LINCOLN INSTITUTE
OF LAND POLICY

Planning for Water Neutral Development Using Efficiency as a Tool

Mary Ann Dickinson

Canadian Water and Wastewater Conference, November 4, 2024

The Problem

- Many cities in North America are already challenged to meet their customer demands for water
- Growing population and economic growth will place even more pressure in arid and water-short areas
- As drought and water shortages occur, residents raise the issue about available water for new development when they are being restricted
- Some communities cannot accommodate growth with current water supplies, especially as drought intensifies

The Mercury News

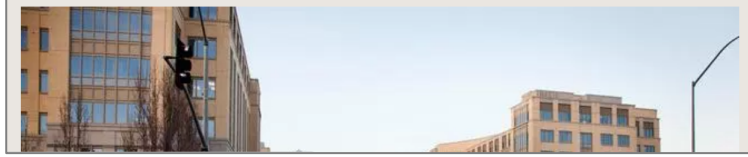
WEATHER
TODAY'S E EDITION
MANAGE SUBSCRIPTION
SIGN UP FOR NEWSLETTERS

NEWS | LOCAL | SPORTS | BUSINESS | ENTERTAINMENT | OBITUARIES | THE CANNIFORNIAN | Search

TRENDING: Beyonce and Jay-Z courtside | Burning Man co-founder obit | Janelle Monáe 'pansexual' | Golden State Killer's rampage | DWTS: Athletes | N. Korea n

Business

East Palo Alto imposes development moratorium due to lack of water



Daily Democrat

NEWS

News | Sports | Business | Entertainment | Lifestyle | Obituaries | Opinion

Home > News

State Water Board Issues Moratorium on New Water Connections

Menu The Seattle Times Local Politics Log In | Subscrib

LOCAL | BIZ/TECH | SPORTS | ENTERTAINMENT | LIFE | TRAVEL | HOMES | OPINION | JOBS | AUTOS | EXPLORE

Jim Brunner | Olympia | Seattle | Income Inequality

Environment | Local News | Local Politics | Northwest | Real Estate

Some home building halted as counties react to water-rights case

Originally published December 10, 2016 at 1:52 pm | *Updated December 10, 2016 at 3:05 pm*

As counties across Washington respond to a far-reaching state Supreme Court decision involving water rights, angry and frustrated property owners are finding they cannot depend on groundwater wells to build new homes as they have in the past.

By PHUONG LE
The Associated Press

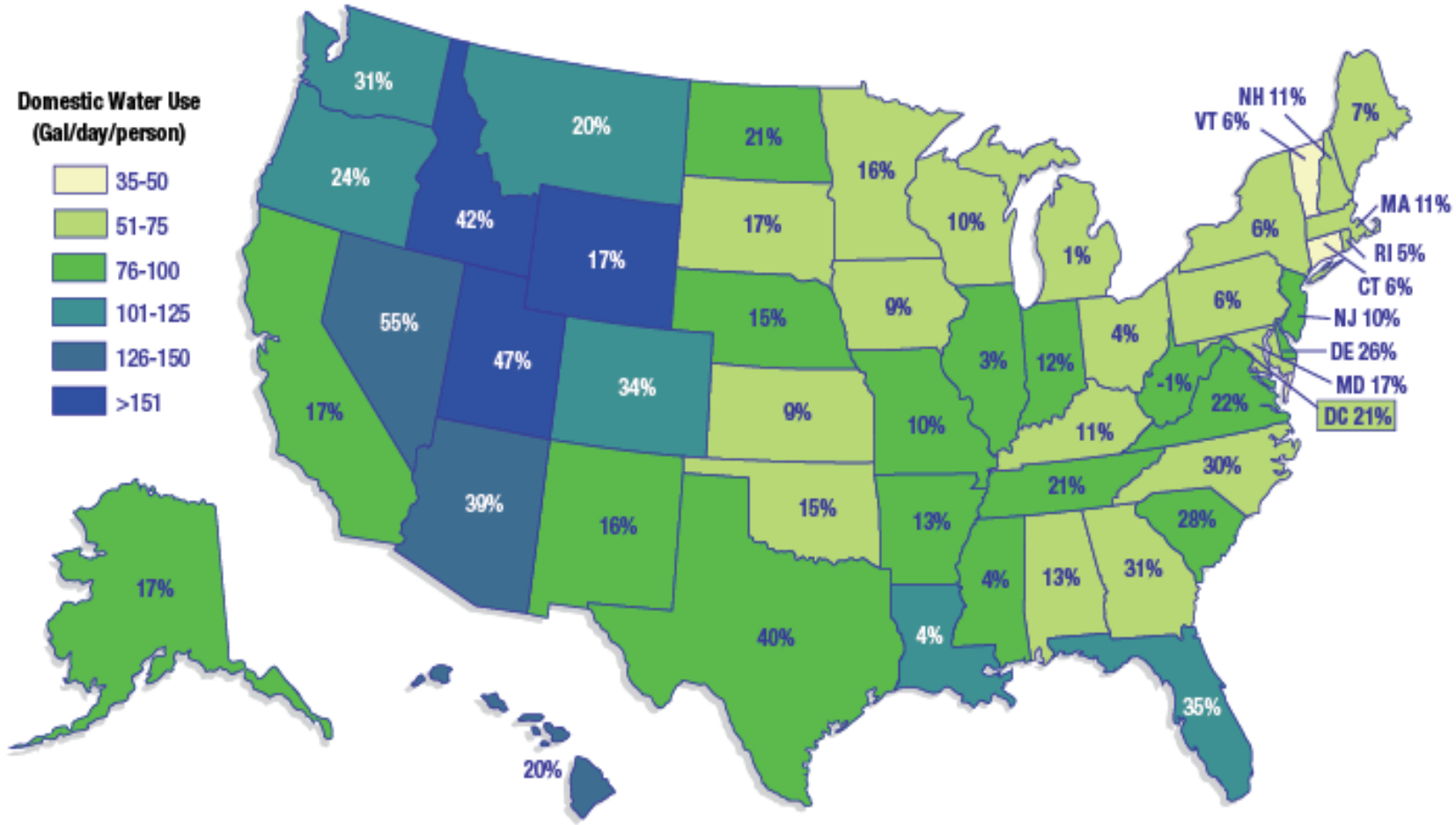
Share story

Share

Email

As counties across Washington respond to a far-reaching state Supreme Court decision involving water rights, angry and frustrated property owners are finding they cannot depend on groundwater wells to build new homes as they have in the past.

Domestic Water Use in Gallons per Day per Person and Percent Population Growth from 2000 to 2020



Sources:
U.S. Geological Survey, Circular 1441
U.S. Census Bureau, Historical Population Change Data (2000-2020)

Another Problem

- Water utility planning and local community comprehensive planning have historically not been well connected
- Strong silos have existed for decades with minimal staff interchange
- Water utility managers historically have been nervous about looking like they are “social engineers” if they get involved in local planning efforts
- This disconnect occurs despite clear evidence that a lack of coordination is a disservice to local planning needs and results in a lack of focus on the very real water and land use nexus

Land Use Coordination Study

- **Only 9 states** require water utilities to incorporate land use planning into their water plans but methods vary considerably: California, Colorado, Connecticut, Kentucky, Maryland, Rhode Island, Tennessee, Utah and Washington
- **10 states** require community land use plans to incorporate water utility plans or water quantity and quality concerns: Delaware, Florida, Maryland, Minnesota, Montana, Nevada, Rhode Island, South Carolina, Virginia and Washington
- **Only 3 states** provide by statute funding or other assistance to help support coordination between water utilities and land use planners: California, Colorado, and Maryland

More Land Use Coordination Issues

- **5 of the 10 states** expressly mention water supply in statutes or regulations that specify the required content of land use plans
- Each of the 10 states requires unique water elements to be included in land use plans (such as stormwater, groundwater, wetlands, and wellhead considerations)
- **Only 6 states** require that water utilities directly coordinate with land use planners in their communities: Connecticut, Maine, Rhode Island, Tennessee, Virginia, Washington

For More Information

Download the Report

https://www.lincolninst.edu/publications/working-papers/examining-water-land-use-connection-in-water-utility-planning

Receive notice of *Planning and Practice for Integrating Land Use and Water Management* and future publications at:

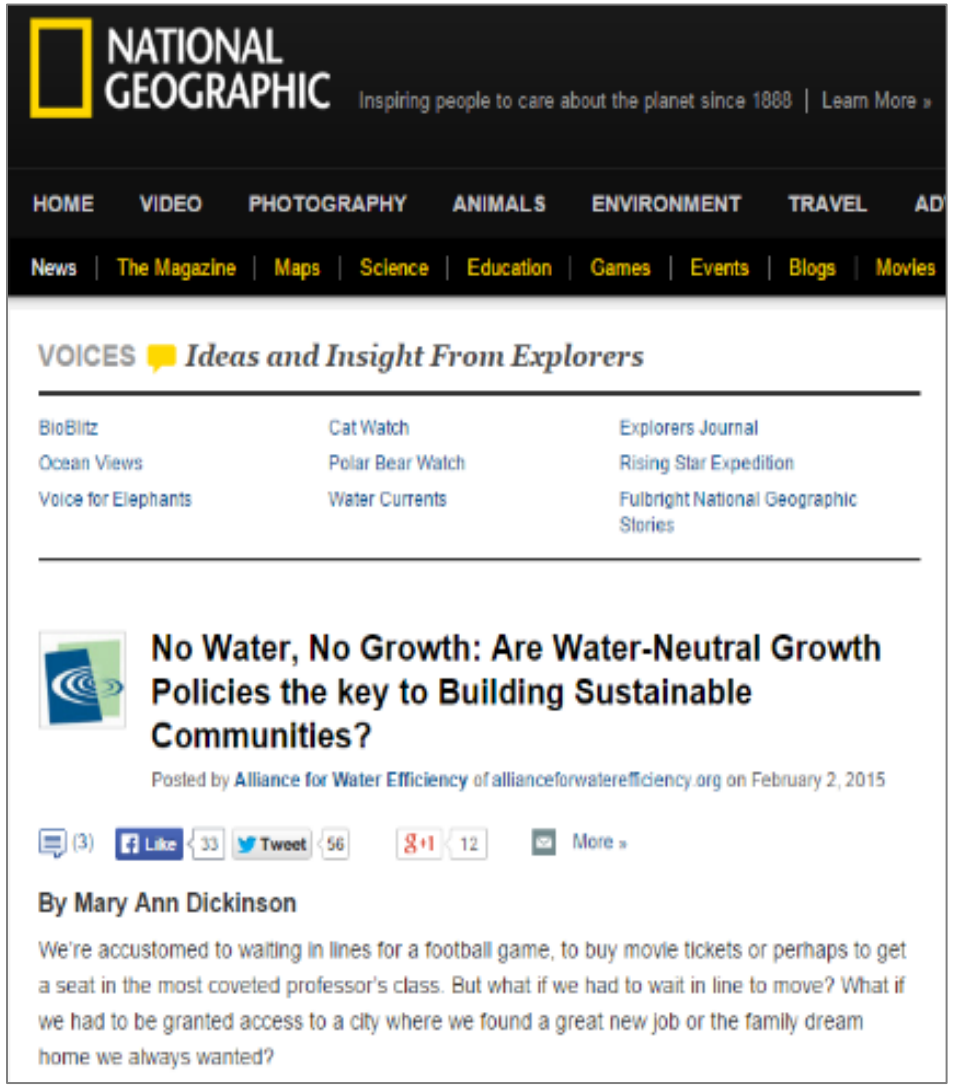
https://go.lincolninst.edu/sign-up-for-land-lines

A Solution to Scarcity: Water Offsets

- Can allow growth without increasing system-wide water consumption across a community or a water supply service area
- Can be a combination of on-site water efficiency and off-site water efficiency
- Can reduce or completely eliminate impact of new development on water supply
- Can help avoid building moratoriums in resource-constrained communities

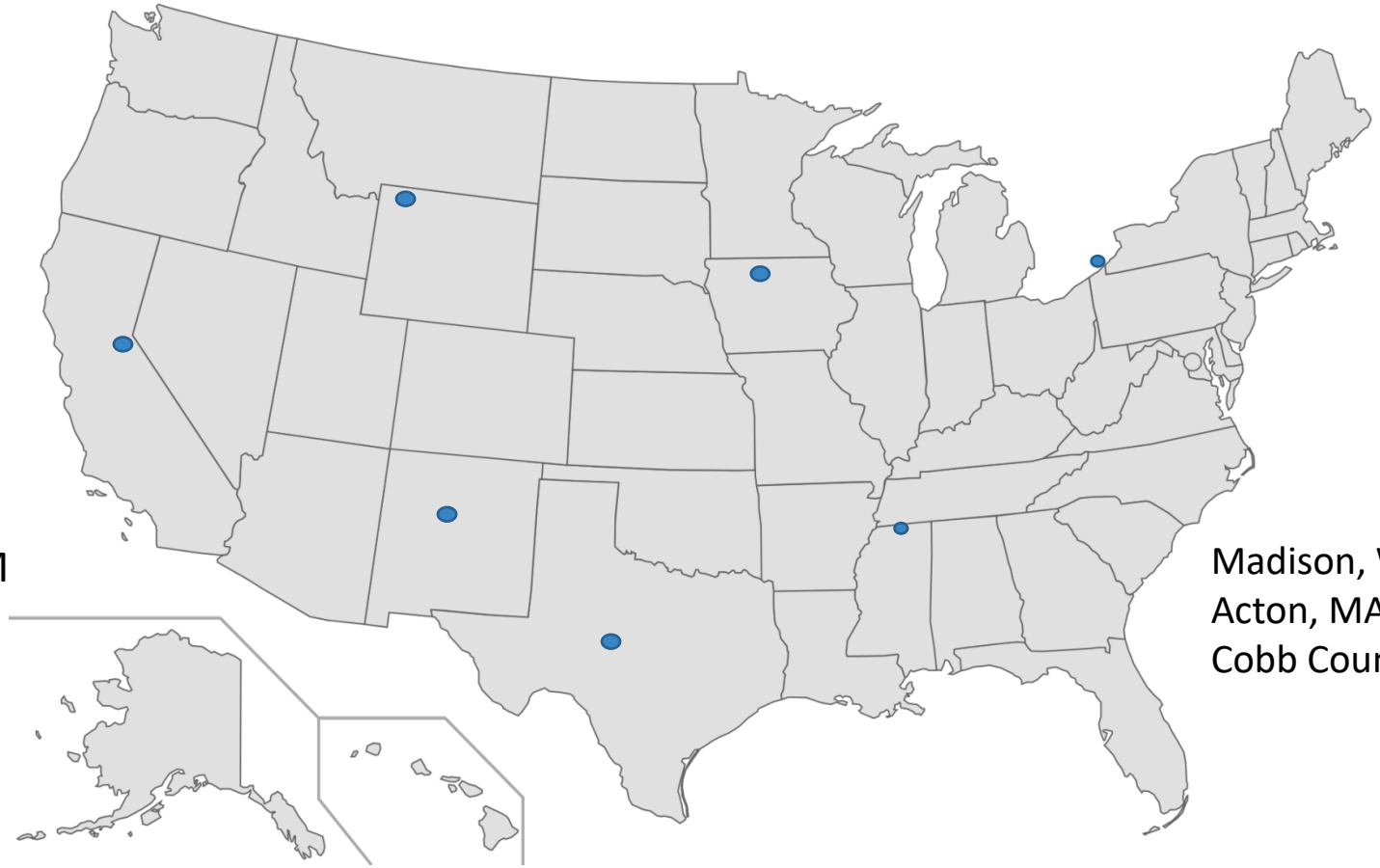
Water-Neutral Growth

- 3-year project to create a national ordinance development tool that can be tailored to create a customized water demand offset approach
- Partners: AWE, Environmental Law Institute, and River Network
- Worked with 7 partner cities in the US to vet the approach



Partner Communities

Bozeman, MT
San Francisco, CA
Albuquerque, NM
Austin, TX



Madison, WI
Acton, MA
Cobb County, GA

Launched “Net Blue” Toolkit

Alliance for Water Efficiency

PROMOTING AN EFFICIENT & SUSTAINABLE WATER FUTURE

Select Language ▾
Powered by Google Translate

IMPACT | RESOURCES | NEWS | EVENTS | MEMBERS | ABOUT

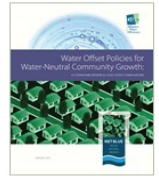
Net Blue: Supporting Water-Neutral Growth

Section: Water and Land Use Planning

Net Blue is a collaborative initiative of the Alliance for Water Efficiency (AWE), the Environmental Law Institute (ELI), and River Network to support sustainable community growth. The project team members developed a model ordinance that communities can tailor and customize to create a water demand offset approach meeting local needs. Communities in different regions throughout the United States were consulted to help develop the model ordinance and the offset components, and to ensure that the program is adaptable to many different political climates, legal frameworks, and environmental challenges.

The Net Blue Project is divided into four parts:

1. **Initial Offset Research**



Report entitled, *Water Offset Policies for Water-Neutral Community Growth*, which reviewed 13 communities throughout the United States that currently have a water demand offset policy or water neutral growth policy in place. These policies require offsetting the projected water demand of new development with water efficiency measures to create a “Net Zero” or neutral impact on overall service area demands and water use. The report found that the most common scenario where this has been applied entails issuing building permits for development that requires offset of the new water use through both on-site water efficiency measures and replacement of inefficient fixtures in pre-existing facilities. In numerous California communities and in cities ranging from Santa Fe, New Mexico to Sharon, Massachusetts, water demand offset programs have been utilized to help enable new construction that likely would have been prohibited due to supply constraints. The report also contains a literature review related to this topic, and information on communities that had a water demand offset policy in the past.

2. **Model Ordinance**

A template for a model ordinance that requires or incentivizes offsetting the impact of new development’s water use via water efficiency measures. ELI led the work on developing the model ordinance. Building on AWE’s initial offset research report, ELI did the following: (1) Analyzed the legal language used in existing water offset ordinances; (2) Identified potentially useful supplemental language in other ordinances; (3) Assessed a variety of institutional configurations that may influence the adoption and implementation of a water offset ordinance; and (4) Examined legal opportunities for and constraints on expanding the concept to new places. The final work product resulted in a model ordinance worksheet, a user’s guide, and three examples of customized ordinances. Due to the variety of circumstances that occur in a county, municipality, or utility, and the diversity of legal constraints and authorities that can dictate the form of such an ordinance, a “one size fits all” approach does not work in this context. Thus, the model ordinance is in the form of a

Net Blue Toolkit

1. Model Ordinance Worksheet
2. Model Ordinance User Guide
3. Three Ordinance Examples
4. Offset Methodology Workbook
5. Offset Methodology User Guide
6. Three Offset Examples matching the ordinance examples
7. Outreach Materials

The Model Ordinance Worksheet

- We built an ordinance-development tool, not just a model ordinance, because:
  - Variety of settings: constraints, governing entities, enabling laws
  - We anticipate a variety of users (not just lawyers)
  - It is intended to assist with outreach
- This tool is intended to help the users identify and think about critical issues in their own communities

The Ordinance Sections

Establishing the Legal Basis
- Purpose
- Findings
- Authority

Fashioning the Ordinance
- Requirement and Applicability or Incentive
- Definitions
- Determining the Offset Amount
- Identifying the Offset Activities

Enforcing the Ordinance
- Compliance with the Offset
- Verification
- Monitoring (optional)
- Enforcement

Options for the Ordinance
- Offset Credit Bank (optional)
- In-Lieu Fee (optional)
- Administrative Fees (optional)
- Modifications (optional)

Administering the Ordinance
- Appeals
- Severability
- Consistency with Other Laws
- Effective Date

NET BLUE WATER NEUTRAL GROWTH

Purpose:

> The declaration of an ordinance's purpose primarily helps reviewing courts and officials charged with its administration to interpret the ordinance. A purpose section also can inform (a) elected officials as to why they are adopting the ordinance, and (b) the general public and property owners as to the intent of the ordinance.
> *Reference ordinances: Dungeness River Watershed; Monterey County; Morro Bay (Ch. 13.20); San Luis Obispo County (Title 26); Soquel Creek Water District*

The purpose of this ordinance is to: [select all that apply]

- Protect and promote the public health, safety, and general welfare
- ☐ Ensure that there is enough water at all times to meet the basic needs of the community, including fighting fires
- ☐ Establish and assist in achieving sustainability goals and objectives
- ☐ Manage the demand for more water in identified city, county, or district, to ensure that [select the applicable one]
  - ☐ demand for water does not exceed available current or future supply
  - ☐ demand for water does not exceed the sustainable yield of the source
  - ☐ demand for water does not disproportionately adversely affect certain water user groups (e.g., low-income communities or the environment)
  - ☐ demands on water infrastructure do not exceed its capacity or impair its function
- ☐ Ensure a reasonable and orderly process and pace of making water supply / infrastructure capacity available to new users
- ☐ Minimize the adverse effects on the community of limitations on identified city, county, or district's water supply / infrastructure
- ☐ Manage water / water infrastructure to better satisfy both present and future human needs
- ☐ Manage water / water infrastructure to be more resilient to drought

This section clarifies the effect that this ordinance has on other laws, to what extent it is limited by other laws and to what extent it supersedes other laws.
Reference ordinances: Dungeness River Watershed; Morro Bay (Ch. 13.20)

This ordinance shall not affect: [select one or more]

- ☐ Rights to surface water and groundwater in existence before the effective date of this ordinance
- ☐ Federal and tribal reserved rights
- ☐ State duty-to-serve laws
- ☐ Other rights, laws, or plans

[Select one or none]

- ☐ To the extent the provisions of this ordinance conflict with any provisions in the existing laws and codes, the provisions of this ordinance shall supersede and control.
- ☐ In the event of conflicts between the provisions of this ordinance and laws and codes, the more restrictive provisions shall prevail.

Effective Date:

This ordinance shall take effect [select one]

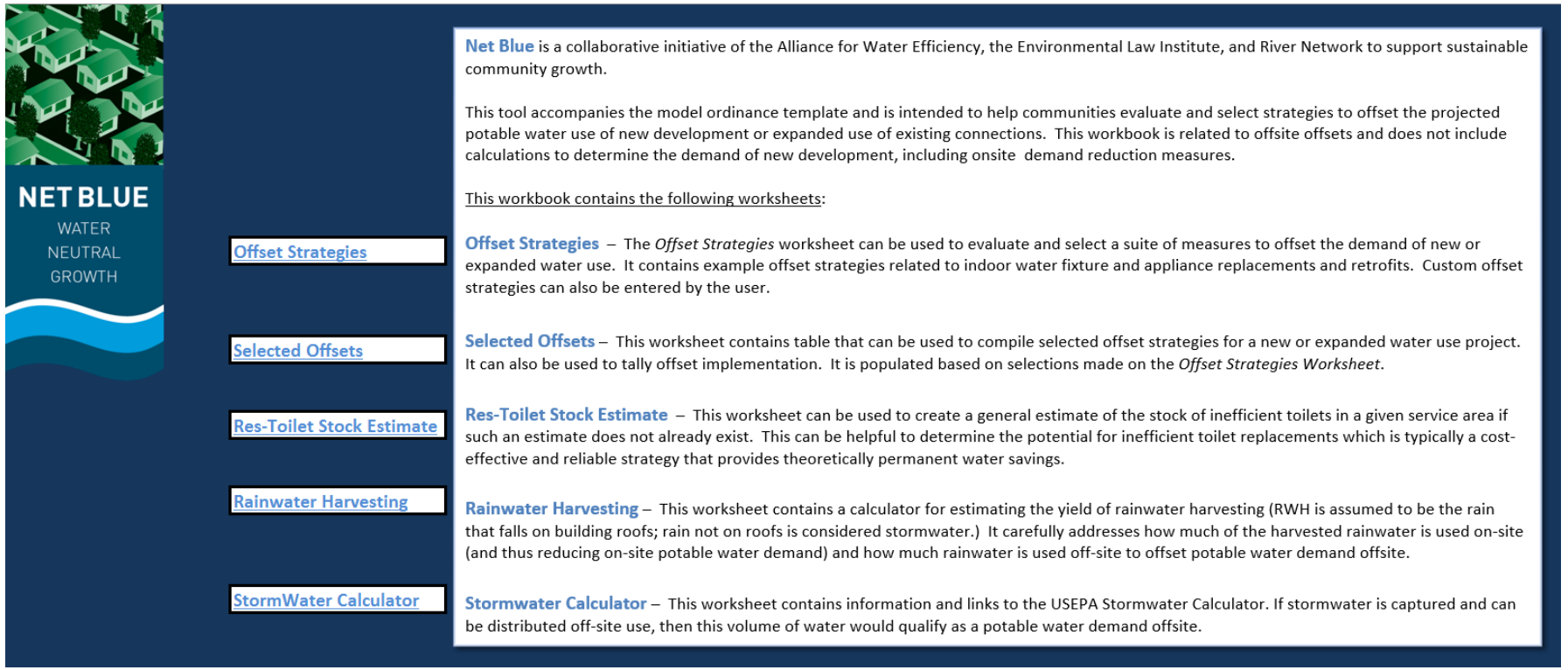
- ☐ immediately upon adoption.
- ☐ on date.
- ☐ upon triggering event (e.g., declaration of drought).

Press Me

Press this button only once, and please be patient.
*It will take **up to a minute** to produce the new document (during which time Word will be unresponsive).*

Offset Methodology Workbook

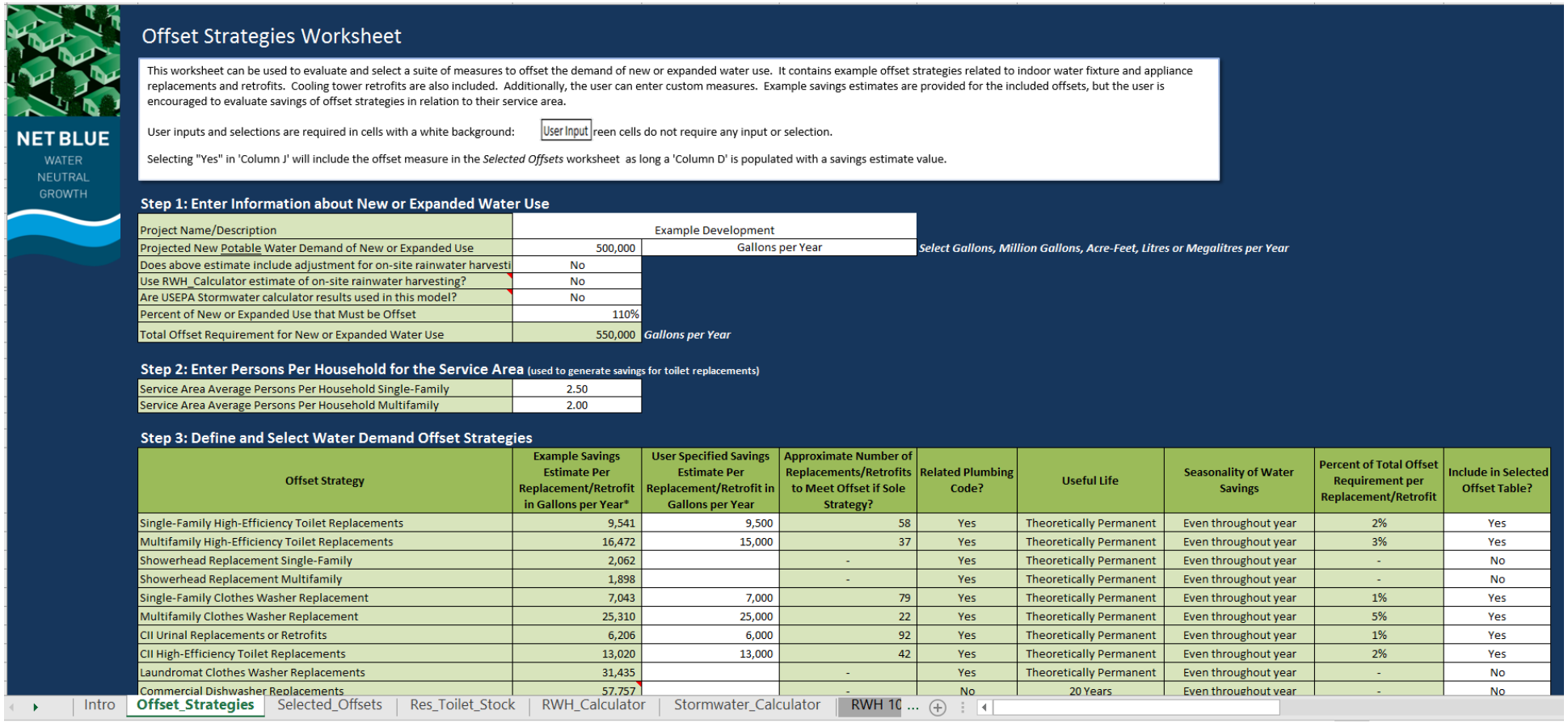
- Designed to help communities evaluate and select off-site offsets for development projects



Offset Workbook Components

- New demand information
- Offset strategy evaluation worksheet
  - Water conservation strategies
  - Rainwater harvesting calculator
  - Stormwater capture calculator
  - Custom offsets
- Selected offsets worksheet
- Supplemental sheets
  - Inefficient toilet stock estimator
  - Baths and Half Baths Housing Data

Offset Strategy Worksheet



NET BLUE
WATER
NEUTRAL
GROWTH

Offset Strategies Worksheet

This worksheet can be used to evaluate and select a suite of measures to offset the demand of new or expanded water use. It contains example offset strategies related to indoor water fixture and appliance replacements and retrofits. Cooling tower retrofits are also included. Additionally, the user can enter custom measures. Example savings estimates are provided for the included offsets, but the user is encouraged to evaluate savings of offset strategies in relation to their service area.

User inputs and selections are required in cells with a white background: User Input reen cells do not require any input or selection.

Selecting "Yes" in 'Column J' will include the offset measure in the *Selected Offsets* worksheet as long a 'Column D' is populated with a savings estimate value.

Step 1: Enter Information about New or Expanded Water Use

Project Name/Description	Example Development		
Projected New Potable Water Demand of New or Expanded Use	500,000	Gallons per Year	*Select Gallons, Million Gallons, Acre-Feet, Litres or Megalitres per Year*
Does above estimate include adjustment for on-site rainwater harvesti	No		
Use RWH_Calculator estimate of on-site rainwater harvesting?	No		
Are USEPA Stormwater calculator results used in this model?	No		
Percent of New or Expanded Use that Must be Offset	110%		
Total Offset Requirement for New or Expanded Water Use	550,000	*Gallons per Year*	

Step 2: Enter Persons Per Household for the Service Area (used to generate savings for toilet replacements)

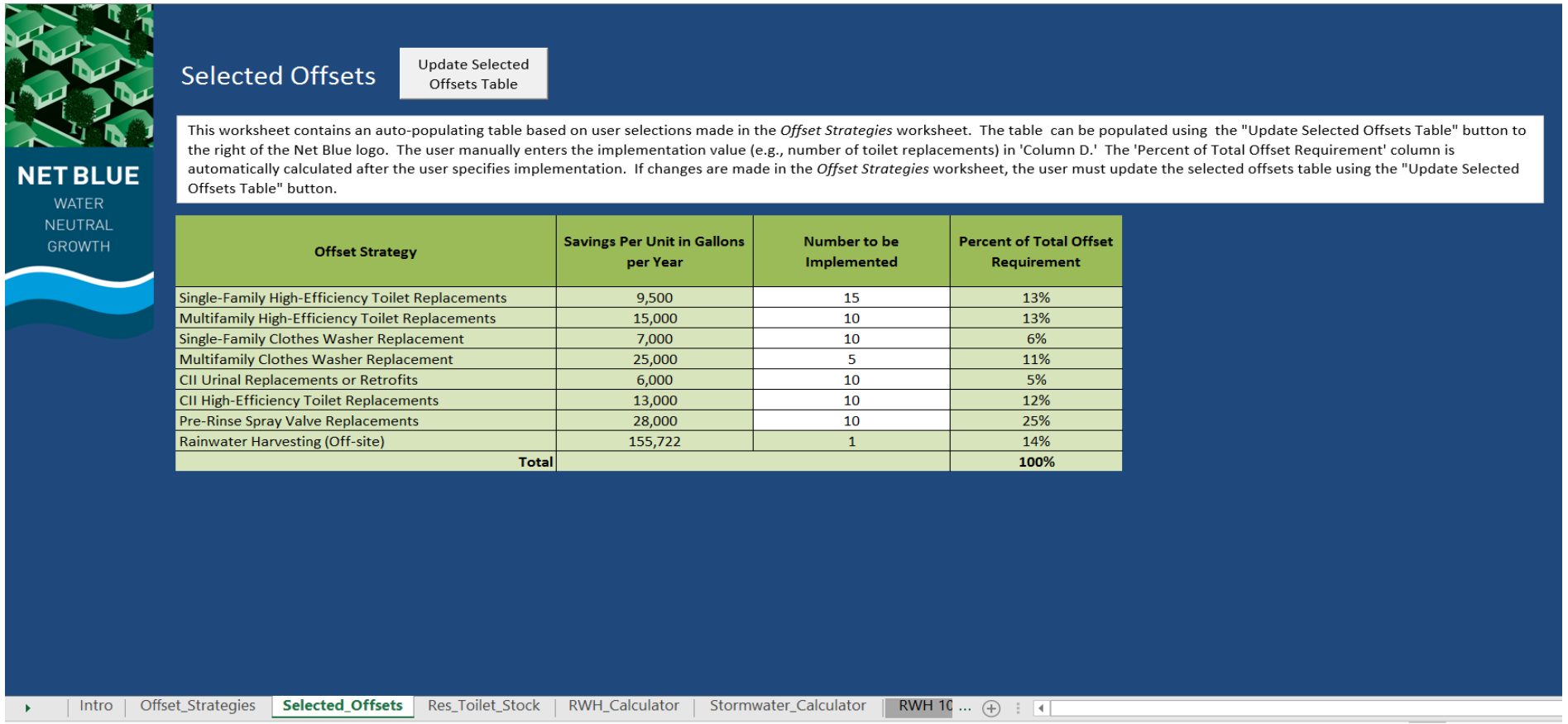
Service Area Average Persons Per Household Single-Family	2.50
Service Area Average Persons Per Household Multifamily	2.00

Step 3: Define and Select Water Demand Offset Strategies

Offset Strategy	Example Savings Estimate Per Replacement/Retrofit in Gallons per Year*	User Specified Savings Estimate Per Replacement/Retrofit in Gallons per Year	Approximate Number of Replacements/Retrofits to Meet Offset if Sole Strategy?	Related Plumbing Code?	Useful Life	Seasonality of Water Savings	Percent of Total Offset Requirement per Replacement/Retrofit	Include in Selected Offset Table?
Single-Family High-Efficiency Toilet Replacements	9,541	9,500	58	Yes	Theoretically Permanent	Even throughout year	2%	Yes
Multifamily High-Efficiency Toilet Replacements	16,472	15,000	37	Yes	Theoretically Permanent	Even throughout year	3%	Yes
Showerhead Replacement Single-Family	2,062		-	Yes	Theoretically Permanent	Even throughout year	-	No
Showerhead Replacement Multifamily	1,898		-	Yes	Theoretically Permanent	Even throughout year	-	No
Single-Family Clothes Washer Replacement	7,043	7,000	79	Yes	Theoretically Permanent	Even throughout year	1%	Yes
Multifamily Clothes Washer Replacement	25,310	25,000	22	Yes	Theoretically Permanent	Even throughout year	5%	Yes
CII Urinal Replacements or Retrofits	6,206	6,000	92	Yes	Theoretically Permanent	Even throughout year	1%	Yes
CII High-Efficiency Toilet Replacements	13,020	13,000	42	Yes	Theoretically Permanent	Even throughout year	2%	Yes
Laundromat Clothes Washer Replacements	31,435		-	Yes	Theoretically Permanent	Even throughout year	-	No
Commercial Dishwasher Replacements	57,757		-	No	20 Years	Even throughout year	-	No

Intro | Offset_Strategies | Selected_Offsets | Res_Toilet_Stock | RWH_Calculator | Stormwater_Calculator | RWH 10 ...

Selected Offset Table



Offset Strategy	Savings Per Unit in Gallons per Year	Number to be Implemented	Percent of Total Offset Requirement
Single-Family High-Efficiency Toilet Replacements	9,500	15	13%
Multifamily High-Efficiency Toilet Replacements	15,000	10	13%
Single-Family Clothes Washer Replacement	7,000	10	6%
Multifamily Clothes Washer Replacement	25,000	5	11%
CII Urinal Replacements or Retrofits	6,000	10	5%
CII High-Efficiency Toilet Replacements	13,000	10	12%
Pre-Rinse Spray Valve Replacements	28,000	10	25%
Rainwater Harvesting (Off-site)	155,722	1	14%
Total			**100%**

Example: Parker County Council

- County government with anticipated surface water shortage
- Offsets required of all site plan approval requests
- Compliance proof required 90 days after application approval
- Monitoring required to validate savings
- Offset amount: 100% (1:1)
- No in-lieu fee option

Example Offset

- New Beer Brewery
- Projected new annual water demand: 1.75 million gallons
- Required Offset amount: 100% or 1:1
- Offset strategy: On-site rainwater harvesting project to flush toilets and single family toilet replacements
- Offset amount: 100% of toilet flushing with rainwater; 330,150 excess gallons per year to be used as off-site credit; 129 single family toilet replacements

Outreach Materials

- Fact Sheet
- Frequently Asked Questions
- All outreach items online
- Requests for toolkit online

www.net-blue.org

NET BLUE Frequently Asked Questions

A collaborative initiative of the Alliance for Water Efficiency, the Environmental Law Institute, and River Network
www.net-blue.org

1. What is Net Blue?

"Net Blue" is an approach to keep water use at the same or reduced levels as a community continues to develop. This concept of "water neutral" growth is achieved by integrating land use planning and water management to require or incentivize water use offsets (e.g., water efficiency retrofits) that will equal or exceed the additional demand of new development or redevelopment (residential and commercial). By choosing to adopt an ordinance or incentive that requires or encourages this approach, communities can stretch their water supplies, decrease the need for new infrastructure, and help ensure more water for fish, wildlife and recreation as well as provide other benefits. The Net Blue team has created a model ordinance toolkit to assist communities interested in tailoring this approach for their specific needs and context at www.net-blue.org

2. Why might my community be interested in adopting Net Blue?

There are many benefits to Net Blue. Communities with high growth and stressed water supplies are finding that water scarcity is affecting their economic development potential. Water demand offset policies thus offer communities a meaningful and sustainable way to enable population and economic growth without increasing overall water demands in a utility service area. Making sure that additional development does not further increase demand for highly treated water will reduce the need to pump and treat additional water and the need for new withdrawals from local water sources, and thus reduce expenses for the community. Another benefit of Net Blue is to defer new and costly infrastructure investment. Water efficiency is often the least expensive form of new supply, especially when compared to developing new reservoirs, diversions or other infrastructure. Even in communities that are not immediately water-stressed, reducing water use helps to build in additional resilience for the future by stretching existing supplies. Net Blue also can benefit recreation and fish and wildlife by keeping more water flowing in streams and rivers.

3. How can Net Blue benefit local streams and rivers and other freshwater resources?

In many places, rivers, streams, groundwater and other waterbodies are suffering from depletion when the amount of water withdrawn is greater than the amount returned. When this happens, fish, wildlife, recreation and downstream communities all suffer. Using a Net Blue approach can help to prevent further depletion of our rivers, streams and aquifers by reducing the current amount of water withdrawn or preventing the need for increased withdrawals. Although this approach may not automatically translate into more water for our rivers, it is one important tool in the toolbox to reduce demand for highly treated water, taking some pressure off of our waterways and groundwater resources.

Water and Planning Network

- Free network of water and land use professionals created by the American Planning Association
- You don’t need to be an APA member
- 550 Network members in US and Canada
- Bi-monthly newsletters and regular updates
- To Join: email water@planning.org
- Canadians welcome!

Thank you

MARY ANN DICKINSON

DIRECTOR OF LAND AND WATER POLICY

LINCOLN INSTITUTE OF LAND POLICY

MADICKINSON@LINCOLNINST.EDU

LINCOLN INSTITUTE
OF LAND POLICY