom. Then she sends them out into the community to do a project that really will help cut energy waste. It fits into why she came to do this impossible job of trying to make California “cool” again in the first place.

“I have two kids. That’s why. I want them to still have an affection for this town when they’re older.” ■