

out_{of the} fog

Emerging Science from California's Central Coast

Solar streetlight illuminates innovative solutions

by **Emily Benson** on [6 December, 2015](#)



This story starts with poop. Bird poop.

A solar panel shouldn't be caked in white crust. It should be a dark flat shelf open to the sky, soaking up sunlight, resting near the streetlight it's meant to power perched on the end of a wharf. But imagine you're a seagull used to roosting on that wharf. What does a warm, inviting solar panel look like to you? A good place to take a rest, maybe build a nest, and, well, poop.

That was one of the problems facing the [Greenwharf Project](#) in Santa Cruz, California. I wrote [an article about how the project is beginning to solve it](#) for the local newspaper, the Santa Cruz Sentinel.

The long-term goal of the Greenwharf Project is to transform the shops and restaurants dotting the wharf, a half-mile long wooden finger poking into Monterey Bay, into an energetically self-sufficient community. The fact that the wharf is on the coast, nestled

among surf breaks and sunbathers, makes it a great place to capture the Earth's natural energy in more ways than one.

“We've got wind, not a lot of wind, we've got sun, not a lot of sun, we've got waves, not a lot of waves,” says Michael Isaacson, director of the [Center for Sustainable Energy and Power Systems](#) at the University of California Santa Cruz. Put them all together, though, and “it actually makes economic sense.”

The Greenwharf Project started harnessing the solar aspect of that trifecta a few years ago when it installed a conventional solar panel on the roof of the wharf headquarters. The panel generates enough electricity to power the two electric vehicles the wharf staff use, but it isn't always as efficient as it could be, thanks to sloppy avian squatters.

“It gets fouled rather easily,” Tiffany Wise-West, a former climate action outreach coordinator with the city of Santa Cruz, told me. “They have to go up there with Windex and a paper towel to wash it off.”

So how do you make a solar panel that's wide open to the sun, but doesn't appeal to the feathered residents of the wharf? The answer is surprisingly simple: you rotate the panel onto its end and, if you're building it to power a streetlight, you bolt two of them to the spine of the light. And you make the panels double-sided, so they can absorb sunshine from morning until evening, regardless of where the sun is in the sky.

Bird poop isn't the only problem facing solar panels in a coastal setting – winds buffet the wharf year-round, fog blankets it many mornings, and corrosive salt spray swirls on the breeze. [Mira Bella Energy](#), the company that made the new streetlight, designed it with those challenges in mind.

The company added self-centering hinges to the double-sided panels, giving them the flexibility to move with the wind, so they act more like flags than sails. The energy-absorbing surfaces can pick up ambient light, so the panels work even on overcast days, and they can capture light reflecting from the surface of the bay, too. To combat corrosion, Mira Bella dips the light's electronic components into a vat of resin before installing them, creating a protective cocoon that's impervious to seawater. Batteries stacked in the pole store the sun's energy during the day so the light can shine at night.

The company

donated one of its
streetlights to the
Greenwharf Project

because the coastal setting of the wharf – the windy, foggy, salty spot it occupies in Monterey Bay – makes it a good place to test its newest technology. By coincidence, the simple gooseneck-style model the company went with is called the “Santa Cruz,” named after one of CEO James A. Meringer’s childhood surfing destinations. (“It looks like it belongs on the wharf,” Meringer told me. “It has that vibe.”)

The new streetlight was installed on the tip of the Santa Cruz wharf in August. Just how well it will do over the winter is still an open question, but Mira Bella Energy and the Greenwharf Project will be watching closely. Lots of people visit the wharf to catch a bite to eat at one of the restaurants tucked along its edges, or to spy on the barking seals lounging on the struts below. The streetlight is meant to be a demonstration, to show that solar power can help a small community like the wharf become self-sufficient and sustainable.

On a sunny Saturday in November, I went down to the wharf’s end to check out the streetlight for myself. Dozens of other people were there that day, fishing or strolling around or sitting on benches gazing out at the bay. And they weren’t alone – gulls and other birds perched on building corners or skittered along railings or hopped across the ground, scavenging for bits of discarded french fries.

But the birds ignored the streetlight. Its dark, unblemished panels glittered in the sunlight, soaking up as much energy as possible before nightfall.



A new streetlight, powered by solar panels bolted to its spine, sits at the end of the Santa Cruz wharf. Photograph by Emily Benson.



Gulls and other birds are a common sight on the Santa Cruz wharf. Photograph by Emily Benson.



About Emily Benson

The steady beat of waves lapping the lakeshore at dawn and the ethereal echo of loons wailing at dusk bracketed my childhood summer days in New York's Adirondack Mountains. Over time, my love of water evolved into a desire to study the creatures beneath the surface. My scientific endeavors took me to Alaska, where I examined algae under both sunny and snowy skies, and to Idaho, where I monitored threatened trout amid the occasional buzz of rattlesnakes. Throughout those adventures, I told my friends tales of fieldwork salvaged from bears and floods, or beavers and cattle drives, first with my voice and later with my pen. I realized I wanted to share stories of scientists struggling to illuminate the world's natural rhythms. Lakes and loons, floods and trout—I'm ready to chronicle their chorus.

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