This presentation premiered at WaterSmart Innovations

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Net Blue National Ordinance: Making New Development Water Neutral

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Director of Programs
Alliance for Water Efficiency

Alliance for Water Efficiency

river NETWORK
connecting people·saving rivers

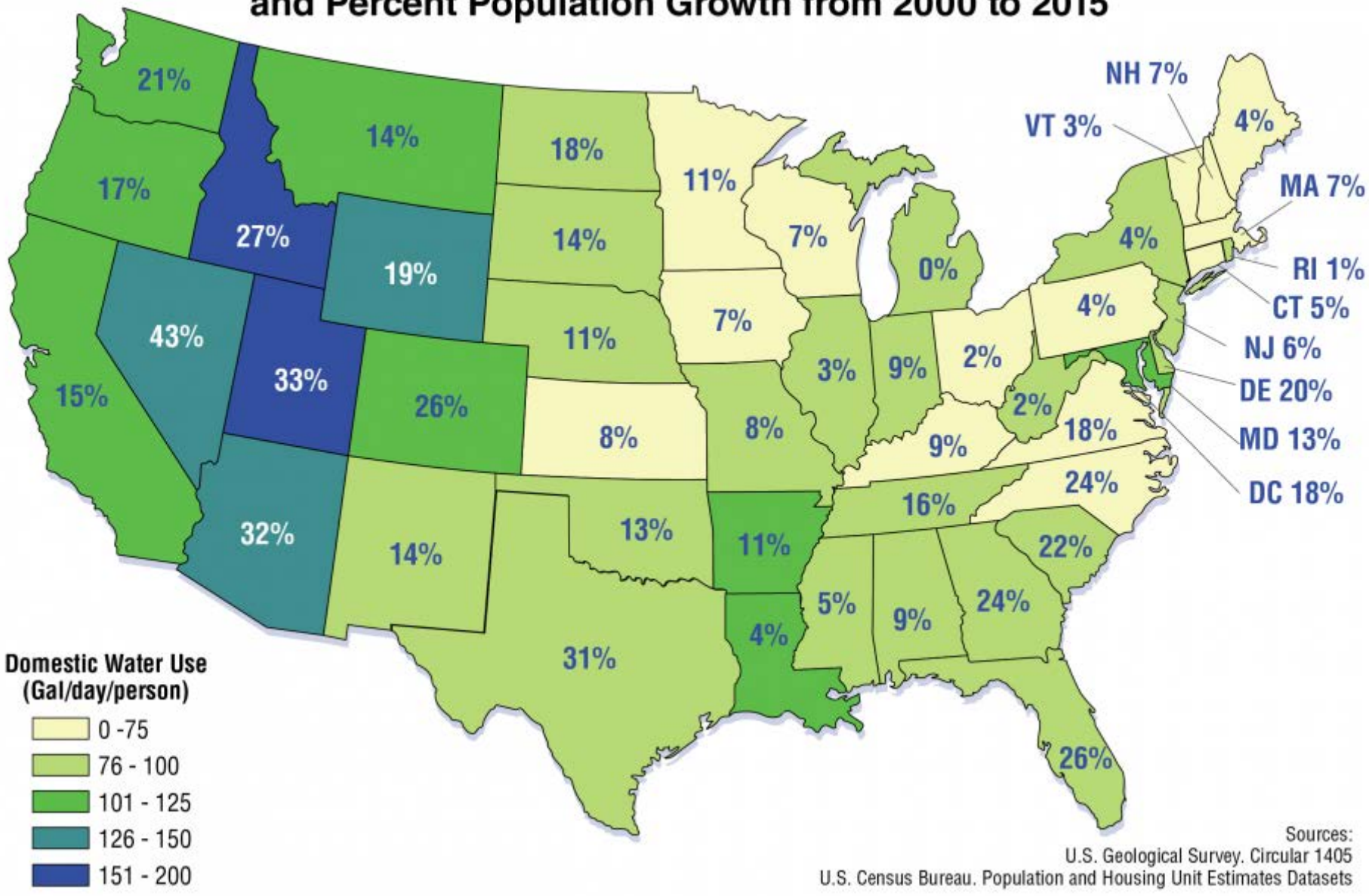
ENVIRONMENTAL LAW•INSTITUTE®

Source: Google Earth.

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

Domestic Water Use in Gallons per Day per Person and Percent Population Growth from 2000 to 2015



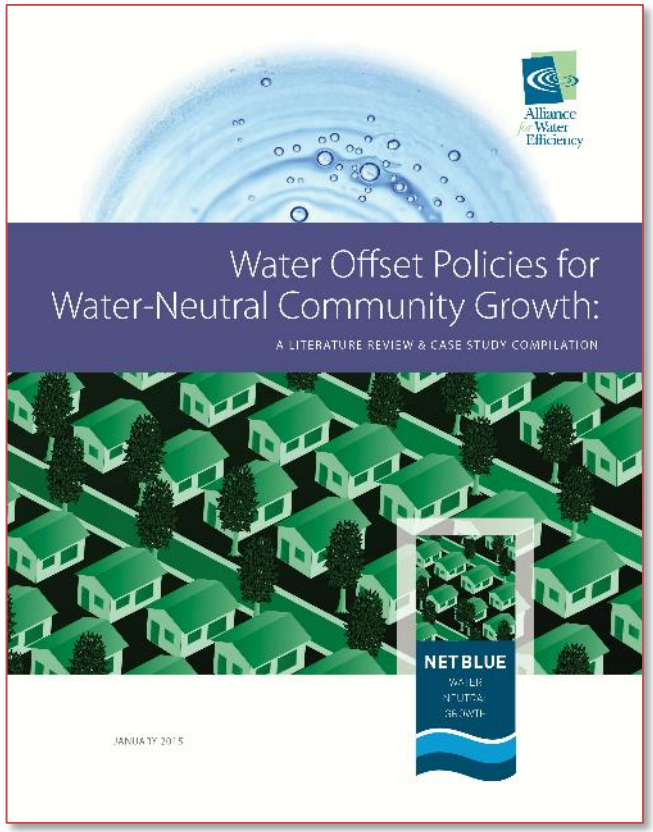
Sources:
U.S. Geological Survey. Circular 1405
U.S. Census Bureau. Population and Housing Unit Estimates Datasets

The Answer: 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
- Not a new concept

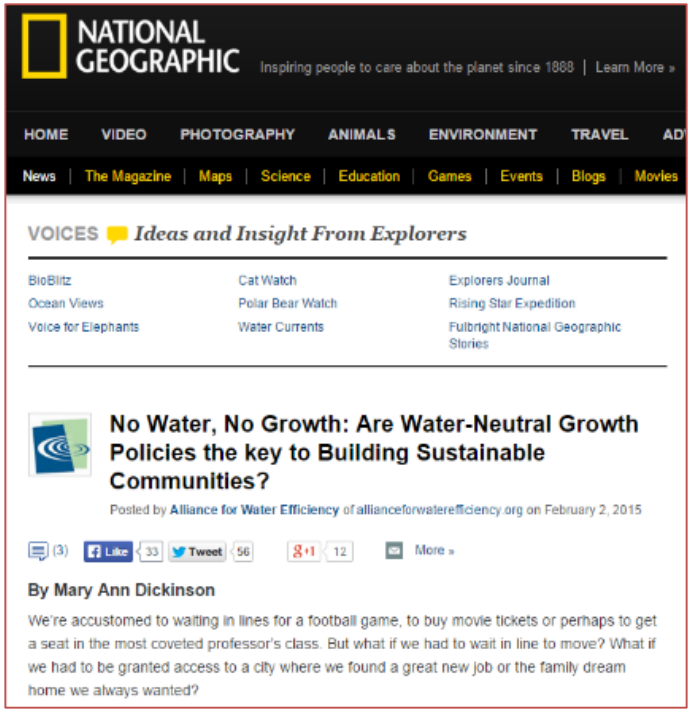
Reviewing Existing Examples

- AWE conducted research related to water demand offset policies
  - ✓ Reviewed terminology
  - ✓ Reviewed literature
  - ✓ Reviewed existing and past policies
- Purpose of review was to provide basis for the development of a national model planning and zoning ordinance



Net Blue: Water-Neutral Growth

- 3-year project to create a national model ordinance that can be tailored to create a customized water demand offset approach
- Partners: AWE, Environmental Law Institute, and River Network
- Funders: Scherman Foundation, Paul Johanson Foundation, and the Metropolitan Water District of Southern California
- Working with 7 partner cities to pilot approach



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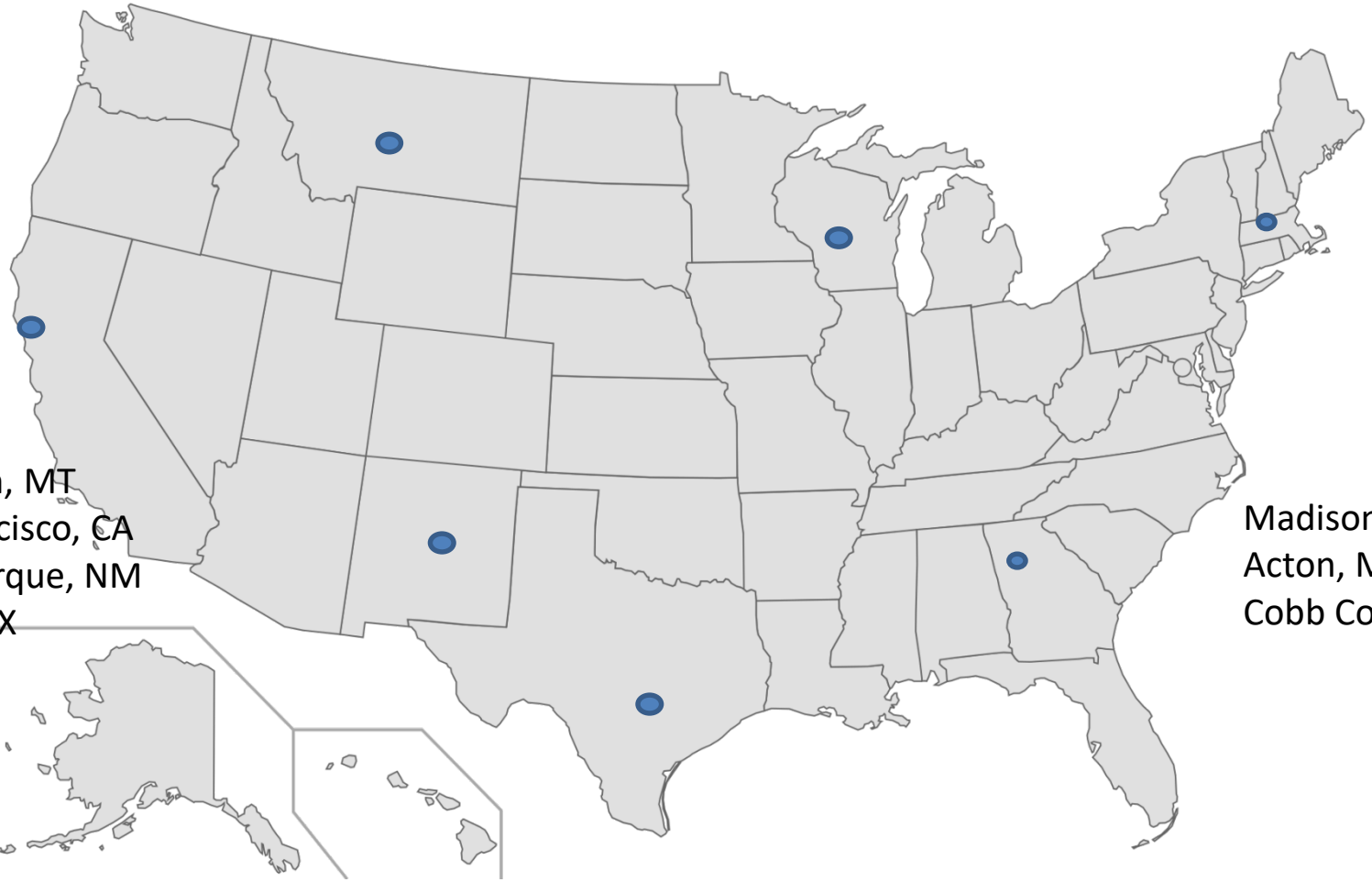
Net Blue Partner Communities



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

Madison, WI
Acton, MA
Cobb County, GA

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Net Blue Project Advisory Committee

1. Dave Anderson (Planning & Zoning)
2. Jacob Atalla (Builder)
3. Sarah Bates (Water law)
4. Bill Cesanek (APA Water Task Force)
5. Doug Farr (Sustainability architect)
6. Kyle Harwood (Offset ordinance attorney)
7. Paula Kehoe (City)
8. Cooper Martin (League of Cities)
9. Dwight Merriam (Developer attorney)
10. Brian Richter (Environmental expert)

Net Blue Toolkit

1. Model Ordinance
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

Approach

- Reviewed literature to identify potential water constraint scenarios where the ordinance may be used
- Dissected existing water offset ordinances
- Designed framework and needed decision points
- Drafted a model ordinance tool with:
  - Elements of existing water offset ordinances
  - Elements drawn from other laws
  - The results of AWE's water offset research

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

The Ordinance Parts and Organization

- 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

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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
- ☐ Manage water to better protect / protect and restore fish, wildlife, and recreation, now and in the future
- ☐ Manage water to better protect water quality as it relates to flows
- ☐ Comply with the specified plan(s)
  - ☐ by identified means
- ☐ Retain groundwater aquifers at levels sufficient to remain healthy
  - ☐ (e.g., protecting against contamination from saltwater intrusion)
  - ☐ (e.g., protecting against increased levels of harmful substances in drinking water)
- ☐ Retain groundwater aquifers at levels sufficient to prevent subsidence / increased pumping costs / reduced baseflows to streams
- ☐ While preserving water resources, allow reasonable time to complete necessary studies and reports for amendments to [select the applicable one]
  - ☐ the general / comprehensive plan

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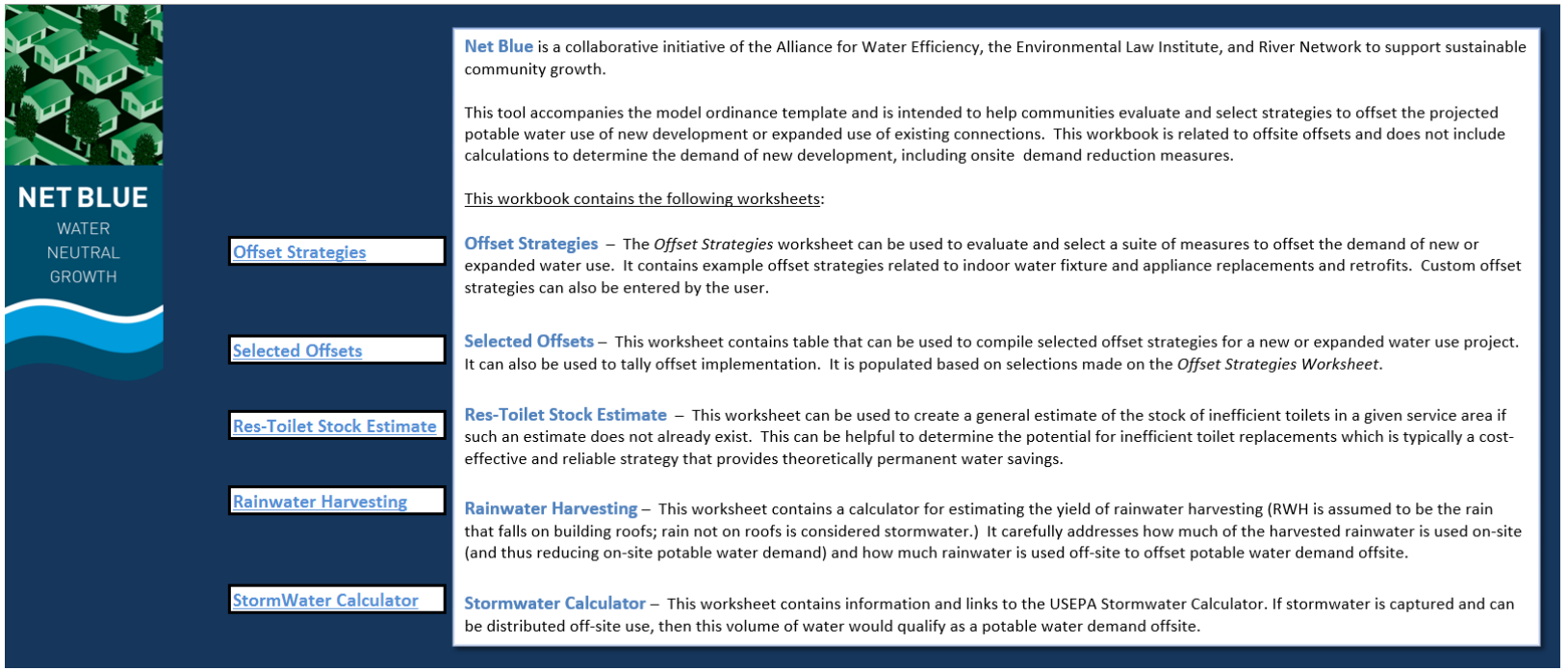
Methodology Workbook

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



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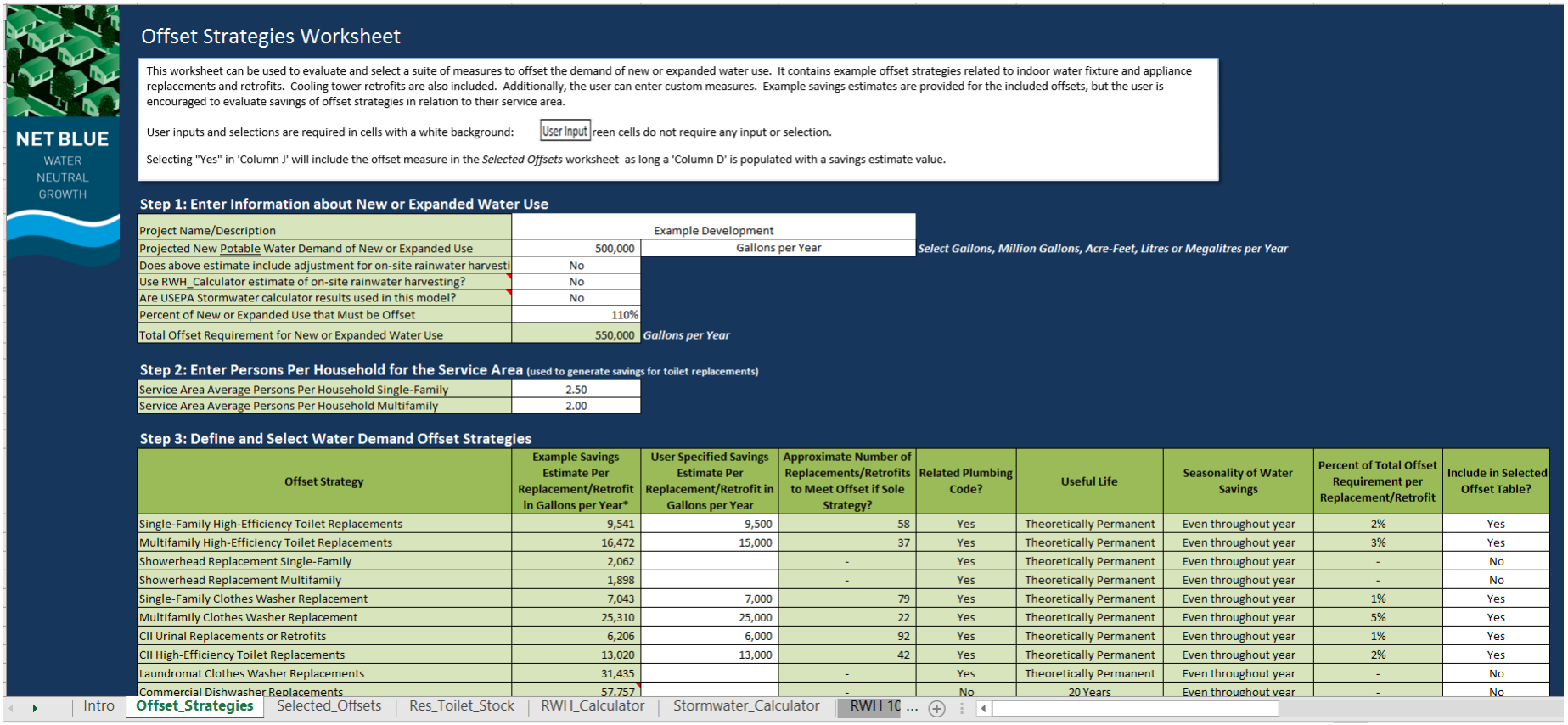
Workbook Components

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

Offset Strategy Worksheet



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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 ...

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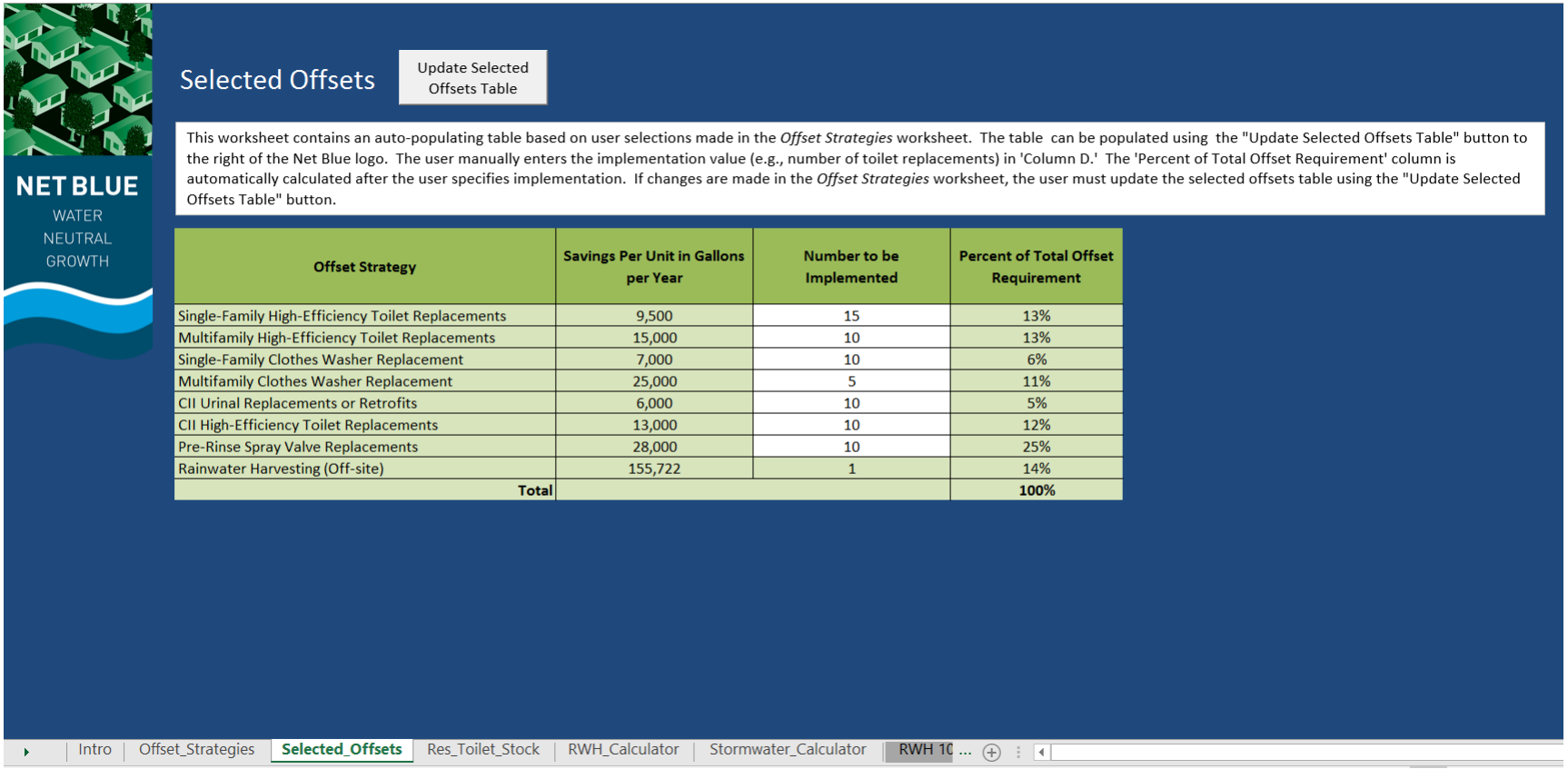
Selected Offset Table



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%**

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Rainwater Harvesting Calculator

- Calculates the amount of harvested rainwater available for on-site and off-site use
- Simulates daily cistern performance over 10-year period using weather data you import into the model
- Estimates potential on-site uses for landscape irrigation and indoor plumbing
- Calculates surplus harvested rainwater available for off-site uses
- Four steps to setup and use the calculator

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Rainwater Harvesting Calculator

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Rainwater Harvest Calculator

This calculator can be used to estimate potential demand offsets from rainwater harvesting and use by a residential or non-residential development fitted with a rainwater collection and storage system (or multiple systems). Three potential demand offsets are estimated: (1) onsite irrigation demand, (2) onsite indoor plumbing demand, and (3) unspecified offsite demand. The calculator simulates daily rainwater collection, storage, and use over a 10-year period using weather data you import into the workbook. There are four steps to setup and use the calculator. The instructions on this worksheet will guide you through each step. Additional information about the calculator is available in the User Guide. The four steps are:

1. Import the weather data.
2. Enter information about onsite landscaping that would potentially use water from the rainwater collection and storage system for irrigation.
3. Enter information about indoor plumbing fixtures that would potentially use water from the rainwater collection and storage system for their operation.
4. Enter information on the design of the rainwater collection and storage system.

Step 1: Import the weather data

Note: to complete this step your computer must be connected to the internet.

In this step you will download the weather data used by the calculator to simulate rainwater collection and storage system performance. To download the data you will need to know the latitude, longitude, and elevation of the location where the rainwater collection and storage system would be installed. Enter these values in the indicated cells below. If you do not know these values, click on this link: Get Latitude, Longitude, and Elevation. Use the navigation features on the map on the webpage to locate your site. Once you have located your site on the map, use your mouse's pointer and click the location. Copy the latitude and longitude coordinates and the elevation.

Latitude	38.600	
Longitude	-121.500	
Elevation	20	Feet

Now you are ready to download the weather data. Click this link to go to the website with the data you will download: Get weather data. On this webpage you complete five steps to download the weather data for your site. Screen shots of each step are shown to the right of this text box. Follow these steps exactly. The calculator will not import the data unless it is formatted correctly.

STEP ONE: Set 'Select Frequency of Desired Data:' to **daily data**; set 'Select Scenario:' to **historical (1950-2005)**; set 'Min Year:' on the left to **1996** and the one on the right to **2005**.
STEP TWO: Enter your latitude (N) and longitude (E) values in the indicated fields. You can use the map on the webpage to confirm the coordinates correspond to your site location.
STEP THREE: Set the number of variables for CSV columns to **7**.
STEP FOUR: Set the first row of columns 2-7 to **MACAv2-METDATA (Climate)**. Set the first row of column 8 to **MACAv2-LIVNEH (Climate)**. See the example to the right.
Set the second row of all the columns to **GFDL-ESM2M (USA)**
Set the third row of the columns as follows: **col 2** pr(Precipitation), **col 3** rsds(Downwelling Solar Radiation), **col 4** tasmax(Max Temperature), **col 5** tasmin(MinTemperature), **col 6** rhsmax(Max Rel Humidity), **col 7** rhsmin(Min Rel Humidity), **col 8** was(Wind Speed).
Warning: The columns must be specified exactly as described above or the calculator will not import the data.
STEP FIVE: Click the button **DOWNLOAD CSV**. A csv formatted file with the data will download to your default download folder. The default file name is 'data.csv.' However, if there is already a file in your default download folder with this name, a number in parentheses will be appended to the file name, like 'data (1).csv."

Now you can import the weather data into the workbook. Click the 'Import Weather Data' button to the right and use the File Explorer to navigate to the data file you downloaded. It will be located in your default download folder, which is probably a folder named 'Downloads.' Once you have navigated to the folder with the file, highlight the file and click the Open button. If the data is imported successfully, you will receive a message telling you this. Otherwise you will receive a message telling you the data could not be imported and to try downloading and importing the data again.

Import Weather Data

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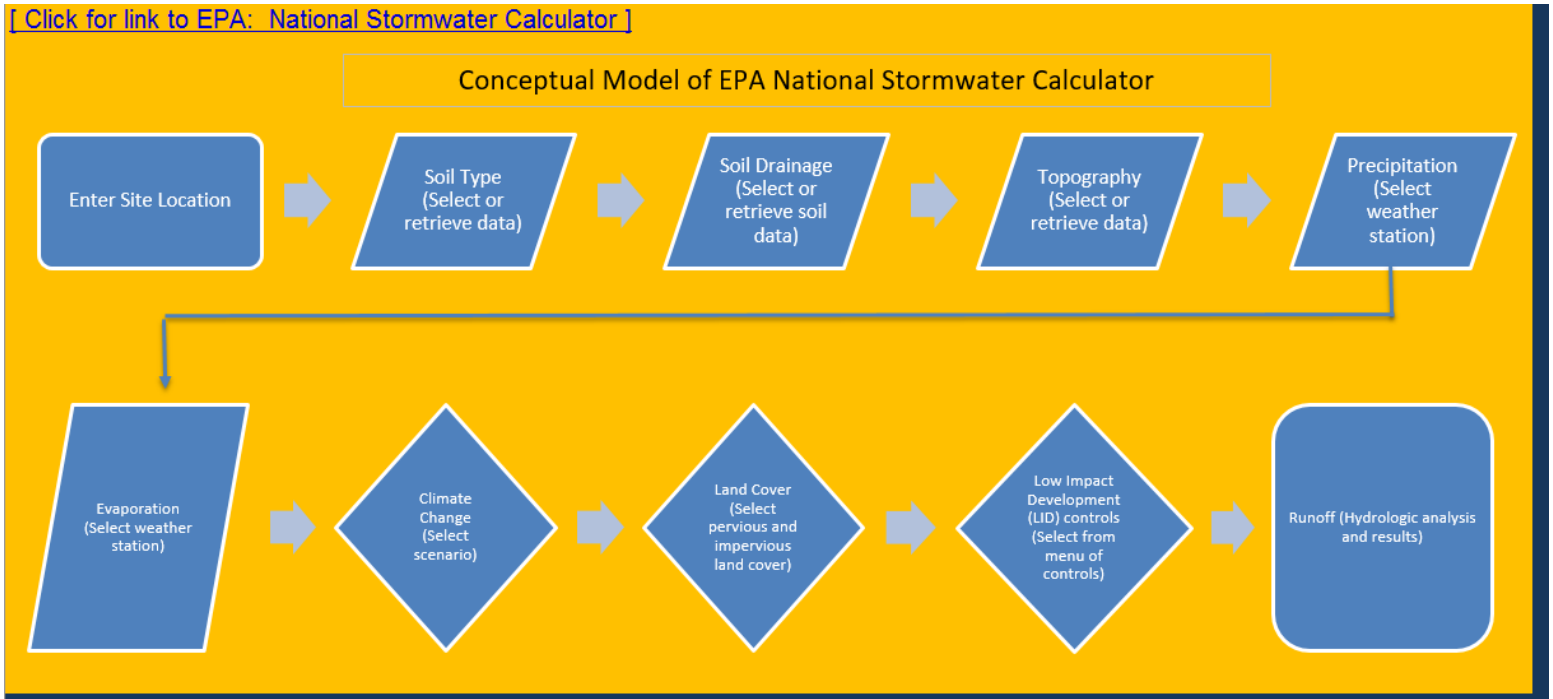
Stormwater Calculator

[Click for link to EPA: National Stormwater Calculator]



Are USEPA Stormwater calculator results used in this n	No	Values below not be linked to Offset_Strategies

Enter output from National Stormwater Calculator: Area:	2.00	acres
Runoff (inches) Current Scenario:	6.13	inches annual runoff
Proportion of Runoff the will be used off-site	50%	

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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.

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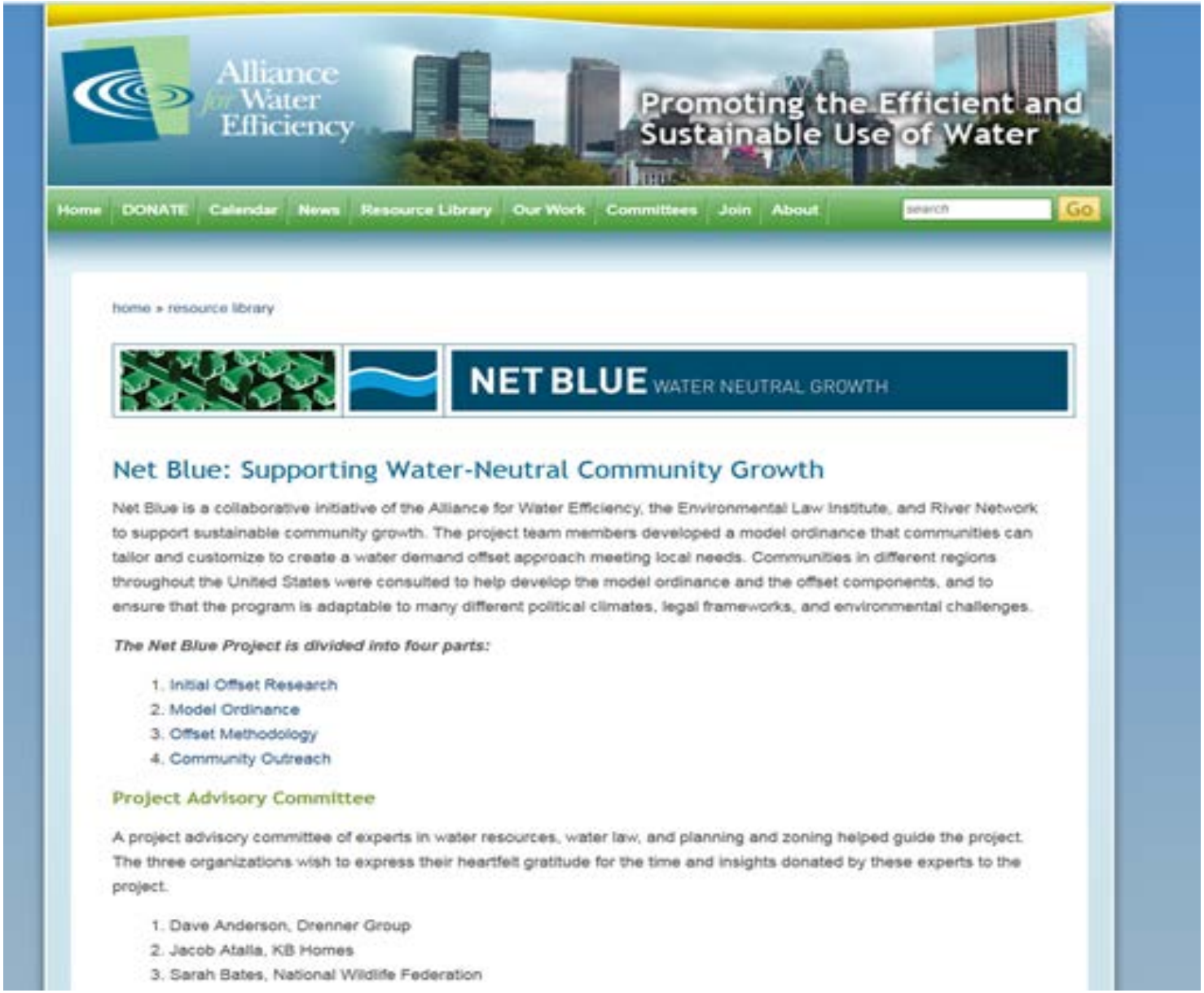
Alliance for Water Efficiency
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NET BLUE WATER NEUTRAL GROWTH
Net Blue: Supporting Water-Neutral Community Growth
Net Blue is a collaborative initiative of the Alliance for Water Efficiency, the Environmental Law Institute, and River Network to support 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
2. Model Ordinance
3. Offset Methodology
4. Community Outreach
Project Advisory Committee
A project advisory committee of experts in water resources, water law, and planning and zoning helped guide the project. The three organizations wish to express their heartfelt gratitude for the time and insights donated by these experts to the project.
1. Dave Anderson, Drenner Group
2. Jacob Atalla, KB Homes
3. Sarah Bates, National Wildlife Federation

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For More Information and to order the Net Blue Toolkit, visit: www.net-blue.org

Alliance for Water Efficiency

river NETWORK
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