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CITYVISION MAGAZINE VOL. 11 / NO. 5

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Association of Washington Cities Inc.
1076 Franklin St. SE
Olympia, WA 98501
360-753-4137
800-562-8981
Fax: 360-753-0149
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Economy and ecology: they're two similar-sounding words often thought to be at cross-purposes. Growing the local economy could entail increased traffic and new smokestacks along a city's skyline. Ecological gains might require

new expenses for businesses and additional restrictions on their operations. But maybe there's another way.

What if we narrowed in on the innovations and businesses that benefit both the environment *and* local economies? These industries could be considered part of the "green economy," and they are exactly what AWC's Center for Quality Communities has been studying. Specifically, they've been looking at the sectors within the green economy that are especially well suited to thriving in the state of Washington.

The center's recently released report, "Growing the Green Economy," identifies four sectors where Washington has a unique competitive advantage: energy, water, agriculture and forestry, and building materials. Washington's leadership in these four sectors would benefit all of the cities and towns in our state. It would provide new jobs and tax revenue to our communities while helping us all use scarce resources in a more sustainable way.

This issue of *Cityvision* discusses the environmental challenges faced and solutions devised by cities across the state. As you're bound to notice, we don't all face the same issues. For instance, some agricultural communities struggle with a lack of water, while others west of the Cascades worry about flooding. And our solutions—grounded in each city's balance of environmental and economic considerations—are sure to be equally diverse.

As you read about these stories and resources, I hope you'll consider how they could apply to your unique situation. What is the right thing to do, both economically and ecologically? And what would it look like for your city or town to help grow the green economy?

Sincerely,



Ed Stern
Councilmember, Poulsbo

Cityvision

9/10.19

Town of Hamilton
Mayor Joan Cromley
**COME WELL OR HIGH
WATER, P. 14**

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Cities seek collaboration and innovation as they grow the green economy. And in our popular **NOTED** feature, we assess the new shape of the Model Toxics Control Act.

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Ocean Shores Mayor Crystal Dingler discusses her city's efforts to stem the rising tides.

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**COME WELL OR
HIGH WATER**

Othello and Hamilton, like other Washington cities, are rethinking their relationship with water—planning for a future with too little, or too much, of this precious resource.
BY KIRSTEN DOBROTH

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Expert perspectives on green infrastructure, bioretention, and comprehensive approaches to the challenges of climate change.

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Never mind the Lorax: our state's mammoth Sitka spruce speaks volumes about the need for environmental stewardship.

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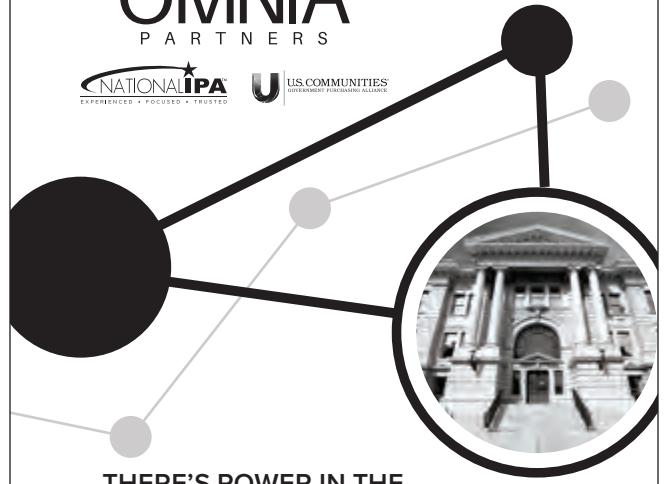
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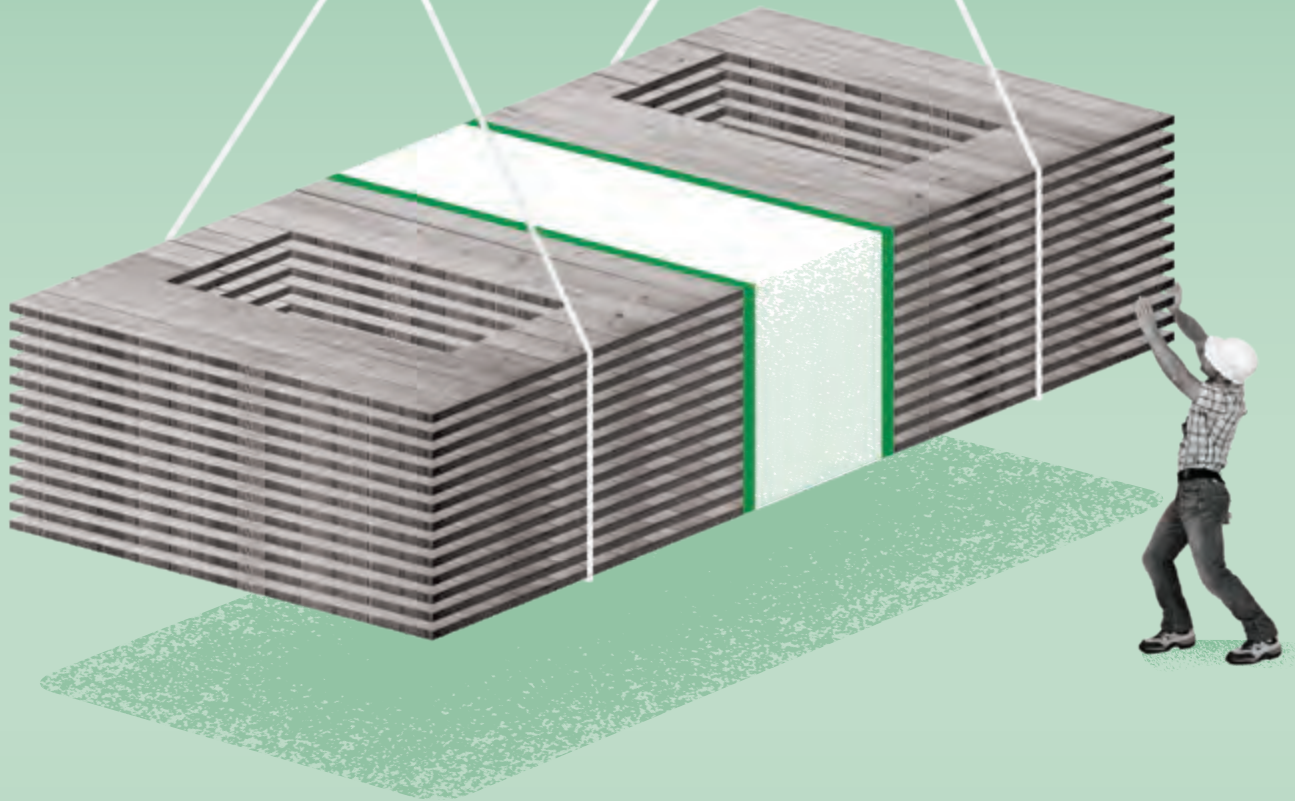
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Citybeat



Benign Growth

Washington cities promote economic development while addressing climate change.

WANT EVIDENCE OF HOW the state of Washington can reduce its carbon footprint while growing the state's economy? Look no further than a \$5.5 million pilot project using cross-laminated timber (CLT) in a statewide buildout of modular public school classrooms.

An emerging technology, CLT hits a green economy trifecta of sorts: the engineered wood product uses sustainably harvested timber, consumes less water, and requires less energy than conventional building materials. For the modular classrooms pilot project, financed by the state Department of Enterprise Services,

the CLT was manufactured in the Northwest with “trash” timber usually passed over by lumber companies—trees deemed too small or diseased to harvest.

The success of the 20 elementary school classrooms—located throughout the state, from Wapato to Mount Vernon—helped inspire the state Legislature in 2017 to pass SB 5450, a new law supporting the expanded use of CLT by requiring the State Building Code Council to adopt rules for using the green material in residential and commercial projects. In turn, that legislation was one reason Kattera, a Northern California **CONTINUED ON P.10** ▶



FRESH
IDEA

Happy Together

Industrial symbiosis outside Spokane turns one company's waste into another's wanted materials.

BY TRACY HOWARD GARTON

WHEN IT COMES TO INDUSTRIAL symbiosis, trash really does equal treasure. Pioneered in the 1960s in Kalundborg, Denmark, the big idea seems simple: the waste produced by one company becomes the raw material for another in a mutually beneficial relationship. Basically, industrial symbiosis tasks businesses with replicating the ecosystem of nature, where creatures great and small work together in symbiotic harmony such that nothing goes to waste: think of a sea anemone hitching a ride on the back of hermit crab, gorging on the crab's leftovers.

In Washington, the nonprofit Center for Sustainable Infrastructure (CSI) helps facilitate symbiotic business relationships through targeted research, working with

local communities to develop industrial symbiosis opportunities, and providing legislative support. In September 2017 (and again in September 2019), CSI worked with fellow Northwest concern i-Sustain to take a bipartisan delegation of 12 Washington legislators on a tour of Denmark to study sustainable infrastructure innovation. In the city of Kalundborg, 12 major facilities host 25 different resource-sharing agreements, which combined reduce greenhouse gases by 600,000 tons a year and generate \$28 million in economic revenue annually—for a community of fewer than 17,000 people.

“Kalundborg lit everyone’s imagination on fire,” says Rhys Roth, CSI’s executive director. “People returned with an appetite to collaborate across the aisle

and find practical policy strategies for adopting industrial symbiosis.”

One such strategy should soon be taking shape in the West Plains Public Development Area just outside of Spokane. The area already houses a waste-to-energy plant, and the West Plains PDA is currently working with CSI on a master industrial symbiosis plan for the area. Conversations with potential tenant companies have already begun,

“PEOPLE RETURNED WITH AN APPETITE TO COLLABORATE ACROSS THE AISLE AND FIND PRACTICAL POLICY STRATEGIES FOR ADOPTING INDUSTRIAL SYMBIOSIS.”

including one that transforms straw into synthetic gas and another interested in using discarded glass in piping. The 9,000-acre area, which is partially owned by the local airport, has also seen interest from advanced manufacturing and aerospace industries, both of which are keen to work toward a zero-waste policy, meaning they’re willing to work collaboratively to turn their waste streams into a resource for someone else.

“The interest is there,” says Todd Coleman, executive director of the West Plains PDA. “So we’re excited to start taking it to that next stage.” Coleman is hopeful that within six months they’ll have a clear vision of the full opportunities in the area, and that within three years they’ll feel like they’re making a big difference.

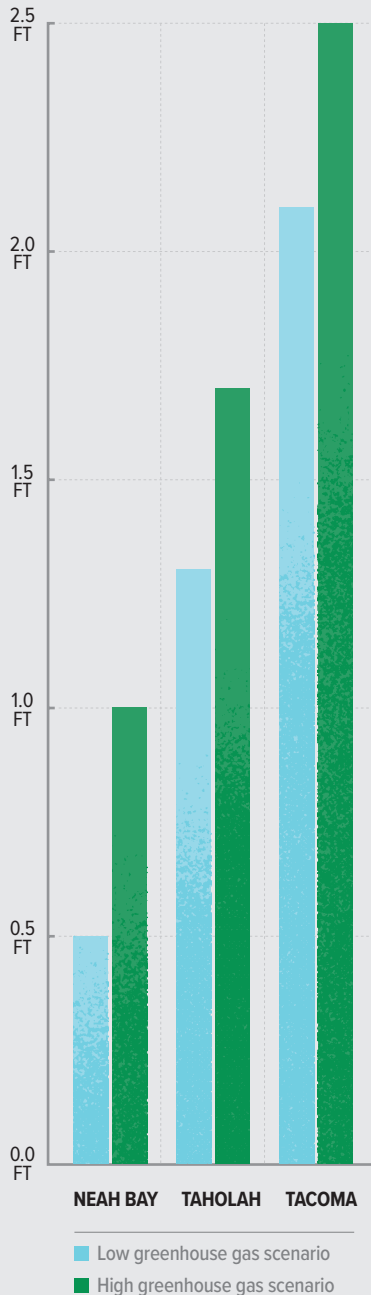
Beyond that? “I think if we can get to zero waste, that’s just amazing,” says Coleman. “Not only will we know we’re leaving a world for our kids, but it also will be very beneficial in the recruitment of jobs to the area.”

Roth couldn’t agree more.

“This is the kind of program that state representatives can all come together to support,” he says. “It’s about good manufacturing jobs, local economic development, and terrific environmental practices.” **C**

HIGH RISE

The effects of climate change could mean major changes for Washington's coastal communities, according to a recent report on projected relative sea level change by year 2100.



Source: Washington Coastal Hazards Resilience Network

TOOL
KIT

GREEN LANTERN

The King County-Cities Climate Collaboration helps guide local government action.

BY TRACY HOWARD GARTON

CLIMATE CHANGE IS A GLOBAL CRISIS. Can small, local efforts really make a difference? The King County-Cities Climate Collaboration thinks so. The K4C (as the King County-Cities Climate Collaboration is known) is a voluntary, opt-in coalition of King County, 16 city partners, and the Port of Seattle working to make a local impact through climate action.

The K4C started informally in 2012, when a graduate student found that many cities were taking action to address climate change, but few were really talking to each other or coordinating policy. That student helped convene city staffs so they could work together more closely. Building on that momentum, the K4C continued to encourage peer-to-peer government staff networking and information sharing.

Today, the K4C works with its partners to develop shared legislative interests and implement action commitments. "Technical analysis commissioned by the K4C shows there's a lot we can do at the city level to address climate change, even though there are things local governments don't have direct control over," says Matt Kuharic, senior climate change specialist for the King County Department of Natural Resources.

Case in point? Green Direct is a city-led partnership with Puget Sound Energy (PSE) to develop new sources of renewable energy for large consumers and local governments. "Green Direct started as the K4C saying clean energy is a

"THERE'S A LOT WE CAN DO AT THE CITY LEVEL TO ADDRESS CLIMATE CHANGE, EVEN THOUGH THERE ARE THINGS LOCAL GOVERNMENTS DON'T HAVE DIRECT CONTROL OVER."

big priority for our partners, and PSE responding," says Kuharic. Two successful rounds of enrollments later, many K4C partners have joined, as well as several large corporate energy users such as Walmart and Kaiser Permanente. Thanks to the demand for clean energy initiated by the K4C, PSE's new wind farm in southwest Washington is now under construction, and plans to build a new solar development in eastern

Washington to feed local government energy needs are underway.

Still, the road to cutting emissions is long and winding, especially at the local government level. "We're not winning, but we are making strides," stresses Kuharic. A study released just this past July shows that per-person emissions of greenhouse gases in King County have dropped 11 percent over the past decade; with the recent passing of Washington's big clean energy bill, those numbers should drop even further in the decades to come. But there's more work to be done, and the K4C hopes even more cities will see the benefits of their joint efforts.

"There's a lot of value in coordinating policy and work across different levels of government," Kuharic says. "To be connected with your neighbor cities is really useful for moving climate action forward at the local level." **C**



For more information:
kingcounty.gov



MODEL TOXICS CONTROL ACT REFORM CHAPTER 422, LAWS OF 2019

AN ACT Relating to reforming the financial structure of the model toxics control program ...

[...]

Sec. 201. RCW 82.21.030 and 1989 c 2 s 10 are each amended to read as follows:

(1)(a) A tax is imposed on the privilege of possession of hazardous substances in this state. Except as provided in (b) of this subsection, the rate of the tax ((shall be)) is seven-tenths of one percent multiplied by the wholesale value of the substance. Moneys collected under this subsection (1)(a) must be deposited in the model toxics control capital account.

(b) Beginning July 1, 2019, the rate of the tax on petroleum products is one dollar and nine cents per barrel. The tax collected under this subsection (1)(b) on petroleum products must be deposited as follows, after first depositing the tax as provided in (c) of this subsection (1):

- (i) Sixty percent to the model toxics control operating account created under section 202 of this act;
- (ii) Twenty-five percent to the model toxics control capital account created under section 203 of this act; and
- (iii) Fifteen percent to the model toxics control stormwater account created under section 204 of this act.

(c) Until the beginning of the ensuing biennium after the enactment of an additive transportation funding act, fifty million dollars per biennium to the motor vehicle fund to be used exclusively for transportation stormwater activities and projects. For purposes of this subsection, "additive transportation funding act" means an act in which the combined total of new revenues deposited into the motor vehicle fund and the multimodal transportation account exceed two billion dollars per biennium attributable solely to an increase in revenue from the enactment of the act.

(d) The department must compile a list of petroleum products that are not easily measured on a per barrel basis. Petroleum products identified on the list are subject to the rate under (a) of this subsection in lieu of the volumetric rate under (b) of this subsection. [...]

[...]

(3) Beginning July 1, 2020, and every July 1st thereafter, the rate specified in subsection (1)(b) of this section must be adjusted to reflect the percentage change in the implicit price deflator for nonresidential structures as published by the United States department of commerce, bureau of economic analysis for the most recent twelve-month period ending December 31st of the prior year.

Commonly referred to as MTCA (Mot-Ka), the Model Toxics Control Act program was created by a citizen's initiative in 1988. It is the state's version of the federal Superfund program.

Much of the hazardous substance is oil, and the volatility of the oil market had a direct impact on funding city projects that relied on the revenue. To help provide fund stability, SB 5993 changed the rate on petroleum products from a price-based tax to a volume-based tax.

Since the Great Recession, the state has been using MTCA dollars to fund basic environmental work, diluting the funding available for cleanup and stormwater projects. SB 5993 refocused the funding to more align with the intent of MTCA: pollution cleanup and prevention.

SB 5993 achieved what cities have been working toward for over a decade: a dedicated funding source for stormwater remediation.

The initiative's primary goals were to raise enough funds to clean up and prevent environmental contamination from hazardous substances.

Revenues are generated by taxes on hazardous substances: petroleum products, pesticides, and other chemicals that present threats to human health or the environment.

MTCA capital funds have been a critical funding source for cities to address legacy toxic pollution and to clean up working waterfronts, brownfields, and other areas to bring them back into productive use.

A key feature of this legislation was applying an inflation adjuster to the tax, which will allow revenues to rise over time and maintain buying power.



THE QUESTION

WHAT SUSTAINABILITY-RELATED ISSUE IS YOUR CITY FACING?



Given that automobile use (primarily in single-occupancy vehicles) represents almost 50 percent of our community's greenhouse gas emissions, the biggest challenge for us is providing access to feasible commuting alternatives to Seattle and Bellevue. Preparing properly for light rail's opening in 2023—with additional parking, a walkable Town Center, and innovative first/last-mile transportation solutions—will be critical to ensuring maximum rail ridership.

—ROSS FREEMAN

Sustainability and Communications Manager, Mercer Island



Tacoma is working on how to maximize the benefits of Tacoma Power's clean hydroelectricity for moving people and goods. Efforts along these lines include increasing awareness of the benefits and choices among electric vehicles, as well as increasing the availability of charging infrastructure.

—KRISTIN LYNETT

Sustainability Officer, Tacoma



For nearly two decades, Spokane has quietly led our region in innovative, practical sustainability. Today, we are focused on actions that are environmentally and financially responsible, and the biggest sustainability issue we face is also our biggest opportunity: integration. For example, if we save water, we reduce the need for wastewater treatment, thus saving energy, requiring less infrastructure, and ultimately helping the planet while saving money.

—CADIE OLSEN

Sustainability Director, Spokane

TRAININGS

OCTOBER

- 1–30 **Cities on Tap**
Various locations
- 2 **Designated Employer Representative**
Kennewick
- 8–30 **Wellness Planning Forum**
Various locations
- 9 **Retro WorkSafe Employer**
Kennewick
- 16 **RMSA Annual Meeting & Dinner**
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- 17–18 **Member Expo**
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- 22–24 **IACC Conference**
Wenatchee
- 30 **Elected Officials Essentials**
Webinar series

TRAINING HIGHLIGHTS

ELECTED OFFICIALS ESSENTIALS
DEC 7

Following municipal elections every other year, AWC offers its signature Elected Officials Essentials workshop at 11 locations across the state. New and seasoned elected officials alike benefit from this training event—a blend of on-site legal counsel and webcast—which explores their most critical legal and functional responsibilities in office. What's more, participation in this event fulfills the Open Government Training Act's specific training requirements (including records, records retention, and open public meetings) for elected officials.

- Network with other city leaders in your region.
- Examine real-world municipal scenarios with the help of an on-site city attorney.

- Learn your basic legal obligations and liabilities, understand your statutory roles and responsibilities, explore elected officials' special ethical considerations, and discover how your leadership shapes your community.

The event will take place live in Olympia with web simulcasts at all other locations. Registration opens October 9, 2019, for those in an uncontested race. Locations:

- Arlington
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- Chewelah
- Covington
- Gig Harbor
- Kennewick
- Kirkland
- Olympia
- Spokane Valley
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Citybeat

Benign Growth *continued from page 5*

CLT manufacturer, broke ground on a 250,000-square-foot factory in Spokane Valley in December 2017—four months after Vaagen Brothers, a competitor, announced plans to build a CLT processing plant in Colville.

“Spokane Valley was an ideal location for Kattera to site its CLT factory,” explains Kattera Chief Architect Craig Curtis. “We’re excited to be growing our operations in the community and are proud to bring advanced manufacturing jobs to Eastern Washington.”

The CLT story is exactly the kind of initiative envisioned in “Growing the Green Economy,” a report the

THE CLT STORY IS EXACTLY THE KIND OF INITIATIVE ENVISIONED IN “GROWING THE GREEN ECONOMY.”

Association of Washington Cities released in March that identifies ways the state can simultaneously address climate change and promote regional economic development. “We haven’t reached draw-down, the point at which we are putting less carbon dioxide in the atmosphere than the previous year,” explains Paul Roberts, an Everett councilmember and past AWC president who was the project director and lead author of the report. (For more on the report, see “From the President” on page 1.) “It takes a change in the economic structure to do that, and that’s what we wanted to look at in this study: What does that mean? What are we doing, and what could we be doing? What does the workforce need, and what’s the role of cities in all of this?”

And there are plenty of sectors to assess. As climate change alters rainfall patterns on the state’s west side and depletes aquifers on the east side, for example, reimagining water management systems also will play a pivotal role in green economic development, Roberts says. To that end, the AWC report recommends creating a city-led Water Innovation Center in Washington to study and implement emerging technologies like smart culverts and modular bridges. Such a center could also advocate the adoption of a statewide “One Water” initiative, which would encourage municipal utilities to adopt a closed-loop system that recycles and reuses effluent. (The report cites Pure Blue—a Seattle-based think tank dedicated to innovation in water management technology—as a resource cities could tap to help realize that goal.)

As for next steps, Roberts hopes to see a coalition of local electeds rallying around these ecological and economic opportunities. “I wouldn’t want to speak for everybody in Washington,” he says, “but I think people are recognizing the need to try to bring all of these resources and pieces together.” **C**

—Kirsten Dobroth

For more information:
spokanevalley.org

Cityscope



Ocean Shores Mayor
Crystal Dingler

Q&A

Sandstorm

Having weathered the recession, Ocean Shores Mayor Crystal Dingler is girding her community for another maelstrom: rising seas stealing the coastal city's namesake strand.

INTERVIEW BY KIRSTEN DOBROTH

What brought you to Ocean Shores?

My husband was in the service, so we traveled a lot for at least 20 years and then settled in Kenmore. When we retired, we put all of our things in storage and drove around in our RV for two years, ending up here in Ocean Shores. We just thought it would be a wonderful place to live, and we moved here 14 years ago.

What prompted you to start a post-retirement career in local government?

I got involved with the library around the time the recession

hit—they were going to close it, and we fought really hard to keep it open. And when there was an opening on the city council, I applied and was named to it.... I felt like I could do a good job as mayor, so I ran for office in 2011.

But your first term was not easy.

No; 2011 was the depths of the recession for us: we were down to our last \$100,000 in the general fund, we had enormous debt, and we had to lay off a lot of people. It was a really tough time, but we weathered the storm, and we're going strong now.

CONTINUED ON P.12 ►



Speaking of storms: Ocean Shores has had its fair share of shoreline troubles. What role has weather played in that?

We had significant El Niño winter storms causing erosion in the late '90s, and the city put in geotubes: big cloth bladders filled with sand that are placed against the coastline to hold things together. The Army Corps of Engineers had also come in and done some work on our North Jetty, and that seemed to solve the problem.

But not for long . . .

In 2010 we had our first significant erosion again, and we experienced our first really deep erosion during the winter of 2015-16. We were having low-pressure storms, which means that the ocean is higher, so it wasn't unusual to have 25 feet of water coming in—the force of that much water crashing in was a really big deal.

You declared a state of emergency in response to that winter storm cycle.

Yes, the bottom geotube split, and then the one above it broke as well. These tremendous storms were just sucking out sand. Our highest point is only at 30 feet above sea level, so we were very concerned that a breach would allow seawater to come into town.

How do you fix something like that?

We tried to resolve the issue using sand and then geotubes, but eventually the [US Army] Corps of Engineers came and put in rock—it was really the last resort. You don't want to armor the shoreline if you can do something else, but we really didn't have any other



Mayor Dingler and an anti-erosion rock wall flanked by geotubes in Ocean Shores

“THE BOTTOM GEOTUBE SPLIT, AND THEN THE ONE ABOVE IT BROKE AS WELL. THESE TREMENDOUS STORMS WERE JUST SUCKING OUT SAND. OUR HIGHEST POINT IS ONLY AT 30 FEET ABOVE SEA LEVEL, SO WE WERE VERY CONCERNED THAT A BREACH WOULD ALLOW SEAWATER TO COME INTO TOWN.”

choice, and that made a huge difference. The Corps's action really saved us.

Despite those challenges, development continues at a blistering pace.

We are still growing really fast—we had 150 housing starts last year—but people who are moving here understand the risks, from both tsunamis and rising sea levels. Some scientific studies have shown that we will not have as much sea level rise here in the central coast as in other places, but this year we applied to FEMA for a vertical evacuation tower (intended for tsunamis, but effective for flooding as well), which would be built near the elementary school. Right

now, we're in the process of hiring a second city planner, so we think that will make a difference in disaster management planning as well.

How else is the city preparing itself?

Educating ourselves is key: learning from those who understand the dynamics of our shorelines. We have worked closely with the Port of Grays Harbor, US Representative Derek Kilmer's office, the Corps, the state's Emergency Management Division and Department of Ecology, and regional academic and government experts. Personally, I also joined the Surfrider Foundation's Leadership Academy and was appoint-

ed by the governor to the Washington Coastal Marine Advisory Council. The contacts and learning points are invaluable as we navigate the future.

Where do you look for inspiration as a local leader preparing for climate change?

We live very close to Quinalt Nation, and we have strong ties to them. One of the things I've admired about the Quinalt over the years is that they are looking a hundred years or more ahead. I think that's really the sort of planning we need to undertake in order to understand the long-term effects of the things we do and don't do.

BY THE NUMBERS

Ocean Shores

Cityvision looks at how Ocean Shores manages the vagaries of life along the coast.

POPULATION

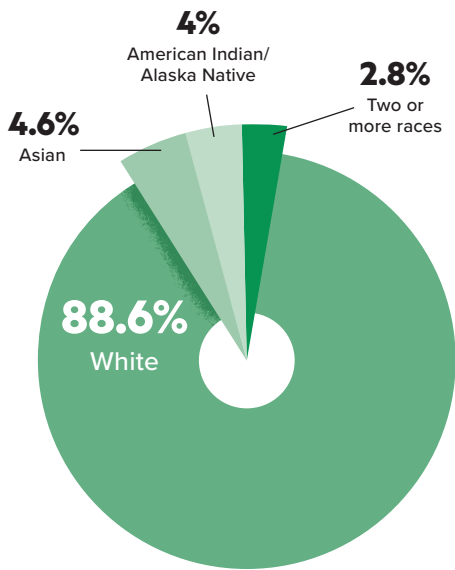
POPULATION DATA FROM THE 2010 US CENSUS, UNLESS OTHERWISE INDICATED



2018 SOURCE: WA OFM

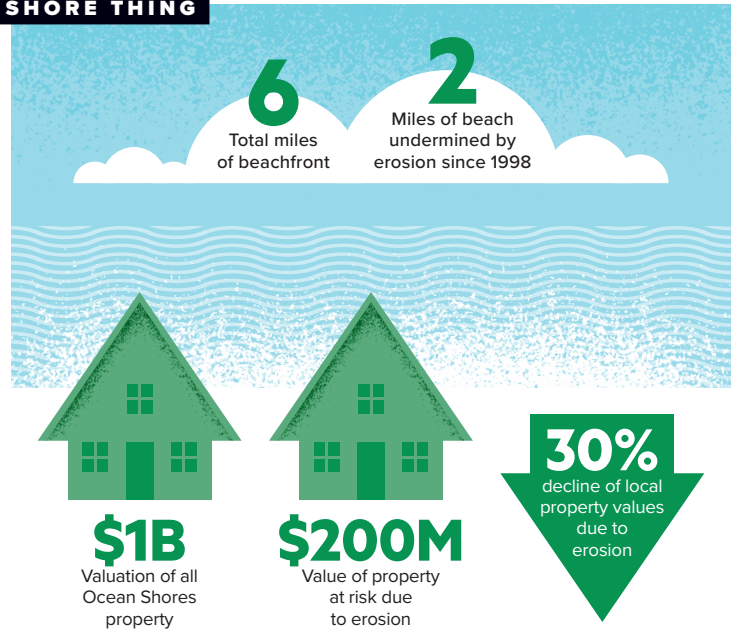


DEMOGRAPHICS



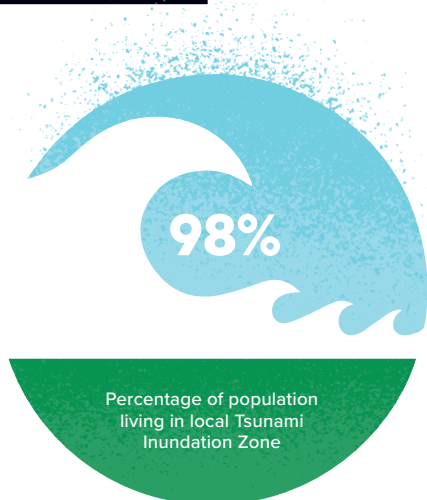
SOURCE: US CENSUS BUREAU

SHORE THING



SOURCE: GRAYS HARBOR RESILIENCE COALITION

WAVE DYNAMICS



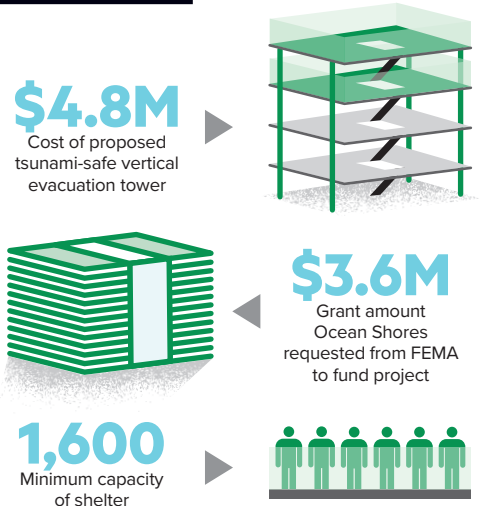
7.5 Square miles of developed land within that zone

300 Number of years since last tsunami-generating earthquake

140-1,000 Historical frequency those earthquakes occur, in years

SOURCE: WASHINGTON MILITARY DEPARTMENT EMERGENCY MANAGEMENT DIVISION

GREAT ESCAPE



SOURCE: CITY OF OCEAN SHORES

OTHELLO AND HAMILTON,
like other Washington cities,
are rethinking their relationship
with water—planning for a
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COME WELL OR HIGH WATER

By Kirsten Dobroth

PHOTOGRAPHS BY
RYAN T. BELL

SINCE THE TOWN'S FOUNDING along a horseshoe bend in the Skagit River more than 130 years ago, flooding has been a way of life in Hamilton. At Boots Bar and Grill, the local watering hole (motto: "A Flood of Fun!"), double shoulder-high rings around a wooden post near the bar mark where floodwaters crested during the deluge of 2003, and again in 2006. Many Hamilton homes (the 2010 Census counted 113 households and a population of 301) have been raised on cinder blocks. So has Hamilton's town hall, quartered in an elevated Victorian that doubles as a history museum, where a wall of photos dating back to the late 19th century chronicles the town's high-water events—including the Flood of 1990, when the late mayor Timothy Bates, a civic icon who held the post for 27 years, stoically drove his hulking Massey Ferguson farm tractor up and down inundated streets, evacuating citizens to higher ground.

Taking a cue from her predecessor, current Mayor Joan Cromley has championed a more audacious, and permanent, evacuation plan: moving Hamilton to a 42-acre former farm, above the floodplain, on the outskirts of town.

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Cromley herself relocated to Hamilton from Pennsylvania in 2002. A year after she arrived, record-breaking late October rains sent the Skagit River cresting at 42.2 feet in Concrete (12 miles upstream), 14 feet above flood stage, the second-highest level ever recorded. Aerial photos of downtown Hamilton submerged under murky river water made national headlines—and caused mass evacuations.

Since then, Cromley, who was elected to Hamilton's council in 2008 and appointed mayor in 2013, has weathered two more significant deluges—most recently in 2017, when the Skagit breached a makeshift levee along First Street by 18 inches, wreaking havoc. According to a recent report in the *Seattle Times*, since 1995 the Federal Emergency Management Agency (FEMA) has received 143 National Flood Insurance Program claims and paid more than \$3.3 million in compensation for losses in Hamilton, on top of spending an additional \$1.3 million on flood-related grant programs in the town during that time.



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A Hamilton home on the floodplain



Memories of past high water



Mayor Cromley with the front door of a farmhouse that was recently razed to serve as the future site for the relocation of Hamilton's town hall

prohibiting repair; moreover, state and local laws ban new construction in the floodplain—occupying more than 80 percent of the town's footprint—which means that Hamilton has slowly and steadily been losing housing inventory (and residents). Most of the homes still standing have been expensively modified—in a town where nearly a third of the population reported poverty-level incomes—yet Hamilton's supply of housing stock still evokes Florida's hurricane alley.

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Flooding has taken a toll not just on the local economy, but also on the environment. With a \$250,000 annual operating budget, Hamilton can't afford a public sewer system, so each flood breaches septic tanks and dumps waste and trash into the river, critical habitat for Puget Sound's threatened wild chinook salmon population. After the 2017 flood, the detritus strewn about town once the water receded filled more than 10 dumpsters, even though, by Cromley's reckoning, “It wasn't really a big one.”

As recently as 2008, town officials established the Hamilton Public Development Authority and identified a 42-acre parcel outside the floodplain where they hoped to relocate willing residents with state and federal money, but after the land was approved to be added into the town's Urban Growth Area, the owner decided not to sell. The relocation plan was shelved until 2018, when the landowner approached Cromley about selling. To help finance the purchase, Hamilton partnered with Forterra NW—a Seattle-based nonprofit land trust that specializes in conservation transactions and community development projects—which put down \$575,000 for the land (with Hamilton anteing an additional \$75,000), located across Highway 20 and outside

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Heather Cooley, director of research at the Pacific Institute, a California think tank specializing in water use and management and how climate change is impacting the world's water resources, talks about how and why cities should start planning now for an uncertain water future.



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Washington is no stranger to rain, but lately westside cities seem to be getting inundated while eastside cities are grappling with historic drought conditions. Is this an anomaly, or will this be the norm?

With climate change, we're seeing more of these extremes: when we get rain, it tends to be in these very intense sorts of rainfall events, and that intensity overwhelms our existing systems that were built to handle certain ranges of certain types

of precipitation events; the same is true with drought. The fact that we're seeing far more extremes is going to force us to rethink how we manage our water resources.

What do cities need to do differently?

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CONTINUED ON P.19 ▶



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MEANWHILE, 250 MILES SOUTHEAST in the heart of the Columbia River Basin, the City of Othello has begun to question its reliance on the lower Wanapum Basalt aquifer—a vast underground cache of pure freshwater dating from the last ice age—as its primary source of potable water. In recent years, Othello's wells, like drinking straws, have been drilled ever deeper into the earth as water levels in the aquifer have diminished, with pumps working harder and harder to keep up with demand.

In June 2015, disaster struck.

"We had triple-digit temperatures for over 30 days in a row,

and two of our groundwater pumps went down," recalls Shawn Logan, a lifelong Othello resident who serves as the city's mayor and administrator.

Logan prefaces the drama that ensued by explaining that Othello's population is booming—the town has grown by over a third since 2000, from 5,847 then to 8,132 today. In just the last decade, Logan estimates that 400 more homes have been built, apartment vacancy rates have hovered below 1 percent, and, he says, the hospital's maternity ward has been busy delivering between 400 and 600 babies a year. (Regional population studies estimate that Othello's population will more than double in the coming decades, to more than 17,000 by 2035.) Two of the world's larger potato processing plants are located in Othello, Logan adds, with McCain Foods announcing this year that it plans to expand its local potato processing plant by over 170,000 square feet. This \$300 million investment will bring a projected 180 jobs to town and require 11,000 additional acres of regionally sourced potatoes to be farmed—irrigated with aquifer water or surface water from US Bureau of Reclamation canals—to keep the plant running at capacity.

So when the city's two primary groundwater pumps failed in the middle of an uncommonly hot summer, it was a big deal: Othello consumes nearly four million gallons of water per day, and it had only six million gallons in reserve. Through June and most of July, while a contractor worked feverishly to get the pumps running again, the city rationed water, restricting lawn watering and curtailing what it could send agricultural processors, which consumed 60 percent of the municipal supply. Once the crisis was over, however, city officials knew they needed to address the sustainability of Othello's water management plan.

"It caused us to realize two things," says Logan. "We realized that we didn't have enough storage capacity for the town . . . and that we were 100 percent dependent on groundwater, so we needed to diversify our supply."

Those two problems were exacerbated by the fact that more and more wells (and new residents taking new jobs at expanding potato processing plants) were simply sucking the aquifer dry—not just in Othello, but all across the region. Groundwater levels in the Columbia Basin have generally been declining for decades, as wells have been drilled deeper and deeper to irrigate farmland and provide potable water to cities and towns. The Western Regional Climate Center describes this area as the "lowest and driest section of Washington," and despite modest summer rain and 10 to 35 inches of snow each winter, notes that "it is not unusual for four to six weeks to pass without measurable rainfall" during the hot summer months. And those months have been getting hotter and drier. Simply put: there's not enough supply to meet the Columbia Basin's demand, and the problem is only expected to get worse.

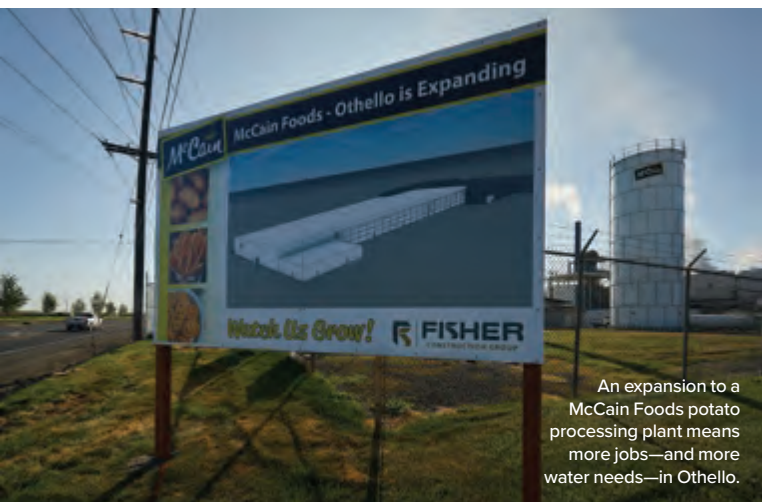
"There's not a lot of recharge that happens in these aquifers," explains Ben Serr, a senior planner with Growth Management Services, who has been conducting outreach to drinking-water providers in the Columbia Basin around groundwater depletion. "The Columbia Basin Ground Water Management Area commissioned studies to carbon-date the water, and on average, the water was 9,000 years old. So basically, if you've got an enclosed source of water and a bunch of straws stuck into it, and if you keep drinking from those straws, eventually your water runs out."

HOPING TO PREEMPT THAT OUTCOME, in May the state Legislature allocated \$15 million from its capital budget—the first installment of \$40 million in funding that the Columbia River Water Supply Development Program will receive between 2019 and 2021—to build a canal, a booster pump station, and an electrical substation that will divert water from the Columbia to farms in the region as an alternative to tapping wells for irrigation. The plan, being overseen by the Department of Ecology, also includes a pipeline with the capacity to irrigate 16,000 acres of farmland near Moses Lake, 25 miles north of Othello.

Four months earlier, state Representative Mary Dye—a Republican from Pomeroy whose district encompasses Othello—had an audience with high-ranking members of the Trump administration to discuss the completion of a long-shelved Grand Coulee Dam irrigation project. Part of the Columbia Basin Project—which encompasses the dam, Franklin D. Roosevelt Lake, three power plants, four switchyards, and a pump-generating plant—the Grand Coulee currently provides water to irrigate 670,000 acres in east central Washington. While substantial, that coverage falls far short of the 1.1 million acres of farmland the dam was intended to irrigate when the Columbia Basin Project was authorized in 1943. In the 1960s, the state issued temporary well-water rights to farmers in the region, assuming that once the project was completed, farmers would switch to river water for irrigation. But construction stalled, funds were diverted elsewhere, and the full vision of the Columbia Basin Project never materialized, leaving regional farms to rely on well water for irrigation—even to this day.

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An expansion to a McCain Foods potato processing plant means more jobs—and more water needs—in Othello.

large amounts of water, but also looking at opportunities for capturing stormwater—preventing runoff and all the water quality and flood risks associated with that. Other pieces around water-smart cities include reusing water and landscaping city parks, homes, or commercial areas with low-water-use plants or climate-appropriate plants.

What cities are doing this already?

Philadelphia is a great example; on the stormwater side, they've made a lot of investments around green infrastructure and distributed infrastructure. Los Angeles has also made a commitment to eliminate their wastewater discharge, so they're looking at opportunities to both reduce the amount of wastewater they're producing and recycle and reuse that water; they just passed a tax last year that's enabled them to invest in some of these stormwater and green infrastructure projects. San Francisco has also done some interesting work around on-site water systems in new, large buildings. They still have some way to go, but they've made some real improvements.

What about rural cities that lack the resources to overhaul water management systems?

That is one of the challenges, and one

of the things I am hopeful about is that we're beginning to acknowledge the needs of smaller communities. In California, we've had a water shortage contingency plan and requirements around developing those for some of the larger utilities, and we haven't had similar requirements for the small utilities because it was thought to be difficult for them to develop such plans. But that's changing. The state just passed legislation last year requiring some type of planning at the local level, and there's a process under way right now of bringing together county governments and other stakeholders to start to talk about what type of planning we need to do specifically for water shortages.

Is there any sort of silver lining for cities large and small when it comes to planning for climate change?

Our infrastructure is aging, and there's a need to replace it whether it's treatment plants or water distribution pipes, so there's an opportunity to rethink this stuff. Perhaps that's even building smaller treatment plants—if we're dealing with the demand management and some of the efficiency changes—and reimagining some of these systems to build a more resilient community given the uncertainty we're facing right now.



Workers at the drilling site for Othello's new well

DRILLING THIS NEXT WELL AND DOING THE WATER RESERVOIR: THAT'S THE IMMEDIATE PLAN.

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Completing the Columbia Basin Project, however, has its own unique issues. Environmental groups oppose it, fearing that diverting water from the Columbia for irrigation will further stress the river's salmon population, which has seen a precipitous decline since the dam was put in place, and will threaten treaty-protected fishing rights of Native American tribes in the area. Despite those concerns, Rep. Dye would like the federal government to earmark \$10 million annually over five years to the project, citing the completion of the Columbia Basin Project as a "total game changer for the state."

Back in Othello, Mayor Logan isn't waiting to see whether ambitious plans like completion of the Columbia Basin Project will ever materialize. Not long after the city's water pump failure in 2015, Othello partnered with regional state legislative leaders, the Governor's Office, and the state departments of Commerce, Health, and Ecology to develop a long-term strategy to secure its water supply to sustain projected growth for the next 75 years.

The plans entail a multistage reimagining and overhaul of the city's water management system that includes drilling a new well to feed a brand-new, 3 million-gallon reservoir. It also includes constructing a state-of-the-art, 12,000-square-foot water treatment pilot test plant that will recycle up to 200,000 gallons per day of wastewater into graywater for irrigation, plus an additional 200,000 gallons per day into potable water that will be injected back into the aquifer via a process known as Aquifer Storage and Recovery (ASR). Cost estimates range from \$23 million to \$50 million for the wastewater reuse system (depending on what capacity the facility ends up being constructed to handle per day) and an additional \$2 million to \$3 million for the ASR system.

"This is an expensive problem, and we don't have it fixed yet—

we're still 100 percent dependent on groundwater," says Logan. "We needed to have an immediate plan and an intermediate plan, and then we needed a long-term plan. And drilling this next well and doing the water reservoir: that's the immediate plan."

Looking to the future, the city has held discussions with McCain Foods about diverting treated effluent from its expanded potato processing facility to the city's new treatment plant, which would then end up being injected back into the ground to recharge the aquifer.

"There are a lot of pieces; it involves a lot of permitting and a lot of cooperation and coordination," explains Logan. "But we're confident in our regulatory team—which includes the Governor's Office, the Department of Health, the Department of Ecology, and the Office of Columbia River—and we're all working together toward solutions to become a model for the rest of the state in areas that are experiencing declining groundwater."

And that's the thing—Othello *thinks* its plan will work, but currently there isn't a comparable system anywhere in eastern Washington to use as a blueprint. Still, the city isn't going it alone; Othello's city engineer sits on the steering committee of the Columbia Basin Sustainable Water Coalition, a nascent regional stakeholder group with representatives from Grant, Lincoln, Adams, and Franklin counties and members advocating for agricultural and environmental interests.

"The stakeholder coalition is to keep this issue in the forefront and to continue working on it," says the Department of Commerce's Serr, who helped organize the group. "Othello has been great to work with; they are one of the leaders that have really stepped up in the area. . . . I've been really impressed by the level of effort they've thrown behind this issue."

IF PRESENT TRENDS CONTINUE, summers will continue to heat up, underground water supplies will continue to dwindle, and the region's population and industry will continue to grow. So it's easy to understand when local leaders in Othello say they don't see any other way but to address their water issues head-on.

Neither do electeds in Hamilton, even if their challenges are distinct. They're not waiting around for the next flood before they act to find a long-term solution to a perennial problem that has stunted the town's growth and is only expected to worsen as the climate changes.

"A lot of people will look at this and say, 'Well, why can't you raise every single house and continue where you are?'" says Mayor Cromley. "But the limitation of the floodplain has really kept the town from growing the way that every other community in the state of Washington is growing, and Forterra has been working really hard to make sure this is a viable project for the future of our community."

In Othello, Mayor Logan echoes that forward thinking.

"We want to establish a minimum of a 50-year water supply that takes care of not only what we currently have here, but also the growth that is going to take place in the next 50 years," he says. "We're trying to be innovative and creative, and we're letting industry know: you have a future here in Othello."

And if everything goes according to plan, they may even have some water to spare. **C**

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So when the city's two primary groundwater pumps failed in the middle of an uncommonly hot summer, it was a big deal: Othello consumes nearly four million gallons of water per day, and it had only six million gallons in reserve. Through June and most of July, while a contractor worked feverishly to get the pumps running again, the city rationed water, restricting lawn watering and curtailing what it could send agricultural processors, which consumed 60 percent of the municipal supply. Once the crisis was over, however, city officials knew they needed to address the sustainability of Othello's water management plan.

"It caused us to realize two things," says Logan. "We realized that we didn't have enough storage capacity for the town . . . and that we were 100 percent dependent on groundwater, so we needed to diversify our supply."

Those two problems were exacerbated by the fact that more and more wells (and new residents taking new jobs at expanding potato processing plants) were simply sucking the aquifer dry—not just in Othello, but all across the region. Groundwater levels in the Columbia Basin have generally been declining for decades, as wells have been drilled deeper and deeper to irrigate farmland and provide potable water to cities and towns. The Western Regional Climate Center describes this area as the "lowest and driest section of Washington," and despite modest summer rain and 10 to 35 inches of snow each winter, notes that "it is not unusual for four to six weeks to pass without measurable rainfall" during the hot summer months. And those months have been getting hotter and drier. Simply put: there's not enough supply to meet the Columbia Basin's demand, and the problem is only expected to get worse.

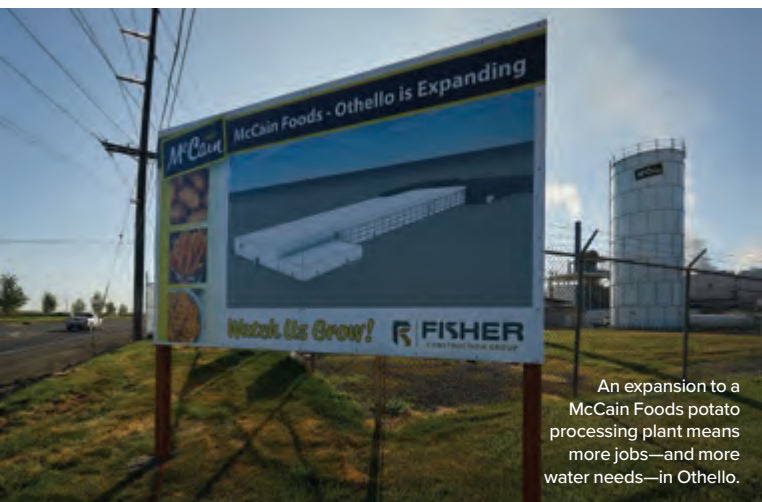
"There's not a lot of recharge that happens in these aquifers," explains Ben Serr, a senior planner with Growth Management Services, who has been conducting outreach to drinking-water providers in the Columbia Basin around groundwater depletion. "The Columbia Basin Ground Water Management Area commissioned studies to carbon-date the water, and on average, the water was 9,000 years old. So basically, if you've got an enclosed source of water and a bunch of straws stuck into it, and if you keep drinking from those straws, eventually your water runs out."

HOPING TO PREEMPT THAT OUTCOME, in May the state Legislature allocated \$15 million from its capital budget—the first installment of \$40 million in funding that the Columbia River Water Supply Development Program will receive between 2019 and 2021—to build a canal, a booster pump station, and an electrical substation that will divert water from the Columbia to farms in the region as an alternative to tapping wells for irrigation. The plan, being overseen by the Department of Ecology, also includes a pipeline with the capacity to irrigate 16,000 acres of farmland near Moses Lake, 25 miles north of Othello.

Four months earlier, state Representative Mary Dye—a Republican from Pomeroy whose district encompasses Othello—had an audience with high-ranking members of the Trump administration to discuss the completion of a long-shelved Grand Coulee Dam irrigation project. Part of the Columbia Basin Project—which encompasses the dam, Franklin D. Roosevelt Lake, three power plants, four switchyards, and a pump-generating plant—the Grand Coulee currently provides water to irrigate 670,000 acres in east central Washington. While substantial, that coverage falls far short of the 1.1 million acres of farmland the dam was intended to irrigate when the Columbia Basin Project was authorized in 1943. In the 1960s, the state issued temporary well-water rights to farmers in the region, assuming that once the project was completed, farmers would switch to river water for irrigation. But construction stalled, funds were diverted elsewhere, and the full vision of the Columbia Basin Project never materialized, leaving regional farms to rely on well water for irrigation—even to this day.

WE REALIZED THAT WE WERE 100 PERCENT DEPENDENT ON GROUNDWATER, SO WE NEEDED TO DIVERSIFY OUR SUPPLY.

—SHAWN LOGAN OTHELLO MAYOR



An expansion to a McCain Foods potato processing plant means more jobs—and more water needs—in Othello.

large amounts of water, but also looking at opportunities for capturing stormwater—preventing runoff and all the water quality and flood risks associated with that. Other pieces around water-smart cities include reusing water and landscaping city parks, homes, or commercial areas with low-water-use plants or climate-appropriate plants.

What cities are doing this already?

Philadelphia is a great example; on the stormwater side, they've made a lot of investments around green infrastructure and distributed infrastructure. Los Angeles has also made a commitment to eliminate their wastewater discharge, so they're looking at opportunities to both reduce the amount of wastewater they're producing and recycle and reuse that water; they just passed a tax last year that's enabled them to invest in some of these stormwater and green infrastructure projects. San Francisco has also done some interesting work around on-site water systems in new, large buildings. They still have some way to go, but they've made some real improvements.

What about rural cities that lack the resources to overhaul water management systems?

That is one of the challenges, and one

of the things I am hopeful about is that we're beginning to acknowledge the needs of smaller communities. In California, we've had a water shortage contingency plan and requirements around developing those for some of the larger utilities, and we haven't had similar requirements for the small utilities because it was thought to be difficult for them to develop such plans. But that's changing. The state just passed legislation last year requiring some type of planning at the local level, and there's a process under way right now of bringing together county governments and other stakeholders to start to talk about what type of planning we need to do specifically for water shortages.

Is there any sort of silver lining for cities large and small when it comes to planning for climate change?

Our infrastructure is aging, and there's a need to replace it whether it's treatment plants or water distribution pipes, so there's an opportunity to rethink this stuff. Perhaps that's even building smaller treatment plants—if we're dealing with the demand management and some of the efficiency changes—and reimagining some of these systems to build a more resilient community given the uncertainty we're facing right now.



Workers at the drilling site for Othello's new well

DRILLING THIS NEXT WELL AND DOING THE WATER RESERVOIR: THAT'S THE IMMEDIATE PLAN.

—SHAWN LOGAN OTHELLO MAYOR

Completing the Columbia Basin Project, however, has its own unique issues. Environmental groups oppose it, fearing that diverting water from the Columbia for irrigation will further stress the river's salmon population, which has seen a precipitous decline since the dam was put in place, and will threaten treaty-protected fishing rights of Native American tribes in the area. Despite those concerns, Rep. Dye would like the federal government to earmark \$10 million annually over five years to the project, citing the completion of the Columbia Basin Project as a "total game changer for the state."

Back in Othello, Mayor Logan isn't waiting to see whether ambitious plans like completion of the Columbia Basin Project will ever materialize. Not long after the city's water pump failure in 2015, Othello partnered with regional state legislative leaders, the Governor's Office, and the state departments of Commerce, Health, and Ecology to develop a long-term strategy to secure its water supply to sustain projected growth for the next 75 years.

The plans entail a multistage reimagining and overhaul of the city's water management system that includes drilling a new well to feed a brand-new, 3 million-gallon reservoir. It also includes constructing a state-of-the-art, 12,000-square-foot water treatment pilot test plant that will recycle up to 200,000 gallons per day of wastewater into graywater for irrigation, plus an additional 200,000 gallons per day into potable water that will be injected back into the aquifer via a process known as Aquifer Storage and Recovery (ASR). Cost estimates range from \$23 million to \$50 million for the wastewater reuse system (depending on what capacity the facility ends up being constructed to handle per day) and an additional \$2 million to \$3 million for the ASR system.

"This is an expensive problem, and we don't have it fixed yet—

we're still 100 percent dependent on groundwater," says Logan. "We needed to have an immediate plan and an intermediate plan, and then we needed a long-term plan. And drilling this next well and doing the water reservoir: that's the immediate plan."

Looking to the future, the city has held discussions with McCain Foods about diverting treated effluent from its expanded potato processing facility to the city's new treatment plant, which would then end up being injected back into the ground to recharge the aquifer.

"There are a lot of pieces; it involves a lot of permitting and a lot of cooperation and coordination," explains Logan. "But we're confident in our regulatory team—which includes the Governor's Office, the Department of Health, the Department of Ecology, and the Office of Columbia River—and we're all working together toward solutions to become a model for the rest of the state in areas that are experiencing declining groundwater."

And that's the thing—Othello *thinks* its plan will work, but currently there isn't a comparable system anywhere in eastern Washington to use as a blueprint. Still, the city isn't going it alone; Othello's city engineer sits on the steering committee of the Columbia Basin Sustainable Water Coalition, a nascent regional stakeholder group with representatives from Grant, Lincoln, Adams, and Franklin counties and members advocating for agricultural and environmental interests.

"The stakeholder coalition is to keep this issue in the forefront and to continue working on it," says the Department of Commerce's Serr, who helped organize the group. "Othello has been great to work with; they are one of the leaders that have really stepped up in the area... I've been really impressed by the level of effort they've thrown behind this issue."

IF PRESENT TRENDS CONTINUE, summers will continue to heat up, underground water supplies will continue to dwindle, and the region's population and industry will continue to grow. So it's easy to understand when local leaders in Othello say they don't see any other way but to address their water issues head-on.

Neither do electeds in Hamilton, even if their challenges are distinct. They're not waiting around for the next flood before they act to find a long-term solution to a perennial problem that has stunted the town's growth and is only expected to worsen as the climate changes.

"A lot of people will look at this and say, 'Well, why can't you raise every single house and continue where you are?'" says Mayor Cromley. "But the limitation of the floodplain has really kept the town from growing the way that every other community in the state of Washington is growing, and Forterra has been working really hard to make sure this is a viable project for the future of our community."

In Othello, Mayor Logan echoes that forward thinking.

"We want to establish a minimum of a 50-year water supply that takes care of not only what we currently have here, but also the growth that is going to take place in the next 50 years," he says. "We're trying to be innovative and creative, and we're letting industry know: you have a future here in Othello."

And if everything goes according to plan, they may even have some water to spare. **C**

Citywise



Expanding bioretention won't return the Puget Sound region to a pristine, premodern past. But it can mitigate and reduce some of the harmful effects of urban life on our rivers, streams, and receiving waters.

—CITY 101 P.22 ▶

22 BENEFITING FROM BIORETENTION **24** FINDING GREEN INFRASTRUCTURE INNOVATION
26 ADDRESSING CLIMATE CHANGE AT THE LOCAL LEVEL



Soil Filter

Bioretention uses plants, microbes, and a specific mixture of soils to mimic the natural systems that have helped maintain healthy Northwest ecosystems for millennia. Some of the benefits in our era include:

- Reduces loading to stormwater pipe systems
- Alleviates flooding
- Reduces the amount of sediment and contaminants reaching receiving waters and biota
- Introduces and benefits more native plants and wildlife
- Prevents acute toxicity to salmon
- Enhances aesthetics

RUNOFF HOME RUN

Bioretention as a winning focus for local ecosystem protection

BRANDI LUBLINER WASHINGTON DEPARTMENT OF ECOLOGY

THE PUGET SOUND AREA hasn't always been this way. There were no highways 300 years ago. There were more trees. There were fewer people, fewer rooftops, and fewer hard surfaces for the rain to splash against as it meandered its way down to the saltwater.

As the population has increased, contaminants have also increased. Fertilizer from lawns meets up with grease from cars and restaurants in our storm drains. Meanwhile, stormwater managers do their best to deal with the increased runoff resulting from more and more hardened surfaces.

Scientists have studied these issues for several decades, considering various stormwater management techniques. We can't turn back the clock, converting all that concrete and compacted soil back to loamy fields and forest floors. But we've discovered that there are things we can do, inspired by our area's native landscape, to create meaningful and positive impacts. Through a method known as bioretention, residents of the Puget Sound region (human and otherwise) can realize a host of benefits, including less strain on stormwater systems, reduced flooding, reduced contaminants, reduced toxicity to salmon, more habitat and shade, and urban beautification.

Bioretention is one way of mimicking the premodern natural management of rainfall and runoff. Rather than having large, centralized facilities like detention ponds, bioretention is decentralized—treating and infiltrating stormwater close to where the rain lands. Bioretention uses plants, microbes, and soils to reduce the harmful effects of stormwater runoff. Not only does this keep toxic compounds out of Puget Sound, but it also reduces stress on municipal stormwater systems.

As you might imagine, bioretention

facilities work best when they are well designed and properly maintained. But to our delight, we've found that even undersized or atypical designs for bioretention are very effective. These facilities do more to control and treat runoff than we anticipated.

So, what can you do? Washington's city leaders can increase bioretention in many ways. Cities and towns can identify municipally owned properties that are

WE'VE DISCOVERED THAT THERE ARE THINGS WE CAN DO, INSPIRED BY OUR AREA'S NATIVE LANDSCAPE, TO CREATE MEANINGFUL AND POSITIVE IMPACTS.

well suited for bioretention, and they can encourage private developers to think about stormwater management at the beginning of the design process to make the most use of bioretention. Cities can also encourage businesses and residents to install new bioretention features and to maintain existing ones. For example, Bellingham provides financial incentives for bioretention that meets specific requirements.

Expanding bioretention won't return the Puget Sound region to a pristine, premodern past. But it can mitigate and reduce some of the harmful effects of urban life on our rivers, streams, and receiving waters. City leaders should consider encouraging bioretention, either directly or indirectly, in new projects and in redevelopments, restorations, and retrofits. **C**

Brandi Lubliner is a stormwater engineer and managing coordinator of the Stormwater Action Monitoring program with the Washington Department of Ecology.



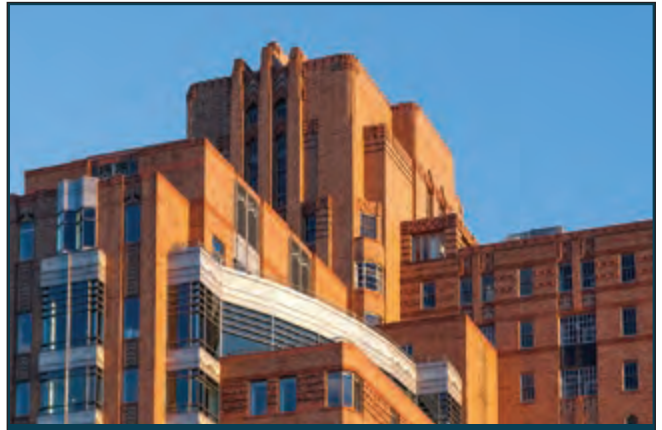


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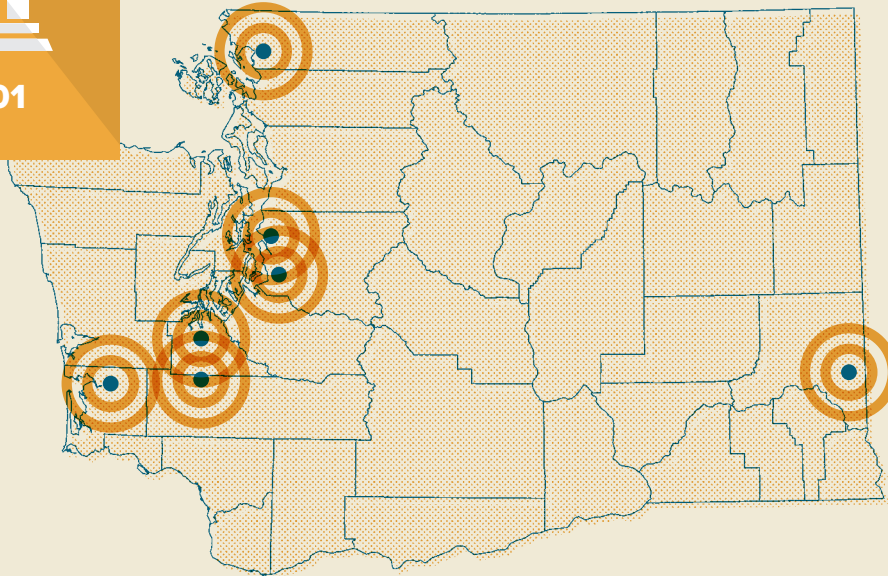
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PROJECT PLACEMENT

A new tool from CSI highlights green infrastructure initiatives.

LISA MCCRUMMEN CENTER FOR SUSTAINABLE INFRASTRUCTURE



CITIES AND TOWNS

across Washington are taking tangible steps to get much more value from their infrastructure investments—while also supporting a more sustainable future. In large and small communities, city leaders are now demonstrating how infrastructure can better support health and environmental priorities, keep communities safe from storms and other disruptions, optimize local resources, and save money.

Take, for example, Half Moon Park in the City of Liberty Lake. This public park incorporates bioswale landscaping, using plants and soil to filter out pollutants and contaminants from stormwater. In fact, the park filters 100 percent of the site's stormwater, resulting in up to 9 percent cost savings for the city. Beyond the environmental and financial benefits, Half Moon Park delivers unique

amenities to residents, such as pipes that audibly move water throughout the park, connecting visitors to the force of water.

Typical of green infrastructure, the design of Half Moon Park is integrative. The landscaping and drainage aren't treated simply as problems to be solved, separate from the public-service purpose of the park. Instead, they become intentional features of the park, enhancing the project's appeal and utility for the community.

Such forward-thinking projects offer tremendous benefits, because as anyone familiar with municipal government knows, infrastructure is a huge part of a city's budget. Fortunately here in Washington, the Center for Sustainable Infrastructure (CSI) works with and encourages communities, agencies, and others to embrace a new 21st-century infrastructure vision—one that delivers more community value through

innovative solutions that get the job done at the same or lower cost.

As part of that effort, CSI has created a helpful new tool—a data map, accessible at sustaininfrastructure.org/virtualltour—that gives high-level information on sustainable infrastructure projects across the state. Listed below are just a few of Washington's innovative projects:

THE DESIGN OF HALF MOON PARK IS INTEGRATIVE. THE LANDSCAPING AND DRAINAGE AREN'T TREATED SIMPLY AS PROBLEMS TO BE SOLVED; INSTEAD, THEY BECOME INTENTIONAL FEATURES OF THE PARK, ENHANCING THE PROJECT'S APPEAL AND UTILITY FOR THE COMMUNITY.

WATER

City of Tumwater - Deschutes Valley Park Project

This park—a collaboration between the City of Tumwater and the LOTT Clean Water Alliance—contains a water



reclamation tank that irrigates the nearby golf course while providing a community space. The result is cost savings for the city and reduced runoff of nitrogen into Budd Inlet.

City of Raymond - Pacific Gro Project

This project uses waste fish, crab, and shrimp to make fertilizer through cold enzymatic digestion. As per the name, the catch scrap comes from the Pacific Ocean along the coast of Washington and Oregon.

ENERGY

City of Pullman - Northwest Smart Grid Demonstration Project

This five-year, \$178 million Smart Grid project helped save energy throughout the grid while empowering consumers to save money with choices and knowledge of their energy consumption.

City of Centralia - Tono Solar Project

This proposed solar project, slated to be constructed in Centralia by Transalta, represents a potential 180-megawatt increase to the state's sustainable energy portfolio. Not only is the current site for

this project unused, but it is also the site of a now-closed coal mine. This project would continue the site's history of energy production in a newer, cleaner way.

WASTE

City of Kent - Styro Recycle

Styro Recycle LLC accepts Styrofoam blocks and packing peanuts from the public for free. Clean and dry number six Styrofoam can be dropped off for recycling at their location in Kent, where it is then ground up and processed to be sold for use in new products.

City of Seattle - Seattle Food Rescue

Seattle Food Rescue is a nonprofit organization that redistributes donated food to communities in need. Volunteers across Seattle pick up food via bicycle at donor locations, then drop it off to recipient communities nearby. This organization primarily focuses on perishable foods with high nutritional value.

TRANSPORTATION

City of Bellingham - 25th Street Improvement Project

Recent improvements on 25th Street

included the construction of multimodal transportation infrastructure, such as a walking path and bike lanes. New methods dramatically reduced the environmental impact of the project, among other things by reducing stormwater issues and minimizing carbon dioxide exhaust. Over 70 percent of the materials used for the asphalt were reclaimed, significantly reducing both cost and environmental impact.

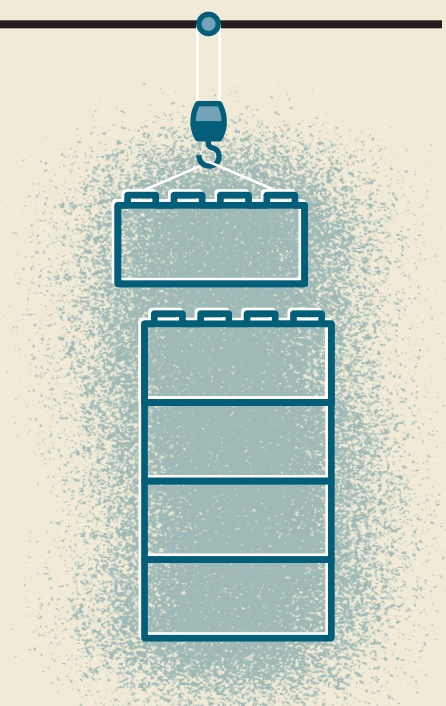
CSI developed the tool in the hopes that cities will use and share it. And cities can contact CSI (lisa@centerforsi.org) with any questions, ideas, or new projects they are interested in adding; CSI will continue to update the tool. **C**

Lisa McCrummen, CSI's director of marketing & strategic partnerships, has more than 25 years of experience in campaign strategy, strategic marketing and communications, and strategic partnership development and deployment for the government, nonprofit, and for-profit sectors.

Building Blocks

So what makes infrastructure green? It's not an official designation. Instead, it's a set of characteristics that—taken together—represent a revolutionary approach to the built environment. Green infrastructure is:

- **SUSTAINABLE**
It promotes the efficient use of natural resources.
- **AFFORDABLE**
Green doesn't have to mean expensive. Through thoughtful design, green infrastructure can save money in both construction and operation.
- **RESILIENT**
Not only is green infrastructure built to last, but it also increases the resiliency of the community that uses it.
- **INTEGRATED**
Green infrastructure is designed with a consideration for the other systems—natural and otherwise—with which it interacts.
- **EFFICIENT**
Green infrastructure can harness the power of natural systems directly by employing technologies that rely on living organisms, such as plants and bacteria, to accomplish functions that would otherwise require additional resources and energy.





Green Acres

In addition to working with state legislators and agencies, collaborating with neighboring cities, and encouraging private businesses to adapt sustainable practices, Lacey is taking many actions of its own to combat the effects of climate change. Here are some recent highlights:

- 4 new EV chargers installed
- 11 additional EV charging stations at 4 other locations planned for 2020, including some fast-charging stations
- Updated building codes that ensure new residential buildings will be solar ready
- Traffic signals converted to LED
- 34 percent of streetlights converted to LED
- 58 percent reduction in electrical usage once all streetlights have been converted

LEADING LIGHTS

How cities are acting to preserve their communities in the face of climate change

CYNTHIA PRATT DEPUTY MAYOR, LACEY

AS OUR RESIDENTS enjoyed what our cities offer in the way of outdoor music festivals, soccer and baseball games, and swimming in our parks during our recent summer months, city officials were busy preparing for more impacts from wildfire smoke, increased temperatures, and drought. These impacts are directly related to climate change.

Each year, we feel and see climate change more and more, from the smoke across the state to the increasing heat in my home city of Lacey. We are a Tree City, but our trees are becoming increasingly stressed by drought and heat. The more weakened a tree becomes, the less resilience it has to other stressors: insect outbreaks may cause tree mortality, and the loss of tree canopy reduces shade when we most need it.

The impacts on our cities' finances will become increasingly debilitating and could lead to major disruptions in our economy—and to city budgets and services. All of this influences our ability to thrive and sustain healthy communities.

Our mayors and city councils are on the front line of efforts to prepare our cities and communities for the realities of climate change. Many, like Lacey, are committed to strong reductions in greenhouse gas emissions. Our mayors and city councils are directly accountable to our constituents, and we can often be nimbler and more responsive to our collective needs. Our cities can be incubators of innovative solutions for better public transportation, cleaner and healthier buildings, smarter land use planning, and commitments to renewable energy. Here in Washington, many of our cities are already leading the nation, often collaborating with each other to make the most of our resources. After all, severe weather fluctuations don't stop at jurisdictional boundaries.

Many Washington cities are initiating new ideas. Spokane and Edmonds committed to 100 percent clean energy by 2030 and 2025, respectively. Many of us partnered with the state Legislature this year to pass groundbreaking policies committing the state to 100 percent clean electricity by 2045, setting a performance standard for large commercial buildings, and increasing air quality by reducing superpollutants. We need to continue to work together to encourage our state to

AFTER ALL, SEVERE WEATHER FLUCTUATIONS DON'T STOP AT JURISDICTIONAL BOUNDARIES.

take strong climate action by empowering and providing grants so that our cities can do more to protect our communities.

In my region, the cities of Lacey, Olympia, and Tumwater, along with Thurston County, have entered into a Regional Climate Mitigation Plan that will set limits on global warming pollution and goals of reducing 85 percent of emissions by 2050. It's important that our residents are engaged and part of the solution. An advisory committee that covers diverse groups will help, both with identifying solutions and finding gaps that need to be filled in order for the plan to succeed.

If municipalities do work on plans together, it's important to realize that each may need to evaluate different options. For instance, Olympia must address sea level rise, since their city sits at the base of Budd Inlet. Lacey sits higher; we have to address drought and heat waves impacting our trees, as well as water availability. All three of our jurisdictions and Thurston County are impacted by poor air quality from wildfires.



In addition, Lacey has partnered with Puget Sound Energy and other cities and businesses to support a wind project that will make our city operations net zero. We have completed a number of energy service projects through the Washington Department of Commerce (WDC) for our city buildings. The WDC provides a building inventory concerning which types of projects are needed in a city, then sets up loans.

We're also looking at businesses and office spaces as places to address climate and energy use. The Utility and Transportation Commission just had a ribbon cutting at a renovated office building in Lacey that has all LED lighting; a solar roof; extremely energy-efficient HVAC; air-sealed walls and ceilings; and a stormwater system that incorporates

roof runoff into porous swales, recharging groundwater. Encouraging developers to think about how they can save money by being more energy efficient and suggesting possible actions they might take will help make your city more sustainable.

And of course, the City of Lacey is taking action on its own—see “Green Acres” at left for some of the details. We recognize that addressing climate change in our city planning is not just good for the environment; it’s good for our health and budgets, too. Greater energy efficiency in our buildings means lower costs, and promoting renewable energy decreases emissions from power plants statewide.

Our cities will continue to deal with the challenges of sustainable growth,

social mobility, economic development, and climate change. I look forward to completing our Regional Climate Mitigation Plan and seeing the results. In the meantime, I hope I can be a positive influence on our residents, encouraging them to take steps to reduce greenhouse emissions. I’m optimistic that we can reduce the effects of climate change and protect our communities as long as we keep taking steps, small and large, to be sustainable. **C**

Lacey Deputy Mayor Cynthia Pratt sits on the *Thurston Thrives Energy Efficiency and Climate subcommittee*, is the *Lacey representative on the Regional Climate Mitigation Plan Steering Committee*, and is a member of *National League of Cities’ Energy, Environment and Natural Resources Advocacy Committee*.

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Cityscape

Natural Wonder

A massive neighbor and tribal traditions of stewardship testify to the challenges and rewards of addressing climate change.

SOARING 191 FEET ABOVE

the mossy floor of the Olympic National Forest on the shores of Lake Quinault, the world's largest Sitka spruce isn't just gigantic, it's ancient: perhaps 1,000 years old. Still, the ancestors of the Quinault Indian Nation walked this land for hundreds of generations before that tree was a sapling. You might call the Quinault the first stewards of this sacred place.

Seven years ago, at the inaugural First Stewards symposium on climate change in Washington, DC, Quinault Tribal President Fawn Sharp told a gathering of Native American and US congressional leaders about a helicopter trip she took over the Olympic Mountains to see the Anderson Glacier. She described the shock she felt upon discovering that the glacier, which once fed the Quinault River and the salmon her tribe subsisted on for millennia, had melted away.

"I can't imagine trying to explain to another generation of Quinaults how our rich blueback salmon tasted," she said. "The only salmon in the world that has that taste, that texture, and has that connection to the Quinault people."

There's a short video documentary of Sharp's speech archived on the website of the tribe's Quinault Climate Change Project, which articulates the many climate-related challenges facing Washington's indigenous peoples. The project also promotes a



The world's largest Sitka Spruce in the Olympic National Forest

long-term goal of creating "a healthy resilient environment and a community of elders, families and children with the capacity to adapt to climate change."

In her keynote address at the symposium, Sen. Maria Cantwell said the gathering reminded her of Washington's motto, *alki*, a Native American word inscribed on the state's territorial seal that translates as "hope for the future." The Lake Quinault spruce symbolizes that hope. And the challenge of tackling climate change is evoked by the challenge of hugging that tree, at nearly 60 feet in diameter: we can only succeed if we all join hands in a collective embrace. [C](#)



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