Webinar

Water Wise Development Coalition Meeting - 8

Date: February 12, 2025

00:00:12 --> 00:00:14:	Hello, everyone, and welcome.
00:00:14 --> 00:00:18:	Thank you for joining us for Ulis Water Wise Development
00:00:18 --> 00:00:18:	Coalition.
00:00:19 --> 00:00:22:	I'm Marian Epig, Senior Director of Resilience for the Urban
00:00:22 --> 00:00:25:	Land Institute, and we are so excited that you're joining
00:00:25 --> 00:00:26:	us here today.
00:00:26 --> 00:00:29:	If you don't mind, we'd love for you to take
00:00:29 --> 00:00:32:	a moment to put in your name, organization, and where
00:00:32 --> 00:00:35:	you're calling in from today in the chat box.
00:00:40 --> 00:00:43:	We have quite a few new people joining us for
00:00:43 --> 00:00:46:	this meeting, so I thought I'd just take a moment
00:00:46 --> 00:00:49:	to talk a little bit about ULIULI is a global
00:00:49 --> 00:00:53:	nonprofit and we're focused on responsible land use and sustainable
00:00:53 --> 00:00:54:	development.
00:00:56 --> 00:01:00:	We have members all around the world, over 48,000 members
00:01:00 --> 00:01:04:	and they really span the gamut in terms of land
00:01:04 --> 00:01:10:	use professions, including developers, architects, Lanners, et cetera, et cetera.
00:01:10 --> 00:01:11:	You can see this chart.
00:01:13 --> 00:01:17:	I work for UI's Urban Resilience program, which focuses focuses
00:01:17 --> 00:01:21:	on how building cities and communities can be more resilient
00:01:21 --> 00:01:25:	to the impacts of climate change and other environmental vulnerabilities.
00:01:25 --> 00:01:29:	We do this by advancing industry understanding of resilience, cultivating
00:01:29 --> 00:01:34:	champions for resilience, and supporting communities and becoming more climate
00:01:34 --> 00:01:35:	resilience.
00:01:35 --> 00:01:39:	We've published a lot of reports on climate resilience.
00:01:39 --> 00:01:42:	Some of the covers you can see down here and

00:01:42 --> 00:01:45:	most of them are available for free on our website.
00:01:47 --> 00:01:51:	The Water Wise Development Coalition was created after we published
00:01:51 --> 00:01:56:	this report on water wise strategies for drought resilient development.
00:01:56 --> 00:01:59:	And this is all basically a how to guide on
00:01:59 --> 00:02:03:	how to do water wise, real estate development and also
00:02:03 --> 00:02:04:	land use.
00:02:04 --> 00:02:06:	And it's free and available to anyone.
00:02:09 --> 00:02:12:	If you're interested on other types of water issues like
00:02:13 --> 00:02:16:	flooding and coastal resilience, we have other reports that are
00:02:16 --> 00:02:17:	available.
00:02:17 --> 00:02:18:	I put a few on the screen.
00:02:18 --> 00:02:22:	Harvesting the value of water is really about flooding and
00:02:22 --> 00:02:24:	surge is about coastal resilience.
00:02:24 --> 00:02:27:	And we have many other resources available for flood resilience
00:02:27 --> 00:02:29:	at the QR code on the right.
00:02:30 --> 00:02:35:	This coalition, though, is primarily focused on how do we
00:02:35 --> 00:02:38:	be more efficient and conserve water.
00:02:39 --> 00:02:43:	And we started this coalition in partnership with the Alliance
00:02:43 --> 00:02:46:	for Water Efficiency, the Sonoran Institute, and the Water Now
00:02:46 --> 00:02:50:	Alliance to convene land use and real estate professionals with
00:02:50 --> 00:02:54:	public sector decision makers to advance water smart real estate
00:02:54 --> 00:02:56:	development and supportive policies.
00:02:57 --> 00:03:01:	So if you're new to the coalition, we meet quarterly
00:03:01 --> 00:03:04:	on Zoom and participants have a say in meeting topics.
00:03:04 --> 00:03:07:	So we hope that you'll stick with us over time.
00:03:10 --> 00:03:14:	Today's agenda is packed with amazing speakers all talking about
00:03:14 --> 00:03:17:	how we can use data to improve our land use
00:03:17 --> 00:03:20:	and water use decision making.
00:03:21 --> 00:03:23:	We'll have a handful of speakers.
00:03:23 --> 00:03:26:	The first presentation will be by Merrill Corbin from the
00:03:26 --> 00:03:29:	Sonoran Institute and Abby Neil from Brendel Group, and they'll
00:03:29 --> 00:03:32:	be talking about Sonoran Institute's metrics project.
00:03:33 --> 00:03:37:	Faith Sternlieb and Emily Wiggins from the Center for Geospatial
00:03:37 --> 00:03:42:	Spatial Solutions at the Lincoln Institute of Land Policy will
00:03:42 --> 00:03:45:	be presenting their water data resources.

00:03:45 --> 00:03:48:	And then Mazda Karabi from the One Water Solutions Institute
00:03:49 --> 00:03:52:	at the Colorado State University will be talking about water
00:03:52 --> 00:03:55:	forecasting for land use decision making with their tools that
00:03:55 --> 00:03:59:	they've developed and lessons learned from the communities that they've
00:03:59 --> 00:04:00:	worked with.
00:04:01 --> 00:04:04:	And we'll follow these presentations with individual Q and As
00:04:04 --> 00:04:07:	after each presentation, but then also group discussion and resource
00:04:07 --> 00:04:08:	sharing at the end.
00:04:09 --> 00:04:11:	So we hope you'll stay with us for the hour
00:04:11 --> 00:04:11:	and a half.
00:04:14 --> 00:04:17:	And I'm going to turn it over to our first
00:04:17 --> 00:04:21:	set of speakers from the Sonoran Institute's Metrics project.
00:04:23 --> 00:04:26:	And if you're just joining us, we ask that you
00:04:26 --> 00:04:29:	please put in your name, organization and where you're calling
00:04:29 --> 00:04:30:	in from into the chat box.
00:04:31 --> 00:04:35:	And also, please feel free during the presentations and after
00:04:35 --> 00:04:38:	to use the chat box for questions and comments, but
00:04:38 --> 00:04:41:	we'll also have verbal Q&A after each presentation.
00:04:43 --> 00:04:43:	Go ahead, Meryl.
00:04:44 --> 00:04:45:	All right, Can you see my screen?
00:04:46 --> 00:04:47:	OK, great.
00:04:47 --> 00:04:51:	Thanks, Marianne, and thank you all for joining us today.
00:04:52 --> 00:04:53:	My name is Meryl Corbin.
00:04:53 --> 00:04:55:	I am the Director of the Growing Water Smart program
00:04:55 --> 00:04:56:	at the Snoring Institute.
00:04:57 --> 00:04:59:	And joining me today is Abby Neal.
00:04:59 --> 00:05:02:	She's the lead water resource engineer with the Brindle Group
00:05:02 --> 00:05:04:	and Metrics program team member.
00:05:04 --> 00:05:07:	And we're here to talk about our Growing Water Smart
00:05:07 --> 00:05:09:	Metrics technical assistance program.
00:05:12 --> 00:05:13:	OK.
00:05:13 --> 00:05:15:	But first, I wanted to provide a little bit of
00:05:15 --> 00:05:18:	background about the Snoring Institute and the Growing Water Smart
00:05:18 --> 00:05:18:	program.
00:05:18 --> 00:05:22:	So the Snoring Institute has nearly 35 years of experience
00:05:22 --> 00:05:27:	working in the Western US and Northern Mexico on conservation

00:05:27 --> 00:05:28:	efficiency issues.
00:05:28 --> 00:05:31:	And our mission is to connect people and communities with
00:05:31 --> 00:05:34:	the natural resources that nourish and sustain them.
00:05:34 --> 00:05:37:	And we do this through four programs, but we're here
00:05:38 --> 00:05:40:	today to talk about Growing Water Smart, which is a
00:05:41 --> 00:05:45:	training and assistance program that empowers local leaders to develop
00:05:45 --> 00:05:49:	plans and policies to support community, community and Regional Water
00:05:49 --> 00:05:49:	resilience.
00:05:50 --> 00:05:53:	It was developed in 2017 with the Sonoran Institute and
00:05:53 --> 00:05:56:	the Babbitt Center for Land and Water Policy, which is
00:05:56 --> 00:05:59:	a center at the Lincoln Institute of Land Policy.
00:06:00 --> 00:06:04:	And a key component to help communities advance their land
00:06:04 --> 00:06:08:	use plans and policies is to provide them with technical
00:06:08 --> 00:06:12:	assistance to help them make data-driven decisions.
00:06:12 --> 00:06:15:	And in 2020, we created the Metrics Program, which is
00:06:15 --> 00:06:20:	a technical assistance program that helps track the quantity, quality
00:06:20 --> 00:06:24:	and impact of integrated water and land use planning.
00:06:25 --> 00:06:28:	And we'll talk today about this effort in with a
00:06:28 --> 00:06:32:	case study for with Fort Lupton Co who have attended
00:06:32 --> 00:06:35:	2 workshops in between those two workshops.
00:06:35 --> 00:06:37:	They were a Metrics program partner.
00:06:40 --> 00:06:44:	So Growing Water Smart focuses on, I'm getting pop up
00:06:44 --> 00:06:46:	from the chats.
00:06:46 --> 00:06:47:	Let me try to minimize this.
00:06:47 --> 00:06:50:	OK, so Growing Water Smart focuses on the power of
00:06:50 --> 00:06:54:	land use planning and water resource management and in particular,
00:06:54 --> 00:06:56:	where these two fields overlap.
00:06:56 --> 00:07:00:	And we believe that integrating water resource management into where
00:07:00 --> 00:07:04:	and how we develop and redevelop can reduce water demand
00:07:04 --> 00:07:09:	while creating more resilience and sustainable and equitable communities.
00:07:12 --> 00:07:14:	And we do that through 5 strategies.
00:07:14 --> 00:07:19:	We've identified water smart planning, adequate and sustainable water supply
00:07:19 --> 00:07:24:	standards, water smart land use policies, protecting and enhancing river
00:07:24 --> 00:07:28:	and watershed health, and efficient water demand programs

	as key
00:07:29 --> 00:07:33:	ways of providing communities with tools to develop plans and
00:07:33 --> 00:07:37:	policies that are best suited for those communities and to
00:07:37 --> 00:07:41:	create more integrated approach to linking water and land use
00:07:41 --> 00:07:44:	to with the end effort of reducing demand.
00:07:46 --> 00:07:50:	And so we hold growing water smart workshops throughout Colorado,
00:07:51 --> 00:07:54:	Arizona, California and along the US Mexico border.
00:07:54 --> 00:07:58:	And we've seen trends in these regions within these five
00:07:58 --> 00:07:58:	strategies.
00:07:59 --> 00:08:02:	So I wanted to highlight the trends that we're seeing
00:08:02 --> 00:08:05:	as well as the, the, the data needs that would
00:08:05 --> 00:08:09:	be helpful to address those trends or potential policies and
00:08:09 --> 00:08:10:	then those outcomes.
00:08:11 --> 00:08:15:	So our first strategy is water smart planning and communities
00:08:15 --> 00:08:19:	can create guiding plans to integrate land use planning and
00:08:19 --> 00:08:21:	water efficiency and conservation plans.
00:08:22 --> 00:08:27:	So we're seeing that communities outgrowing water smart workshops identify
00:08:27 --> 00:08:30:	the the need to understand municipal water to serve their
00:08:30 --> 00:08:32:	their current demand trends.
00:08:33 --> 00:08:36:	And so a data need around this is how the
00:08:36 --> 00:08:41:	amount of water that a water provider distributes to serve
00:08:41 --> 00:08:45:	municipal demands and linking that with per capita demand and
00:08:45 --> 00:08:47:	a potential outcome.
00:08:48 --> 00:08:51:	Excuse me, let me catch, let me catch my breath
00:08:51 --> 00:08:51:	one second.
00:08:55 --> 00:08:58:	An outcome for this metric is really the basis for
00:08:58 --> 00:09:02:	understanding water use and water efficiency and conservation trends over
00:09:02 --> 00:09:04:	a longer period of time.
00:09:06 --> 00:09:11:	The next strategy is adequate and sustainable water supply standards,
00:09:11 --> 00:09:15:	which ensures that the development has demonstrated that it has
00:09:15 --> 00:09:17:	enough water to sustain that development.
00:09:18 --> 00:09:22:	And we're seeing that communities really want to understand, does
00:09:22 --> 00:09:26:	their community, their region or the state at large have
00:09:26 --> 00:09:30:	reliable water supply to meet their municipal demands.
00:09:30 --> 00:09:34:	And so some key data needs are hydrologic and water

00:09:34 --> 00:09:38:	allocation models with the end goal or outcome of adopting
00:09:38 --> 00:09:43:	adequate water supply rules, linking water supply to to development.
00:09:45 --> 00:09:48:	The next strategy is water smart land use policies.
00:09:48 --> 00:09:52:	So this is really addressing urban form, outdoor water use,
00:09:52 --> 00:09:56:	indoor water use and new and new development and redevelopment.
00:09:57 --> 00:10:00:	And a trend that we're seeing is communities are really
00:10:00 --> 00:10:02:	focused on outdoor water use.
00:10:02 --> 00:10:06:	So how much water are they currently allocating or using
00:10:06 --> 00:10:07:	for outdoor?
00:10:08 --> 00:10:11:	And a key data need is understanding the total water
00:10:11 --> 00:10:13:	distributed and billing and meter information.
00:10:14 --> 00:10:18:	And what we're seeing are otential outcomes are landscape codes
00:10:18 --> 00:10:21:	that require low water material, but also understanding like what
00:10:21 --> 00:10:24:	are those quantifiable savings over time.
00:10:28 --> 00:10:31:	The the next area of opportunity is, is using land
00:10:31 --> 00:10:34:	use plans and policies to protect and enhance watershed health.
00:10:34 --> 00:10:40:	So those opportunities include low impact development, green infrastructure, and
00:10:40 --> 00:10:43:	then really making strategic use of all water resources and
00:10:44 --> 00:10:44:	uses.
00:10:44 --> 00:10:49:	And we're seeing that communities are wanting to understand can
00:10:49 --> 00:10:52:	they align the white right water quality with the right
00:10:52 --> 00:10:54:	use within their system.
00:10:54 --> 00:10:58:	So I'm really focused on reusing water supplies and how
00:10:58 --> 00:11:03:	they can do that throughout the water supply, the water
00:11:03 --> 00:11:03:	chain.
00:11:03 --> 00:11:08:	So one data need is understanding total water distributed.
00:11:08 --> 00:11:12:	And then what reuse supplies or reclaimed or grey water
00:11:12 --> 00:11:13:	opportunities do you have?
00:11:14 --> 00:11:17:	And then how can you use that water for either
00:11:17 --> 00:11:21:	irrigation or cooling or other opportunities to reduce demand and
00:11:21 --> 00:11:24:	sort of use that water, kind of stretching the water
00:11:24 --> 00:11:27:	throughout your system to meet all of your needs?
00:11:29 --> 00:11:33:	The 5th and the last strategy that we've identified is,
00:11:33 --> 00:11:37:	you know, once a development is online, how can water
00:11:37 --> 00:11:43:	providers and communities support conservation and efficiency and through water

00:11:43 --> 00:11:45:	demand programs.
00:11:45 --> 00:11:49:	So this includes conservation oriented rate structures, but also educating
00:11:49 --> 00:11:53:	the community on their role and responsibility to be water
00:11:53 --> 00:11:53:	rise.
00:11:53 --> 00:11:56:	So we often see at workshops, a big part of
00:11:56 --> 00:11:59:	this is what is the community outreach and engagement look
00:11:59 --> 00:12:00:	like.
00:12:00 --> 00:12:03:	And one way or one trend that is quite popular
00:12:03 --> 00:12:08:	is really understanding like what are the conservation oriented rate
00:12:08 --> 00:12:11:	structures that can incentivize efficiency.
00:12:11 --> 00:12:15:	And when you're thinking about that, it's important to understand
00:12:15 --> 00:12:18:	what is the total water distributed and the per capita
00:12:18 --> 00:12:21:	water demands and that also link to the goals that
00:12:21 --> 00:12:21:	you have.
00:12:21 --> 00:12:24:	So are those more indoor programs?
00:12:24 --> 00:12:26:	Are they outdoor, are they landscape?
00:12:26 --> 00:12:29:	And there's lots of different community values that we have
00:12:29 --> 00:12:32:	to consider when thinking about water efficient demand programs.
00:12:34 --> 00:12:37:	And so I mentioned we wanted to talk about Fort
00:12:37 --> 00:12:38:	Lupton.
00:12:38 --> 00:12:42:	So one reason that we're we're highlighting this team and
00:12:42 --> 00:12:45:	using them as a case study is they had a
00:12:45 --> 00:12:48:	really diverse experience on their team roster.
00:12:48 --> 00:12:51:	So they had elected officials as well as land use
00:12:51 --> 00:12:56:	planners, engineers, utility billing managers, communication, marketing.
00:12:56 --> 00:12:59:	They really had A-Team that was diverse and brought a
00:13:00 --> 00:13:01:	lot of education and experience.
00:13:02 --> 00:13:07:	And they attended Growing Water Smarts in team May of
00:13:07 --> 00:13:08:	2023.
00:13:08 --> 00:13:11:	And then after that workshop, they, they really spent a
00:13:11 --> 00:13:13:	lot of their time focusing on what's the big picture,
00:13:14 --> 00:13:16:	what do we have, what are our current plans and
00:13:16 --> 00:13:18:	efforts and where can we find alignment.
00:13:18 --> 00:13:21:	And then they worked with the Sonoran Institute and the
00:13:21 --> 00:13:25:	Brindle Group on ATA project, which Abby will talk about
00:13:25 --> 00:13:26:	here in a moment.
00:13:27 --> 00:13:29:	And then they came back to Growing Water Smart.
00:13:29 --> 00:13:34:	So they attended Growing Water Smart in September of

	2024.
00:13:34 --> 00:13:37:	And they were you able to utilize the data that
00:13:37 --> 00:13:41:	they developed with the TA projects to understand, you know,
00:13:41 --> 00:13:46:	what are those opportunities to leverage this information across multiple
00:13:46 --> 00:13:50:	plans and have a more integrated water conservation effort across
00:13:50 --> 00:13:51:	the city.
00:13:51 --> 00:13:51:	OK.
00:13:55 --> 00:13:57:	So if this sounds interesting to you and you happen
00:13:57 --> 00:14:00:	to live on the West slope of Colorado, we do
00:14:00 --> 00:14:03:	have an upcoming workshop and this will be April 28th
00:14:03 --> 00:14:04:	through the 30th.
00:14:04 --> 00:14:06:	And we can talk a little bit about this more
00:14:06 --> 00:14:08:	at the end when we're talking about opportunities.
00:14:08 --> 00:14:11:	But if this sounds interesting to you, I'd be happy
00:14:11 --> 00:14:12:	to chat more.
00:14:14 --> 00:14:16:	With that, I will hand it over to Abby.
00:14:17 --> 00:14:17:	Great.
00:14:17 --> 00:14:18:	Thank you, Meryl.
00:14:19 --> 00:14:21:	I'm going to drop a link into the chat for
00:14:21 --> 00:14:25:	this Green Water Spark metrics guidebook that Meryl has mentioned
00:14:25 --> 00:14:28:	a couple of times, and I just would encourage you
00:14:28 --> 00:14:30:	all to take a look at it.
00:14:30 --> 00:14:31:	It is tailored to Colorado.
00:14:31 --> 00:14:34:	So I know we have a handful, a number of
00:14:34 --> 00:14:37:	folks who are not from Colorado on the call, but
00:14:37 --> 00:14:41:	a lot of the fundamental concepts in this metrics guidebook
00:14:41 --> 00:14:42:	do apply to everybody.
00:14:43 --> 00:14:47:	And today we're going to focus on a specific example
00:14:47 --> 00:14:51:	of a technical assistance offering that Sonoran has to support
00:14:51 --> 00:14:55:	communities and calculating some of the metrics that are outlined
00:14:55 --> 00:14:56:	in the guidebook.
00:14:57 --> 00:15:02:	So if you go to the next slide, please, there
00:15:02 --> 00:15:07:	are 24 different metrics in the guidebook.
00:15:08 --> 00:15:10:	I won't read through all of them here, but the
00:15:10 --> 00:15:15:	Snort Institute offers technical assistance to help communities, water providers
00:15:15 --> 00:15:18:	and other entities calculate what these metrics are.
00:15:19 --> 00:15:22:	If you go to the next slide, zoom through this

00:15:22 --> 00:15:25:	pretty quickly so we can get to the example it
00:15:25 --> 00:15:29:	that technical assistance takes the form of 6 to 8
00:15:29 --> 00:15:30:	months of assistance.
00:15:31 --> 00:15:32:	We open that up every August.
00:15:32 --> 00:15:34:	So if you get to the end of this and
00:15:34 --> 00:15:36:	you're super interested, be sure to look through look for
00:15:37 --> 00:15:39:	the next hopeful announcement that will be out in August.
00:15:39 --> 00:15:41:	I also want to have a shout out to the
00:15:41 --> 00:15:44:	Colorado Water Conservation Board that helps fund this program.
00:15:44 --> 00:15:48:	We've done 3 rounds so far supporting 6 different communities
00:15:48 --> 00:15:52:	and we're going to talk specifically about Fort Lepton today.
00:15:53 --> 00:15:57:	So on the next slide, these are some of the
00:15:57 --> 00:15:59:	high level program benefits.
00:15:59 --> 00:16:02:	If I were to distill it down super succinctly, the
00:16:02 --> 00:16:05:	whole goal of the program is to help communities, water
00:16:05 --> 00:16:10:	providers, entities make data, different data-driven decisions that help with
00:16:10 --> 00:16:13:	data management, tracking progress over time, as well as the
00:16:13 --> 00:16:17:	ability to invest resources where you're going to have the
00:16:17 --> 00:16:18:	most bang for your buck.
00:16:19 --> 00:16:21:	And then also how to communicate all of that out.
00:16:21 --> 00:16:23:	So how do you talk to your counsel, your Commission,
00:16:23 --> 00:16:27:	leadership, public about why you're making the decisions you're making
00:16:27 --> 00:16:29:	and the data behind those decisions?
00:16:30 --> 00:16:32:	On the next slide, you'll see kind of array of
00:16:33 --> 00:16:36:	the type of technical assistance that we can provide through
00:16:36 --> 00:16:36:	this program.
00:16:37 --> 00:16:41:	It has taken the form of everything from developing a
00:16:41 --> 00:16:44:	tool that helps entities track water use over time.
00:16:44 --> 00:16:47:	So let's say you change your code to make your
00:16:47 --> 00:16:50:	landscape standards more water efficient, and you need to see
00:16:50 --> 00:16:52:	if that is actually happening.
00:16:53 --> 00:16:55:	One of the forms of technical assistance that could come
00:16:55 --> 00:16:57:	from this program is tracking that to see if those
00:16:58 --> 00:16:59:	changes are making a difference.
00:17:00 --> 00:17:04:	We've also helped planners get a better understanding of what
00:17:04 --> 00:17:07:	a new development might use when it comes to water
00:17:07 --> 00:17:10:	use, how to estimate water demands by zone or future

00:17:10 --> 00:17:13:	land use, as well as some Policy Research to help
00:17:14 --> 00:17:18:	communities understand what tools they have in their toolkit to
00:17:18 --> 00:17:21:	advance integrated land use and water planning.
00:17:22 --> 00:17:25:	So on the next slide, the city of Fort Lupton,
00:17:25 --> 00:17:27:	I think I just want to call out a few
00:17:27 --> 00:17:30:	details about the city of Fort Lupton that does make
00:17:30 --> 00:17:31:	them unique.
00:17:31 --> 00:17:34:	The 1st is that I'll note that the city and
00:17:34 --> 00:17:36:	the water agency are the same.
00:17:36 --> 00:17:38:	So when your land use authority and your water use
00:17:38 --> 00:17:41:	authority are not the same, there's just some additional coordination
00:17:41 --> 00:17:43:	challenges for the city of Fort Lupton, they are the
00:17:43 --> 00:17:45:	same entity, which is awesome.
00:17:46 --> 00:17:48:	I think the other reason the city of Fort Lupton
00:17:48 --> 00:17:50:	is such a great success, in addition to the examples
00:17:50 --> 00:17:53:	that Merrill shared, is they had a really clear end
00:17:53 --> 00:17:54:	use in mind.
00:17:54 --> 00:17:57:	So they joined this program after going through the Growing
00:17:57 --> 00:18:01:	Water Smart workshop and they were updating a comprehensive plan
00:18:01 --> 00:18:04:	and they wanted to understand water demands by land use
00:18:04 --> 00:18:07:	and forecasted water demands by land use to inform that
00:18:07 --> 00:18:07:	process.
00:18:08 --> 00:18:11:	And it was clear and it had guardrails.
00:18:11 --> 00:18:13:	And so it let us stay really focused and do
00:18:13 --> 00:18:16:	a pretty deep dive into their water and land use
00:18:16 --> 00:18:17:	data.
00:18:18 --> 00:18:21:	So for those of you who might not be familiar
00:18:21 --> 00:18:24:	with Fort Lupton and Colorado, on the next slide is
00:18:24 --> 00:18:27:	just a map of Fort Lupton on the left and
00:18:27 --> 00:18:30:	as well as their future land use on the right.
00:18:31 --> 00:18:34:	Fort Lepton, for those who might not be familiar, is
00:18:34 --> 00:18:36:	located about 25 miles north of Denver.
00:18:36 --> 00:18:39:	I have that future land use map because again, their
00:18:39 --> 00:18:43:	goal was really to inform their comprehensive plan and understanding
00:18:43 --> 00:18:46:	how much water these future land use areas might use
00:18:46 --> 00:18:48:	in the future to help with their overall planning.
00:18:49 --> 00:18:53:	So on the next slide, I will do my best
00:18:53 --> 00:18:56:	to distill this process down succinctly.
00:18:57 --> 00:19:00:	I'll note it's not a simple process, as I'm sure

00:19:00 --> 00:19:03:	those on this call can appreciate, but the very first
00:19:03 --> 00:19:07:	step, which I'm a water resource engineer and a data
00:19:07 --> 00:19:10:	nerd, so I might be biased in this opinion, but
00:19:10 --> 00:19:13:	the very first thing for kind of any of this
00:19:13 --> 00:19:14:	is cleaning up your data.
00:19:14 --> 00:19:16:	So we spent a lot of time cleaning up our
00:19:17 --> 00:19:19:	water use data as well as the land use data.
00:19:19 --> 00:19:22:	You have to have good data in to get good
00:19:22 --> 00:19:23:	outcomes on the back end.
00:19:24 --> 00:19:26:	So that was the first step.
00:19:26 --> 00:19:29:	The second step was trying to figure out how to
00:19:29 --> 00:19:32:	integrate that water use data with land use data.
00:19:32 --> 00:19:35:	So we used water meters and we matched those to
00:19:36 --> 00:19:36:	zones.
00:19:36 --> 00:19:40:	We are doing everything on a parcel basis, which allowed
00:19:40 --> 00:19:42:	us to roll things up both on a per zone
00:19:42 --> 00:19:45:	basis as well as a future land use basis.
00:19:45 --> 00:19:48:	We made those ties we then needed to get from
00:19:49 --> 00:19:52:	current state, which is what we were using the zoning
00:19:52 --> 00:19:54:	data for, to future state.
00:19:54 --> 00:19:56:	So how do we get to that future land use
00:19:56 --> 00:19:56:	type?
00:19:57 --> 00:20:00:	So we did some work to match current zoning, the
00:20:00 --> 00:20:02:	future land use.
00:20:02 --> 00:20:04:	This is another one I'll highlight.
00:20:04 --> 00:20:07:	It sounds like that was very simple, but for all
00:20:07 --> 00:20:11:	the planners on the call, zoning to future land use
00:20:11 --> 00:20:12:	isn't 1 to one.
00:20:12 --> 00:20:15:	I'm not a planner, but we did some things like
00:20:15 --> 00:20:18:	reclassing PU DS that are kind of ambiguous.
00:20:19 --> 00:20:22:	We also took into consideration the fact that a future
00:20:22 --> 00:20:25:	land use might be representative of multiple zones.
00:20:25 --> 00:20:31:	So we said, all right, single family future land use,
00:20:31 --> 00:20:36:	maybe that's 10% zone R1, a 10% zone R2A and
00:20:36 --> 00:20:38:	7080% multi family.
00:20:38 --> 00:20:40:	So we did an exercise to figure out how to
00:20:40 --> 00:20:43:	slice and dice our zones to match to the future
00:20:43 --> 00:20:43:	land use.
00:20:44 --> 00:20:47:	That in turn allowed us to assign water use by
00:20:47 --> 00:20:51:	zone and then determine those future land use water use
00:20:52 --> 00:20:52:	assumptions.
00:20:54 --> 00:20:57:	So for those who might need some visuals on the

00:20:57 --> 00:20:59:	next slide, we can kind of run through some of
00:20:59 --> 00:21:01:	these as a high level, I don't have a cool
00:21:01 --> 00:21:04:	picture for cleaning water use data because that doesn't have
00:21:04 --> 00:21:06:	a cool picture associated with it.
00:21:06 --> 00:21:08:	But I will still say it's very important though.
00:21:08 --> 00:21:11:	Again, that first step was matching our meters to zones.
00:21:11 --> 00:21:14:	You can see Fort Lupton zones on the right.
00:21:15 --> 00:21:18:	We then took this zoning information and on the next
00:21:18 --> 00:21:21:	slide we were pairing that up to the future land
00:21:21 --> 00:21:21:	use types.
00:21:23 --> 00:21:27:	We also were identifying undeveloped parcels to by whether or
00:21:27 --> 00:21:29:	not they had a water meter.
00:21:29 --> 00:21:31:	So if they did not have a water meter, we
00:21:31 --> 00:21:33:	assumed they were undeveloped.
00:21:33 --> 00:21:35:	This was just important because if we had water use
00:21:36 --> 00:21:37:	data, we just use the water use data.
00:21:37 --> 00:21:41:	So we only applied to our assumptions to those undeveloped
00:21:41 --> 00:21:44:	parcels that you can see a little snippet of on
00:21:44 --> 00:21:45:	this slide.
00:21:48 --> 00:21:51:	And then the very next thing was tying water use
00:21:51 --> 00:21:52:	to this.
00:21:52 --> 00:21:55:	So again, we were using our water use by zones
00:21:55 --> 00:22:00:	to create that percentage mix of, you know, single family
00:22:00 --> 00:22:04:	R1, single family R1A to kind of mix and match.
00:22:04 --> 00:22:07:	And then finally we got some outputs with lots of
00:22:07 --> 00:22:09:	other little steps in between.
00:22:11 --> 00:22:12:	There's lots of ways to look at this data.
00:22:13 --> 00:22:16:	I I purposely cut off the legends just for data
00:22:16 --> 00:22:17:	privacy reasons.
00:22:17 --> 00:22:20:	But this is showing like total water use on a
00:22:21 --> 00:22:24:	parcel, so dark blue is more water use.
00:22:24 --> 00:22:28:	Unsurprisingly, larger parcels are having more water use because they
00:22:28 --> 00:22:28:	are bigger.
00:22:30 --> 00:22:34:	On the next slide, we also normalize things to acres.
00:22:34 --> 00:22:37:	So this is gallons per acre data and you can
00:22:37 --> 00:22:39:	see that our more dense developments.
00:22:39 --> 00:22:41:	So like our multi family, it does have a higher
00:22:41 --> 00:22:42:	water use intensity.
00:22:43 --> 00:22:46:	That makes sense though, because there's theoretically going to be

00:22:46 --> 00:22:50:	more people living in that multi family parcel than your
00:22:50 --> 00:22:51:	single family.
00:22:51 --> 00:22:55:	And then again, commercial higher water use assumptions for those.
00:22:56 --> 00:22:59:	So that takes us to the end of our Fort
00:22:59 --> 00:23:01:	Lepton example.
00:23:01 --> 00:23:06:	And I think we can pause now for questions and
00:23:06 --> 00:23:08:	comments if there are any.
00:23:08 --> 00:23:10:	And Marianne, feel free to jump in.
00:23:10 --> 00:23:10:	Yeah.
00:23:10 --> 00:23:13:	Thank you so much for that presentation.
00:23:13 --> 00:23:15:	I'd love to open it up for questions.
00:23:15 --> 00:23:18:	We have two minutes for questions, but if you have
00:23:18 --> 00:23:20:	questions that go beyond those two minutes, you can put
00:23:20 --> 00:23:21:	them in the chat box.
00:23:23 --> 00:23:25:	Nick, do you want to just unmute and ask your
00:23:25 --> 00:23:26:	question?
00:23:29 --> 00:23:30:	Yeah, sure can.
00:23:32 --> 00:23:32:	You hear me?
00:23:34 --> 00:23:34:	Or Merrill?
00:23:35 --> 00:23:37:	Yes, go ahead, Go ahead, Nick.
00:23:38 --> 00:23:38:	Yeah, I was just.
00:23:38 --> 00:23:42:	Wondering if agriculture farm use, you know any other any
00:23:42 --> 00:23:46:	other uses besides residential is taking into account and into
00:23:46 --> 00:23:47:	the analysis?
00:23:48 --> 00:23:51:	Yeah, so this we were specifically working with the city
00:23:51 --> 00:23:55:	of city of Fort Lepton doesn't serve agricultural users.
00:23:55 --> 00:23:58:	So we did not take agricultural users into account because
00:23:58 --> 00:24:01:	that's not a customer base they serve.
00:24:01 --> 00:24:06:	So we were focusing on residential, multi family, commercial and
00:24:06 --> 00:24:10:	institutional and kind of narrowed it down to their service
00:24:11 --> 00:24:14:	area population to come up with that list.
00:24:15 --> 00:24:15:	OK, that makes sense.
00:24:15 --> 00:24:18:	But if there is a if there is a municipality
00:24:18 --> 00:24:22:	that that does service AG use, it would be included
00:24:22 --> 00:24:23:	in the analysis, correct?
00:24:24 --> 00:24:24:	OK.
00:24:24 --> 00:24:24:	Understood.
00:24:25 --> 00:24:25:	Thanks.
00:24:25 --> 00:24:25:	Yeah.
00:24:25 --> 00:24:26:	Good question.

00:24:29 --> 00:24:30:	Oh, I have a question.
00:24:31 --> 00:24:31:	Go ahead.
00:24:33 --> 00:24:36:	Hey, how did you get your utility information?
00:24:38 --> 00:24:38:	Yeah.
00:24:38 --> 00:24:40:	So that's a great question to you.
00:24:40 --> 00:24:42:	So I made that comment at the beginning where I
00:24:42 --> 00:24:46:	said Fort Lupton was a great example because their water
00:24:46 --> 00:24:49:	authority and their land use authority are the same entity.
00:24:50 --> 00:24:53:	So the City of Fort Lupton supplies water to the
00:24:53 --> 00:24:54:	City of Fort Lupton area.
00:24:54 --> 00:24:58:	So it was easy because they are the same organization.
00:24:59 --> 00:25:01:	In places where that isn't the case, we usually have
00:25:01 --> 00:25:04:	to do a data sharing agreement and coordinate to make
00:25:04 --> 00:25:05:	that happen.
00:25:10 --> 00:25:10:	Interesting.
00:25:10 --> 00:25:11:	Thank you.
00:25:12 --> 00:25:13:	All right, well, we're out of time.
00:25:13 --> 00:25:16:	If you have any other questions for this group, please
00:25:16 --> 00:25:18:	put it in the chat box and they can respond.
00:25:18 --> 00:25:22:	I'll turn it over to our next set of presentations
00:25:22 --> 00:25:25:	from the Center for Geospatial Solutions.
00:25:28 --> 00:25:31:	All right, I will share my screen.
00:25:36 --> 00:25:40:	Thanks so much, Marianne, for hosting us.
00:25:41 --> 00:25:44:	So Many thanks to the Coalition.
00:25:44 --> 00:25:46:	And I see a lot of names.
00:25:46 --> 00:25:50:	I recognize people I haven't seen in a while, but
00:25:50 --> 00:25:51:	I'm really happy you're on.
00:25:54 --> 00:25:58:	I think there is somebody who does not have us
00:25:58 --> 00:25:59:	not muted.
00:25:59 --> 00:26:00:	Can everyone please mute?
00:26:02 --> 00:26:02:	Wonderful.
00:26:05 --> 00:26:08:	Emily, I think that's you actually, if you don't mind
00:26:08 --> 00:26:08:	me.
00:26:11 --> 00:26:12:	Thank you.
00:26:12 --> 00:26:15:	So my name is Faith Sternlyb and I'm the Associate
00:26:15 --> 00:26:19:	Director for Global Engagement for the Internet of Water team
00:26:19 --> 00:26:22:	at the Center for Geospatial Solutions.
00:26:22 --> 00:26:25:	We refer to as CGS for the Future, a center
00:26:25 --> 00:26:28:	of the Lincoln Institute of Land Policy, which you just
00:26:28 --> 00:26:31:	heard a little bit about some of their other efforts.
00:26:33 --> 00:26:37:	I, I wanted to actually reach out and put a

00:26:37 --> 00:26:39:	plug in for Marianne Dickinson.
00:26:40 --> 00:26:42:	She is one of our newest members at the Lincoln
00:26:42 --> 00:26:45:	Institute and a member of the Coalition.
00:26:45 --> 00:26:48:	So hey Marianne, I will give at first a quick
00:26:49 --> 00:26:53:	primer on CGS and the Internet of Water and what
00:26:53 --> 00:26:57:	we do and give a little background on our work
00:26:57 --> 00:27:01:	in the Pinal County Water Data Hub in Central AZ.
00:27:01 --> 00:27:04:	And then I'll hand it over to my colleague Emily,
00:27:04 --> 00:27:07:	who is a senior analyst with CGS and will walk
00:27:07 --> 00:27:10:	us through the technical aspects of the project as well
00:27:10 --> 00:27:12:	as policy implications next.
00:27:16 --> 00:27:20:	So CGS, the Center for Geospatial Solutions is a center
00:27:20 --> 00:27:23:	of the Lincoln Institute of Land Policy.
00:27:23 --> 00:27:27:	We work with non profit and private organizations as well
00:27:27 --> 00:27:31:	as local, state and federal governments to help them address
00:27:31 --> 00:27:35:	challenges at the Nexus of land, water and people through
00:27:35 --> 00:27:41:	geographic information systems and analysis, earth observations, artificial intelligence, machine
00:27:41 --> 00:27:44:	learning, and advanced analytics.
00:27:44 --> 00:27:48:	At the Internet of Water, we focus on helping our
00:27:48 --> 00:27:52:	partners on with modernizing their water data systems.
00:27:52 --> 00:27:55:	So we work with them to ensure their open water
00:27:55 --> 00:27:58:	data follows the fair and care principles.
00:27:58 --> 00:28:01:	I'm not going to go over them here right now,
00:28:01 --> 00:28:04:	but I will add a link afterwards after we, you
00:28:04 --> 00:28:08:	know, after I'm finished speaking to those to both sets
00:28:08 --> 00:28:11:	of principles which are really important for open data.
00:28:12 --> 00:28:15:	I I'm going to next.
00:28:15 --> 00:28:17:	Thanks, Emily.
00:28:17 --> 00:28:18:	Yeah.
00:28:18 --> 00:28:23:	So, so we are indeed talking about a project that
00:28:23 --> 00:28:29:	is a story of modern data modernization, data fusion, data
00:28:30 --> 00:28:33:	storytelling and partnerships.
00:28:33 --> 00:28:36:	It started with the Arizona Water Company.
00:28:36 --> 00:28:40:	They are a private water company that serves over 30
00:28:40 --> 00:28:42:	communities throughout Arizona.
00:28:42 --> 00:28:47:	So going back to what Meryl and Abby were talking
00:28:47 --> 00:28:52:	about, they were a Growing Water Smart community team.
00:28:53 --> 00:28:57:	They actually went twice because Arizona Water Company serves more
00:28:57 --> 00:29:00:	than you know, serves so many communities.
00:29:00 --> 00:29:04:	They brought Casa Grande 1st and then they brought another

00:29:04 --> 00:29:05:	community after that.
00:29:06 --> 00:29:10:	So after a couple, so after the Growing Water Smart
00:29:11 --> 00:29:16:	workshop and then in 2020, they attended right when COVID
00:29:16 --> 00:29:16:	hit.
00:29:17 --> 00:29:20:	And then through COVID, they were able to implement 2
00:29:20 --> 00:29:25:	technical assistance projects, which brought about the eventual realization that
00:29:25 --> 00:29:29:	they, Arizona Water Company badly needed to have better understanding
00:29:29 --> 00:29:31:	of their land and water data.
00:29:31 --> 00:29:36:	More specifically, looking at, as you just saw parcel level
00:29:36 --> 00:29:41:	data including water allocation, actual water use, projected future demand,
00:29:41 --> 00:29:47:	certificates of assured water supply and projected subdivision developments.
00:29:48 --> 00:29:52:	So the Lincoln Institute partnered with Arizona Water Company, Casa
00:29:52 --> 00:29:56:	Grande Pinal County and the University of Arizona.
00:29:56 --> 00:30:00:	We signed an MOU in 2022 and then we started
00:30:00 --> 00:30:04:	on a long day to discovery journey, which Emily will
00:30:04 --> 00:30:06:	dig into in a minute.
00:30:06 --> 00:30:11:	From 2023, Arizona Water Company contracted CGS to continue hub
00:30:11 --> 00:30:12:	development.
00:30:13 --> 00:30:15:	So I'm going to leave it to you, Emily, to
00:30:15 --> 00:30:17:	to tell us about the hub all.
00:30:19 --> 00:30:19:	Right.
00:30:19 --> 00:30:20:	Thanks, Faith.
00:30:22 --> 00:30:25:	So talking a little more from what Faith said about
00:30:25 --> 00:30:28:	some of these challenges, and one of them was just
00:30:28 --> 00:30:32:	getting all of these folks to the table because there's
00:30:32 --> 00:30:35:	often times uncertainty about sharing data and how it will
00:30:35 --> 00:30:38:	be handled and permissions and all that.
00:30:38 --> 00:30:42:	So there's the data challenge, there's the water scarcity challenge.
00:30:43 --> 00:30:46:	And as our previous presenter said, you know, there's data
00:30:46 --> 00:30:48:	cleaning challenges, there's a lot of challenges.
00:30:49 --> 00:30:52:	So we're going into this knowing we we've got a
00:30:52 --> 00:30:55:	lot to to deal with, but one of the main
00:30:55 --> 00:30:58:	ones that's that's kind of behind all of this is
00:30:58 --> 00:31:00:	just a water scarcity issue.
00:31:01 --> 00:31:04:	So a little bit of of a history on Arizona
00:31:04 --> 00:31:05:	groundwater.

00:31:05 --> 00:31:08:	The main thing that we're going to focus on for
00:31:08 --> 00:31:13:	this project was the implications of the assured water supply
00:31:13 --> 00:31:16:	program that went into effect in 1995.
00:31:16 --> 00:31:21:	And those rules require developers to demonstrate renewable water for
00:31:21 --> 00:31:22:	100 years.
00:31:22 --> 00:31:26:	So they are required to show that they can demonstrate
00:31:26 --> 00:31:30:	water groundwater supply to developments that are within a assured
00:31:30 --> 00:31:33:	water supply region for 100 years, kind of a big
00:31:33 --> 00:31:34:	commitment.
00:31:34 --> 00:31:40:	Unfortunately, in 2019, modelling of the groundwater in Pinal County's
00:31:40 --> 00:31:45:	region, but the Greater Pinal Active Management Area showed an
00:31:45 --> 00:31:49:	unmet demand of 8.1 million acre feet, 2 million of
00:31:49 --> 00:31:53:	which were associated with the assured water supply program.
00:31:54 --> 00:31:58:	So there was kind of this crisis and challenge that
00:31:58 --> 00:32:03:	arose that there wasn't enough groundwater, highlighting that some of
00:32:03 --> 00:32:07:	you may have seen sensational headlines such as these to
00:32:07 --> 00:32:11:	the effect of that, you know, is there enough water
00:32:11 --> 00:32:12:	for agriculture?
00:32:12 --> 00:32:14:	Is there enough water for more development?
00:32:14 --> 00:32:17:	How can we build more houses with more demand when
00:32:17 --> 00:32:18:	there's this water shortage?
00:32:19 --> 00:32:21:	You can see the mayor of Casa Grande actually there
00:32:21 --> 00:32:23:	on the right, and he's saying, you know, we have
00:32:23 --> 00:32:25:	to be frugal with the water we have.
00:32:25 --> 00:32:28:	And how do we solve these challenges of these competing
00:32:28 --> 00:32:29:	interests?
00:32:29 --> 00:32:32:	How does the water utility meet the demands and of
00:32:32 --> 00:32:33:	all of these challenges?
00:32:33 --> 00:32:37:	So where are we talking about?
00:32:37 --> 00:32:40:	Again, as Faith said, CAS Grande and the larger Pinal
00:32:40 --> 00:32:43:	County, you can see on the image on the right,
00:32:43 --> 00:32:47:	the lighter blue color is the Pinal Active Management Area.
00:32:47 --> 00:32:50:	And you can see in the pie graph on the
00:32:50 --> 00:32:54:	left, the Pinal AMA has mostly agricultural water use, but
00:32:54 --> 00:32:58:	there is some tribal, municipal, and industrial use as well.
00:32:58 --> 00:33:01:	But you can see overall for the middle pie graph,
00:33:01 --> 00:33:04:	a large majority of it comes from groundwater.

00:33:04 --> 00:33:08:	So that's why we're really concerned with the groundwater supply
00:33:08 --> 00:33:11:	in the Pinal County area and in the Pinal AMA.
00:33:13 --> 00:33:16:	So when we're looking at solving these challenges, we kind
00:33:16 --> 00:33:19:	of narrowed down onto a couple of features that we
00:33:19 --> 00:33:22:	know we needed to incorporate into this project and effort.
00:33:22 --> 00:33:25:	One of them was that it quickly became apparent we
00:33:25 --> 00:33:27:	had to do this on a parcel level.
00:33:27 --> 00:33:30:	As you just saw in the previous presentation, you got
00:33:30 --> 00:33:33:	to, you got to drill down to that parcel level
00:33:33 --> 00:33:35:	for the kind of analysis at that scale.
00:33:36 --> 00:33:40:	So we wanted to make sure we, we started with
00:33:40 --> 00:33:43:	the most level of detail and you can always aggregate
00:33:43 --> 00:33:47:	up, but looking at the parcels as well as the
00:33:47 --> 00:33:51:	water meters at the specific level for every, every meter
00:33:51 --> 00:33:54:	in, in the Casa Grande, Greater Casa Grande area.
00:33:55 --> 00:33:57:	We also knew that there needed to be a common
00:33:57 --> 00:34:00:	workspace for folks because we're talking about working with the
00:34:00 --> 00:34:03:	water utility and as Faith said, the county and the
00:34:03 --> 00:34:04:	city as well.
00:34:04 --> 00:34:06:	So we used Arc JS Online as a tool to
00:34:06 --> 00:34:11:	share data responsibly and control the permissions and the access
00:34:11 --> 00:34:14:	that people had because we didn't want to let any
00:34:14 --> 00:34:19:	of that personal identifiable information or individual water use get
00:34:19 --> 00:34:21:	to someone where it shouldn't be.
00:34:22 --> 00:34:26:	Along with that, you know, good documentation of all of
00:34:26 --> 00:34:29:	the data, making sure it's clear what it is and
00:34:29 --> 00:34:32:	the degree of temporal nature of it.
00:34:32 --> 00:34:36:	Because, you know, water meters are read monthly for our
00:34:36 --> 00:34:36:	data.
00:34:36 --> 00:34:40:	And so there's a natural requirement to update the data
00:34:40 --> 00:34:41:	and keep it current.
00:34:41 --> 00:34:44:	Tax parcel data changes when land is sold.
00:34:44 --> 00:34:47:	So you really need to be conscious of the versioning.
00:34:48 --> 00:34:50:	Along with that, we wanted to make sure that we
00:34:50 --> 00:34:53:	scripted the workflows that we were using frequently.
00:34:53 --> 00:34:56:	So everything was clear cut and straightforward as we, you
00:34:56 --> 00:34:59:	know, controlled the versioning and made sure that everyone was
00:34:59 --> 00:35:02:	on the same page on the currency of the data

Timestamp	Text
00:35:02 --> 00:35:03:	we were looking at.
00:35:04 --> 00:35:07:	Of course, we're looking at water, but you can't look
00:35:07 --> 00:35:08:	at water without considering land.
00:35:08 --> 00:35:12:	So while we are focusing on an urban area, there's
00:35:12 --> 00:35:16:	definitely zoning data and other land use data that we
00:35:16 --> 00:35:19:	incorporated into this overall project.
00:35:20 --> 00:35:22:	Finally, some elements of data visualization.
00:35:22 --> 00:35:23:	I'll show a couple visuals.
00:35:24 --> 00:35:27:	And then ultimately what we hope to accomplish with this
00:35:27 --> 00:35:30:	is finding some tools and findings that could be used
00:35:30 --> 00:35:34:	to inform legal and policy decisions moving forward, which is
00:35:34 --> 00:35:37:	actually something that has already come to fruition as we
00:35:37 --> 00:35:39:	continue to move along with this effort.
00:35:41 --> 00:35:43:	So as I mentioned, we started at the parcel level
00:35:43 --> 00:35:46:	and you can see down on the bottom we have
00:35:46 --> 00:35:49:	our little parcels, little houses and the individual water meters.
00:35:50 --> 00:35:52:	And then looking up at the next level for the
00:35:52 --> 00:35:55:	unit of analysis, we were looking at the certificate of
00:35:55 --> 00:35:56:	assured water supply areas.
00:35:56 --> 00:36:00:	So that's what was the program that was instituted in
00:36:00 --> 00:36:00:	1995.
00:36:00 --> 00:36:04:	And these areas are, are kind of like a subdivision
00:36:04 --> 00:36:05:	or a neighborhood size.
00:36:05 --> 00:36:11:	They depend region to region, but they're largely subdivision level
00:36:11 --> 00:36:11:	sizes.
00:36:12 --> 00:36:15:	Sometimes one subdivision has, you know, two or three.
00:36:15 --> 00:36:20:	And the the variety of subdivisions in the areas contributes
00:36:20 --> 00:36:23:	to a variety of of the data, but you want
00:36:23 --> 00:36:26:	to look at that level because those are the regions
00:36:26 --> 00:36:30:	for which a designated amount of water was permitted for
00:36:30 --> 00:36:32:	per year for the 100 years.
00:36:32 --> 00:36:35:	So by aggregating up the water data to that level,
00:36:35 --> 00:36:37:	we can see is this region using the amount of
00:36:37 --> 00:36:40:	water they're permitted to use, are they using less, Are
00:36:40 --> 00:36:41:	they using more?
00:36:42 --> 00:36:45:	And we can look at it across the landscape by
00:36:45 --> 00:36:49:	considering the entirety of the utility sub region across Casa
00:36:49 --> 00:36:52:	Grande and you know, making sure that all of the
00:36:52 --> 00:36:56:	region that Arizona Water Company serves in this area is
00:36:56 --> 00:36:58:	covered for our purposes.
00:36:59 --> 00:37:03:	So as I mentioned, we're already moving forward with some

00:37:03 --> 00:37:06:	great outcomes and policy that is being put into place
00:37:06 --> 00:37:07:	with this work.
00:37:09 --> 00:37:12:	Namely because of all the challenges with the lack of
00:37:12 --> 00:37:15:	groundwater and the modelling, there has been kind of a
00:37:16 --> 00:37:19:	freeze on a lot of new growth because more certificates
00:37:19 --> 00:37:22:	of assured water supply have not been able to be
00:37:22 --> 00:37:22:	issued.
00:37:23 --> 00:37:26:	So that's obviously not good for developers and for, you
00:37:26 --> 00:37:29:	know, all of the interests of having more people move
00:37:29 --> 00:37:29:	to the area.
00:37:30 --> 00:37:32:	So what we're trying to do is figure out how
00:37:32 --> 00:37:36:	we can plan for growth, but responsibly and understanding how
00:37:36 --> 00:37:38:	that growth will happen.
00:37:38 --> 00:37:41:	And so by doing that with our data and analysis
00:37:41 --> 00:37:44:	that we've worked on and then combining that from the
00:37:44 --> 00:37:47:	water data from, you know, the water utility and the
00:37:47 --> 00:37:51:	certificates of assured water supply, which do come from the
00:37:51 --> 00:37:54:	state, we looked at data from Pinal County, so their
00:37:54 --> 00:37:56:	permit data and the city's permit data.
00:37:56 --> 00:37:59:	So that permit data, they issue a permit every time
00:37:59 --> 00:38:03:	house is ready for occupancy, so we can understand the
00:38:03 --> 00:38:06:	rate and the timing at which these houses are being
00:38:06 --> 00:38:09:	built and kind of coming online for residential purposes.
00:38:09 --> 00:38:13:	Then we also looked at data from the Maricopa Association
00:38:13 --> 00:38:17:	of Governments and they produce projections on future growth in
00:38:17 --> 00:38:18:	the region.
00:38:18 --> 00:38:20:	So we're able to understand how much growth is going
00:38:20 --> 00:38:21:	to be expected.
00:38:21 --> 00:38:24:	We're looking out to 2040 right now and where that
00:38:24 --> 00:38:26:	growth is going to occur actually.
00:38:27 --> 00:38:29:	So by looking at all of this data, we can
00:38:29 --> 00:38:33:	both understand the current water use in those caused geometries
00:38:33 --> 00:38:36:	and when the housing units were built and the current
00:38:36 --> 00:38:38:	amount of housing units.
00:38:38 --> 00:38:41:	So all of that can be extrapolated kind of to
00:38:41 --> 00:38:44:	look at the future and kind of try and predict
00:38:44 --> 00:38:47:	trends with, you know, intelligent and fine scale data.
00:38:49 --> 00:38:53:	So again, looking into the future, Arizona Water Company is
00:38:53 --> 00:38:56:	seeking now what is called an alternative designation of a

00:38:56 --> 00:38:59:	short water supply, bit of a mouthful.
00:38:59 --> 00:39:01:	So it's very conveniently called an ADOS.
00:39:02 --> 00:39:05:	And so the ADAS is kind of a, a step
00:39:05 --> 00:39:10:	around the cause certificate of assured Water supply program, where
00:39:10 --> 00:39:14:	the utility will be designated as a water provider for
00:39:14 --> 00:39:14:	the region.
00:39:15 --> 00:39:18:	And it will allow the developers and the water utility
00:39:18 --> 00:39:22:	to more easily develop with the understanding that there is
00:39:22 --> 00:39:24:	enough water for what is promised.
00:39:24 --> 00:39:28:	This is actually a new policy that was recently passed
00:39:28 --> 00:39:31:	late last year by the state legislature.
00:39:31 --> 00:39:32:	So it's brand new.
00:39:32 --> 00:39:35:	We're we're kind of building the ship as we're sailing
00:39:35 --> 00:39:35:	it.
00:39:36 --> 00:39:38:	But because we took the time to do all of
00:39:38 --> 00:39:42:	the key features and think through the level of information
00:39:42 --> 00:39:45:	that we would need, we're able to provide the answers
00:39:45 --> 00:39:47:	the state is asking for as we pursue this.
00:39:47 --> 00:39:48:	Adolf.
00:39:48 --> 00:39:51:	So you know, how much water is each is each
00:39:51 --> 00:39:55:	region using, how much water is promised in those other
00:39:55 --> 00:39:59:	certificate of assured certificate of assured water supply areas.
00:39:59 --> 00:40:03:	Because if even if there's no houses built on it
00:40:03 --> 00:40:07:	yet, that's still a legal permitted water that has to
00:40:07 --> 00:40:11:	be, you know, served to that area by the certificate
00:40:11 --> 00:40:13:	of assured water supply.
00:40:13 --> 00:40:13:	So.
00:40:13 --> 00:40:16:	The utility is really just trying to understand how much
00:40:16 --> 00:40:19:	water is promised, how much water is being served, and
00:40:19 --> 00:40:22:	where that next promised water is probably going to occur.
00:40:23 --> 00:40:26:	So happily throughout this effort, we have found that for
00:40:26 --> 00:40:30:	all of the existing subdivisions that are built out, meaning
00:40:30 --> 00:40:33:	all of the houses are built, they all have water
00:40:33 --> 00:40:37:	meters, they're largely all, you know, serving water, they're occupied.
00:40:38 --> 00:40:41:	We are finding across the board in this region, those
00:40:41 --> 00:40:45:	subdivisions or certificate of assured water regions I should say,
00:40:45 --> 00:40:49:	because they're not quite the same, are using about 1/3
00:40:49 --> 00:40:52:	of the water that was originally certified to them.
00:40:52 --> 00:40:56:	So that means if your subdivision was granted 100 acre

00:40:56 --> 00:40:59:	feet per year, you're using 30 acre feet, 40 acre
00:40:59 --> 00:41:00:	feet instead.
00:41:01 --> 00:41:05:	So that's great news because that means things like low
00:41:05 --> 00:41:09:	flow toilets and 0 escaping and other water saving measures
00:41:09 --> 00:41:14:	that perhaps weren't as common back when this program started
00:41:14 --> 00:41:15:	in 1995 are working.
00:41:15 --> 00:41:19:	They're showing a clear reduction in the amount of water
00:41:19 --> 00:41:20:	that's being used.
00:41:21 --> 00:41:24:	So we have proof now, we have data-driven proof that
00:41:24 --> 00:41:27:	there is less need for water in these places and
00:41:27 --> 00:41:30:	we can show spatially where that is happening, which is
00:41:30 --> 00:41:34:	going to help inform the future development because we know
00:41:34 --> 00:41:37:	these huge amounts of water that are granted to some
00:41:37 --> 00:41:41:	of these cause regions are far more than are realistically
00:41:41 --> 00:41:41:	being used.
00:41:43 --> 00:41:46:	So now as a spatial and GIS person, selfishly, this
00:41:47 --> 00:41:49:	is what really gets me excited.
00:41:49 --> 00:41:52:	This is a map again of the the Casa Grande
00:41:52 --> 00:41:55:	area and the different sub regions that the Arizona Water
00:41:55 --> 00:41:56:	Company serves.
00:41:56 --> 00:41:59:	And you can see in the blue to yellow scale,
00:41:59 --> 00:42:02:	the blue regions are areas where the Maricopa Association of
00:42:02 --> 00:42:06:	Governments say not a lot of more residential units expected
00:42:06 --> 00:42:09:	to grow there, not a lot of development expected to
00:42:09 --> 00:42:10:	grow there.
00:42:10 --> 00:42:12:	And they do that modeling on their own.
00:42:12 --> 00:42:14:	So OK, not too much growth there, don't have to
00:42:15 --> 00:42:16:	worry about it too much.
00:42:16 --> 00:42:18:	The more yellow regions are where they do expect more
00:42:18 --> 00:42:19:	growth.
00:42:19 --> 00:42:22:	So you can see kind of up here in the
00:42:22 --> 00:42:25:	Coolidge area, there is a lot of growth up to
00:42:25 --> 00:42:30:	2200 residential units that are expected to come online between
00:42:30 --> 00:42:31:	2020 and 2040.
00:42:31 --> 00:42:34:	So we know where the growth is going to be.
00:42:34 --> 00:42:37:	And then in the green hatch, those are our certificate
00:42:37 --> 00:42:39:	of assured water supply areas.
00:42:39 --> 00:42:42:	So in some cases like these here, we see that
00:42:42 --> 00:42:46:	there is growth expected in those regions that are already
00:42:46 --> 00:42:50:	promised water, but we also see that there's growth expected

00:42:50 --> 00:42:53:	where there are no 'CAUSE certificates.
00:42:53 --> 00:42:56:	So how are those places going to get water?
00:42:56 --> 00:42:59:	Well, the next step that Arizona Water Company is doing
00:43:00 --> 00:43:02:	is taking their water meter or excuse me, their water
00:43:03 --> 00:43:05:	mains, which are the white lines, if you can see
00:43:05 --> 00:43:08:	here and saying do we have infrastructure to move water
00:43:08 --> 00:43:12:	around from our groundwater wells from one location to another?
00:43:12 --> 00:43:14:	Where are we going to need infrastructure?
00:43:14 --> 00:43:17:	And then the dashed line are the future planned water
00:43:17 --> 00:43:18:	mains.
00:43:18 --> 00:43:21:	So are those future planned mains in the right place
00:43:21 --> 00:43:24:	for where we expect the growth to be and are
00:43:24 --> 00:43:27:	we having enough water going through the system to meet
00:43:27 --> 00:43:29:	the needs for that future growth?
00:43:30 --> 00:43:33:	So this project, as Faith mentioned, has been going on
00:43:33 --> 00:43:36:	for several years now and it's hard to distill down
00:43:36 --> 00:43:39:	to a couple minutes, but I'm happy to take a
00:43:39 --> 00:43:40:	few questions.
00:43:40 --> 00:43:43:	And otherwise, if you have more detailed follow-ups, here's our
00:43:43 --> 00:43:46:	emails and you're welcome to reach out and get in
00:43:46 --> 00:43:46:	touch.
00:43:49 --> 00:43:50:	Wonderful.
00:43:50 --> 00:43:51:	Thank you so much, Faith.
00:43:51 --> 00:43:54:	And Emily, if you don't mind stopping sharing and people
00:43:54 --> 00:43:56:	are welcome to unmute for a couple minutes.
00:43:56 --> 00:43:59:	We have 2 minutes for questions again, and then we'll
00:43:59 --> 00:44:01:	move on to the next set of presentations.
00:44:01 --> 00:44:03:	But you're always welcome to use the chat box.
00:44:08 --> 00:44:09:	Any questions?
00:44:13 --> 00:44:15:	Scott, do you wanna unmute?
00:44:16 --> 00:44:20:	Yeah, happy to unmute and thanks so much, Dave and
00:44:20 --> 00:44:20:	Emily.
00:44:21 --> 00:44:24:	My question was more on like, like the timing of
00:44:24 --> 00:44:27:	the assured water supply certificate and what that means for
00:44:27 --> 00:44:29:	the development process.
00:44:29 --> 00:44:33:	Like does the assured water certificate cover a broad area
00:44:33 --> 00:44:36:	and it's associated with the zoning or is it only
00:44:36 --> 00:44:40:	when like the subdivision is permitted for, you know, what
00:44:40 --> 00:44:43:	kind of specific use is that when they get that
00:44:43 --> 00:44:45:	kind of promised water supply?
00:44:45 --> 00:44:48:	And is there like a time frame associated with that

00:44:48 --> 00:44:50:	or is it kind of imperfect?
00:44:50 --> 00:44:52:	We know it's 100 year, but in terms of before
00:44:52 --> 00:44:54:	ground is broken and everything.
00:44:55 --> 00:44:55:	Yeah.
00:44:55 --> 00:44:59:	So I'm gonna say there's a lot of detail to
00:44:59 --> 00:44:59:	that.
00:44:59 --> 00:45:03:	But broadly how the cycle works is the developer would
00:45:03 --> 00:45:07:	have a preliminary plat of the development made and often
00:45:07 --> 00:45:09:	times that comes with like a master plan.
00:45:10 --> 00:45:12:	And so they then applied.
00:45:12 --> 00:45:16:	Again, this is not actively happening because of the groundwater
00:45:16 --> 00:45:19:	shortage, but they would get the preliminary plat, apply for
00:45:19 --> 00:45:22:	the certificate of assured water, then a final plat would
00:45:22 --> 00:45:25:	be created and then development would start.
00:45:26 --> 00:45:29:	So that's kind of the general process in terms of
00:45:29 --> 00:45:29:	timing.
00:45:30 --> 00:45:33:	It depends is my answer in the in the instances
00:45:34 --> 00:45:37:	that we've seen, but I believe if if memory serves
00:45:37 --> 00:45:42:	for Casa Grande and Pinal County, the preliminary plat is
00:45:42 --> 00:45:45:	only valid for a year after it's filed.
00:45:45 --> 00:45:47:	So you have a bit of a narrow window to
00:45:47 --> 00:45:49:	get that certificate of assured water supply.
00:45:50 --> 00:45:54:	So it's a challenging process, and this alternative designation of
00:45:54 --> 00:45:58:	Assured Water Supply is, you know, the utility's effort to
00:45:58 --> 00:46:00:	make development easier for moving forward.
00:46:01 --> 00:46:02:	Thank you so much.
00:46:03 --> 00:46:06:	I would say, sorry, Marianne, just a quick comment is
00:46:06 --> 00:46:08:	that I think it's the first of its kind in
00:46:09 --> 00:46:09:	Arizona.
00:46:09 --> 00:46:12:	So this is a ground breaking kind of policy that
00:46:13 --> 00:46:14:	came from this research.
00:46:15 --> 00:46:16:	Excellent.
00:46:16 --> 00:46:17:	Thank you both so much.
00:46:18 --> 00:46:18:	So we're out of time.
00:46:18 --> 00:46:20:	We're going to move to our next speaker.
00:46:20 --> 00:46:23:	But again, if you have questions for these speakers, please
00:46:23 --> 00:46:25:	put them in the chat box and they'll respond.
00:46:26 --> 00:46:27:	Go ahead, Mazdock.
00:46:41 --> 00:46:43:	Mazdaq, we can't hear you if you're talking.
00:46:45 --> 00:46:46:	Yes, I wasn't mute.

00:46:46 --> 00:46:47:	I apologize.
00:46:47 --> 00:46:49:	My good afternoon, everybody.
00:46:49 --> 00:46:51:	My name is Mazdaq Robbie.
00:46:51 --> 00:46:54:	I am a professor of civil and environmental engineering at
00:46:54 --> 00:46:55:	Colorado State University.
00:46:55 --> 00:46:57:	I also serve as the director of the One World
00:46:58 --> 00:46:58:	Solutions Institute.
00:46:59 --> 00:47:02:	First of all, I would like to thank the Wire
00:47:02 --> 00:47:06:	Wise Development Coalition for inviting me to participate in this
00:47:06 --> 00:47:08:	great meeting, and I'm so delighted.
00:47:08 --> 00:47:14:	I'm going after the wonderful presentations by the previous presenters
00:47:14 --> 00:47:19:	because obviously the process of integrating land use planning and
00:47:19 --> 00:47:22:	water supply planning is one that requires a lot of
00:47:23 --> 00:47:27:	steps and often is conducted in a different fashion depending
00:47:27 --> 00:47:30:	on the communities that we are serving.
00:47:31 --> 00:47:34:	So what I'm going to present today is a web-based
00:47:34 --> 00:47:38:	software that we have developed via variety of funding mechanisms,
00:47:38 --> 00:47:43:	but particularly in collaboration with Colorado Water Conservation Board.
00:47:43 --> 00:47:47:	The software that I described is public domain software and
00:47:47 --> 00:47:49:	can be applied anywhere in the world.
00:47:50 --> 00:47:53:	It's not specific to a local or a specific region,
00:47:53 --> 00:47:56:	but some of the data that we show since the
00:47:56 --> 00:48:00:	project was or is being continued to be funded by
00:48:00 --> 00:48:04:	Colorado while conservation board, the examples or the focus of
00:48:04 --> 00:48:07:	data analysis will be in Colorado.
00:48:08 --> 00:48:11:	OK, So what does Polaris do?
00:48:11 --> 00:48:17:	There are 4 fundamental steps or analysis that Polaris supports.
00:48:17 --> 00:48:22:	1 is characterization of the relationship between land use practices,
00:48:22 --> 00:48:25:	zoning regulations and policy and water consumption.
00:48:25 --> 00:48:28:	So how does land use and water consumption relate?
00:48:29 --> 00:48:34:	Second is breaking down is water use consumption metrics and
00:48:34 --> 00:48:38:	intensities with land use practices, but also by sectors of
00:48:38 --> 00:48:44:	different languages like residential, commercial, industrial and so on, and
00:48:44 --> 00:48:50:	also algorithms using machine learning that automatically

	separate water for
00:48:50 --> 00:48:55:	indoor water uses, outdoor and the other water budget components
00:48:55 --> 00:48:56:	that may be considered.
00:48:57 --> 00:49:02:	The third function of the tool is scenario assessment for
00:49:03 --> 00:49:08:	forecasting water use for a variety of scenarios and including
00:49:08 --> 00:49:14:	land use and population change, climate scenarios, and also conservation
00:49:14 --> 00:49:17:	plans that may be considered.
00:49:17 --> 00:49:20:	So for example, in Colorado, the state has done a
00:49:20 --> 00:49:25:	tremendous job by developing planning scenarios for future water use
00:49:25 --> 00:49:30:	analysis and water supply demand assessments in Colorado for early
00:49:30 --> 00:49:32:	community across Colorado.
00:49:32 --> 00:49:36:	We have taken Colorado's water plant planning scenarios and I've
00:49:36 --> 00:49:41:	translated the drivers of changing our state including again, population,
00:49:41 --> 00:49:45:	land use and climate for all communities to be able
00:49:45 --> 00:49:48:	to do integrate land use and water supply planning.
00:49:48 --> 00:49:52:	So scenario assessment is the third module of the tool.
00:49:52 --> 00:49:57:	And the last part for these variety of scenarios, Polaris
00:49:57 --> 00:50:05:	characterizes reliability and resilience, resilience of 1 water supply system.
00:50:05 --> 00:50:09:	So essentially do we have enough water for population and
00:50:09 --> 00:50:14:	socio economic and land use futures that we envision for
00:50:14 --> 00:50:15:	the region.
00:50:15 --> 00:50:20:	And the second, there is a module that essentially analysis
00:50:20 --> 00:50:24:	water distribution networks that are needed to support the type
00:50:24 --> 00:50:29:	of land use, population and growth trajectories that we envision
00:50:29 --> 00:50:30:	for for the region.
00:50:30 --> 00:50:35:	So again, water supply needs and then water distribution needs
00:50:35 --> 00:50:40:	that are automatically arranged and assessed in the software.
00:50:41 --> 00:50:44:	So some of the metrics that we have already been
00:50:44 --> 00:50:48:	talking about today are included in the Polaris store.
00:50:48 --> 00:50:51:	So some of the examples for water use and while
00:50:51 --> 00:50:55:	consumption intensity are gallons per capita per day or GPCD
00:50:55 --> 00:50:59:	gallons per household per day, million gallons per acre of
00:50:59 --> 00:51:04:	development by different zoning regulations and districts and

	1,000,000 gallons
00:51:04 --> 00:51:05:	per meter.
00:51:05 --> 00:51:10:	And these water metrics and others that are included are
00:51:10 --> 00:51:15:	characterized in different or by different land use categories that
00:51:15 --> 00:51:21:	are characterized by population density, housing density, household occupancy, green
00:51:21 --> 00:51:27:	spaces and open spaces, gross domestic products, employment, and other
00:51:27 --> 00:51:29:	socio economic factors.
00:51:29 --> 00:51:35:	So the tool automatically features this data, population demographics and
00:51:35 --> 00:51:40:	other information related to land use activities from the United
00:51:40 --> 00:51:45:	States Census Bureau and in for other countries or other
00:51:45 --> 00:51:48:	regions throughout the world.
00:51:48 --> 00:51:51:	If one is interested to use the tool, user can
00:51:51 --> 00:51:54:	upload their data for this information.
00:51:56 --> 00:52:00:	Abby did a great job describing the the nature of
00:52:00 --> 00:52:05:	the process for integrated land use and water supply analysis
00:52:05 --> 00:52:07:	or water consumption analysis.
00:52:07 --> 00:52:11:	And Polaris essentially streamlines the same process.
00:52:12 --> 00:52:16:	We take the zoning and all land use Polygon bandwidth,
00:52:16 --> 00:52:21:	overlay that with the water meter data and once they're
00:52:21 --> 00:52:27:	uploaded, the tool uses robust methods to then characterize historical
00:52:27 --> 00:52:33:	water consumption and then including things such as trends in
00:52:33 --> 00:52:34:	water use intensity.
00:52:34 --> 00:52:38:	So if a in many communities across the country, we
00:52:38 --> 00:52:42:	observe that water consumption intensity or water use intensity has
00:52:43 --> 00:52:44:	been decreasing.
00:52:44 --> 00:52:47:	So for example, GPCD has been going down.
00:52:47 --> 00:52:52:	The tool automatically characterizes those trends and then forecasts for
00:52:52 --> 00:52:56:	a variety of scenarios in future how much water supply
00:52:56 --> 00:52:59:	will be in or how much water demands will be
00:52:59 --> 00:53:03:	influenced and then subsequently what water supply needs we have.
00:53:05 --> 00:53:08:	The specific module of the tool that I would like
00:53:08 --> 00:53:11:	to highlight is the scenario planning tool, which which is
00:53:12 --> 00:53:15:	really the context of what most of the groups that
00:53:15 --> 00:53:17:	we work with are interested in.

00:53:17 --> 00:53:23:	I summarize the scenario planning characteristics and capacities in six
00:53:23 --> 00:53:23:	groups.
00:53:24 --> 00:53:27:	So the tool allows the user to upload for a
00:53:27 --> 00:53:28:	community.
00:53:28 --> 00:53:32:	If there is a comprehensive plan, you can just simply
00:53:32 --> 00:53:36:	upload the comprehensive plan and the tool takes that and
00:53:36 --> 00:53:41:	forecasts water demands for that comprehensive plan using trends and
00:53:41 --> 00:53:45:	patterns observed in the water meter data and the current
00:53:45 --> 00:53:48:	zoning and land use data and then reconciles all of
00:53:49 --> 00:53:53:	the discrepancies that may be involving that comprehensive plan.
00:53:53 --> 00:53:59:	So again, having discussed some of these potential challenges, communities
00:53:59 --> 00:54:03:	can do water efficiency planning using the tools.
00:54:03 --> 00:54:08:	So indoor outdoor water conservation and how those activities in
00:54:08 --> 00:54:14:	different zoning districts can affect or influence water consumption and
00:54:14 --> 00:54:19:	water supply needs for future sub area plans, transit oriented
00:54:19 --> 00:54:23:	plans, growth area plans, such As for example, if you
00:54:23 --> 00:54:27:	have a growth management area, the user can upload those.
00:54:27 --> 00:54:31:	The tool automatically incorporates that in scenario planning.
00:54:31 --> 00:54:36:	And finally, the data will support water supply master planning
00:54:36 --> 00:54:37:	for communities.
00:54:38 --> 00:54:41:	And we are really lucky that many communities across Colorado
00:54:41 --> 00:54:43:	have already started working with us.
00:54:44 --> 00:54:47:	And you will see as I finish my presentation that
00:54:47 --> 00:54:52:	because of the extensive nature of our collaboration and partnerships,
00:54:52 --> 00:54:57:	now we can conduct regional and statewide analysis and assessments
00:54:57 --> 00:55:01:	that would not be feasible in the absence of this
00:55:01 --> 00:55:04:	group that we are working together to develop.
00:55:05 --> 00:55:08:	And not only the Polaris tool, but also the assessments
00:55:08 --> 00:55:12:	and water supply needs and more demand characterizations that we
00:55:12 --> 00:55:12:	see.
00:55:12 --> 00:55:14:	So you can see the and name of some of
00:55:15 --> 00:55:19:	the groups that have already shared data and participated in
00:55:19 --> 00:55:23:	our activities, but there are several other municipalities that

	were
00:55:23 --> 00:55:27:	immediately engaged with to be able to start the process.
00:55:27 --> 00:55:30:	And some of those folks are also on this call
00:55:30 --> 00:55:31:	and we really appreciate it.
00:55:32 --> 00:55:35:	So I'm just presenting here some of the outputs of
00:55:35 --> 00:55:39:	the the model that are automatically generated by the tool.
00:55:39 --> 00:55:42:	You can look at total water volume or water intensity
00:55:42 --> 00:55:45:	over months depending on how much of data you have.
00:55:46 --> 00:55:49:	You can look at data total or for specific zoning
00:55:49 --> 00:55:54:	districts the tool automatically characterizes water use on a monthly
00:55:54 --> 00:55:55:	basis.
00:55:55 --> 00:55:58:	So you for example, in this specific community, you can
00:55:58 --> 00:56:01:	see that here is the total wire use in terms
00:56:01 --> 00:56:04:	of 1,000,000 gallons per acre and how residential low and
00:56:04 --> 00:56:08:	mixed-use residential compare for the outdoor components.
00:56:08 --> 00:56:12:	So clearly residential law uses more water than mixed-use and
00:56:12 --> 00:56:16:	in some areas where we have denser developments or whether
00:56:17 --> 00:56:21:	they are maybe there are industrial districts and what are
00:56:21 --> 00:56:23:	used outdoor is lower than others.
00:56:23 --> 00:56:27:	So again, the tool automatically characterizes what are used by
00:56:27 --> 00:56:31:	sector and by component, whether it's indoor or outdoor, and
00:56:31 --> 00:56:33:	all of the visualization components are there.
00:56:35 --> 00:56:37:	I also want to highlight a really neat feature of
00:56:37 --> 00:56:41:	the tool, which is the water historical water withdrawals module
00:56:41 --> 00:56:42:	of the tool.
00:56:43 --> 00:56:46:	Any user or any community can specify how much water
00:56:46 --> 00:56:50:	withdrawals typically they have on a monthly or annual basis
00:56:50 --> 00:56:52:	from different components.
00:56:52 --> 00:56:55:	Like for example, in this case, we have a river
00:56:55 --> 00:57:00:	wire system, supply system, and reservoir so they can visualize
00:57:00 --> 00:57:04:	how their water withdrawals from different components look like.
00:57:04 --> 00:57:09:	And then the tool text is information for future assessments
00:57:09 --> 00:57:15:	to characterize reliability of existing water supply systems for future
00:57:15 --> 00:57:15:	needs.
00:57:16 --> 00:57:20:	So here's the scenario assessment and comparison module of the

00:57:20 --> 00:57:20:	two.
00:57:20 --> 00:57:24:	You can see that we can compare historical water use
00:57:24 --> 00:57:28:	with the baseline scenario, for example, and a variety of
00:57:28 --> 00:57:33:	other scenarios that a community can develop for assessments, including
00:57:33 --> 00:57:36:	those six categories of scenarios that I mentioned.
00:57:37 --> 00:57:39:	And then time series of forecasts are available.
00:57:39 --> 00:57:44:	The forecast horizon can be any horizon that the community
00:57:44 --> 00:57:48:	wants to have 20-30 or 20502060 and so on.
00:57:48 --> 00:57:52:	And again, as I said, by characterizing historical water supply
00:57:52 --> 00:57:57:	and withdrawals, then we estimate the reliability of existing systems
00:57:58 --> 00:58:00:	for meeting the future demands.
00:58:00 --> 00:58:03:	So this is this are just some of the screenshots
00:58:03 --> 00:58:05:	that I'm presenting from the tool.
00:58:05 --> 00:58:08:	And the tool also have really robust mapping tools.
00:58:08 --> 00:58:11:	You can then look at, for example, in this case,
00:58:12 --> 00:58:16:	I'm looking at this specific area, looking at the housing
00:58:16 --> 00:58:19:	density, number of houses per square mile or you can
00:58:19 --> 00:58:23:	look at water use intensity, in this case million gallons
00:58:24 --> 00:58:24:	per acre.
00:58:24 --> 00:58:28:	But you can toggle between the attributes, what year that
00:58:28 --> 00:58:32:	you want to look at, and the tool automatically maps
00:58:32 --> 00:58:35:	all of those for the uses that we have now.
00:58:35 --> 00:58:39:	I just showed specific applications of the tool for a
00:58:39 --> 00:58:42:	specific community when they upload their own data.
00:58:42 --> 00:58:45:	Again, this is a software as a service, meaning that
00:58:45 --> 00:58:50:	although the One Word Solutions Institute supports provides Technical Support
00:58:50 --> 00:58:53:	for using the tool, we don't need to be involved.
00:58:53 --> 00:58:55:	Everything is autonomous.
00:58:55 --> 00:58:59:	Communities can use the tool even without interactions with our
00:58:59 --> 00:59:03:	group and I think that's a significant barrier that the
00:59:03 --> 00:59:08:	tool memory is because of data sharing agreements and privacy
00:59:08 --> 00:59:09:	considerations.
00:59:10 --> 00:59:14:	And as I mentioned, as more communities at least in
00:59:14 --> 00:59:18:	Colorado have started using the tool, now we can actually
00:59:18 --> 00:59:23:	see a trends at various spatial scales that are appearing
00:59:23 --> 00:59:25:	to us and we didn't know before.
00:59:25 --> 00:59:28:	So for example, if I if you look at all
00:59:28 --> 00:59:33:	of the municipalities that have shared the data in using

00:59:33 --> 00:59:37:	Polaris, we can see that as percent imperviousness in a
00:59:37 --> 00:59:39:	municipality goes up.
00:59:39 --> 00:59:42:	Again, these are each point is a different city as
00:59:42 --> 00:59:46:	percent imperviousness goes up, water use intensity in million gallons
00:59:47 --> 00:59:48:	per acre goes up.
00:59:48 --> 00:59:52:	So again, some basic information that if one is interested
00:59:52 --> 00:59:57:	to know what happens when we add imperviousness to our
00:59:57 --> 01:00:02:	areas, this immediately would give you at municipal scales, these
01:00:02 --> 01:00:07:	are the type of relationships that we see in Colorado,
01:00:07 --> 01:00:10:	but also we can dive deeper into trends.
01:00:10 --> 01:00:13:	So for example, if I look at all of the
01:00:13 --> 01:00:18:	zonings, different zoning districts that now are available in the
01:00:18 --> 01:00:23:	tool, we can see that for example, outdoor water consumption
01:00:23 --> 01:00:26:	significantly goes down in municipal areas.
01:00:26 --> 01:00:31:	In the residential sector and the gallons per capita per
01:00:31 --> 01:00:37:	day GPCD also substantially reduced as housing density increases.
01:00:37 --> 01:00:43:	So again water consumption intensity per capita decreases substantially in
01:00:43 --> 01:00:48:	Colorado and this there is a very, very strong model
01:00:48 --> 01:00:50:	that characterizes that.
01:00:50 --> 01:00:54:	So for regional and statewide planning, we can simply use
01:00:54 --> 01:00:58:	this type of relationships to understand how water demand would
01:00:58 --> 01:01:00:	change in this kind of areas.
01:01:01 --> 01:01:04:	Now if we look at other metrics such as million
01:01:04 --> 01:01:07:	gallons per acre, we see that as a matter of
01:01:07 --> 01:01:12:	fact million gallons per acre exponentially grows in urban regions
01:01:12 --> 01:01:13:	or municipal regions.
01:01:14 --> 01:01:17:	If you look at imperviousness as the descriptor and we
01:01:17 --> 01:01:20:	can see that water use in there was in the
01:01:20 --> 01:01:25:	domestic sector increases to some level of imperviousness and then
01:01:25 --> 01:01:26:	it decreases.
01:01:26 --> 01:01:32:	But CII commercial, institutional and industrial water use substantially exponentially
01:01:32 --> 01:01:33:	grows in this area.
01:01:33 --> 01:01:38:	So again, if we are developing conservation plants or water
01:01:38 --> 01:01:42:	reuse plans, this type of analysis become available to us

01:01:42 --> 01:01:44:	using the Polaris tool.
01:01:45 --> 01:01:48:	And then you can see the same thing when we
01:01:48 --> 01:01:51:	look at the per area water use intensity as a
01:01:51 --> 01:01:56:	function of household density, meaning household units per acre.
01:01:57 --> 01:02:00:	And also what we can see is trends in water
01:02:00 --> 01:02:00:	use.
01:02:00 --> 01:02:02:	In this case, we are showing the percent change in
01:02:02 --> 01:02:04:	gallons per capita per day water use.
01:02:04 --> 01:02:08:	We can see that new communities actually GPCD goes up
01:02:09 --> 01:02:13:	as communities start developing for, you know, in the initial
01:02:13 --> 01:02:18:	stages when they are new, the development is new development.
01:02:18 --> 01:02:23:	GPCD doesn't necessarily go down over time, but for more
01:02:23 --> 01:02:28:	mature cities, particularly as population increases and we have more
01:02:28 --> 01:02:31:	infill, GPCD tends to decrease over time.
01:02:31 --> 01:02:35:	So again, there are some of the capacities that the
01:02:35 --> 01:02:40:	tool provides that can really inform regional, so municipal water
01:02:40 --> 01:02:44:	supply utility, but also regional and statewide assessment.
01:02:45 --> 01:02:48:	The final type of products that I will highlight is
01:02:48 --> 01:02:52:	that the tool also has really robust AI and machine
01:02:52 --> 01:02:58:	learning algorithms that translates forecasted population to evolution of land
01:02:58 --> 01:02:58:	use.
01:02:58 --> 01:03:01:	So for example, if you look at Symbol Spring, which
01:03:01 --> 01:03:04:	is one of our partners, population in 2021 is about
01:03:04 --> 01:03:05:	13,000 people.
01:03:06 --> 01:03:10:	And in one of the Colorado's water plant scenario, scenario
01:03:10 --> 01:03:14:	E which is hot growth, the population estimate is about
01:03:14 --> 01:03:17:	25,000 people in city of Colorado Springs.
01:03:18 --> 01:03:22:	The tool has this very robust mechanisms to take land
01:03:22 --> 01:03:27:	use land cover products and then translate that changing population
01:03:27 --> 01:03:29:	to changing land use.
01:03:29 --> 01:03:32:	So again, I'll go back and forth a little bit
01:03:32 --> 01:03:35:	so we can see how those changes in population under
01:03:35 --> 01:03:39:	this hot growth scenario would influence actual land use.
01:03:39 --> 01:03:43:	There are many, many of these type of products for
01:03:43 --> 01:03:46:	climate change assessment, land, land cover change and so on
01:03:47 --> 01:03:48:	that I can describe.
01:03:48 --> 01:03:51:	But for in, in the interest of time, I, I

01:03:52 --> 01:03:56:	will just stay with this land use land cover map
01:03:56 --> 01:03:56:	here.
01:03:57 --> 01:04:00:	The final point that I'll make is that I think
01:04:00 --> 01:04:03:	Meryl mentioned that the integration of water and land use,
01:04:03 --> 01:04:07:	water wise development is not only water supply development and
01:04:07 --> 01:04:09:	water supply characteristics.
01:04:10 --> 01:04:13:	At the One Water Solutions Institute, we develop a number
01:04:13 --> 01:04:17:	of tools that reconciles land use and water considerations and
01:04:17 --> 01:04:20:	the other two tools that we have many, many of
01:04:20 --> 01:04:21:	them.
01:04:21 --> 01:04:25:	The two tools that I immediately would like to introduce
01:04:25 --> 01:04:28:	to you are our Net 0 Water toolkit that is
01:04:28 --> 01:04:32:	focused on building to municipal scale conservation, end uses, end
01:04:32 --> 01:04:35:	use efficiency and reuse strategies.
01:04:35 --> 01:04:40:	And the classic tool, which is a stormwater infrastructure tool
01:04:40 --> 01:04:45:	for making decisions about mixing green and grey infrastructure to
01:04:45 --> 01:04:49:	meet water quality and sustainability goals of the community.
01:04:49 --> 01:04:53:	So this particular tool classic has been developed in using
01:04:53 --> 01:04:57:	funds from the from EPA in partnership with both the
01:04:57 --> 01:04:58:	Research Foundation.
01:04:59 --> 01:05:01:	Again, thank you for this opportunity.
01:05:02 --> 01:05:06:	Please feel free to contact me if you're interested to
01:05:06 --> 01:05:09:	get some Technical Support for the use of tool or
01:05:09 --> 01:05:13:	any other tool that you find interesting from our One
01:05:13 --> 01:05:15:	Bar Solutions Institute.
01:05:17 --> 01:05:17:	Wonderful.
01:05:17 --> 01:05:21:	Thank you so much, Rozdak, if you don't mind.
01:05:21 --> 01:05:24:	Yeah, I'd love to just open it up for questions.
01:05:24 --> 01:05:26:	And I think this could be time for Q&A for
01:05:26 --> 01:05:29:	any of the panelists, and we'll have 15 minutes.
01:05:29 --> 01:05:32:	So yeah, we invite you to unmute and just ask
01:05:32 --> 01:05:33:	away.
01:05:35 --> 01:05:37:	Maddie Bill Sesnick here.
01:05:38 --> 01:05:42:	I I'm very much supportive of machine learning tools, but
01:05:42 --> 01:05:47:	in forecasting future data sets, they, they tend to be
01:05:47 --> 01:05:52:	difficult to use because they're basically looking at past correlations
01:05:52 --> 01:05:55:	and associations and machine learning.
01:05:56 --> 01:05:59:	So if you're looking out to the future and trying

01:05:59 --> 01:06:03:	to perhaps characterize future trends, especially in in water demand
01:06:03 --> 01:06:07:	and land use, I'm really interested in things that might
01:06:07 --> 01:06:08:	be trend Breakers.
01:06:08 --> 01:06:12:	So if you have a a geography or a location
01:06:12 --> 01:06:17:	that is susceptible, vulnerable, likely to incur trend breaking events,
01:06:18 --> 01:06:22:	use of things like gallon per capita a day assumes
01:06:22 --> 01:06:26:	that the population to employment ratio will be constant into
01:06:27 --> 01:06:27:	the future.
01:06:28 --> 01:06:32:	And and there are some locations in which there may
01:06:32 --> 01:06:37:	be employment expansion and less population expansion.
01:06:38 --> 01:06:40:	So those kinds of trends are very significant.
01:06:40 --> 01:06:45:	Also trends where future urban land uses might begin to
01:06:45 --> 01:06:50:	incorporate more hydroponic or urban farming would change water use
01:06:50 --> 01:06:53:	characteristics very significantly.
01:06:53 --> 01:06:57:	So looking at the past relationships might not be really
01:06:57 --> 01:06:59:	good at getting at the nuance of the future.
01:07:00 --> 01:07:04:	So I'm curious how we leverage machine learning tools which
01:07:04 --> 01:07:07:	can be fantastic and yet apply the the kind of
01:07:07 --> 01:07:11:	trend breaking characteristics that might occur.
01:07:11 --> 01:07:12:	Great question Bill.
01:07:12 --> 01:07:13:	I really appreciate that.
01:07:13 --> 01:07:16:	Let me add very quick comments here because I know
01:07:16 --> 01:07:18:	that there may be other questions.
01:07:18 --> 01:07:21:	So, so we, we first of all the Polaris tool
01:07:21 --> 01:07:26:	provides an opportunity to even create new land uses with
01:07:26 --> 01:07:28:	completely new new wire use intensity.
01:07:28 --> 01:07:32:	So you may say, you know, analyze the trends, learn
01:07:32 --> 01:07:36:	from historical conditions and forecast them, but this part of
01:07:36 --> 01:07:40:	my development is new development and this is the type
01:07:40 --> 01:07:43:	of intensity that we we can envision for those.
01:07:43 --> 01:07:46:	You haven't observed that in the past, but it may
01:07:46 --> 01:07:47:	be feasible in future.
01:07:47 --> 01:07:50:	So another example of that is that in Colorado now,
01:07:50 --> 01:07:53:	now that we have this significant group of communities partnering,
01:07:54 --> 01:07:57:	there may be a municipality that didn't have a historical
01:07:57 --> 01:07:59:	land use, but another municipality had done it.
01:08:00 --> 01:08:03:	So once they identify those, we can say no.
01:08:04 --> 01:08:08:	In our Front Range communities, we have seen that land

01:08:08 --> 01:08:08:	use.
01:08:09 --> 01:08:10:	Would you like to borrow that?
01:08:10 --> 01:08:12:	Or you can completely define the new characteristics.
01:08:12 --> 01:08:15:	So the tool allows the user to specify new land
01:08:15 --> 01:08:19:	use categories and then say how much of the new
01:08:19 --> 01:08:23:	development or redevelopment will be assigned to those new development.
01:08:24 --> 01:08:27:	The other component of that Bill is that there is
01:08:27 --> 01:08:32:	a concept in machine learning called knowledge guided machine learning
01:08:32 --> 01:08:36:	and knowledge they look machine learning allows to add process
01:08:36 --> 01:08:40:	oriented concepts to to constrain the type of forecast that
01:08:40 --> 01:08:40:	we see.
01:08:40 --> 01:08:42:	So some of these are managed to do that.
01:08:42 --> 01:08:46:	I would love to have this conversation, but you are
01:08:46 --> 01:08:49:	right on in terms of the nuances of using new
01:08:49 --> 01:08:53:	technology in our applications that can actually inform our planning
01:08:54 --> 01:08:54:	processes.
01:08:54 --> 01:08:57:	And we need new data to help support that.
01:08:57 --> 01:08:59:	I'm part of a trend forecasting group at APA and,
01:09:00 --> 01:09:03:	you know, we're very sensitive to these kinds of changes.
01:09:03 --> 01:09:03:	Thank you.
01:09:03 --> 01:09:04:	Good answers of.
01:09:04 --> 01:09:05:	Course, thank you.
01:09:05 --> 01:09:06:	No, no worries.
01:09:07 --> 01:09:08:	Mike has a question.
01:09:08 --> 01:09:10:	Marion, if you don't mind, I would like to answer
01:09:10 --> 01:09:12:	about the household occupancy data.
01:09:12 --> 01:09:15:	And just just quickly, so Mike, we'll go Mike 1st
01:09:15 --> 01:09:18:	and then we'll have Scott and then Kelly, 'cause I
01:09:18 --> 01:09:19:	see her hand is raised.
01:09:19 --> 01:09:19:	Go ahead.
01:09:19 --> 01:09:19:	OK.
01:09:21 --> 01:09:24:	My answer to Mike's question is that we get data
01:09:25 --> 01:09:27:	live from US Census website.
01:09:27 --> 01:09:31:	So you can conduct analysis every year we get the
01:09:31 --> 01:09:35:	data and process that for that corresponding year from US
01:09:35 --> 01:09:37:	Census information.
01:09:37 --> 01:09:40:	For other countries where we don't have US Census and
01:09:40 --> 01:09:42:	by the way, we use Census block group as the
01:09:42 --> 01:09:44:	special resolution of our analysis.

01:09:45 --> 01:09:50:	But for other countries user can upload the data at
01:09:50 --> 01:09:53:	one snapshot or over time.
01:09:53 --> 01:09:57:	And again the Polaris tool unfortunately in this short time
01:09:57 --> 01:10:02:	I couldn't demonstrate all of this has a population forecasting
01:10:02 --> 01:10:06:	module that and that applies to household density and occupancy
01:10:06 --> 01:10:10:	too that we use those logistic role models or linear
01:10:10 --> 01:10:15:	or power functions to forecast future population household density, household
01:10:15 --> 01:10:19:	occupancy and other socio economic factors Bosomic.
01:10:22 --> 01:10:23:	That's great.
01:10:23 --> 01:10:25:	Mike, did that answer your question?
01:10:27 --> 01:10:27:	Yeah, I think so.
01:10:27 --> 01:10:30:	I you know, my, it was really in regards to
01:10:30 --> 01:10:33:	like, you know, how do you know what the occupancy
01:10:34 --> 01:10:35:	is on a specific address?
01:10:37 --> 01:10:40:	Mike, we don't know this household occupancy at a specific
01:10:40 --> 01:10:40:	address.
01:10:40 --> 01:10:45:	US Census data has household occupancy and other metrics at
01:10:45 --> 01:10:49:	census block group and the way Polaris, the way Polaris
01:10:50 --> 01:10:54:	works, it reconciles census block and block group data to
01:10:54 --> 01:11:00:	the zoning district polygons and establishes relationships at that level.
01:11:00 --> 01:11:04:	We don't have household occupancy at parcel level or building
01:11:04 --> 01:11:05:	level.
01:11:06 --> 01:11:07:	Understood.
01:11:07 --> 01:11:07:	Thank you.
01:11:09 --> 01:11:09:	Great.
01:11:09 --> 01:11:09:	OK.
01:11:09 --> 01:11:11:	Scott, do you want to unmute?
01:11:11 --> 01:11:18:	And that's your question, Scott Williamson?
01:11:20 --> 01:11:24:	Oh, sorry, I don't have another question.
01:11:24 --> 01:11:25:	Oh, you put one in the chat.
01:11:25 --> 01:11:29:	At what point in the development process is the developer
01:11:29 --> 01:11:31:	promised water supply?
01:11:31 --> 01:11:33:	Yes, that was for fate.
01:11:34 --> 01:11:37:	OK, Faith and Emily, do you want to unmute?
01:11:37 --> 01:11:39:	We answered that we didn't.
01:11:39 --> 01:11:39:	Answer.
01:11:39 --> 01:11:40:	That Yep.
01:11:41 --> 01:11:41:	OK, great.

01:11:42 --> 01:11:43:	I didn't see that response.
01:11:43 --> 01:11:48:	We answered after Scott wrote in the chat.
01:11:49 --> 01:11:52:	You invited him to speak up and he did and
01:11:52 --> 01:11:54:	then and then we answered verbally.
01:11:54 --> 01:11:56:	Would you like us to put a a response to
01:11:56 --> 01:11:57:	the chat?
01:11:57 --> 01:11:58:	No, that's great.
01:11:58 --> 01:11:59:	Thank you so much.
01:11:59 --> 01:12:03:	Sorry, Kelly, you have your hand raised.
01:12:03 --> 01:12:03:	Go ahead.
01:12:04 --> 01:12:06:	Hi, my name is Ellie.
01:12:06 --> 01:12:09:	And I was kind of I have a question for
01:12:10 --> 01:12:15:	about what are the factors that affect new communities to
01:12:15 --> 01:12:19:	have a higher GPCD in the beginning.
01:12:19 --> 01:12:23:	And I was wondering whether that's usually associated with like
01:12:23 --> 01:12:27:	higher construction that might be using more water?
01:12:27 --> 01:12:29:	'Cause I was just really curious.
01:12:29 --> 01:12:35:	About like how or how like why mature neighborhoods and
01:12:35 --> 01:12:41:	cities just kind of lower that GPCD in this going
01:12:41 --> 01:12:42:	into the future?
01:12:43 --> 01:12:45:	Kinda this is a great question.
01:12:45 --> 01:12:48:	There are there are mere the factors that influence that,
01:12:48 --> 01:12:52:	but the simplest just again, I'm just simplifying in the
01:12:52 --> 01:12:55:	absence of the time since we don't have time to
01:12:55 --> 01:12:56:	go through all of that.
01:12:56 --> 01:13:01:	A part of that is construction and in general during
01:13:01 --> 01:13:04:	the build conditions you need somewhere.
01:13:04 --> 01:13:08:	But more importantly, and this is the, the most important
01:13:08 --> 01:13:12:	factor is that more mature cities tend to have infill
01:13:12 --> 01:13:14:	patterns of growth rather than sprawl.
01:13:14 --> 01:13:19:	So as we add more people, so essentially as household
01:13:19 --> 01:13:22:	occupancy goes up, GPCD tends to go down.
01:13:23 --> 01:13:28:	So that's really the and then essentially primary reason for
01:13:28 --> 01:13:31:	that is less irrigate landscape in in our type of
01:13:31 --> 01:13:35:	region where we do have irrigated landscape and by smaller
01:13:35 --> 01:13:39:	yards and landscape areas, outdoor water goes down.
01:13:39 --> 01:13:43:	Indoor also tends to slightly go down but not much.
01:13:44 --> 01:13:48:	But on aggregate GPC tends to go down as household
01:13:48 --> 01:13:52:	occupancy goes up and more mature cities tend to have
01:13:52 --> 01:13:53:	that.
01:13:53 --> 01:13:56:	And then obviously more mature cities may have more or

01:13:57 --> 01:14:02:	higher financial capacity for putting conservation programs together and support
01:14:02 --> 01:14:04:	that kind of activity as well.
01:14:04 --> 01:14:04:	OK.
01:14:07 --> 01:14:09:	Thank you so much for your response.
01:14:09 --> 01:14:12:	I was going to just add that, yeah, I think
01:14:12 --> 01:14:16:	what Mozart said about the landscape, like the size of
01:14:16 --> 01:14:19:	the landscape is actually a huge point because we see
01:14:19 --> 01:14:23:	at least 50% of water going towards landscaping.
01:14:23 --> 01:14:25:	So if you have less landscaping, let's say you live
01:14:26 --> 01:14:28:	in a multi family building and you don't have your
01:14:28 --> 01:14:31:	own yard, you're not going to be watering it as
01:14:31 --> 01:14:31:	much.
01:14:31 --> 01:14:33:	So I think that is actually a huge factor.
01:14:35 --> 01:14:43:	Does anyone have any other questions, Any questions for any
01:14:43 --> 01:14:46:	of the panelists?
01:14:50 --> 01:14:50:	Excellent.
01:14:50 --> 01:14:53:	Well, I just want to take this moment to thank
01:14:53 --> 01:14:57:	all of our speakers, but wonderful presentations and thank you
01:14:57 --> 01:14:59:	for all of your resources.
01:14:59 --> 01:15:02:	Before people jump off, we have some resources that we
01:15:02 --> 01:15:04:	would like to share with you all as well.
01:15:09 --> 01:15:13:	So just in terms of this coalition, many of you
01:15:13 --> 01:15:18:	have been on prior coalition meetings where we started resource
01:15:18 --> 01:15:24:	lists for water wise, landscapes, policies and affordability.
01:15:24 --> 01:15:26:	And I'm wondering if you would like us to create
01:15:26 --> 01:15:30:	a resource list for data resources including the ones that
01:15:30 --> 01:15:33:	were mentioned today and any others that you share with
01:15:33 --> 01:15:33:	us.
01:15:34 --> 01:15:36:	Does that sound interesting to people?
01:15:36 --> 01:15:37:	Yes.
01:15:37 --> 01:15:37:	OK.
01:15:37 --> 01:15:38:	I'm seeing some yeses.
01:15:38 --> 01:15:39:	Great.
01:15:40 --> 01:15:40:	OK.
01:15:41 --> 01:15:45:	Another thing that I'm currently working on is getting input
01:15:45 --> 01:15:49:	on how land use decision making has or hasn't changed
01:15:49 --> 01:15:53:	since the court decision, Sackett versus EPA.
01:15:53 --> 01:15:58:	That's the one that basically changed federal regulation over United

01:15:58 --> 01:16:02:	States wetlands and changed the definition of the waters of
01:16:02 --> 01:16:03:	the United States.
01:16:04 --> 01:16:07:	So if you or other people you know have some
01:16:07 --> 01:16:11:	information or experiences related to how land use decision making
01:16:12 --> 01:16:16:	is changing since that Supreme Court decision, I'd love to
01:16:16 --> 01:16:17:	hear from you.
01:16:17 --> 01:16:18:	Please just e-mail me.
01:16:18 --> 01:16:21:	My e-mail is right on my face, but if you
01:16:22 --> 01:16:24:	want me to put in the chat, I can.
01:16:26 --> 01:16:28:	You're also welcome to put notes in the chat box
01:16:28 --> 01:16:29:	as always.
01:16:31 --> 01:16:35:	And then we're going to share some opportunities with you.
01:16:35 --> 01:16:38:	So I'll turn it over to the some of my
01:16:38 --> 01:16:38:	partners.
01:16:38 --> 01:16:41:	But I guess 1st, I'm going to talk about the
01:16:41 --> 01:16:42:	2025 Resilience Summit.
01:16:42 --> 01:16:46:	ULI is hosting its spring meeting in Denver this year
01:16:46 --> 01:16:46:	in May.
01:16:46 --> 01:16:50:	And the Resilience Summit is a day long summit in
01:16:50 --> 01:16:54:	conjunction with our spring meeting that is just dedicated to
01:16:54 --> 01:16:59:	resilience topics and we'll have content related to water wise
01:16:59 --> 01:16:59:	development.
01:17:00 --> 01:17:01:	And we hope you guys will join us.
01:17:01 --> 01:17:05:	You can find out more information and the pricing for
01:17:05 --> 01:17:08:	registration by scanning that QR code.
01:17:08 --> 01:17:11:	But if also if you'd like additional information, you're welcome
01:17:11 --> 01:17:12:	to reach out.
01:17:14 --> 01:17:16:	And then I'll turn it over to my friends at
01:17:16 --> 01:17:19:	Alliance for Water Efficiency to talk about some of their
01:17:19 --> 01:17:21:	resources that they have for you.
01:17:22 --> 01:17:25:	Thank you, Marianne, can you hear me OK?
01:17:26 --> 01:17:26:	Go ahead, Pete.
01:17:27 --> 01:17:28:	It's nice to meet you all.
01:17:28 --> 01:17:30:	This is my first time on this coalition call.
01:17:32 --> 01:17:34:	Great presentations by everyone.
01:17:34 --> 01:17:36:	I really enjoyed listening so thank you for that.
01:17:36 --> 01:17:41:	Just wanted to share a few quick opportunities and updates
01:17:41 --> 01:17:42:	from AWE.
01:17:43 --> 01:17:46:	So first of all, if you haven't heard about our
01:17:46 --> 01:17:50:	Water Efficiency and Conservation symposium yet, we will be hosting
01:17:51 --> 01:17:54:	our third annual symposium in August 6th through 8th in

01:17:54 --> 01:17:55:	Chicago.
01:17:55 --> 01:17:59:	And our call for abstracts has been opened and it
01:17:59 --> 01:18:02:	will be open until March 7th.
01:18:02 --> 01:18:06:	On the slides, you'll see some core topics that we're
01:18:06 --> 01:18:09:	hoping to explore in this year's symposium, so I'll pop
01:18:09 --> 01:18:12:	the link here in the chat and we're excited to
01:18:12 --> 01:18:14:	see everyone's submissions.
01:18:15 --> 01:18:18:	If you have any questions about the symposium, feel free
01:18:18 --> 01:18:21:	to reach out and then go ahead on the next
01:18:21 --> 01:18:21:	slide.
01:18:22 --> 01:18:26:	AWE is currently working on a project with the Water
01:18:26 --> 01:18:30:	Resource Foundation, Water Research Foundation.
01:18:30 --> 01:18:34:	Apologies on evaluating changes in peak water demand and how
01:18:34 --> 01:18:38:	that may affect the choice, design, management and evaluation of
01:18:38 --> 01:18:42:	demand management, demand management strategies.
01:18:42 --> 01:18:45:	The goal for this project is to really understand trends
01:18:45 --> 01:18:47:	in peak demands, what are driving those trends.
01:18:47 --> 01:18:51:	Also exploring how climate change might be impacting peak demands
01:18:51 --> 01:18:55:	and then evaluating demand management strategies that utility may take
01:18:55 --> 01:18:59:	to help reduce utility costs, The need for expanded infrastructure,
01:18:59 --> 01:19:04:	really emphasizing the role that water conservation efficiency strategies may
01:19:04 --> 01:19:06:	play in peak water demand management.
01:19:07 --> 01:19:12:	This project will include a more detailed quantitative data analysis.
01:19:12 --> 01:19:15:	We have a number of partner utilities who are providing
01:19:15 --> 01:19:18:	their data, but we developed this survey as a way
01:19:18 --> 01:19:22:	to kind of supplement the quantitative data analysis and get
01:19:22 --> 01:19:27:	some qualitative information on how utilities are, you know, thinking
01:19:27 --> 01:19:29:	about peak water demand management.
01:19:30 --> 01:19:33:	And we really want to ensure broad representation in this
01:19:33 --> 01:19:35:	study and get a lot of perspective.
01:19:35 --> 01:19:37:	So if you're able to fill out the survey or
01:19:38 --> 01:19:40:	share it out to folks that you think you know
01:19:40 --> 01:19:42:	would be interested in filling it out.
01:19:42 --> 01:19:44:	I just popped a link to that in the chat
01:19:44 --> 01:19:44:	as well.
01:19:45 --> 01:19:48:	And that survey is also available until March 7th.

01:19:49 --> 01:19:49:	Thank you.
01:19:50 --> 01:19:54:	And then lastly, more on the policy side of our
01:19:54 --> 01:19:54:	work.
01:19:55 --> 01:19:59:	AWE along with partners in the plumbing industry have drafted
01:19:59 --> 01:20:02:	a letter to the new US EPA administration expressing our
01:20:02 --> 01:20:05:	support for the Watersons program.
01:20:05 --> 01:20:09:	This is response to executive order signed by President Trump,
01:20:09 --> 01:20:13:	which directs agency heads to identify strategies to change policies
01:20:13 --> 01:20:16:	that limit limit the ability to choose from a variety
01:20:16 --> 01:20:19:	of goods and appliances specifically.
01:20:19 --> 01:20:22:	Listing dishwashers, washing machines, toilets and shower heads.
01:20:22 --> 01:20:26:	And so our message for this letter is that Watersense
01:20:26 --> 01:20:30:	as a voluntary program actually increases consumer choice, fosters innovation
01:20:30 --> 01:20:33:	and provides A framework for competition.
01:20:33 --> 01:20:37:	So if you are your organization or interesting sign on
01:20:37 --> 01:20:40:	to this letter, please reach out to AW's Director of
01:20:40 --> 01:20:41:	Policy, Andrew Morris.
01:20:42 --> 01:20:43:	His emails on the slide.
01:20:44 --> 01:20:47:	And we're hoping to wrap up this process by the
01:20:47 --> 01:20:48:	end of the week.
01:20:48 --> 01:20:50:	So if you also want to know what next steps
01:20:50 --> 01:20:52:	are, you can reach out to Andrew.
01:20:53 --> 01:20:54:	And those are my updates.
01:20:54 --> 01:20:56:	Thanks for letting me share with the group.
01:20:58 --> 01:20:58:	Thank you, Amanda.
01:20:59 --> 01:21:02:	And I know Mike had an event that he wants
01:21:02 --> 01:21:03:	to talk about.
01:21:03 --> 01:21:05:	Mike, do you want to just unmute?
01:21:06 --> 01:21:07:	Thanks, Marianne.
01:21:07 --> 01:21:09:	I just wanted to give a quick plug for the
01:21:09 --> 01:21:11:	Next Generation Water Summit.
01:21:11 --> 01:21:14:	Some of you have been there before and we certainly
01:21:14 --> 01:21:15:	welcome you back once again.
01:21:16 --> 01:21:18:	So take place June 5 and 6.
01:21:18 --> 01:21:21:	It is a hybrid event, so the in person component
01:21:21 --> 01:21:23:	is in Santa Fe, NM, but you can also attend
01:21:23 --> 01:21:24:	remotely.
01:21:24 --> 01:21:28:	Our theme to a nod to Marianne's Resilience Summit is

01:21:28 --> 01:21:31:	increasing resilience and unpredictable climate.
01:21:33 --> 01:21:34:	And so you're all are welcome to attend and there's
01:21:34 --> 01:21:35:	a little bit of a teaser.
01:21:36 --> 01:21:39:	I know many of you know Marianne Dickinson, she will
01:21:39 --> 01:21:41:	be keynoting on Friday of that event.
01:21:41 --> 01:21:42:	So hope you all can attend.
01:21:42 --> 01:21:45:	I will put the link to the event in the
01:21:45 --> 01:21:45:	chat.
01:21:45 --> 01:21:47:	It's Next Generation Water Summit.
01:21:47 --> 01:21:47:	Dot com.
01:21:47 --> 01:21:48:	Thank you, Marianne.
01:21:48 --> 01:21:49:	Wonderful.
01:21:49 --> 01:21:50:	Thank you, Mike.
01:21:52 --> 01:21:54:	Oh, and then some water now updates.
01:21:56 --> 01:21:57:	Victoria, are you there?
01:21:57 --> 01:21:58:	Go ahead.
01:21:58 --> 01:21:58:	I'm here.
01:21:58 --> 01:21:59:	Thanks, Marianne.
01:22:00 --> 01:22:03:	I'll throw these links in the chat, but just wanted
01:22:03 --> 01:22:05:	to give a few quick plugs about some of the
01:22:05 --> 01:22:09:	programs we have coming going on and upcoming deadlines and
01:22:09 --> 01:22:11:	resources that are going out right now.
01:22:11 --> 01:22:15:	So the first one is for our project accelerator program.
01:22:15 --> 01:22:19:	This is a technical assistance program available right now just
01:22:19 --> 01:22:24:	to Colorado utilities, municipalities, water providers and their partners to
01:22:24 --> 01:22:27:	help them jumpstart sustainable water projects.
01:22:27 --> 01:22:31:	So we deadlines coming up this Friday for this Colorado
01:22:32 --> 01:22:33:	specific round.
01:22:33 --> 01:22:34:	So I just threw the link in the chat.
01:22:34 --> 01:22:35:	You can learn more at our website.
01:22:36 --> 01:22:39:	But yeah, through this, we provide 250 hours of pro
01:22:39 --> 01:22:42:	bono technical assistance over about a six to 12 month
01:22:42 --> 01:22:44:	period to help you scope and launch a project.
01:22:46 --> 01:22:49:	If you're outside of Colorado, we do have another national
01:22:49 --> 01:22:52:	accelerator round that's going to be coming up later this
01:22:52 --> 01:22:55:	spring, so get on our e-mail list and stay tuned.
01:22:56 --> 01:22:59:	The next resource I want to share that we just
01:22:59 --> 01:23:02:	launched today is a new tool and resource hub called
01:23:02 --> 01:23:06:	our Colorado State Revolving Fund Technical Assistance Dashboard.

01:23:07 --> 01:23:11:	And this is really designed to help Colorado water, drinking
01:23:11 --> 01:23:15:	water and wastewater systems navigate and apply for the SRFS.
01:23:16 --> 01:23:20:	It's really designed to be an interactive tool and really
01:23:20 --> 01:23:22:	helps can help you like focus on honing in on
01:23:22 --> 01:23:27:	different sustainable water project elements to add to your application.
01:23:27 --> 01:23:30:	And so through this program, you can request some pro
01:23:30 --> 01:23:34:	bono water Now technical assistance support to yeah, just help
01:23:34 --> 01:23:37:	you with any steps along the way of the process.
01:23:37 --> 01:23:38:	So check out that dashboard.
01:23:39 --> 01:23:40:	It just went Live Today.
01:23:41 --> 01:23:45:	And then finally we have an event coming up June
01:23:45 --> 01:23:47:	11th in Denver.
01:23:47 --> 01:23:51:	We're going to be celebrating and honoring our emerging leader
01:23:51 --> 01:23:54:	Awards or emerging leaders through an award ceremony.
01:23:55 --> 01:24:00:	And this is going to be set alongside AWWAS ACE
01:24:00 --> 01:24:02:	conference in Denver.
01:24:02 --> 01:24:04:	So if you're going to be in town for that
01:24:04 --> 01:24:06:	or you're local as well and you'd like to learn
01:24:06 --> 01:24:09:	more about our emerging leader award ceremony and join us
01:24:10 --> 01:24:13:	for a really fun night of honoring these leaders, dinner,
01:24:13 --> 01:24:14:	drinks, things like that.
01:24:15 --> 01:24:16:	Reach out to me.
01:24:16 --> 01:24:17:	I can send you more information.
01:24:17 --> 01:24:20:	We're we're still putting together the details for that, but
01:24:20 --> 01:24:21:	save the date for now.
01:24:21 --> 01:24:22:	So thank you.
01:24:22 --> 01:24:24:	My email's at the bottom of the slide if anyone
01:24:24 --> 01:24:25:	has questions.
01:24:26 --> 01:24:27:	Thank you, Vic.
01:24:28 --> 01:24:31:	And then final, just a quick look at upcoming topics
01:24:31 --> 01:24:32:	for the coalition.
01:24:33 --> 01:24:36:	Are these dates will probably need to be shifted a
01:24:36 --> 01:24:39:	little bit, but this spring we're going to have a
01:24:39 --> 01:24:41:	coalition meeting on water reuse.
01:24:41 --> 01:24:44:	So if you know of speakers who you think would
01:24:44 --> 01:24:46:	be great to hear from or you have some burning
01:24:46 --> 01:24:49:	questions related to water reuse that you think we should
01:24:49 --> 01:24:52:	focus on, please either put them in the chat box
01:24:52 --> 01:24:52:	or e-mail me.

01:24:52 --> 01:24:54:	We'd love to hear from you.
01:24:54 --> 01:24:58:	Then in the summer we're thinking about focusing on the
01:24:58 --> 01:25:00:	1 water approach and what that means for land use
01:25:01 --> 01:25:01:	decision making.
01:25:02 --> 01:25:06:	And then in the fall, we're thinking of focusing on
01:25:06 --> 01:25:11:	the Colorado Water Wise Guidebook on best practices in water
01:25:11 --> 01:25:12:	wise land use.
01:25:12 --> 01:25:15:	If any of these topics interest you and you have
01:25:15 --> 01:25:18:	suggestions for speakers, we'd love to hear from you.
01:25:18 --> 01:25:21:	Or if there's other ideas you want to share, please
01:25:21 --> 01:25:22:	share them.
01:25:22 --> 01:25:23:	We'd love to hear from you.
01:25:23 --> 01:25:26:	What you guys share helps us shape the topics that
01:25:26 --> 01:25:29:	we focus on in the speakers that we invite.
01:25:32 --> 01:25:34:	With that, I think we can all sign off.
01:25:34 --> 01:25:36:	It was so wonderful seeing you all.
01:25:36 --> 01:25:39:	Thank you for joining us today and a huge thank
01:25:39 --> 01:25:40:	you to our speakers.
01:25:40 --> 01:25:41:	We can't thank you enough.
01:25:41 --> 01:25:45:	That was such wonderful presentations and we appreciate you.
01:25:54 --> 01:25:54:	Bye all.
01:25:54 --> 01:25:55:	Thank you.