going green for groundwater

Awwa Research Foundation
Advancing the Science of Water®

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MSWD Mission Springs Water District

WATER DISTRICT

USGS science for a changing world

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Groundwater Foundation
National Conference
and Groundwater Guardian Designation
in Desert Hot Springs, CA
November 18-20, 2008

Conference Agenda

TUESDAY, NOVEMBER 18, 2008

3:00–5:00 p.m. **Registration**

5:00–7:00 p.m. OPENING RECEPTION: **Meet The Groundwater Foundation President**
Host: Albert A. Webb Associates, Riverside, CA

WEDNESDAY, NOVEMBER 19, 2008

8:00 a.m. **Registration**

8:30 a.m. **Welcome**
Cindy Kreifels, The Groundwater Foundation, Lincoln, NE

8:45 a.m. **Desert Hot Springs Welcome**
Mayor Yvonne Parks, Desert Hot Springs, CA

9:00 a.m. **Going Green for Groundwater: New Directions**
(View Presentation Slides)
Presenter: Tam M. Doduc, Board Chair, State Water Resources Control Board, Sacramento, CA

Groundwater: An Important Aspect of Green Programs

9:30 a.m. **Groundwater: An Important Aspect of Green Programs**
(View Presentation Slides)
Presenter: Gerould Wilhelm, Conservation Design Forum, Elmhurst, IL

10:15 a.m. **Water Sense: Do You Measure Up?**
(View Presentation Slides)
Presenter: Charlotte Ely, US Environmental Protection Agency, Region 9, San Francisco, CA

10:45 a.m. **Networking Break**

11:00 a.m. **Groundwater Guardian Green Sites**
(View Presentation Slides)
Presenter: Jennifer Wemhoff, The Groundwater Foundation, Lincoln, NE

11:30 a.m. **The "Green" Movement: Connections to Groundwater Use and Protection**
(View Presentation Slides)
Presenter: William Alley, US Geological Survey, San Diego, CA

12:00 p.m. Lunch: **Going Green: A Growing Industry**
Presenter: California Governor Arnold Schwarzenegger (invited)

Going Green for Groundwater: It's Catching On

1:30 p.m. **Recycled Water: Perfect for Groundwater Replenishment**
(View Presentation Slides)
Presenter: Phil Anthony, Orange County Water District, CA

2:00 p.m. **Water Smart Home**
(View Presentation Slides)
Presenter: Toby Bickmore, Southern Nevada Water Authority, Las Vegas, NV

2:30 p.m. **Irrigation for A Growing World**
(View Presentation Slides)
Presenter: Dave Johnson, Rain Bird Corporation, Tucson, AZ

3:00 p.m. PANEL: **Stormwater Management: Rain Gardens, Rain Harvesting, Rain Barrels**
(View Presentation Slides)
Moderator: Arden Wallum, Mission Springs Water District, Desert Hot Springs, CA
Presenters: Suzanne Wade, University of Wisconsin Extension, Jefferson, WI; Cathy Lotzer, Groundwater Guardians of the Marshfield Area, WI

3:30 p.m. PANEL: **Going Green One Community at a Time**
(View Presentation Slides)
Moderator: Mike Ekberg, Miami Conservancy, Dayton, OH
Presenters: Cathy Lotzer, Groundwater Guardians for the Marshfield Area and Norb Salamonski, Walgreens Pharmacy, Marshfield, WI; Ross Penhallegon, OSU/ Lane County Extension, Eugene, OR; Debra Boadway, County Sanitation Districts of Los Angeles County, Whittier, CA

4:00 p.m. **"Green" in the Desert**
(View Presentation Slides)
Presenter: David Koller, Coachella Valley Water District, Coachella, CA

4:30 p.m. **Networking Break**

5:00 p.m. **Groundwater Guardian and Groundwater Guardian Green Site Designation Ceremony**

5:45 p.m. **Silent Auction and Reception**

7:00 p.m. DINNER: **Celebration Banquet**

THURSDAY, NOVEMBER 20, 2008

8:30 a.m. **Opening Remarks**
Presenter: Jane Griffin, The Groundwater Foundation, Lincoln, NE

The Greening of America: Industry to Individual

8:45 a.m. PANEL: **Going Green: It's a Growing Industry**
(View Presentation Slides)
Moderator: Nancy Wright, Mission Springs Water District, Desert Hot Springs, CA
Presenters: Mark Johnson, Golf Course Superintendents Association of America, Lawrence, KS; Jeff Tiemann, Cargill, Blair, NE; Jennifer Crain, Nolte Associates, San Diego, CA

9:30 a.m. **Communicating the Value of Water**
(View Presentation Slides)
Presenter: Ed Means, Malcolm Pirnie, Inc., Irvine, CA

10:00 a.m. **Explaining Groundwater Issues: The Responsibility of Newsrooms**
Presenter: Frank Allen, Institutes for Journalism and Natural Resources, Missoula, MT

10:45 a.m. **Meeting Media Challenges: Case Studies**
(View Presentation Slides)
Moderator: Frank Allen, Institutes for Journalism and Natural Resources, Missoula, MT
Presenters: John Soulliere, Coachella Valley Economic Partnership, Palm Desert, CA; Christine Spitzley, Tri-County Regional Planning Commission, Lansing, MI

11:15 a.m. **Networking Break**

11:30 a.m. PANEL: **Greener Communities: Significance of Individual Efforts**
(View Presentation Slides)
Moderator: Jay Beaumont, Eustance & Horowitz, P.C., Walden, NY
Presenters: Lee Drummond, City of Dayton, OH; Tracy Hemmeter, Santa Clara Valley Water District, CA ; Catherine Chertudi, Boise Public Works, ID; Marge Cook, Desert Hot Springs Groundwater Guardians, CA

12:15 p.m. **A Green Future**
Presenter: Jane Griffin, The Groundwater Foundation, Lincoln, NE

12:30 p.m. **Adjourn**

2008 Conference Co-Sponsors
The Groundwater Foundation, Lincoln, NE
Awwa Research Foundation, Denver, CO

2008 Major Conference Donors
Albert A. Webb Associates, Riverside, CA
Coachella Valley Water District, Coachella, CA
Mission Springs Water District, Desert Hot Springs, CA
Richards, Watson, and Gershon, Brea, CA
U. S. Geological Survey California Water Science Center, Sacramento, CA

2008 Conference Partners
Psomas, Costa Mesa, CA
U.S. Geological Survey Nebraska Water Science Center, Lincoln, NE

2008 Conference Exhibitors
The Groundwater Foundation, Lincoln, NE
GSi/water, South Pasadena, CA
Rock River Coalition Groundwater Guardian Affiliate, WI
R.W. Beck, Inc., San Diego, CA
Tom Dodson and Associates, San Bernardino, CA
Water Replenishment District of Southern California, Lakewood, CA

In Kind Contributions
Desert Hot Springs Groundwater Guardians, CA
Nolte Associates, Inc. , San Diego, CA

Thank you so much to all who donated items for the Silent Auction. Proceeds from the Silent Auction will benefit the Groundwater Guardian and Groundwater Guardian Green Sites programs.

A very special thank you to the Desert Hot Springs Groundwater Guardians, especially Marge Cook and Nancy Wright, and the Mission Springs Water District, especially Arden Wallum, Marilyn McKay, Tina Mayo, Meilani MacDonald, and Carol Morin, for their leadership, assistance and support for this conference.

2008 Conference Executive Committee
Alys Brockway, Hernando County Utilities Department, Brooksville, FL • Marge Cook, Desert Hot Springs Groundwater Guardian Team, Desert Hot Springs, CA • Mike Ekberg, Miami Conservancy District, Dayton, OH • Karen Griffin O'Connor, Olsson Associates, Lincoln, NE • Tracy Hemmeter, Santa Clara Valley Water District, San Jose, CA • Rachael Herpel, Water Center/School of Natural Resources, Lincoln, NE • Rick Karlin, Awwa Research Foundation, Denver, CO • Christine Kosmowski, Battle Creek, MI • Rita Schmidt Sudman, Water Education Foundation, Sacramento, CA • Nancy Wright, Mission Springs Water District, Desert Hot Springs, CA • Rick Yoder, P2RIC, Omaha, NE

Going Green for Groundwater: New Directions

Tam M. Doduc

California Water Resources Control Board

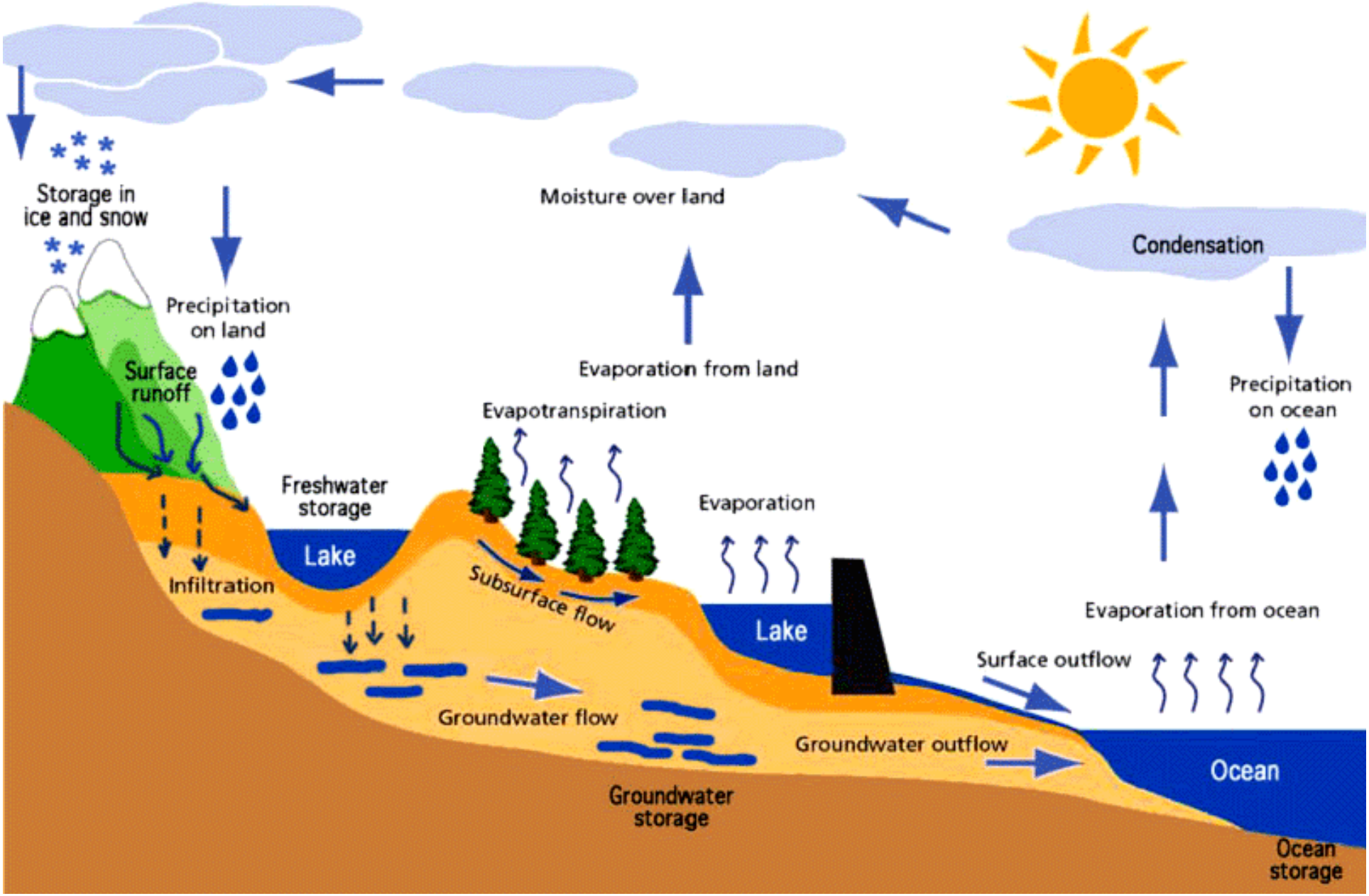
November 19, 2008

Why Groundwater…

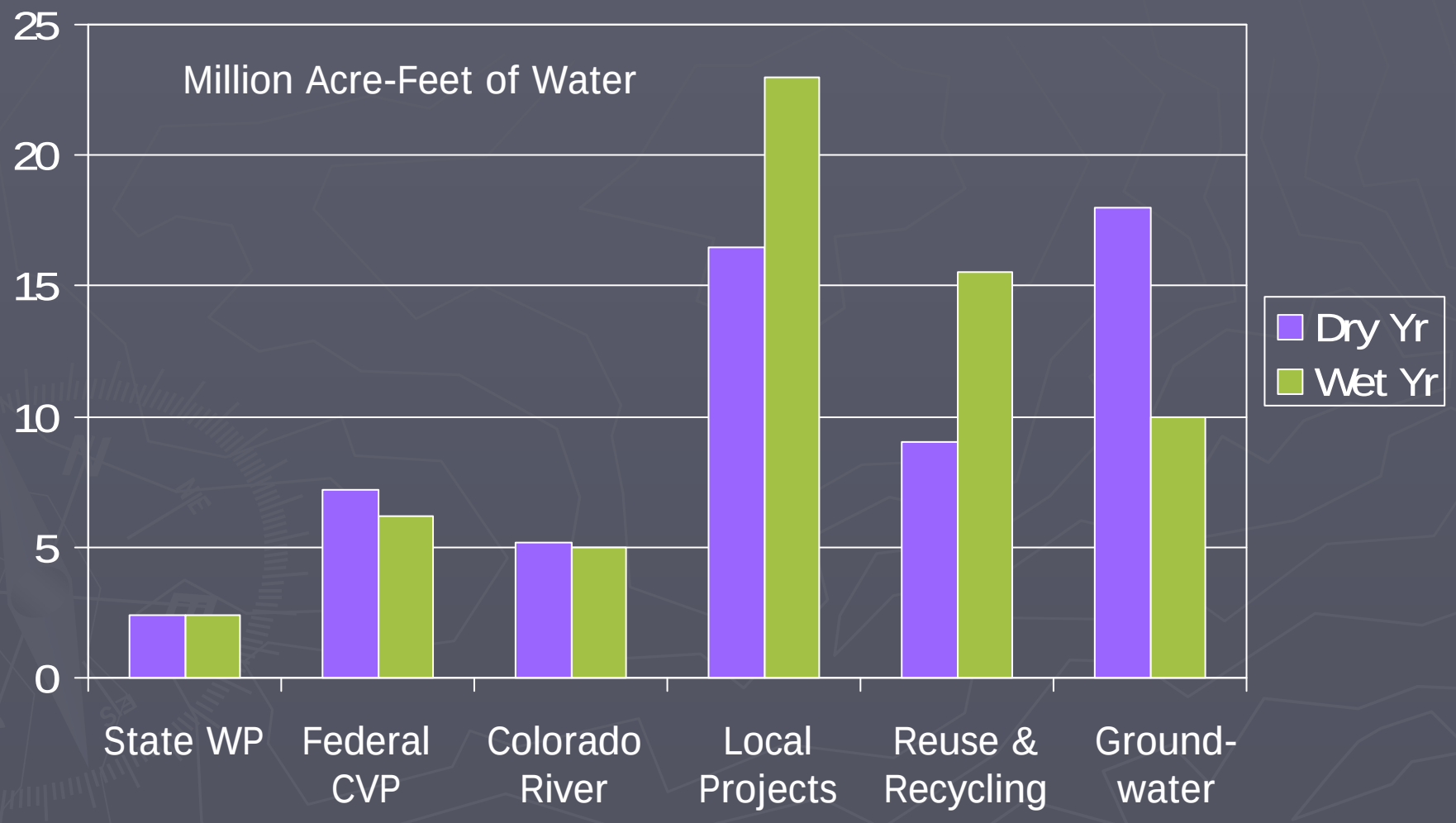
The Crazy Relative

The Odd One

The Hydrologic Cycle

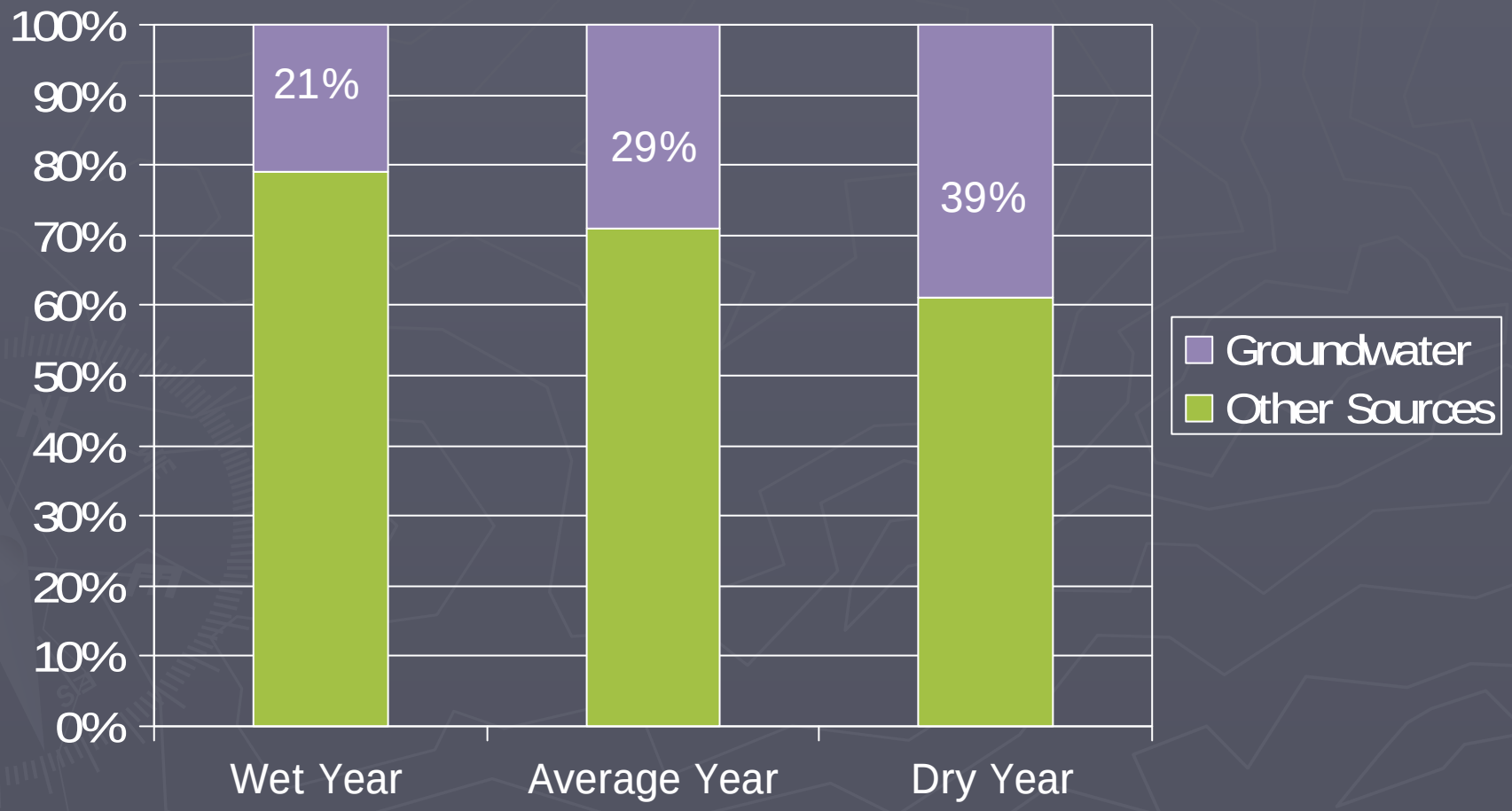


CA Water Supply Sources



Groundwater Contribution

43% of Californians obtain some DW from GW sources



Need for sustainable water supply…

Some CA Initiatives…

Septic Systems Regulations

Recycled Water Policy

Salt Management Plans

Financial Investment and Assistance

Orange County

(Axel Koester for The New York Times)

(Carlos Chavez / Los Angeles Times)

Some New Directions...

Stormwater is a Resource!!!

Natural Treatment Systems!!!

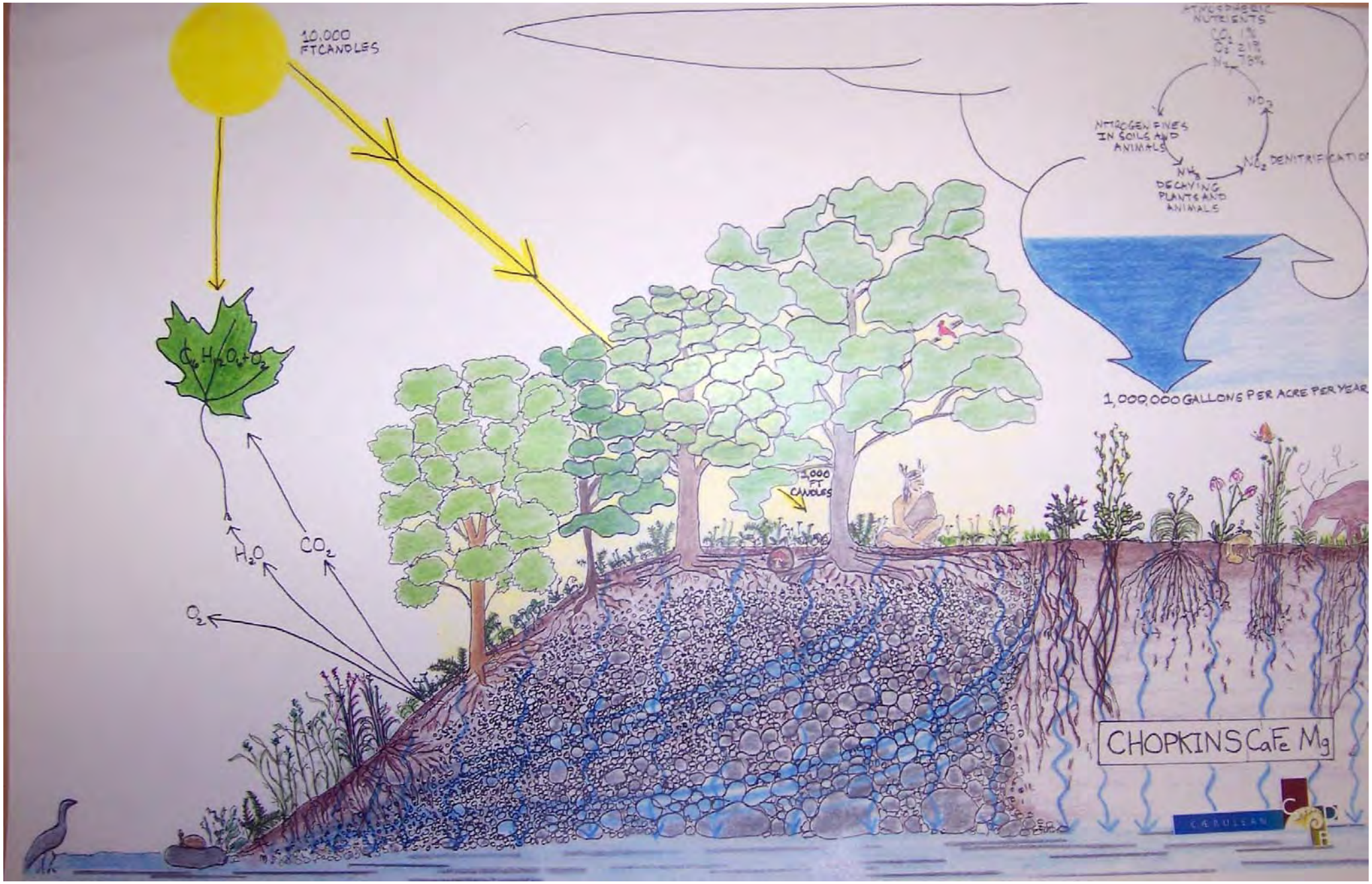
Green Chemistry!!!

Data and More
Data!!!

Statewide Groundwater Rights
and Quality Permitting
System!?!?

Education and Outreach

“In the end, we will preserve only what we love. We will love only what we understand. We will understand only what we are taught.”


10,000 FTCANDLES
$C_6H_{12}O_6+O_2$
H_2O
CO_2
O_2
1,000 FT CANDLES
ATMOSPHERIC NUTRIENTS
CO_2 1%
O_2 21%
N_2 78%
NO_3
NITROGEN FIXES IN SOILS AND ANIMALS
NH_3
DECAYING PLANTS AND ANIMALS
NO_2
DENITRIFICATION
1,000,000 GALLONS PER ACRE PER YEAR
CHOPKINS CaFe Mg
CERULEAN

EPA Region 9 Sustainable Water Infrastructure and Climate Change Initiative

Charlotte Ely
Life Scientist, WTR4
Ely.charlotte@epa.gov

Background

Nationally

- National Water Program Strategy: Response to Climate Change
  - Impacts, mitigation and adaptation

Regionally

- Energy and Climate Change Strategy
  - Highest Priority Activity 8: **Water Energy**
    - Focus on sustainable infrastructure outreach, using State Revolving Funds, and creating new partnerships.
    - Lead Division: Water

EPA National Water Programs Climate Change Strategy

Water Climate Change Strategy

- **Overview: Climate Change Adverse Impacts on Water Resources:**
  - Increases in Water Pollution Problems
  - More Extreme Water-Related Events
  - Changes in Availability of Drinking Water Supplies
  - Waterbody Movement and Displacement
  - Changing Aquatic System Biology
  - Collective Impacts on Coastal Areas

EPA National Water Programs Climate Change Strategy

Water Climate Change Strategy

- **5 Major Water Program Goals:**
  - Goal 1: Mitigation of Greenhouse Gases
  - Goal 2: Adaptation to Climate Change
  - Goal 3: Climate Change Research Related to Water
  - Goal 4: Education on Climate Change
  - Goal 5: Management of Climate Change

WTR-4: Infrastructure Office

- Created in February 2008
- Consolidated earmark grant management, State Revolving Fund, Border Infrastructure, and climate change activities
- We’re coordinating our programs and existing external resources to maximize efficiency
- Home of the *Sustainable Water Infrastructure and Climate Change Initiative…*

Ratio decidendi

Water-Energy Nexus

The use of water in the world of energy

Water is used to turn turbines for hydropower, to produce steam for thermoelectric power, and to cool equipment by absorbing the waste heat produced by power generation with **once-through** or **closed-loop** cooling systems.

Each kilowatt-hour (kWh) of thermoelectric generation requires the withdrawal of approximately 25 gallons of water, primarily for cooling purposes.

Water used to extract oil and coal

The use of energy in the world of water

Extracting and conveying water
Treating water
Distributing water
Using water
Collecting and treating wastewater

Context/Factoids

Running the hot water faucet for 5 minutes uses about the same amount of energy as burning a 60-watt bulb for 14 hours.

-U.S. Environmental Protection Agency

19 percent of all the electricity used in California is attributed to the extraction, conveyance, treatment, distribution and use of water.

-California Energy Commission

In 2000, thermoelectric facilities used 195,000 million gallons of water a day. This represents almost half of all of the water withdrawn in the United States.

- United States Geological Survey

Water and wastewater facilities are among the largest and most energy-intensive systems owned and operated by local governments, accounting for as much as 56% of municipal energy usage in California

-California Energy Commission

Conclusions...

Saving Energy Saves Water

Saving Water Saves Energy

Saving Water and Energy reduce GHGs!

Sustainable Water Infrastructure and Climate Change Initiative

Our mission statement:

Promote sustainable infrastructure and reduce greenhouse gas emissions by increasing water and energy efficiency in water, wastewater, and stormwater infrastructure throughout Region 9.

Current Activities

1) **Coordinating with existing programs and offices** (Energy team, border, Islands, Tribes, local governments, permits, enforcement, SRF, and congressional earmark grants.)
2) **Providing outreach, training, and workshops to Water & Waste Water Treatment Facilities:**

   3 steps to sustainability

   Step 1- Conduct Energy STAR Portfolio Manager Analysis

   Step 2- Conduct Energy Audit

   Step 3- Implement Recommendations/Replace Equipment
3) **Promote EMS workbook (Ensuring a Sustainable Future, 2008) through regional workshops** (First one is 12/16!)

Current activities continued...

4) **Funding fact sheets**
5) **Water conservation and efficiency (Water recycling, WaterSense)**
6) **Green Education**
7) **Promoting energy efficiency through biofuels and anaerobic digestion**
8) **Awards/recognition**

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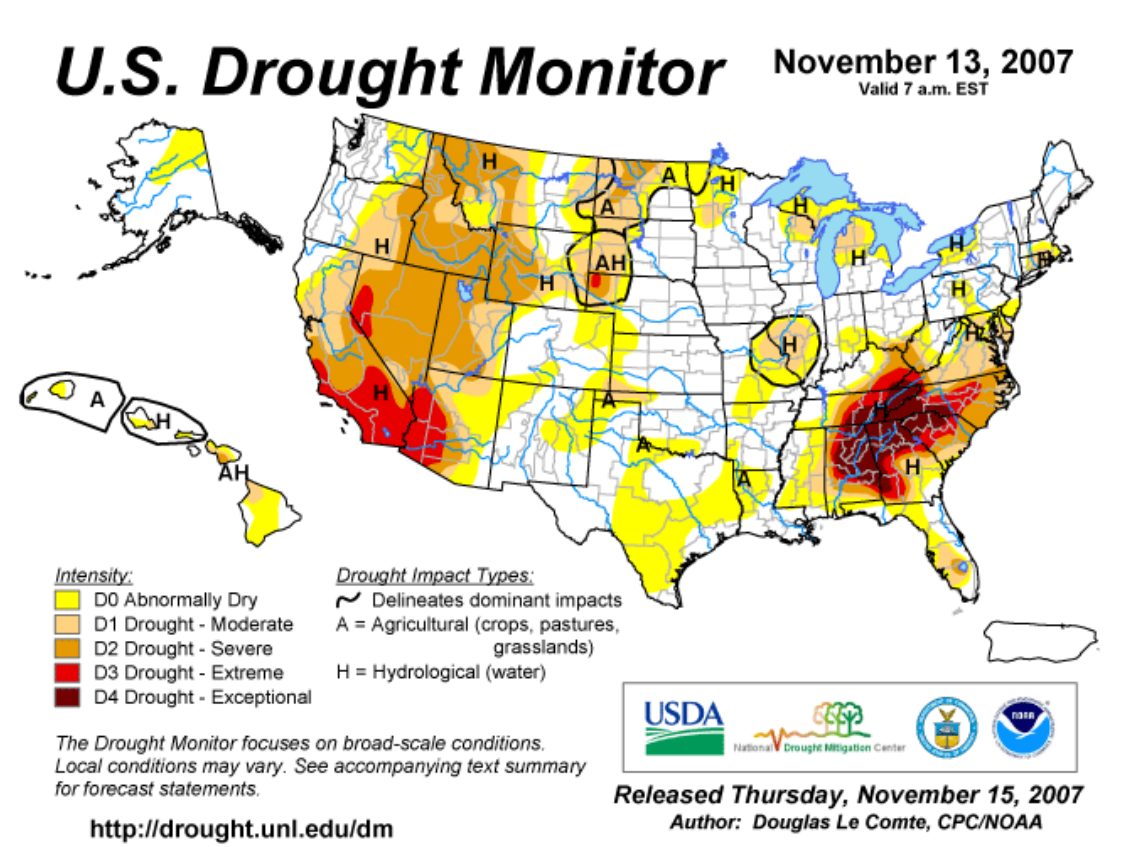
Every drop counts.

A Thirsty Nation

- Increasing population and demand on public supply systems.
- Water shortages throughout the country

Continuing Drought



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Strained Resources

- Updating infrastructure could cost nearly $500 billion!
- Water efficiency could help delay these costly projects and save energy associated with pumping and treating water.

Inefficient Water Use

- Approximately 5% to 10% of American homes have water leaks that drip away 90 gallons a day or more.
- Older toilets are 60% less efficient than today's WaterSense labeled toilets.
- Up to 50% of landscape watering is wasted.

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Need for Water Efficiency

Water shortages

Consumers looking for ways to save on rising utility bills

WaterSense • Meets EPA Criteria • SM

High-performing technology available

Opportunity to change practices

Water Efficiency = significant infrastructure savings

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What Is WaterSense?

A partnership program sponsored by the U.S. EPA

Promotes the value of water and help Americans make smart decisions regarding water use and water-using products.

Aims to increase the adoption of water-efficient products and services by consumers and organizations.

EPA WaterSense

WaterSense Product Evaluation Factors

WaterSense uses the following factors in determining which products to label. Products must:

- Offer equivalent or superior performance.
- Be about 20 percent more water-efficient than conventional models.
- Realize water savings on a national level.
- Provide measurable results.
- Achieve water efficiency through several technology options.
- Be effectively differentiated by the WaterSense label.
- Be independently certified.

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Schedule for Evaluating WaterSense Products & Programs

	Completed: 2006/2007	*Planned: 2008 and Beyond*
Irrigation	*Certification for Irrigation Professionals*	*Moisture Sensors* *Drip Micro Technology* *Smart Controllers*
Residential Plumbing	*Toilets* *Faucets*	*Showerheads* *Water Softening Systems*
Commercial Plumbing		*Toilets* *Pre-rinse Spray Valves* *Urinals*
Other		*New Homes* *Autoclaves* *Medical Vacuums* *Additional Professional Certifications*

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The WaterSense Strategy

- 1: Market Transformation
- 2: WaterSense Benefits
- 3: Residential Plumbing
- 4: Irrigation
- 5: New Homes
- 6: Partnership

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1: Market Transformation

- Overview
- Strategy
- Barriers
- Solutions

Market Transformation—Overview

What is "Market Transformation"?

The process by which sustained and permanent change is achieved by incrementally influencing the market

How does this affect water efficiency?

Result in permanent and measurable improvements in the way people value, provide, use, or choose water-efficient products and services

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WaterSense Market Transformation Strategy

- Deliver water-efficient products, services, and practices to market
- Shift residential and commercial demand for water-efficient products and services over a long-term basis
- Create a dynamic “push/pull” effect that results in a stable, sustainable market condition that supports water-use reduction goals

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Market Transformation—Barriers

- Inability to identify/recognize water-efficient products
- Negative performance perceptions of water-efficient products
- Lack of information on water-efficient products
- Low water cost/unclear financial signals
- Lack of credible source of information
- Lack of incentive
- Lack of awareness about water supply

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Market Transformation—Solutions

To overcome those barriers, the U.S. EPA:

- Designed the WaterSense label
- Provides national leadership and defines water efficiency
- Has increased research on water use to provide a credible source of information and improve awareness of water supply
- Encourages the design of water-efficient products with performance specifications

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Market Transformations—Solutions

- Build cooperative partnerships to:
  - Promote water-efficient products and increase their introduction into the market
  - Encourage water-efficient products placed on the shelves of suppliers and retailers
  - Help increase consumer understanding of the benefits of water efficiency and increase the demand for labeled products

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2: WaterSense Benefits

- Environmental
- Economic
- Health
- Climate Change

Program Benefits—Environmental

- Reduces water use today so that water resources are maintained for future generations
- Maintains the health of aquatic environments
- Protects drinking water resources by decreasing the need to withdraw ground or surface water supplies
- Minimizes water pollution by decreasing the amount of runoff from landscaping and irrigation practices
- Helps mitigate the effects of drought

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Drops to Watts

- Water savings also translate to energy savings.
- Approximately 80% of municipal water processing and distribution costs are for electricity.
- This means nationwide, drinking water and wastewater systems use 56 billion kilowatt-hours per year—enough electricity to power more than 5 million homes for an entire year.
- Water efficiency could help reduce this energy drain.

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Program Benefits—Economic

- Reduces the need for developing new water supplies and building new wastewater treatment facilities, which are very costly
- Saves energy used to pump, heat, and treat water
- Provides a competitive edge for businesses as water quality regulations become stricter and the cost of water increases

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Program Benefits—Health

- Minimizes health risks associated with water pollution
- Reduces the amount of energy needed to treat wastewater, resulting in less energy demand and therefore, less air pollution from power plants

Program Benefits—Global Climate

- Reduces greenhouse gas emissions associated with energy needed to pump, treat, and heat water
- Helps minimize risks associated with uncertain future climate impacts
- If only one out of every 100 American homes retrofitted with water-efficient fixtures, we could avoid 80,000 tons of greenhouse gas emissions—equivalent to removing nearly 15,000 automobiles from the road for a year!

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3: Residential Plumbing

- Manufacturer Partners
- Market Overview
- Case Study
- Market Retrofit Goals

WaterSense Manufacturer Partners

- Most major plumbing fixture manufacturers have already partnered with WaterSense:
  - American Standard - Kitchen and Bath Division
  - Caroma Industries Ltd.
  - Crane Plumbing, LLC
  - Delta Faucet Company
  - Foremost Groups, Inc.
  - Kohler Company
  - Niagara Conservation Corp.
  - TOTO USA, Inc.
  - VitrA USA
  - Zurn Industries Inc.

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Residential Market Overview

- Total Installed Toilets: 266.5 million
  - Of these, 78 million residential toilets use 3.5 gallons per flush or greater
  - And 46.5 million commercial toilets use 3.5 gallons per flush or greater
- Annual Residential Sales: $10.1 million
  - Bathroom remodeling–$5.2 million
  - New construction–$4.7 million
- Remodeling Activity
  - Home improvement market has had 12-year growth curve with no sign of slowing
  - Northeast and West show greatest growth in remodeling
- Residential Distribution Chain
  - Lowe's, Home Depot, and Sears account for 60 percent of total bathroom projects in the retail sector
  - About 50 percent of residential toilets are sold to builders via direct sales for new construction
  - Do-it and buy-it-yourself projects account for 85 percent of retail sales

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Water Efficient Retrofits—Save Water & Money

- Three-City Residential Retrofit Study
  - Cities
    - Seattle, Washington
    - East Bay, California
    - Tampa, Florida
  - Fixtures updated in 96 homes
    - Toilets
    - Faucets
    - Showerheads
    - Clothes Washers
  - Savings Demonstrated
    - Seattle and East Bay: 39 percent reduction from baseline use
    - Tampa: Nearly 50 percent reduction
    - Including leak reduction, toilets accounted for 71 percent of savings
    - In one year, typical residences saved 30,000 gallons, or $172

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Improving Residential Water Efficiency

- *Goal 1—Increase Awareness of Water-Efficient Products*
  - Make water efficiency an attribute of choice
  - Action plan
    - Partner with local utilities and retailers to promote products
    - Train in-store staff on labeled products
- *Goal 2– Reduce Fixture Water Use*
  - Ensure water efficiency, as well as product performance
  - Encourage product innovation
  - Action plan
    - Develop product specifications
    - Publish list of WaterSense labeled products
    - Encourage consumers to purchase WaterSense labeled products

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Niagara-Sized Savings

- If we replaced all the inefficient toilets in U.S. homes to WaterSense labeled models, we could save more than 640 billion gallons of water per year—more than two weeks flow over Niagara Falls.
- Over 10 years, WaterSense labeled toilets can save a family of four roughly $1,000.

Look for the WaterSense Label

- Toilets
  - More than 120 labeled models
  - List available online at:

  www.epa.gov/watersense/pp/het.htm
- Faucets
  - More than 30 labeled models
  - List available online at:

  www.epa.gov/watersense/pp/bathroom_faucets.htm
- Showerheads
  - Under development

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4: Irrigation

- Market Overview
- Case Study
- Water-Efficient Retrofits
- Improving Water Efficiency

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Irrigation Market Overview

- Outdoor use is estimated to be about 30 percent of residential use, or approximately 7.8 billion gallons per day, with the largest component being used for irrigation.
- But it can be as high as 70 percent in the drier regions of the West and Southwest, where population growth is often greatest.
- If homeowners hire WaterSense irrigation partners to perform regular maintenance on their irrigation systems, they could reduce irrigation water use by 15 percent, or about 9,000 gallons annually.

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Irrigation Focus

- Services
  - Irrigation system audits
  - Irrigation system design
  - Irrigation system installation and maintenance
  - Landscape design (future)
- Products
  - Weather- or sensor-based irrigation control technology
  - Micro drip irrigation (future)

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Water Efficient Retrofits—Save Water and Money

- Harvard Business School–Upgrade of Irrigation Controls and Equipment (2002)
  - Retrofit existing irrigation system
    - Weather station
    - Sensors
    - Computerized control/zone programmability
    - Automatic shut-off for excessive flow
    - Remote access to schedule system
  - Savings
    - Nearly 5 million gallons of water per year
    - $50,000 saved per year in water, labor, and related costs
    - Payback period under 5 years

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Improving Irrigation Water Efficiency

- *Goal 1– Increase Awareness of Water-Efficient Products and Services*
  - Make water efficiency an attribute of choice
  - Partner with national and local organizations to promote water efficiency
- *Goal 2—Improve the Performance of Irrigation Systems*
  - Promote good design, installation, and O&M of irrigation systems
  - Promote the use of water-efficient irrigation equipment
- *Goal 3– Promote Water-Efficient Landscaping*
  - Work with existing partners and other EPA programs to address efficient landscape design, plant selection, and soil amendments

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Certifying Organizations and Labeled Programs

WaterSense Certifying Organization Partners

- Irrigation Association
- North Coast Water Conservation Group
- Rain Bird Services Corporation

WaterSense Labeled Programs

- IA Certified Irrigation Contractor (CIC)
- IA Certified Irrigation Designer (CID)
- IA Certified Landscape Irrigation Auditor (CLIA)
- IA Certified Golf Irrigation Auditor (CGIA)
- North Coast's Qualified Water-Efficient Landscaper

WaterSense Certified Professional Partners

- More than 300 Irrigation Partners as of February 2008

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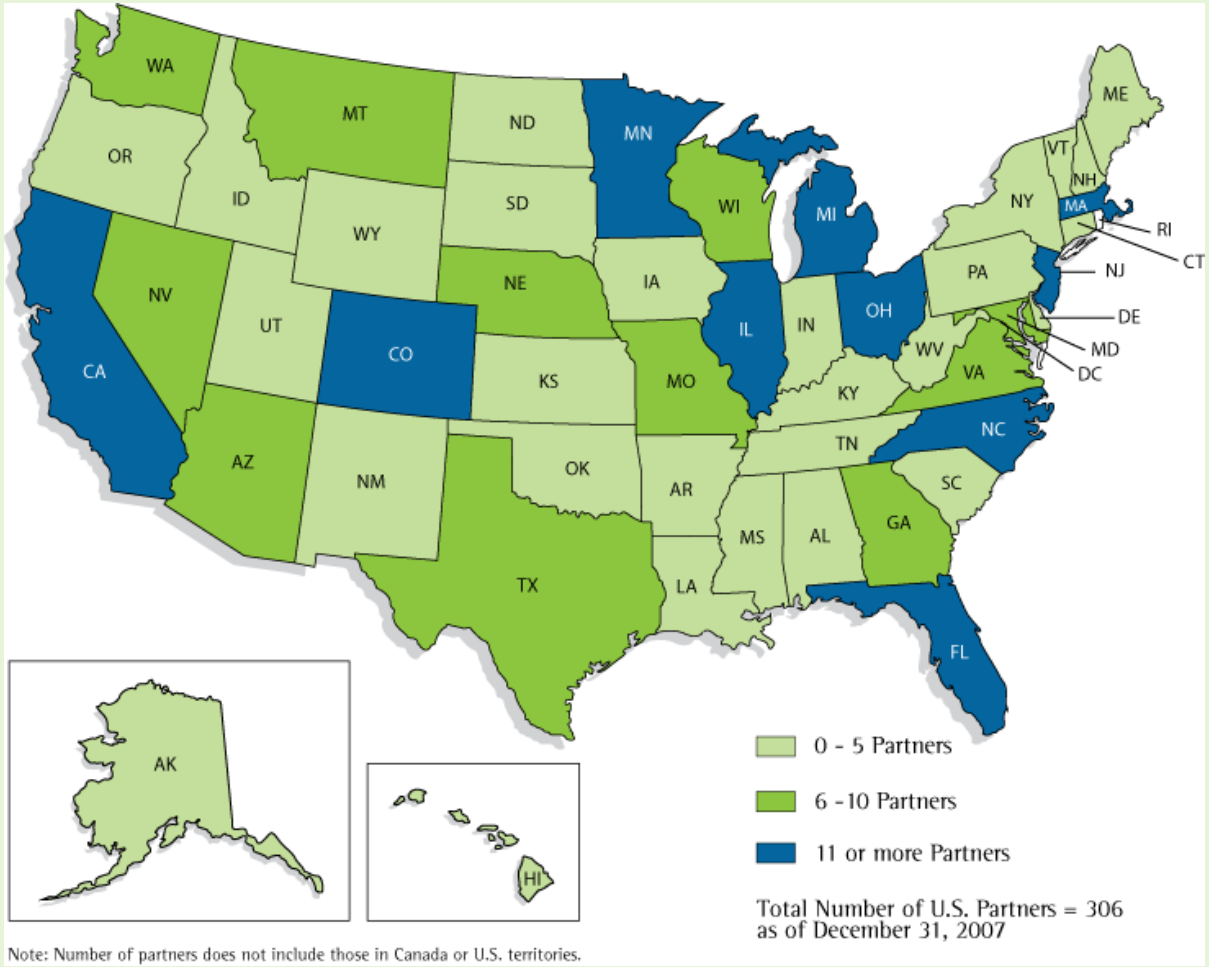
Irrigation Partners Across the Country



Note: Number of partners does not include those in Canada or U.S. territories.

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Household Savings

- The average household uses approximately 29,000 gallons of water for outdoor use, most of which is used to water yards and gardens.
- Using weather-based irrigation controllers could help the nation save nearly 24 billion gallons of water per year—equal to more than 7,000 garden hoses running nonstop for a year.

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5: New Homes

- Overview
- Stakeholders
- Efficiency Components
- Schedule

Why New Homes?

- One-half of the homes that will exist in 2030 will have been built after 2000.
- As many as 14 million new single-family homes may be needed by 2015.
- Homes with highly efficient technology can save about 30% or more in water use.
- If all new homes used high-efficiency technology, about 1 billion gallons of water per day could be saved by 2015.

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New Homes Stakeholders

- EPA has been soliciting input from more than 60 key stakeholders including:
  - National new home program representatives
  - Local program representatives
  - Home builders
  - Landscape professionals
  - Product manufacturers
  - Trade associations
  - Environmental groups

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WaterSense New Homes Efficiency Components

- Plumbing and fixtures: WaterSense labeled toilets and faucets, showerheads, hot water delivery
- Appliances: dishwasher and clothes washer
- Landscape design
- Irrigation system (if installed)
- Homeowner education

New Homes Schedule

- *EPA's anticipated activities for 2008:*
  - Release draft specifications for public comment
  - Begin conducting marketing and outreach activities
  - Work with stakeholders to develop final specifications
  - Release final specifications

6: Partnering With WaterSense

- Partnership Opportunities
- Benefits of Participation
- Resources for More Information

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Partnership Opportunities

Promotional Partners -Utilities -State & Local Governments -Nonprofit Organizations	▪ Promote WaterSense labeled products and practices to customers ▪ Promote the concept of water efficiency and value of water ▪ Offer rebates for WaterSense labeled products (utilities)
Manufacturers	▪ Manufacture WaterSense labeled products and promote them to buyers
Professional Certifying Organizations	▪ Sponsor and promote professional certification programs that highlight water efficiency (currently only irrigation) ▪ Encourage certified individuals to become WaterSense partners
Irrigation Partners	▪ Promote WaterSense labeled products ▪ Practice water-efficient services
Retailers/Distributors	▪ Stock, promote, and sell WaterSense labeled products

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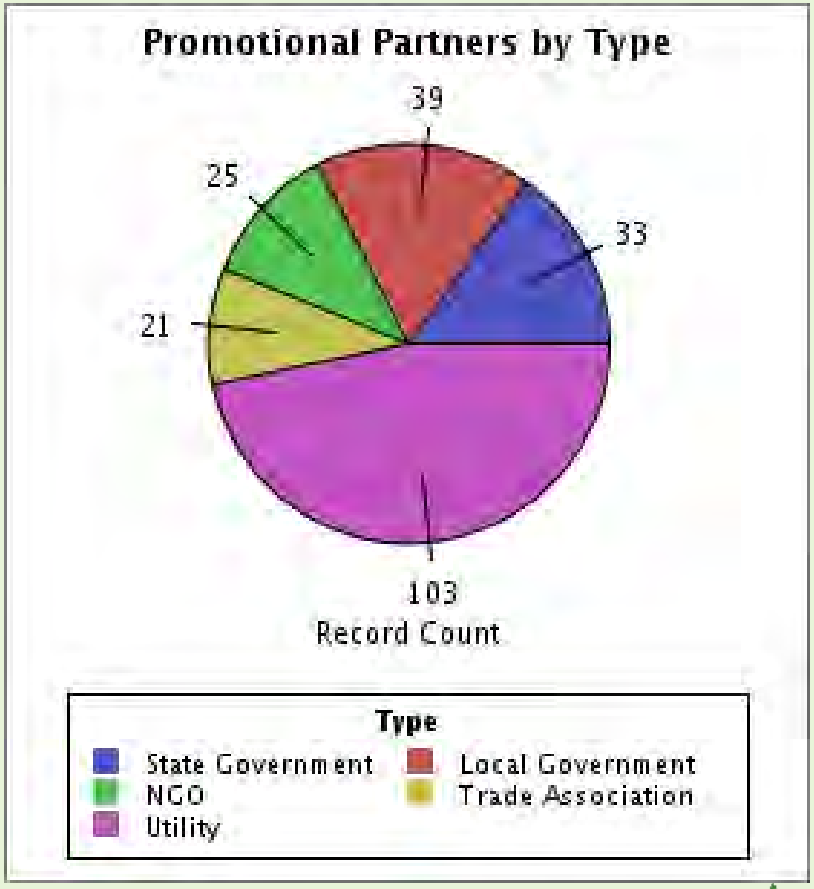
WaterSense Promotional Partners

Partners:

- 39 Manufacturers
- 221 Promotional Partners
  - 103 utilities in 29 states
  - 33 state agencies
  - 39 local governments
  - 25 NGOs
  - 21 trade associations
- 4 Certifying Organizations
- 35 Retailers/Distributors
- 359 Certified Irrigation Professionals



Benefits of Participation

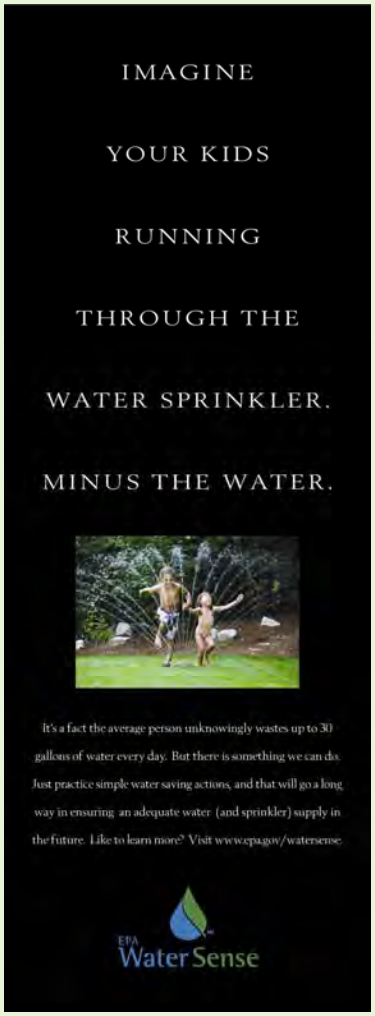
- National specifications for water-efficient products and services
- Recognition as a leader in water efficiency from EPA
- Membership in a national network of water efficiency leaders
- Access to WaterSense materials, templates, and logo or label for promotional use
- Tools for promoting WaterSense labeled products, certification programs, and practices

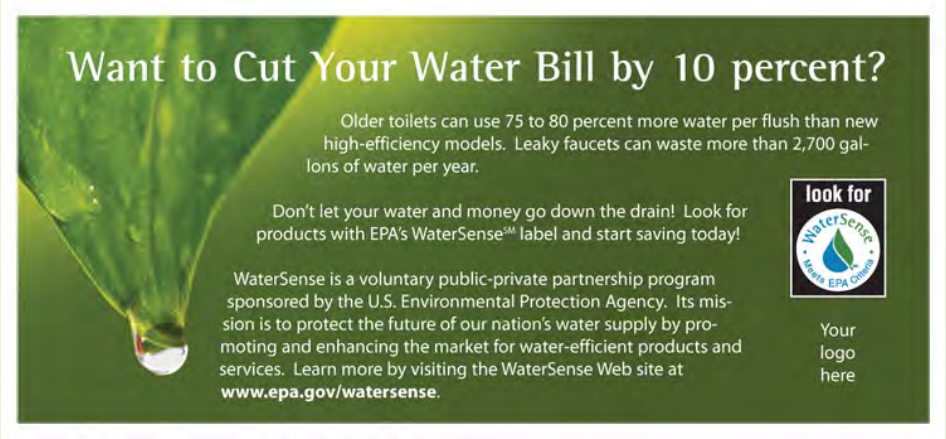
EPA WaterSense

Sample Partner Resources

- Tool Kits

- PSAs





- Bill stuffer, magnet, and water bottle templates

EPA WaterSense

Make a Difference!

You Can Make a Difference by Participating in EPA's WaterSense Program!

EPA WaterSense

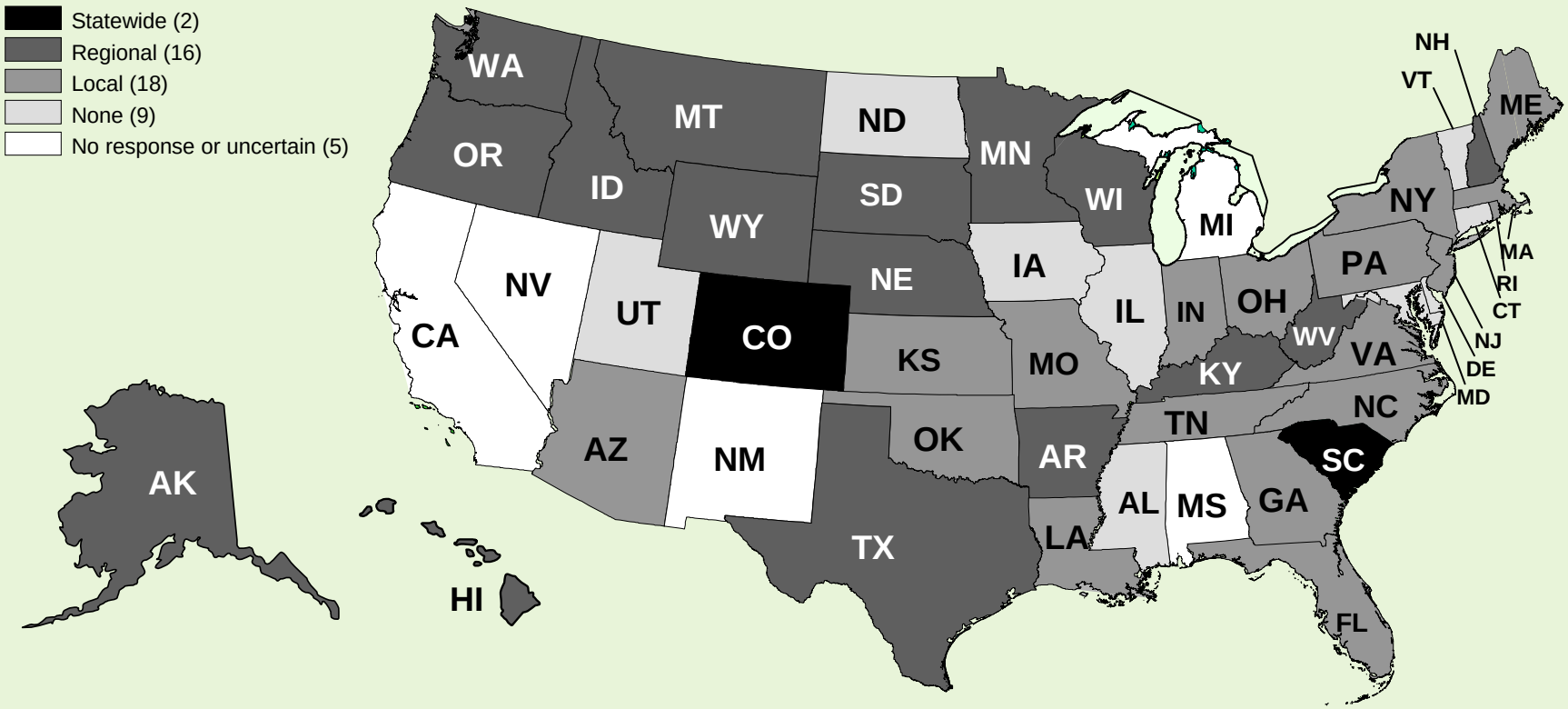
More Information

- WaterSense Information
  - Web site: www.epa.gov/watersense
    - List of products
    - Partnership information
    - Test Your WaterSense Quiz
    - Fact sheets and other resources
  - E-mail: watersense@epa.gov
  - Toll-free Helpline: (866) WTR-SENS

EPA WaterSense

Every drop counts.

Anticipated Water Shortages



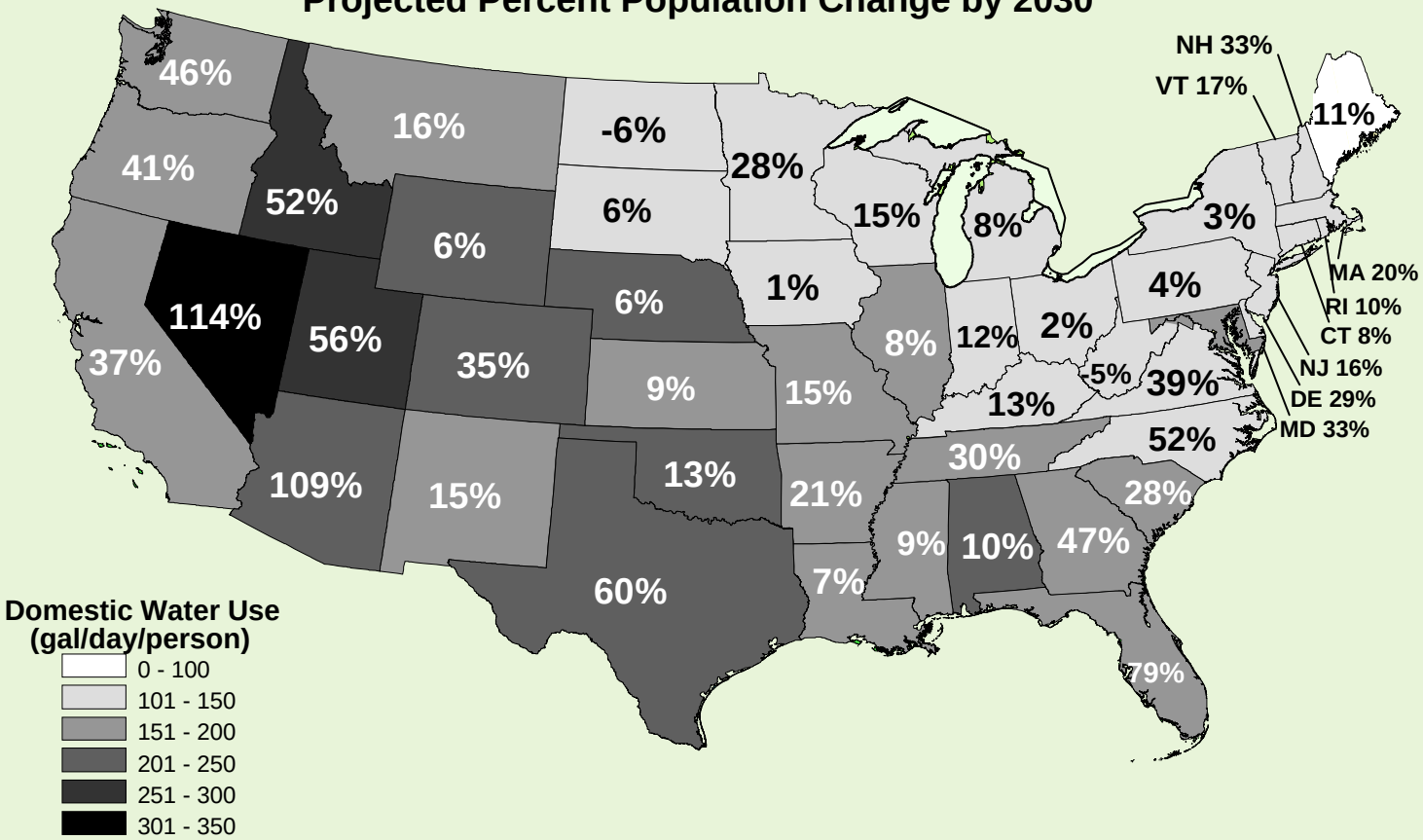
Source: GAO analysis of state water managers' responses to GAO survey

- Extent of state shortages likely over the next decade under average water conditions
- White & light gray states expect some shortages

EPA WaterSense

Regional Water Impacts

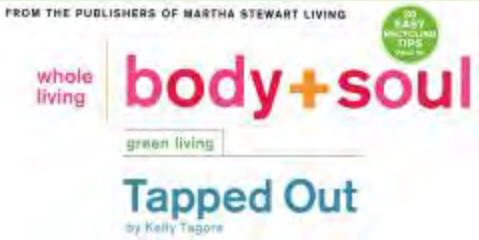
Domestic Water Use in Gallons per Day per Person and Projected Percent Population Change by 2030



EPA WaterSense

WaterSense In The News

- WaterSense has been featured in numerous media outlets, including:
  - CNN
  - Good Morning America
  - NPR
  - USA Today
  - The Washington Post
  - Newsweek
  - Kitchen & Bath Business
- Media outreach has resulted in more than $14 million in advertising value and has reached more than 980 million people



EPA WaterSense

Relationship to Other Water Initiatives

- Alliance for Water Efficiency (AWE):
  - EPA sponsored initial program development.
  - AWE recently announced board of directors and mission statement.
  - EPA anticipates partnering with AWE on common interest areas.
- State, Local, and Utility-Based Water Efficiency and Conservation Programs
  - Eligible to partner with EPA to promote water efficiency.
  - EPA develops national specifications for water-efficient products and services; establishes and maintains the WaterSense brand; provides templates for partners.
  - Partners incorporate WaterSense brand into existing materials or use templates to develop new materials consistent with local priorities.

EPA WaterSense

Groundwater Guardian Green Site Program

Groundwater Guardian Program

- Provides a framework for local action to protect groundwater.
- Supports, recognizes, and connects communities on an annual basis
- A "Groundwater Guardian Community" is broadly defined as a group of stakeholders with an interest in groundwater
  - Examples include: cities, counties, rural areas, watersheds, water districts, school and colleges

Groundwater Guardian Program

- Annual earned designation
- The Designation Process
  - Form a diverse team of stakeholders to develop ideas for projects and activities to address community concerns
  - Complete and submit the Annual Entry Form, Team List, and Result-Oriented Activities (ROAs) plans
  - Implement activities
  - Submit Annual Report to detail progress

Groundwater Guardian Program

- Community team
  - Citizen groups/interested citizens
  - Business and/or Agriculture
  - Education
  - Local Government
- Result Oriented Activities
  - Conservation
  - Public education/awareness
  - Best management practices
  - Pollution prevention
  - Public policy

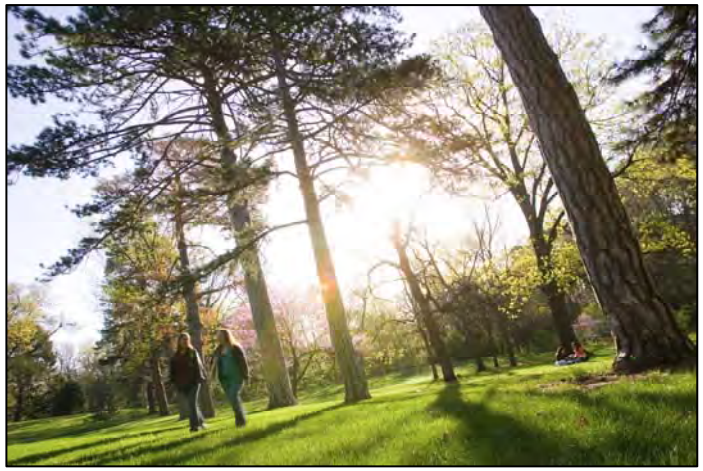
Groundwater Guardian Program

- Began in 1994
  - In 2008, 51% designated for 10 years or more
  - 85% designated for 5 years or more
- 2006 grant from W.K. Kellogg Foundation to revitalize and grow the program
- Led to development of…

Groundwater Guardian Green Site Program

GG Green Site Program - WHAT

- Developed to recognize groundwater stewardship
- Calculate, document, and recognize benefit of groundwater-friendly practices
- Designation based on earning at least 70% on program application



GG Green Site Program - WHAT

- No team or GG Community/Affiliate affiliation required
- Serves to expand Groundwater Guardian Community program

GG Green Site Program - WHO

- Highly-managed green spaces, including:
  - Golf courses
  - Ball fields
  - Educational campuses
  - Residential, recreational, and office parks
- Open to all sites implementing groundwater-friendly practices

GG Green Site Program - WHO

- 2007 Green Site Pilot Sites
  - Arbor Links Golf Course – Nebraska City, Nebraska
  - Bayside Golf Course – Brule, Nebraska
  - Eastern Nebraska 4H Center – Gretna, Nebraska
  - Firethorn Golf Club – Lincoln, Nebraska
  - Heritage Hills Golf Course – McCook, Nebraska
  - Hickory Hills Golf Club – Grove City, Ohio
  - Players Club at Deer Creek – Omaha, Nebraska

GG Green Site Program - WHO

- 2008 Green Site Sites
  - Golf courses
  - Parks (city, regional, community, state, athletic)
  - High school and college campuses
  - Education/nature centers
  - Church
  - Zoo
  - California, Colorado, Indiana, Iowa, Kansas, Missouri, Nebraska, North Dakota, Ohio

GG Green Site Program - WHY

- Publicly recognizes highly-managed green spaces for their groundwater stewardship.
- Provides an opportunity for managers of highly-managed green space to educate themselves, site staff, and site visitors about groundwater.
- Started as GG Golf, and then became the focus of the Growing Groundwater Guardians (Kellogg-funded) project

GG Green Site Program - WHY

- Documents the environmental benefit of each site's groundwater-friendly practices.
- Encourages the sustained use of groundwater-friendly practices on highly-managed green spaces.

GG Green Site Program - WHY

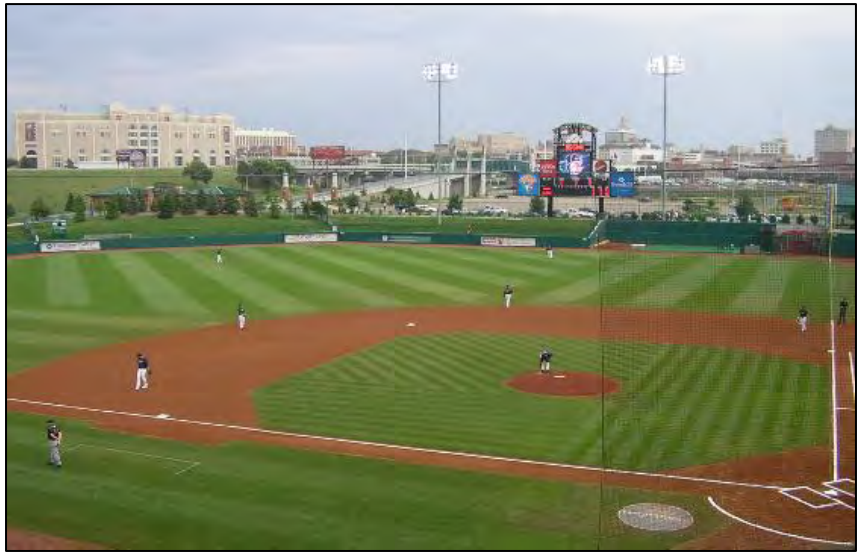
- Positive Public Relations for site and industry
  - PR kit, media attention
- Exclusive use of Green Site logo and name
- Plaque
- Small time investment

GG Green Site Program - WHY

- Complements GG teams' efforts to:
  - Protect their community's groundwater
  - Further their local impact
  - Expand their outreach efforts
  - Work with new partners
  - Collect data about groundwater-friendly practices at sites in their community
  - Recognize the environmental stewardship of community partners

GG Green Site Program - WHY

Participating site managers see how their practices impact water resources.



"The Green Site application made me think about all the ways that what we do impacts water. I hadn't really thought about our operation that way before."

Jen Roeber, Assistant Athletic Turf Manager
Haymarket Park, Lincoln, NE

GG Green Site Program - WHY

Demonstrates a commitment to environmental stewardship.

"Water is a precious resource, and we need to let our neighbors know that we do everything we can to manage our water use wisely."

Elton Nolde, Superintendent
Bayside Golf Course, Brule, NE

GG Green Site Program - WHY

Prompts site managers to examine their operation and groundwater-friendly practices.

"As a golf course manager, I've always been cognizant of the importance of groundwater protection and usage. At a time when our industry and others are being scrutinized for environmental practices, the Green Site program is a non-invasive program of self evaluation. It is a proactive approach that demonstrates to the public an awareness and a commitment to a future of sustainable ecology."

Bill Bieck, Superintendent
Heritage Hills Golf Course, McCook, NE

GG Green Site Program - WHEN

- Site managers applying for first-time Green Site designation may submit their application at any time
  - Applications must by submitted by December 31 to be designated in that program year
- In subsequent years, site managers simply review and update site information, if necessary

GG Green Site Program - WHEN

- GG Green Sites are nationally recognized at The Groundwater Foundation's National Conference each November.
- Local recognition

GG Green Site Program - HOW

- Completion of a simple application
  - Available in hard copy or electronically

- **All information submitted to TGF is confidential.**

2008 Program Application

Your site's designation as a Groundwater Guardian Green Site is based on the information provided in this application, so please be as thorough and accurate as possible. If you have any questions about any part of the application, including Section E, please contact The Groundwater Foundation at 1-800-858-4844 or guardian@groundwater.org.

Completed applications may be submitted to The Groundwater Foundation at any time by mail (P.O. Box 22558, Lincoln, NE 68542-2558), fax (402-434-2742), or email (guardian@groundwater.org). To maintain your designation, your application must be checked for accuracy annually so any changes in your operations are documented. If no changes have occurred, a simple indication of this fact is all that is needed to maintain your designation as a Groundwater Guardian Green Site. All information submitted to The Groundwater Foundation in this application is confidential, and will not be shared without permission of the site manager.

To spotlight the good work you do, The Groundwater Foundation will send notice of your Groundwater Guardian Designation to both local and national media. Thank you for all you do to safeguard groundwater and other water resources!

A. Contact Information

Site Name: _____

Site Owner or Leaseholder: _____

Site Manager Name: _____

Application Contact Name *(if different from manager)*: _____

Application Contact Job Title or Description: _____

Site Address: _____

Community/County: _____

State: _____

E-mail: _____ **Zip Code:** _____

Fax: _____ **Phone:** _____

Website *(if applicable)*: _____

Is your site located in a Groundwater Guardian Community? Yes ☐ No ☐ Don't know ☐
(If you "don't know," visit www.groundwater.org and jump to the Groundwater Guardian page for a complete Directory of Current Groundwater Guardians.)

Groundwater Guardian Community Name: _____

Local Media Outlets *(please provide names and addresses if known)*: _____

2008 Application - Page 1 of 12

C. Internal Education Efforts

Check as many as apply. Describe how you have educated yourself, staff members, field personnel, and/or other colleagues about the topics reflected in Section E (i.e. fertilizer and pesticide use, water use, potential contaminant source management, water quality protection) and how site management impacts water quality and supply. Please provide details for each item selected. Also include information about other educational resources and environmental stewardship programs with which your site is involved.

- ☐ **Trade magazines:** _____
- ☐ **Local peer group meetings:** _____
- ☐ **Local extension agents:** _____
- ☐ **Groundwater basics brochure:** _____
- ☐ **Groundwater Foundation, USGS, or other partner websites:** _____
- ☐ **Attended groundwater education event:** _____
- ☐ **On-line courses:** _____
- ☐ **Conferences:** _____
- ☐ **Other:** _____
- ☐ **Other:** _____
- ☐ **Other:** _____
- ☐ **Other:** _____
- ☐ **Other:** _____

D. External Education Efforts

Check as many as apply. Describe any education efforts about the topics reflected in Section E (i.e. fertilizer and pesticide use, water use, potential contaminant source management, water quality protection) and the site's protection practices (including participation in this program) that have been directed to partners, customers, and/or constituents. Please provide details for each item selected. Also include information about other educational resources and environmental stewardship programs with which your site is involved.

- ☐ **Worked with students conducting research on:** _____
- ☐ **Hosted educational tours of the site:** _____
- ☐ **Hosted peer group meeting(s):** _____
- ☐ **Installed signage identifying low water use plants:** _____
- ☐ **Printed groundwater protection tips on items given to site visitors:** _____
- ☐ **Hosted educational events for youth:** _____
- ☐ **Hosted educational events for adults:** _____
- ☐ **Other:** _____
- ☐ **Other:** _____
- ☐ **Other:** _____
- ☐ **Other:** _____
- ☐ **Other:** _____

GG Green Site Program HOW

- Documents internal and external education efforts.

E. Groundwater-friendly Practices Survey and Related Measures of Environmental Impact

Note: Points are awarded for the answers to questions 1-32. Environmental impact sections are required, but no points are awarded. Exact calculations are preferred, but not necessary; your best estimates of environmental impact are sufficient. Choose only one response unless otherwise indicated.

1. How often is soil tested to determine nutrient requirements?

- ☐ Annually (10 points)
- ☐ Every other year (5 points)
- ☐ Every three years (3 points)
- ☐ Not currently testing (0 points)
- ☐ Not applicable – soil is not tested because no fertilizer is applied on-site
- ☐ Using alternative practice to determine nutrient requirement (10 points), please describe to earn points: _____

_____

2. Is fertilizer applied based on nutrient analysis?

- ☐ Yes (10 points)
- ☐ At least 75% of the time (5 points)
- ☐ No (0 points)
- ☐ Not applicable – no fertilizer is applied on-site

Environmental Impact for items 1-2

Estimated amount of fertilizer applied versus the amount recommended by the soil test:

_____

3. Are label or agronomist recommended application rates followed during pesticide applications?

- ☐ Yes, always (10 points)
- ☐ Yes, at least 75% of the time (5 points)
- ☐ Less than 75% of the time (0 points)
- ☐ Not applicable – no pesticide is applied on-site

Environmental Impact

Estimated amount of pesticide applied versus the amount recommended by the label rate or an agronomist: _____

GG Green Site Program HOW

- Uniformly evaluates site practices

7. Do you track irrigation water usage and modify practices to reduce water use?
   - ☐ Yes, we track use and modify practices when necessary (10 points)
   - ☐ Track use only (5 points)
   - ☐ Modify practices but do not track use (5 points)
   - ☐ No (0 points)
   - ☐ Not Applicable – turf is not irrigated

   Environmental Impact
   Estimated gallons of water saved annually from tracking/conservation practices (*subtract current use from pre-tracking/conservation use*): _____

8. Are your fertilizers and pesticides stored on an impervious surface in a secured facility capable of containing spillage?
   - ☐ Yes, always (10 points)
   - ☐ Yes, in a secure facility not capable of containing spillage (5 points)
   - ☐ Yes, in a non-secure facility that is capable of containing spillage (5 points)
   - ☐ No (0 points)
   - ☐ Not applicable – no fertilizer or pesticide is stored on-site

   Environmental Impact
   Monthly average during operation of fertilizer in storage on-site (*pounds*): _____
   Monthly average during operation of pesticide in storage on-site (*gallons*): _____
   Average percent of fertilizer and pesticide stored on an impervious surface in a secured facility capable of containing spillage: _____

9. Are your fertilizers and pesticides mixed and loaded on an impervious surface capable of containing spillage?
   - ☐ Yes, always (10 points)
   - ☐ Yes, at least 75% of the time (5 points)
   - ☐ No (0 points)
   - ☐ Not applicable – no fertilizer or pesticide is mixed or loaded on-site

   Environmental Impact
   Monthly average during operation of fertilizer mixed and loaded on-site (*pounds*): _____
   Monthly average during operation of pesticide mixed and loaded on-site (*gallons*): _____
   Average percent of fertilizer and pesticide mixed and loaded on an impervious surface capable of containing spillage: _____

Area Application • Page 4 of 10

GG Green Site Program HOW

- Documents impact of groundwater-friendly practices.

Sample Best Practices

- Conversion to drought tolerant grass
- Irrigation system updates
- Use of native grasses
- Increase wildlife habitat
- Use of recycled water
- Maintaining no-application zones around surface water and wellheads
- Installation of rain gardens
- Managing runoff
- Timing of fertilizer, pesticide, and irrigation water applications

Lessons Learned

- Best practices benefit source water protection efforts.
- Application serves as an educational tool.
- Sites are already doing good things; Green Site program can help encourage their sustainability.

Share the Green

- Shed a positive light on your site and industry
- Help draw new visitors to your site
- Join the "green movement"
- Communicate your site's groundwater and environmental stewardship
- Doesn't have to be time-consuming or complicated

GROUNDWATER GUARDIAN GREEN SITE ®

Share the Green

- "Share the Green: Making the Most of Your Groundwater Guardian Green Site Designation"
- PR toolkit
- Provided to designated Green Sites

GROUNDWATER GUARDIAN GREEN SITE

Share the Green

Making the Most of Your Groundwater Guardian Green Site Designation

A Public Relations Toolkit

The Groundwater Foundation
P.O. Box 22558
Lincoln, NE 68542-2558
Phone: 402-434-2740
Fax: 402-434-2742
Email: info@groundwater.org
Web: www.groundwater.org

How do I become a Green Site?

- Complete and submit the 2008 Green Site Program Application (available in hard copy or online).
- Questions or concerns?
  - Visit **www.groundwater.org/greensites.html** to learn more.
  - Communicate with Groundwater Foundation staff by calling 402-434-2740 or e-mailing **guardian@groundwater.org**.

Program Funders

- Cargill
- Nebraska Environmental Trust
- Nebraska Department of Environmental Quality
- U.S. Environmental Protection Agency Region 7 Pollution Prevention Program
- W.K. Kellogg Foundation

Questions?

The Groundwater Foundation
P.O. Box 22558
Lincoln, NE 68542-2558
Toll free: 1-800-858-4844
Web: www.groundwater.org
Email: guardian@groundwater.org

The Green Movement: Connections to Groundwater Use and Protection

William M. Alley

GW Foundation National Conference

November 19, 2008

USGS

UK Vision Statement (1998)

THE PRIORITIES FOR GROUND-WATER MANAGEMENT

- SUSTAINABLE LONG-TERM YIELDS FROM AQUIFERS
- EFFECTIVE USE OF THE LARGE VOLUME OF WATER STORED IN AQUIFERS
- PRESERVATION OF GROUND-WATER QUALITY
- PRESERVATION OF THE AQUATIC ENVIRONMENT BY PRUDENT ABSTRACTION OF GROUND WATER
- INTEGRATION OF GROUND WATER AND SURFACE WATER INTO A COMPREHENSIVE WATER AND ENVIRONMENTAL MANAGEMENT SYSTEM

TO PROTECT A PRICELESS NATIONAL ASSET

USGS

Some Basic Issues

- **Preserving ground-water quality**
- Tracking our water use
- Assuring adequate monitoring

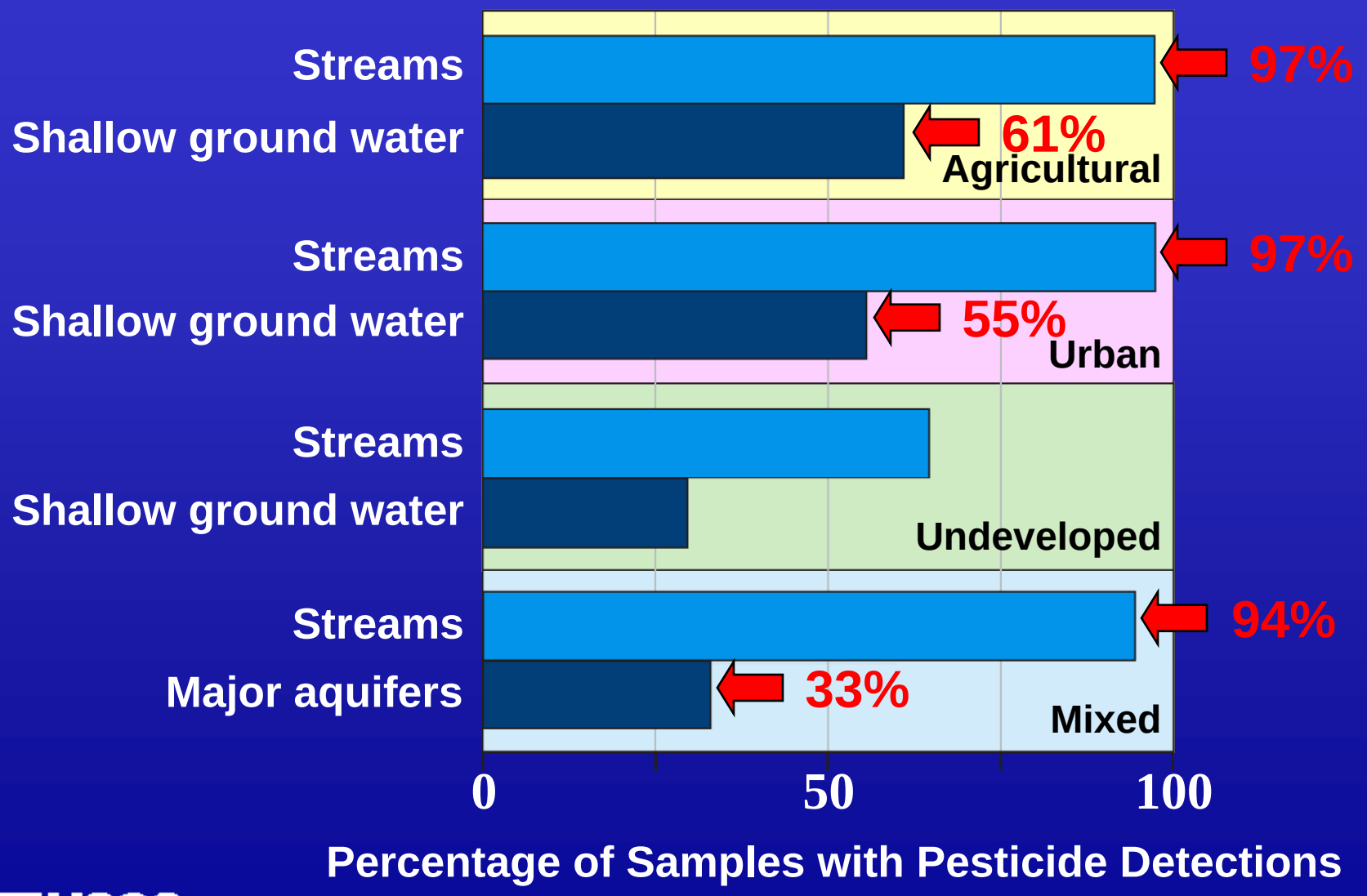
USGS

Effects of Individual Actions:

(It's not just the farms and factories)

USGS

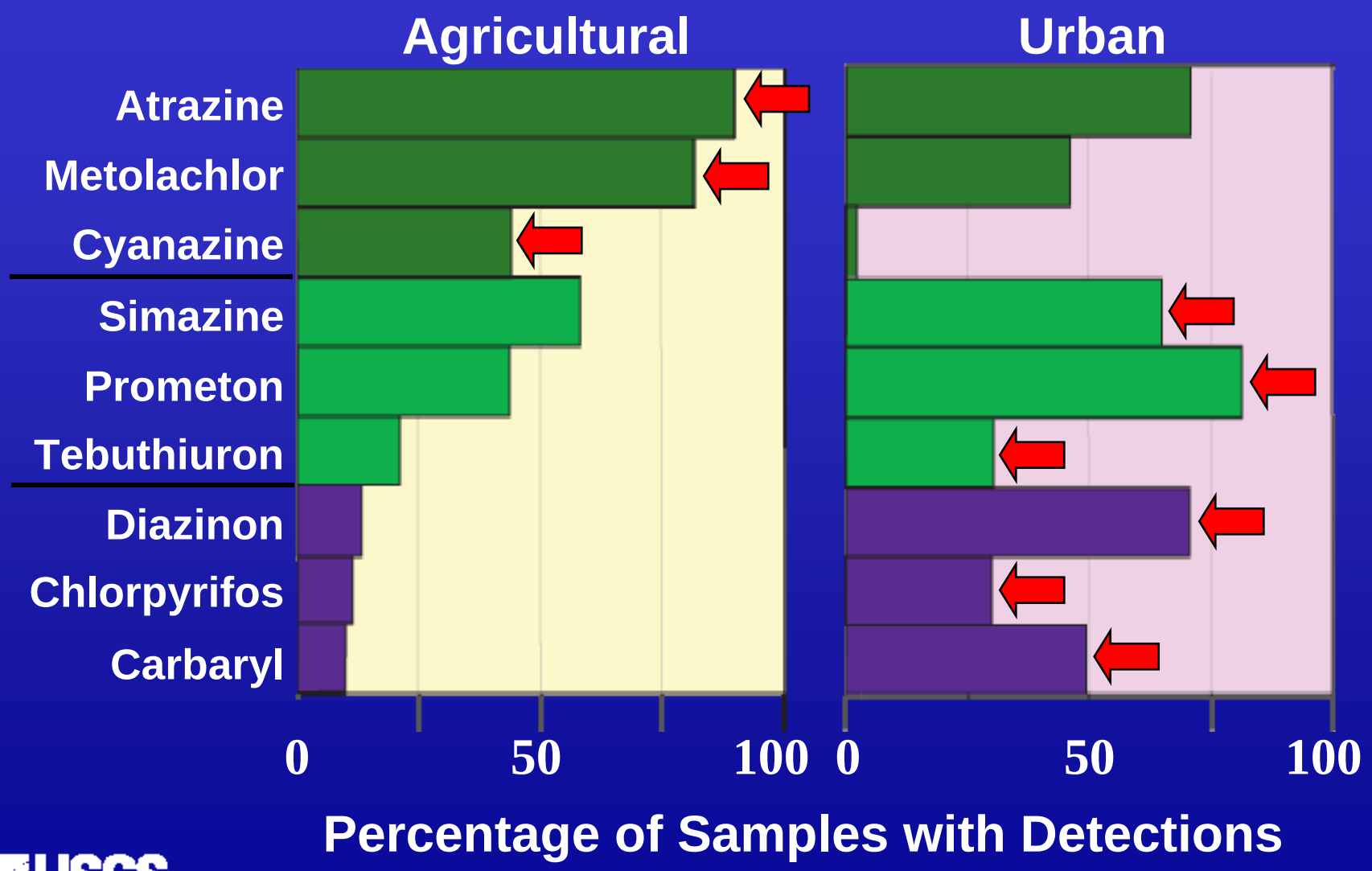
Pesticide Detections



USGS

Gilliom and others (2006)

Common Pesticides in Streams



USGS

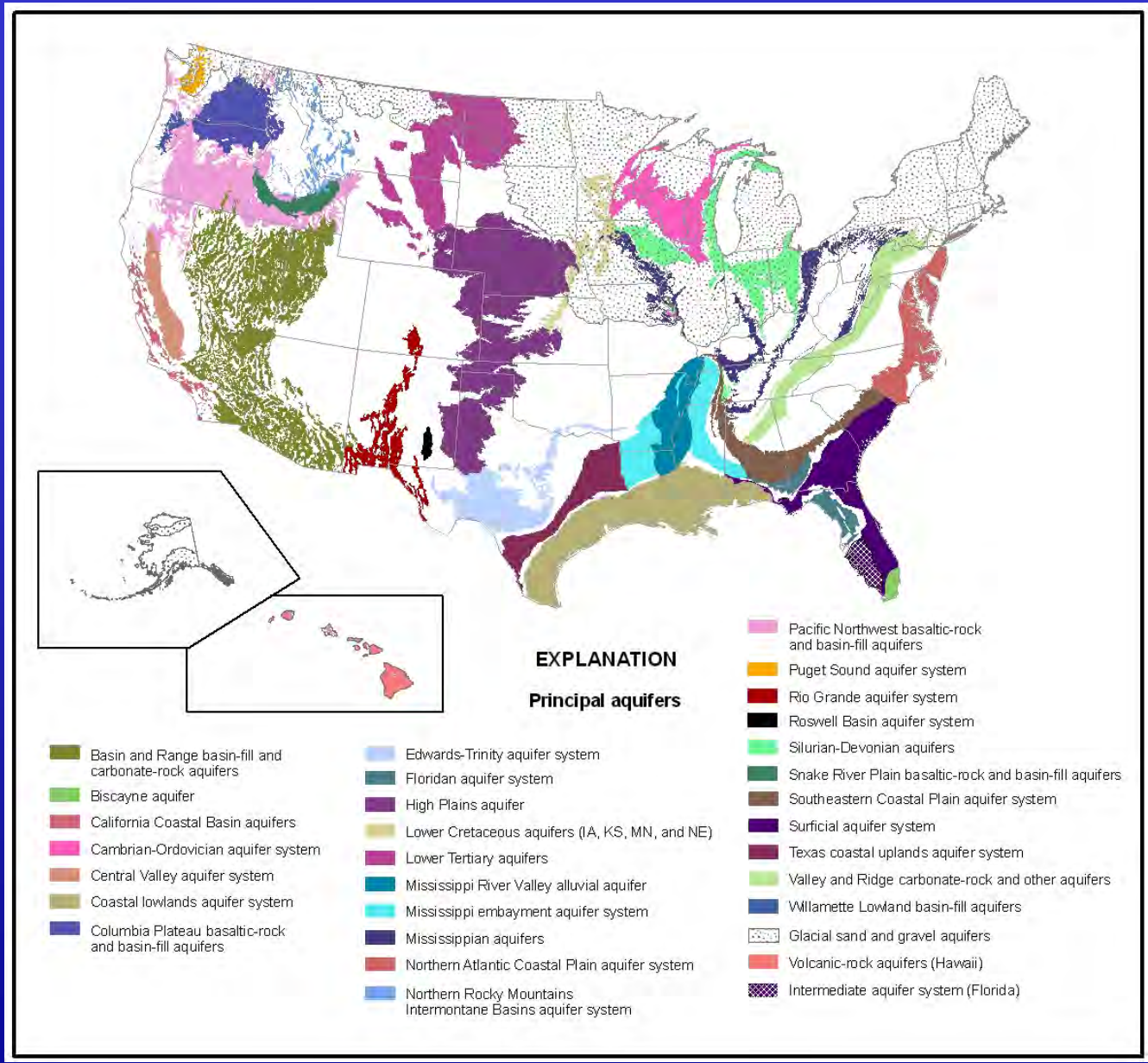
Gilliom and others (2006)

Some Basic Issues

- Preserving ground-water quality
- **Tracking our water use**
- Assuring adequate monitoring

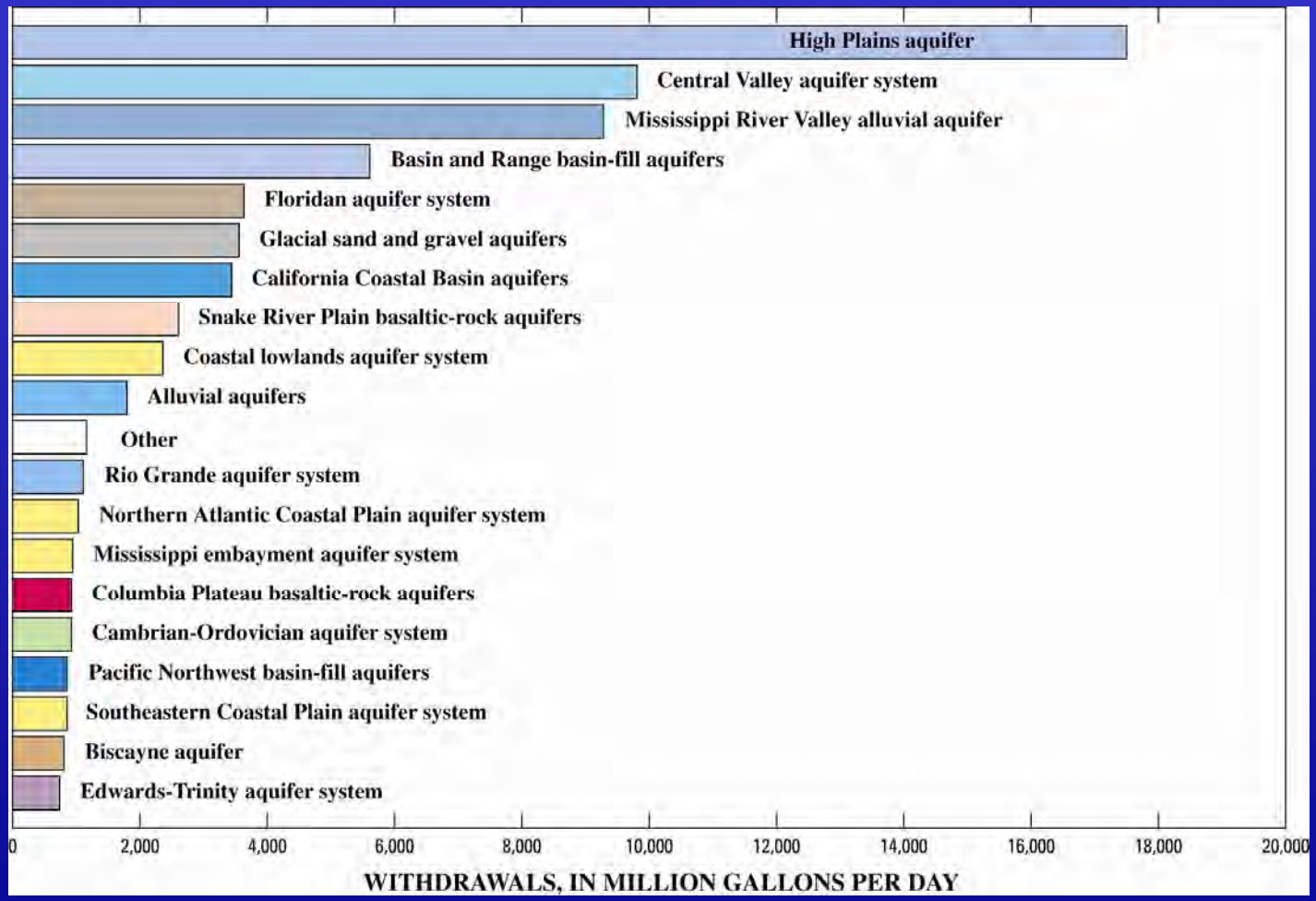
USGS

30 aquifers that account for about 94 percent of US ground-water use



USGS

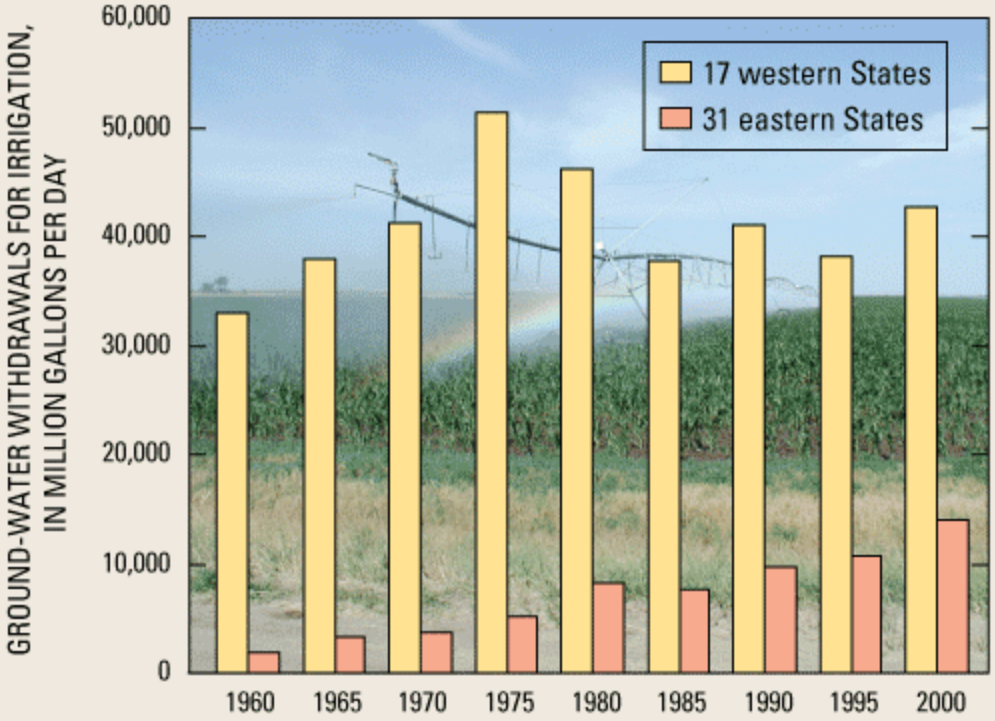
Top 20 aquifer withdrawals

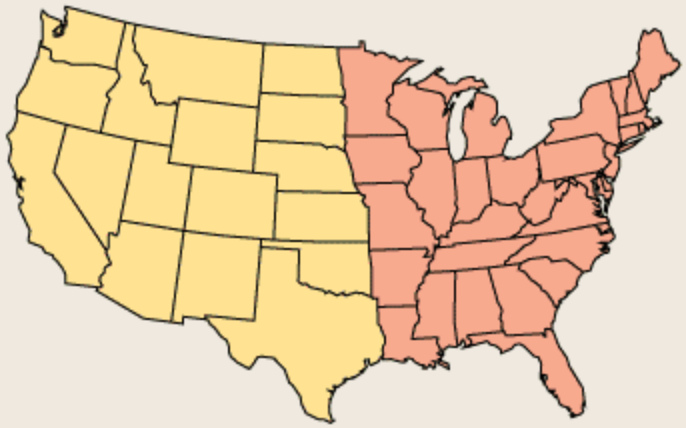


USGS

(Maupin and Barber, 2005)

Ground-Water Withdrawals for Irrigation 1960-2000





USGS

Water Use Information Needs

- Nationally consistent water-use databases
- Annual and seasonal data
- Site-specific data on significant withdrawals and return flows
- Better tracking of redistribution of water by human activities
- Improved application of remote sensing

USGS

Ground Water and Climate

- More emphasis on unsaturated zone and shallow ground water
- Monitoring potential impacts on ground-water resources
- Distinguishing climate from other effects

search &discovery

Trends in the hydrology of the western US bear the imprint of manmade climate change

Water managers may no longer be safe in assuming that resources will remain within their historical range of uncertainty.

The snowpack in the western US has been declining over the past 50 years—a trend that should alarm urban dwellers of Los Angeles as much as skiers in Park City, Utah. Furthermore, the snow runoff has been occurring earlier in the year, so that less water flows through rivers during the later months of the summer. The decreasing river flow further stresses a region that is experiencing drier summer conditions. In the past few years, large and intense fires have ravaged western forests, and water levels in the region's critical reservoirs have dropped to alarmingly low levels. Lake Mead in Arizona and Nevada, a lifeblood of cities and farms in the Southwest, is currently only half

Figure 1. Lake Mead's water level has fallen dramatically in recent years, as seen by the exposure of formerly submerged white rock. Located in Nevada and Arizona, this reservoir on the Colorado River is currently only half full. (Photo courtesy of Ken Dewey, University of Nebraska, Lincoln.)

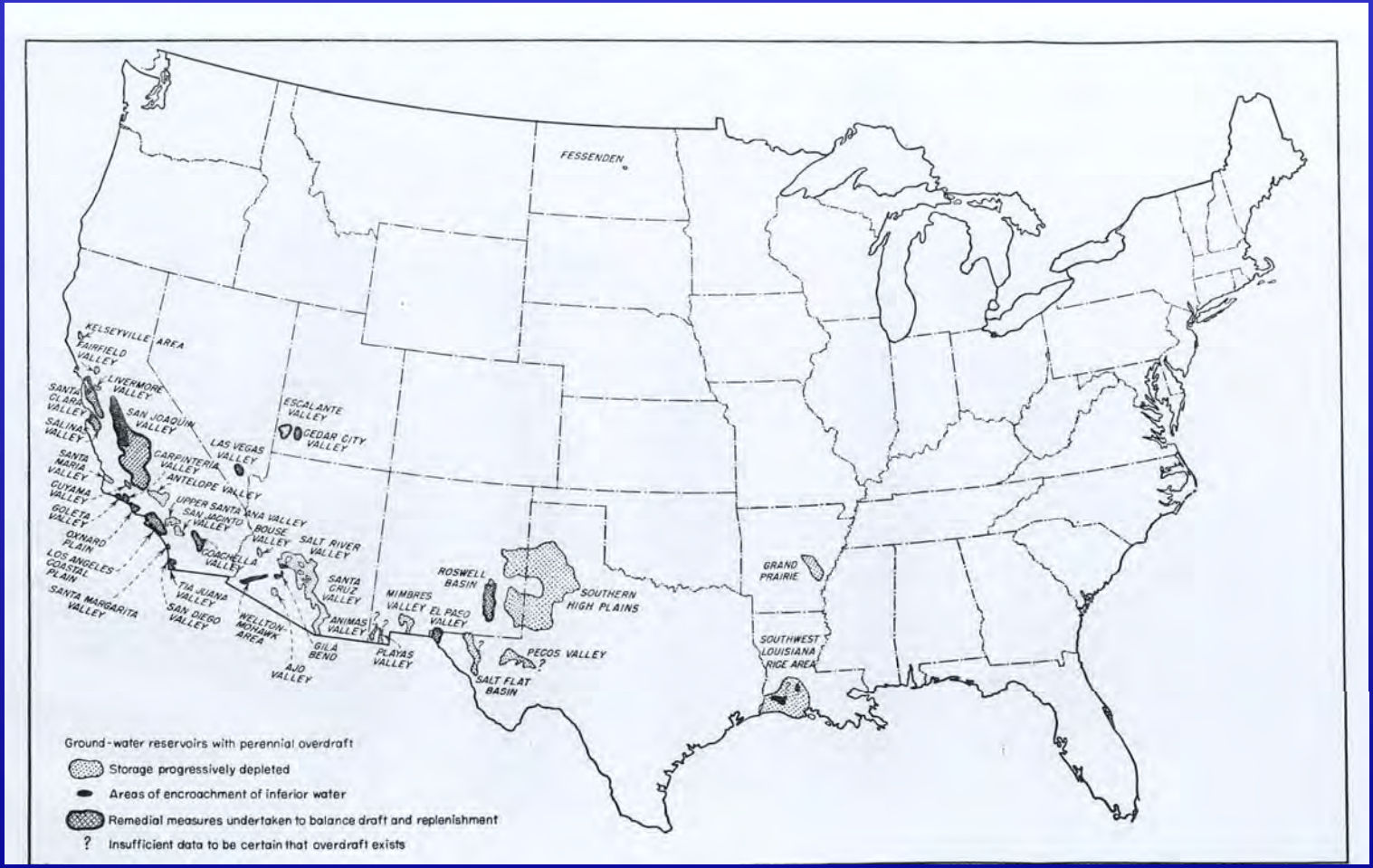
USGS

Some Basic Issues

- Preserving ground-water quality
- Tracking our water use
- **Assuring adequate monitoring**

USGS

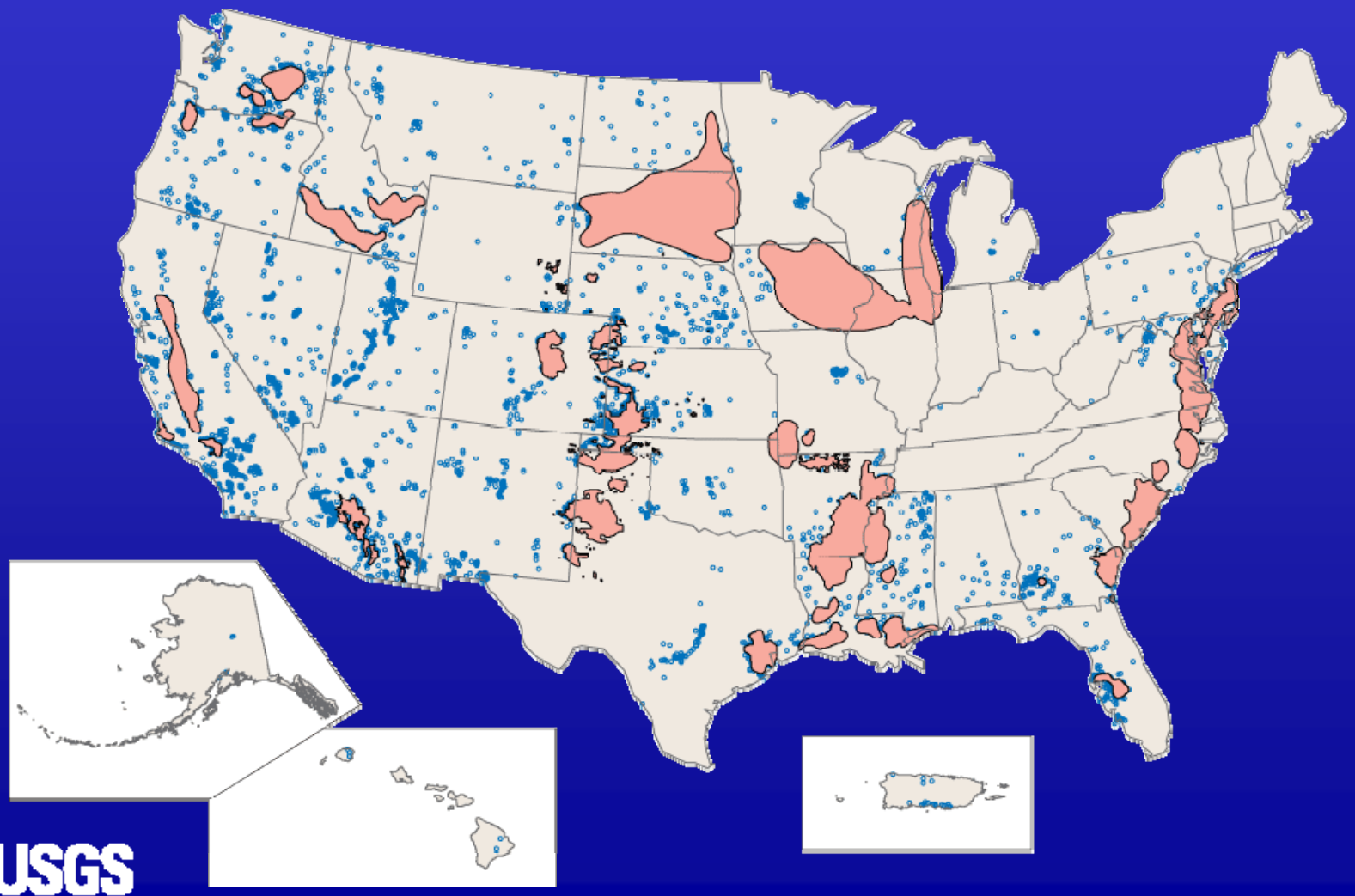
Ground-Water Reservoirs with Perennial Overdraft (Thomas, 1951)



USGS

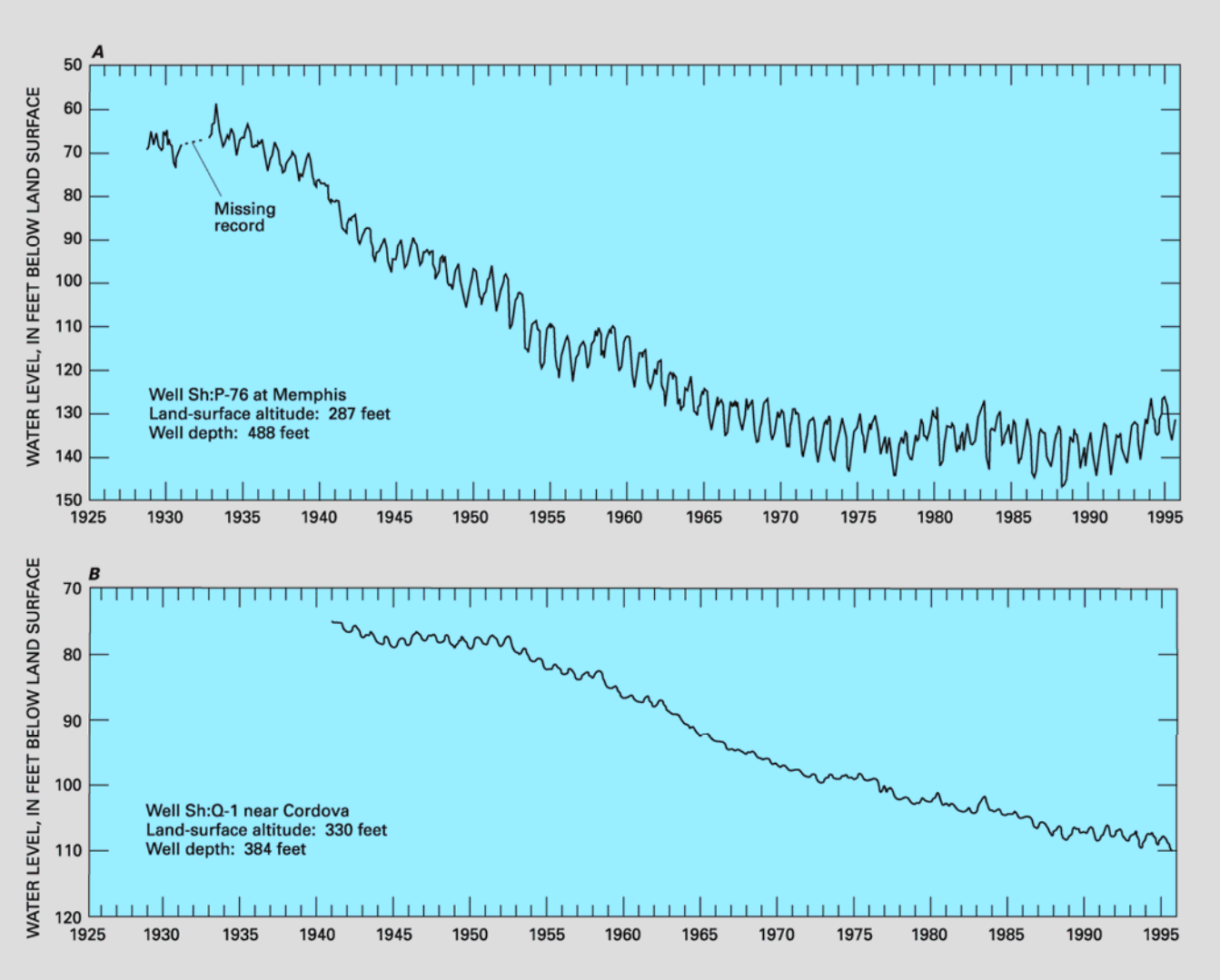
Water-level declines in 2007

(Reilly, Dennehy, Alley, and Cunningham, 2008)



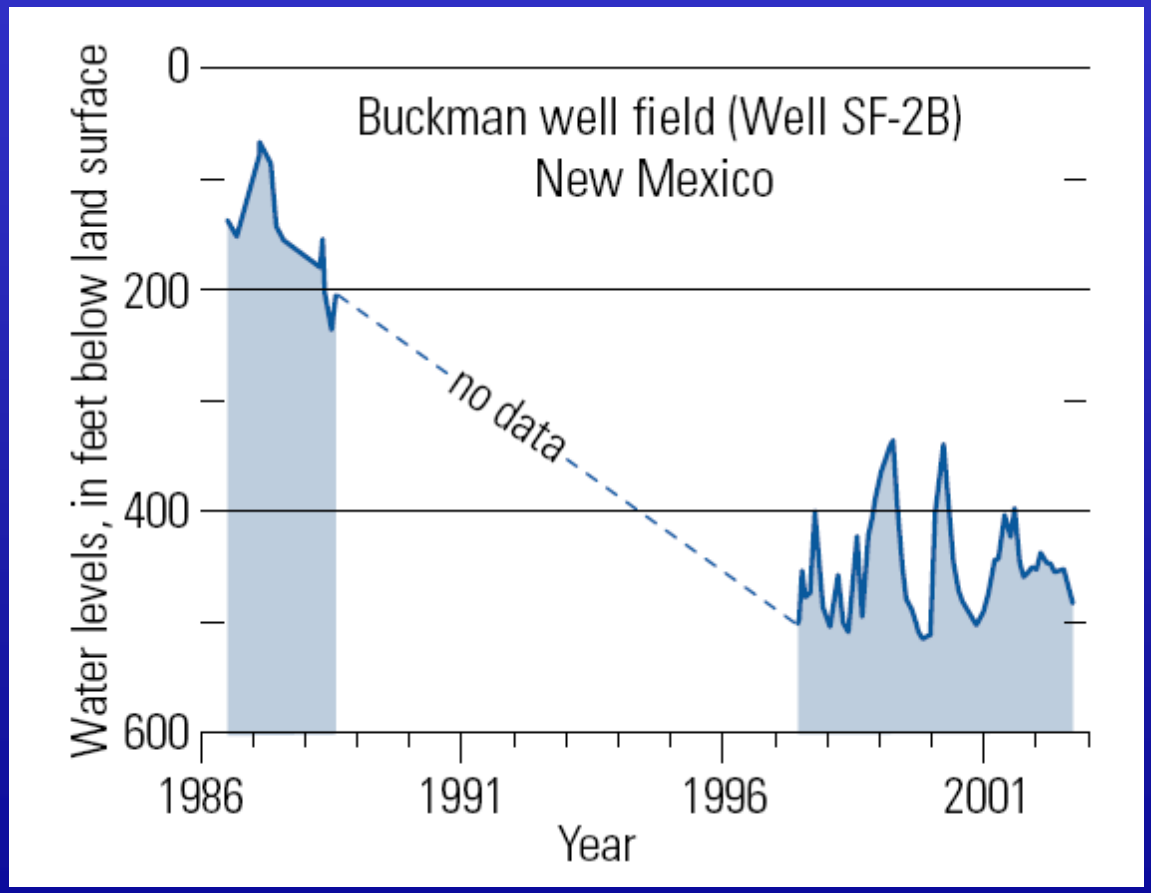
USGS

Long-Term Data: The Ideal



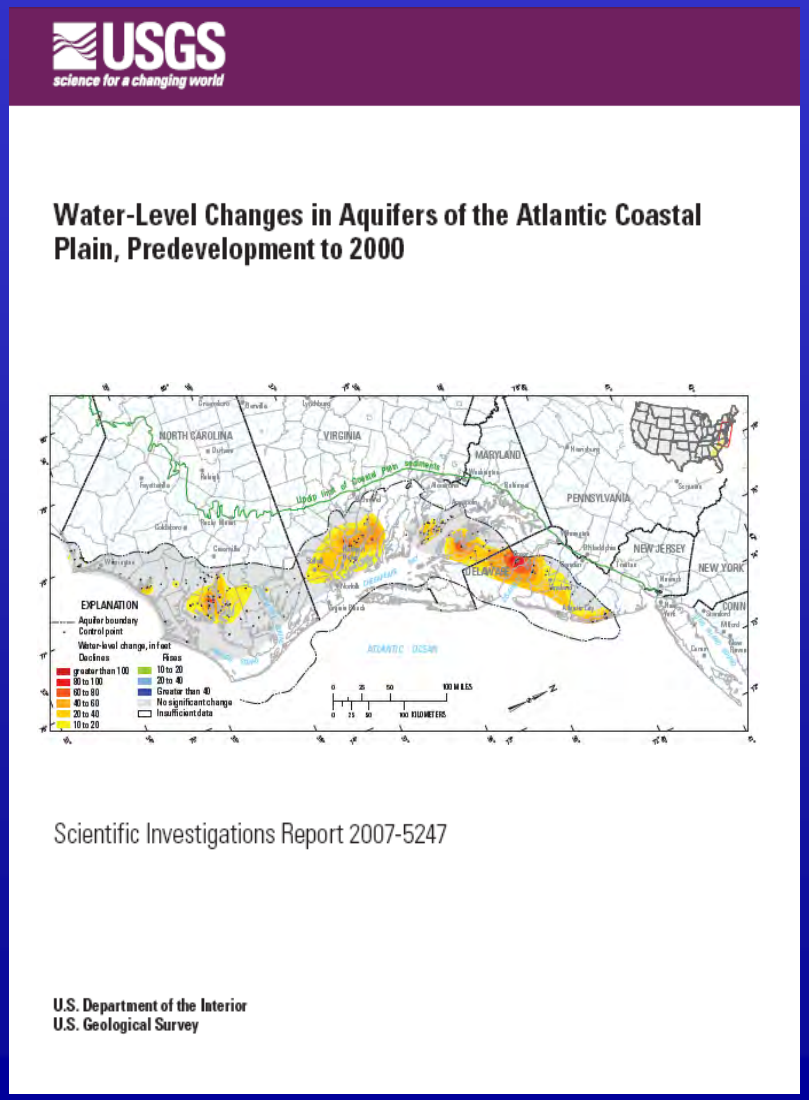
USGS

Long-Term Data: The Reality



USGS

Regional Water-Level Maps



USGS
science for a changing world

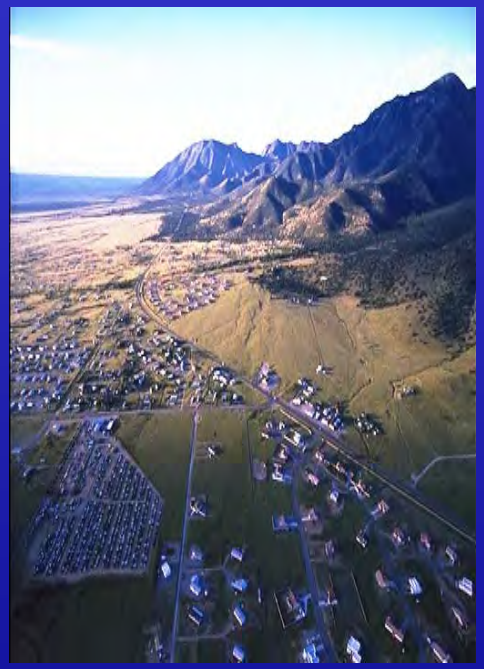
Water-Level Changes in Aquifers of the Atlantic Coastal Plain, Predevelopment to 2000

Scientific Investigations Report 2007-5247

U.S. Department of the Interior
U.S. Geological Survey

USGS

Depletion of a small part of the total volume of water in storage can have large effects on surface water, water quality, and subsidence which become limiting factors to development.



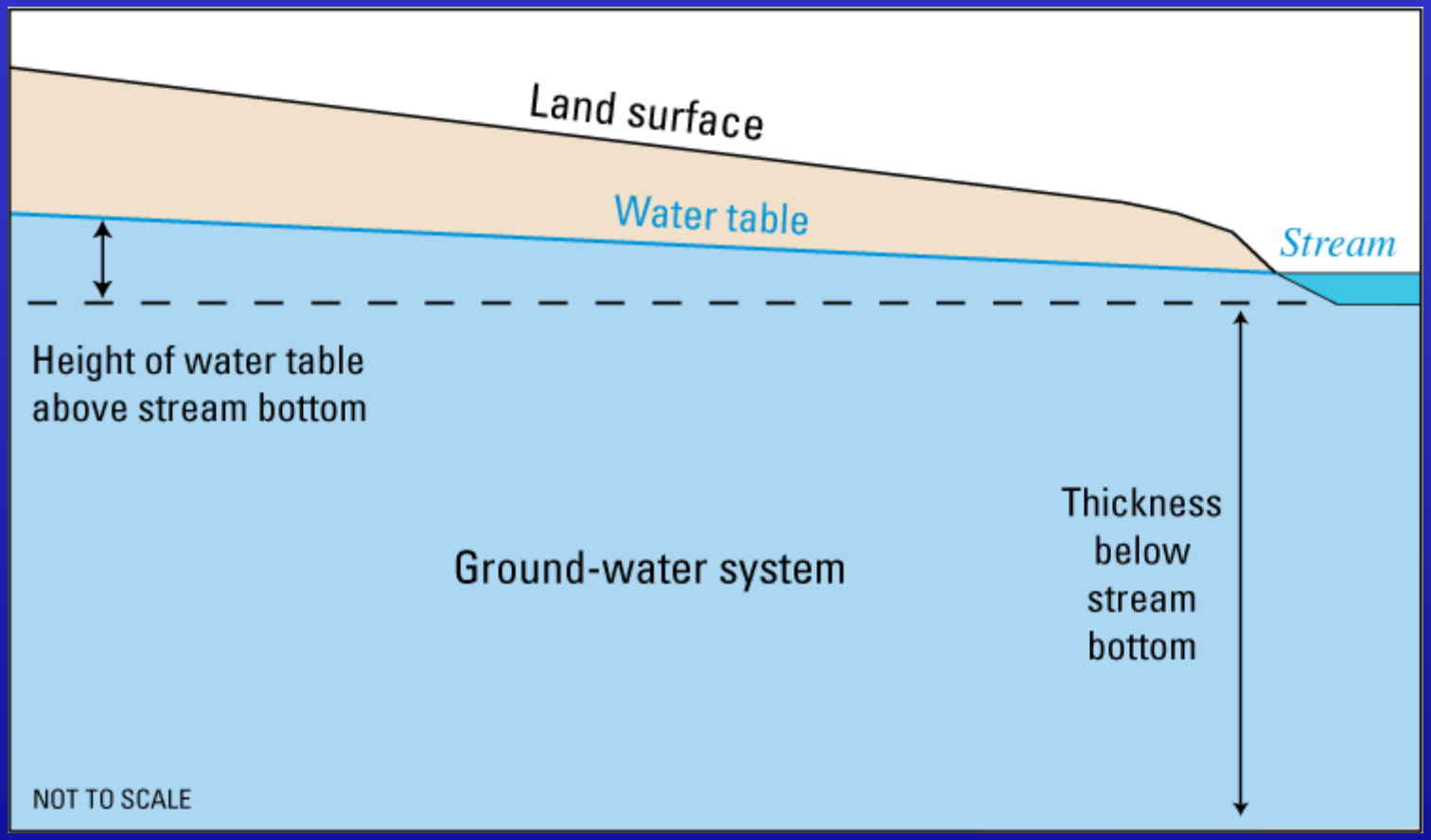
Upper San Pedro Basin, AZ

Houston, TX

Edwards Aquifer, TX

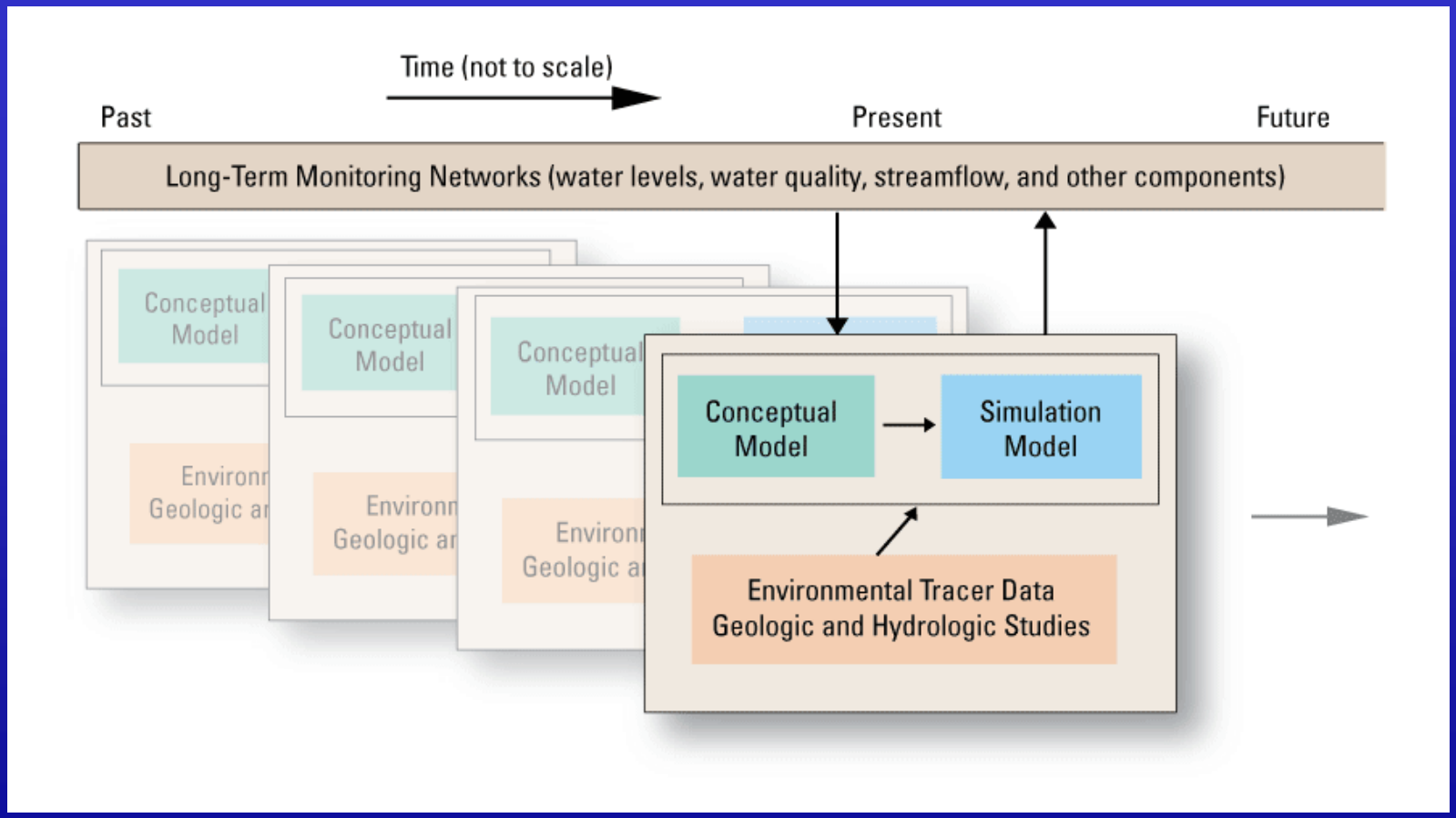
Republican River Basin, CO, KS, NE

USGS


Land surface
Water table
Stream
Height of water table
above stream bottom
Ground-water system
Thickness
below
stream
bottom
NOT TO SCALE

USGS

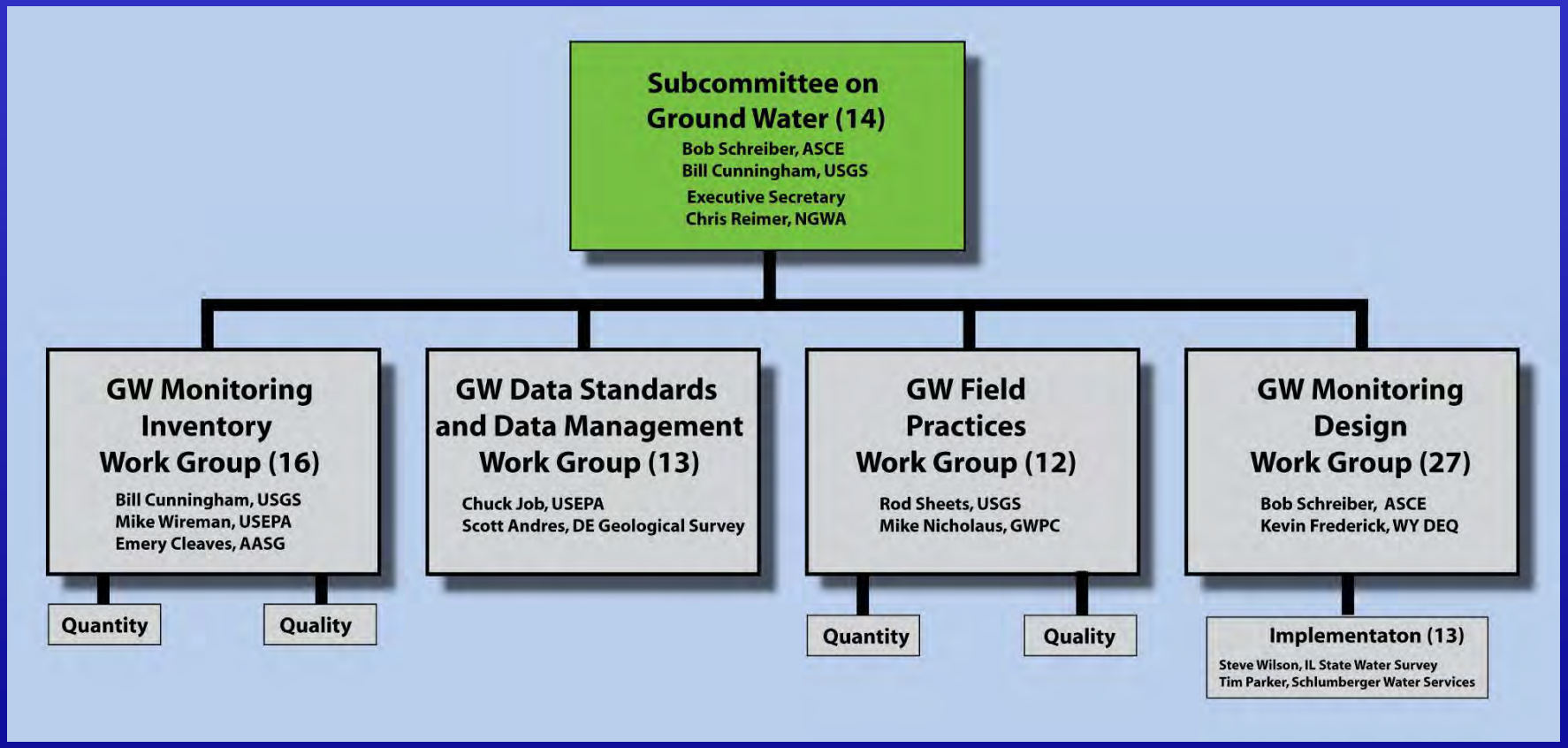
Integrated Monitoring and Modeling



USGS

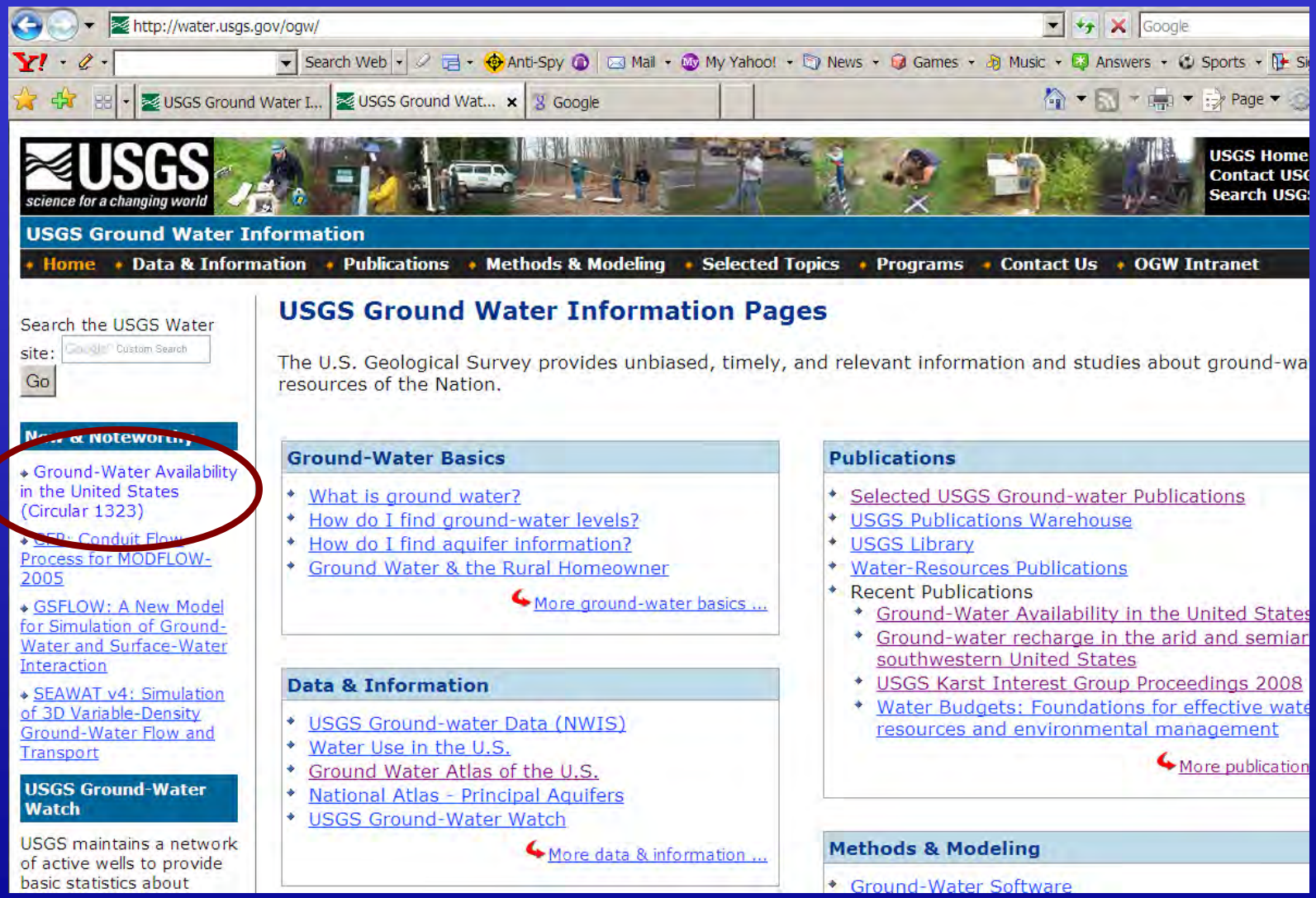
Alley, 2006

ACWI Subcommittee on Ground Water



USGS

For more information:



USGS

http://water.usgs.gov/ogw

Recycled Water: Perfect For Groundwater Replenishment

Philip L. Anthony

Director, Orange County Water District

Chair, GWRS Steering Committee

2008 Groundwater Foundation National Conference

Desert Hot Springs, California

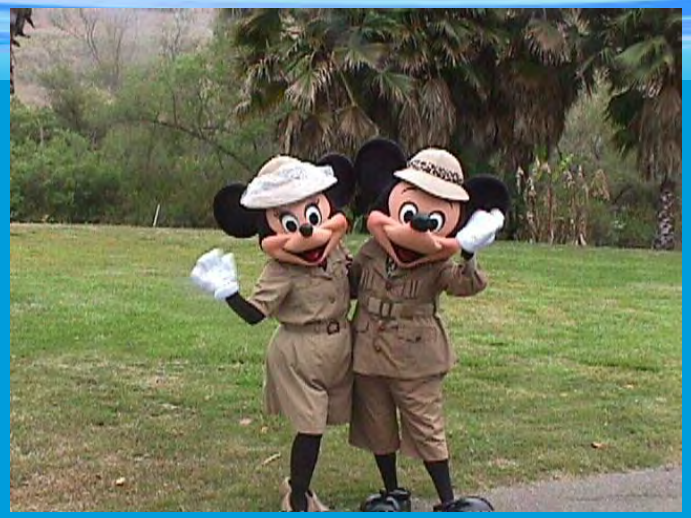
November 19, 2008

What is the Festival?

- Teaches Orange County youth about the environment, recycling and water-use through interactive, hands-on and fun activities
- Largest national event of its kind serving over 6,000 annually (Over 70,000 total to date)
- In the past, event held at Hidden Valley Park, Irvine. 2009 will be hosted at the Richard Nixon Presidential Library & Birthplace

Groundwater Guardian Team and Partners

- Groundwater Guardian Team
- Disney
- NWRI
- MWDOC
- 25 team members that represent local organizations, companies and agencies
- Meet monthly to plan, organize and coordinate the Festival



HISTORY OF WW FOR GW RECHARGE

1962	LA – Montebello	45 mgd	Tertiary
1976	Orange Co. WF21	10 mgd	RO
1978	Fairfax, VA	25 mgd	GAC
1985	El Paso, TX	10 mgd	03/GAC
1988	Scottsdale, AZ	10 mgd	RO
1995	LA – West Basin	6 mgd	RO
2003	Singapore	10 mgd	RO/UV
2008	Orange Co. – GWRS	70 mgd	RO/AOP

PRE-GWRS HISTORY AT OCWD

- 1965 Pilot Project on Seawater Intrusion
- 1971 State Board of Public Health Approves Project & EIR Published
- 1972 Work Starts on WF21 & Barrier Wells
- 1976 Full Operation of WF21 & Barrier
- 1991 GAP On Line for Title 22 Water
- 1992 More Water & Bigger Barrier Needed

GWRS HISTORY – EARLY 1990's

OCWD's Water Needs Urgent

- Population & Water Demands Increasing
- More Water for Basin Recharge Needed
- Imported Supplies More Threatened
- Larger Seawater Barrier Needed
- Water for Barrier Must be Steady & Reliable

GWRS HISTORY – EARLY 1990's

Water Supply Options Evaluated by OCWD

- More Conservation
- Purchase Full Service Imported Water
- Seawater Desalination
- More Wastewater Recycling

GWRS HISTORY – EARLY 1990's

Why Recycled Wastewater Chosen

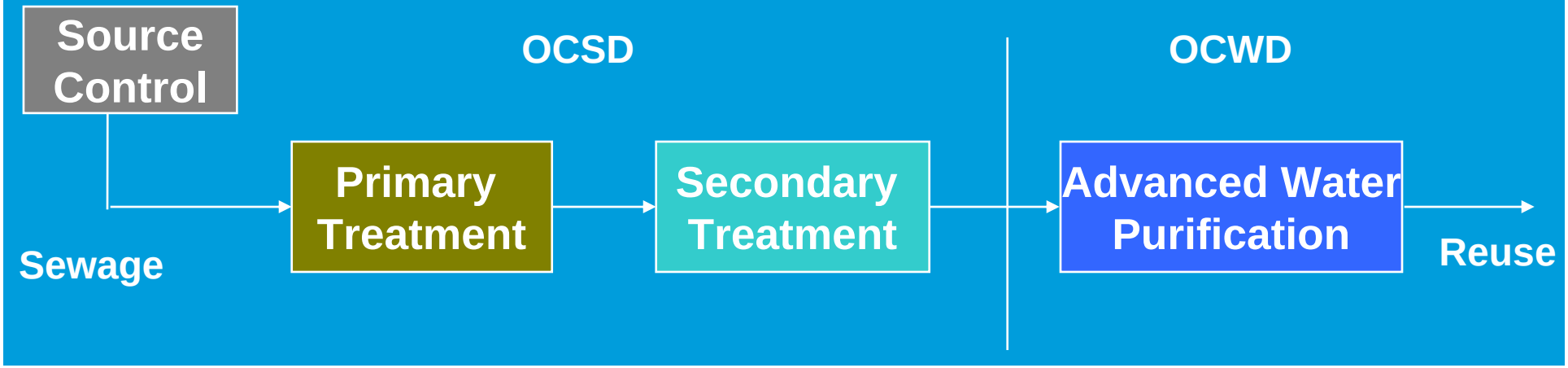
- Water Factory 21 Experience Since 1975
- Technology Steadily Improving
- Cost Comparable to Imported Water
- Locally Controlled
- Always Available
- Very-High-Quality Water

OCWD/OCSD Partnership

OCSD - Wastewater Collection, Treatment and Disposal

OCWD - Manage and Protect the Orange County Groundwater Basin

Partnership since 1972 for Wastewater Reclamation



GWR System

Santa Ana River
Fullerton
Long Beach
Groundwater Basin
Huntington Beach
Seawater Intrusion Barrier
Pacific Ocean
Irvine
South Orange County
N

GWR System Advanced Water Purification Process

OCSD Secondary Effluent

Normally Goes to Ocean

Microfiltration (MF)

Backwash to OCSD treatment

Reverse Osmosis (RO)

Brine to OCSD Outfall

Ultraviolet Light (UV) with Hydrogen Peroxide

Expanded Seawater Barrier

Recharge Basins in Anaheim

GWR System Aerial View

GWRS Water Quality

Component	Influent	Effluent
Fecal Coliform (MPN)	534,306	<2
Total Coliform (MPN)	1,445,556	<2
Hexavalent Cr (ug/L)	<1	<1
Surfactants (mg/L)	0.3	<0.02
TDS (mg/L)	918	37
TOC (mg/L)	14.1	0.2
1,4-Dioxane (ug/L)	1.7	<1
NDMA (ng/L)	27.2	<2

GWRS Water Test Results

▶ Inorganic Chemicals	15	All ND
▶ VOCs	28	All ND
▶ SOCs	39	All ND
▶ Disinfection Byproducts	8	All ND
▶ Action Levels – Cu & Pb		All ND
▶ Unregulated Chemicals	10	All ND*

*Boron detectable but well below limit

Remaining Priority Pollutants

▶ Volatile Organics	10	All ND
▶ All Extractibles	49	All ND
▶ Pesticides	12	All ND
▶ Hormones	3	All ND
▶ Endocrine Disrupters	7	All ND
▶ Pharmaceuticals, etc.	11	All ND
▶ Radionuclides	6	All ND

All Wastewater Is Not Equal

OCSD's Special Efforts

- Outstanding Source Control Programs
- NDMA & 1,4-Dioxane Sources Avoided
- Six Tributary Sewers Monitored
- Chemically Enhanced Primary Treatment
- NDMA Precursors from Dewatering Diverted
- Full Secondary = More Recyclable Wastewater

Uses of GWRS Recycled Water

Seawater Barrier Injection (35 mgd)

- First 18 Months – 3 GWRS to 1 Potable
- One Year Travel Time Before Reuse
- New Draft Regulations Change to Six Months

Surface Recharge (35 mgd)

- Six Months Travel Time Before Reuse

End of Presentation

Southern Nevada Water Authority

Water Smart Home Program

Toby Bickmore
Conservation Services Administrator

Water Smart Home

This program encourages promotion and adoption of high-efficiency appliances, plumbing fixtures and landscape designs in new single-family residential construction.

Water Smart Home Program

- Partnership with Southern Nevada Homebuilders Assn.

- Will save an estimated 75,000 gallons per year over a home built prior to 1994

- First of it's kind program to certify for water efficiency

Property Criteria

- Single-family home or townhouses only
- Complete neighborhood (sub-division)
  - Common and pool areas must also qualify if provided
- Individually metered by a member agency
- Discharge all wastewater to a public sewer system

Program Requirements

- Outdoors
  - Landscape Design
  - Irrigation System Standards
  - Swimming Pools
- Indoors
  - Plumbing & Fixtures
  - Appliances
  - Air Conditioning System

Plumbing Standards

- Pressure regulated to a maximum of 60 psi
- High-efficiency Fixtures
  - Showerhead 2.5 gallon maximum (multiple heads prohibited)
  - 2.2 gallon Kitchen faucet
  - 1.5 gallon Bathroom faucet
  - 1.6 gallon Toilet flush

Appliance Standards

- High efficiency dishwasher (6.5 gallon or less per normal cycle)
- High efficiency washing machine (Energy Star water factor of 7.0 or less)
- Water softeners with a NSF/ANSI 44 Standard
- Drinking water system with a recovery rate of 85% of higher

Hot Water Systems

Three options to choose from:

- Manifold System
- Recirculating System
- Efficient Design (0.5 gallons or less from unit to any faucet)

Landscape Design

- All landscape and irrigation work guaranteed to comply with applicable laws and codes in effect at the time of installation
- No grass lawns in front yards
- No ornamental water features at the homes or in common areas
- Grass lawns 50% or less of total landscapable area of backyard, but not to exceed 1,000 square feet

Irrigation System Standards

- Drip system will be equipped with pressure regulator, filter, and flush end assembly

- Irrigation system will not create any flow off of the property

- Minimum irrigation controller requirements

Drought Watering Restrictions

My assigned group:

Watering Group	Winter (November - February)	Spring / Fall (March - April / September - October)	Summer (May - August)
A	Monday	Monday, Wednesday, Friday	Any day
B	Tuesday	Tuesday, Thursday, Saturday	Any day
C	Wednesday	Monday, Wednesday, Friday	Any day
D	Thursday	Tuesday, Thursday, Saturday	Any day
E	Friday	Monday, Wednesday, Friday	Any day
F	Saturday	Tuesday, Thursday, Saturday	Any day

- Seasonal watering schedule will be posted at the controller

Swimming Pool Standards

- Pool features may not spray or drop water more than 24 inches from the main water surface
- Combined pool and spa surface will be deducted from turf allowance
- Sewer cleanout enclosed and marked with “Pool/Sewer Drain”

Enclosed and Marked Sewer Cleanout

Water Smart Neighborhood

Community Swimming Pools and Common Landscape Areas

- Swimming pools 20 square feet per household (or up to 1,000 ft for communities with 50 dwellings or less)

- Lawn areas will be no less than 50 feet in width or length and meet distribution uniformity standard of 65% or more

Program Enhancements for Homes Completed by January 1, 2009

- All toilets will be High Efficiency Toilets (HET's) with a minimum flushing performance of 350 grams as rated by the Maximum Performance (MaP) Test.
- Dishwashers will use 6.0 gallons or less per normal cycle
- Washing machines will have a Water Factor of 6.0 gallons or less per cubic foot capacity
- All common area landscape will be equipped with a "smart" controller

Water Smart Home Fees

- Contract Fee:
  - $2,000 per Contractor
- Quarterly Fees
  - $15 per completed home
    - April (Jan, Feb, Mar)
    - July (Apr, May, Jun)
    - Aug (Jul, Aug, Sep)
    - Jan (Oct, Nov, Dec)
- Re-inspection Fee
  - $100 per re-inspected home
- **All fees used to market the program for the builder**

Training/Inspection Process

Contract Requirements for Training

- Mandatory program overview
  - Superintendents
  - Sub-contractors
- Mock field-inspections
- Optional, but encouraged
  - Sales
  - Customer Services
  - Purchasing

Inspection Process

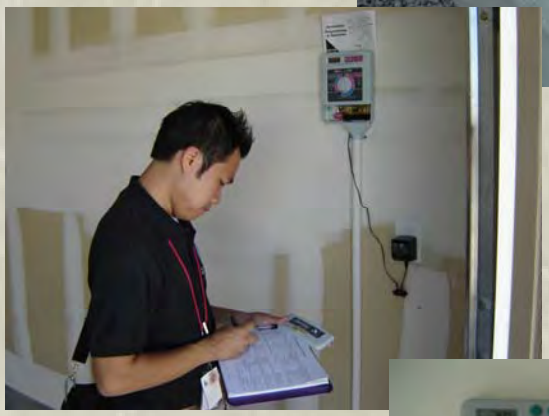
- 10% of the homes and all of the models are inspected
  - The process is coordinated through the builder and SNWA through different builder applications
  - The homes are randomly selected by a database program
  - Inspection takes approximately 30-45 minutes
  - Results are provided within one business day

Outdoor Program Verification

- Check for Leaks
- Irrigation System Standards
- Landscape Design
- Swimming Pools and Spa
- Pool/Sewer Drain Enclosure

Other Outdoor Items Verified

- Verify water pressure at hose bib
- Verify irrigation controller has the minimum requirements
- Verify seasonal lawn water guide posted next to controller



Indoor Program Verification

- Appliance Standards
- High Efficiency Fixtures
- Hot Water System

Current Builders Enrolled

RS
R/S DEVELOPMENT CO

KB HOME

www.AstoriaHomes.com
More for Your Money.®

Pulte Homes

Currently there are over 7,000 Water Smart Homes in the Las Vegas Valley

Questions?

WATER SMART home

Toby.Bickmore@snwa.com (702) 862-3759

Irrigation for a Growing World

Dave Johnson

Director of Corporate Marketing

The Intelligent Use of Water.™

LEADERSHIP • EDUCATION • PARTNERSHIPS • PRODUCTS

What We'll Cover Today

- The World's Water Crisis
- Options to Address Water Scarcity
- Conservation through Efficient Irrigation
- Encouraging Water Conservation

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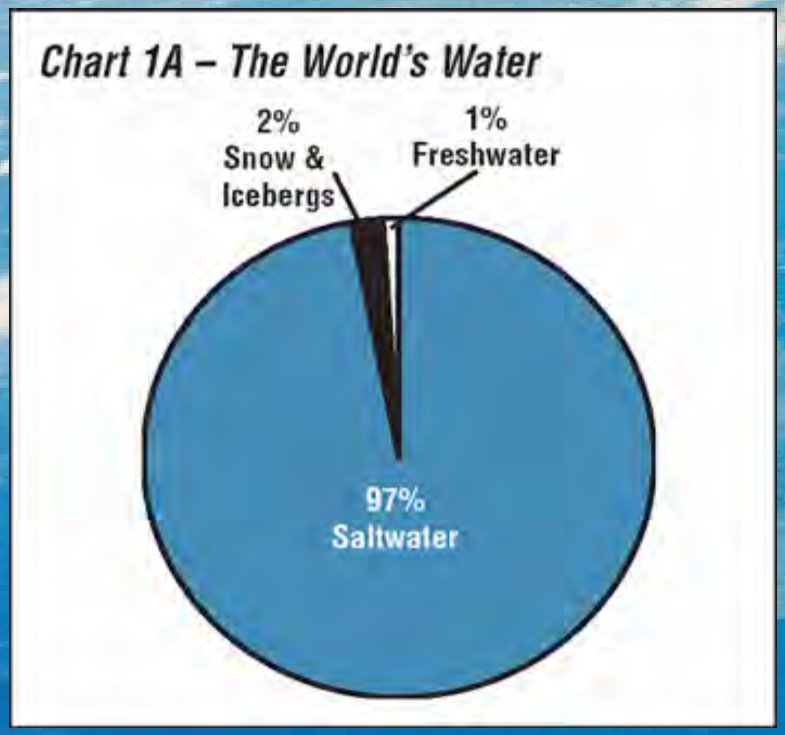
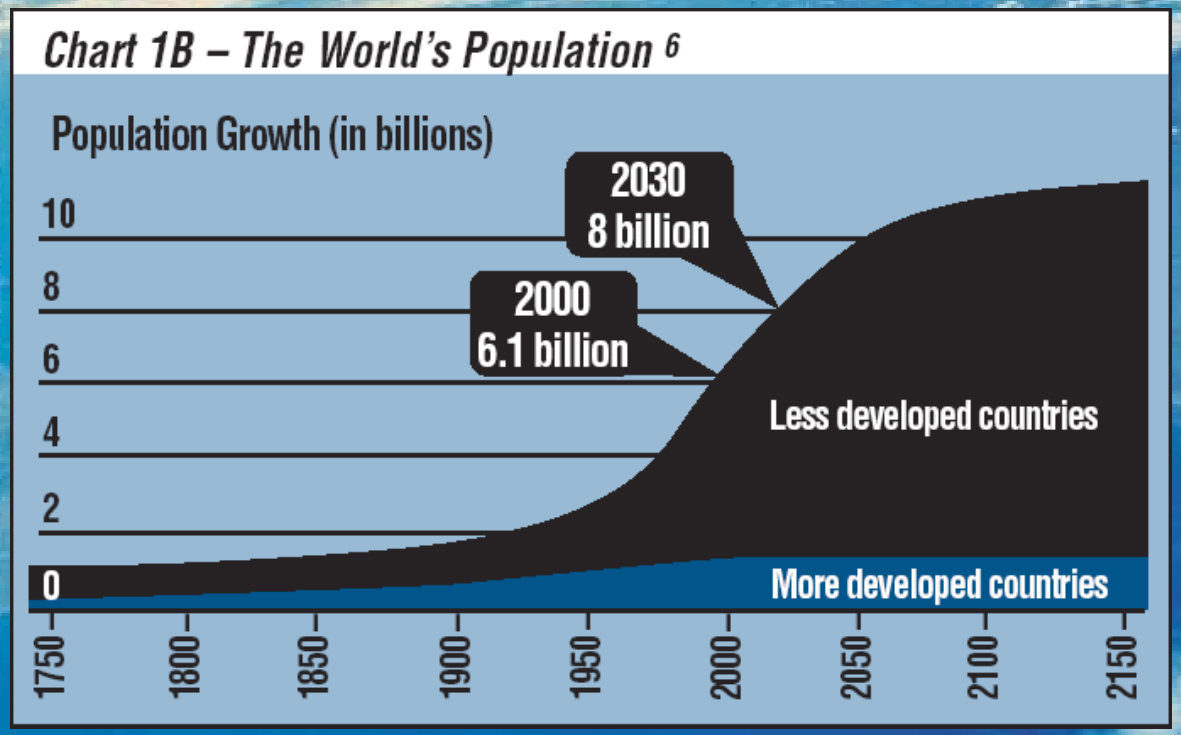
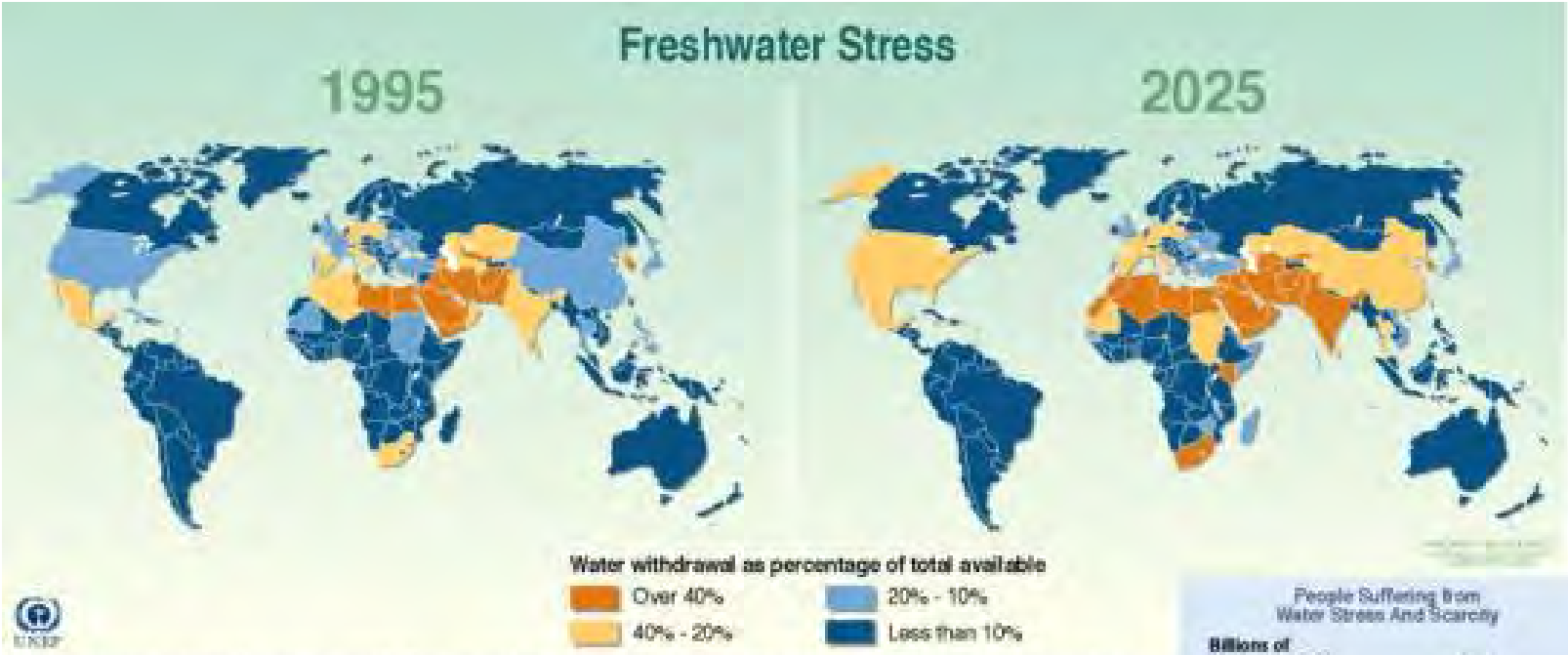
The World's Water Crisis

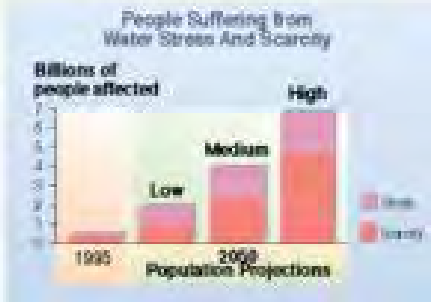




There is no new water.



Source: World Meteorological Organisation (WMO), Geneva, 1996; Global Environment Outlook 2000 (GEO), UNEP, Earthscan, London, 1999



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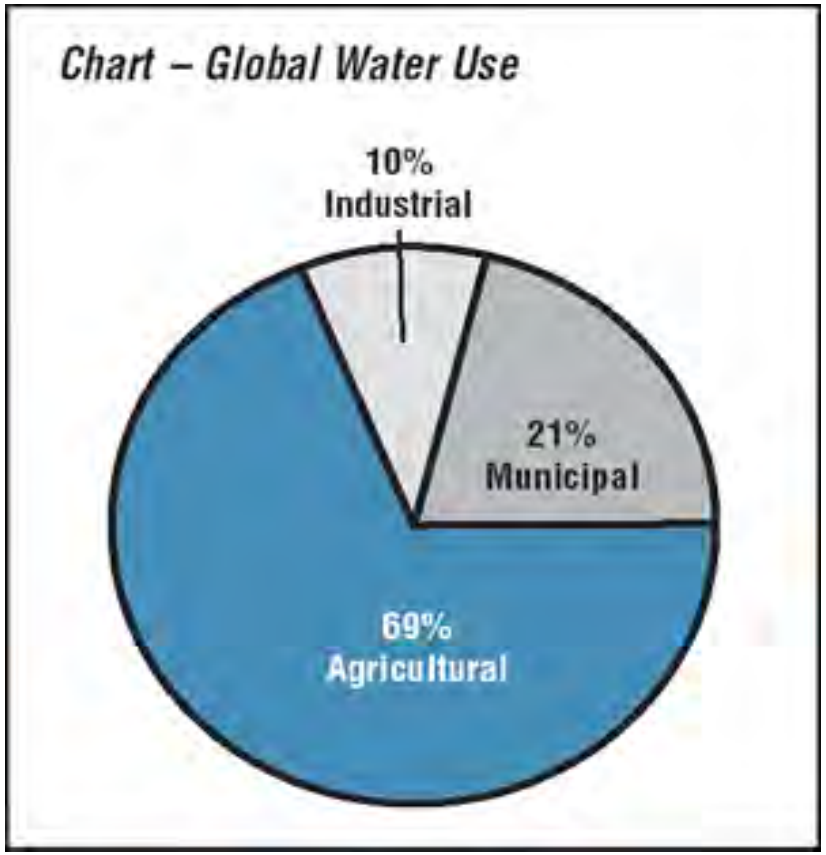
Outlook for the Future

- 69% of water used in Agriculture
- More efficient use can have significant impact on available supply
- Increasing number of international and regional summits
- Working together to find a solution



© Rain Bird Corporation

Options to Address Water Scarcity

© Rain Bird Corporation

The Options

OPTION 1:
Water
Re-Pricing

OPTION 2:
Water
Re-Use

OPTION 3:
Desalination

OPTION 4:
Water Transfers &
Improvements to
Water Delivery
Systems

OPTION 5:
Alternate
Plant
Selection

OPTION 6:
Conservation
Through
Water-Efficient
Irrigation

© Rain Bird Corporation

1. Water Re-Pricing

- Government subsidized
- Set artificially low to promote development
- Low water prices encourage wastefulness
- Re-pricing impact can be immediate
- Lengthy process to get buy-in from all groups

© Rain Bird Corporation

2. Water Re-Use

- **Water recycling can reduce fresh water consumption by up to 80%**
- **Power-plant cooling, construction, manufacturing, golf course irrigation**
- **Expensive, high capital costs, not available in all areas**

© Rain Bird Corporation

3. Desalination

- Tap into the 97% supply of ocean water
- Technology improving
- Costs coming down
- Negative impact on environment, high capital start up costs, high water cost

© Rain Bird Corporation

4. Transfers & Delivery Systems

- **Transfers from agricultural to urban use**
- **Satisfies immediate need**
- **Improved delivery systems prevent water lost in transit**
- **Transfers only reallocate, infrastructure improvements can be expensive**

© Rain Bird Corporation

5. Alternative Plant Selection

- **Use native plants that can thriv on natural levels of rainfall**
- **Can reduce irrigation and watering needs**
- **Restricted plant selection; som people mix native and non-native plants**
- **Irrigation design and scheduling are very important**

© Rain Bird Corporation

6. Water-Efficient Irrigation

- **Can be implemented immediately and in stages**
- **Significant savings opportunity in Agriculture**
- **Benefits can be reaped immediately**
- **Requires 4 important components:**
  - Proper system design, products, installation and usage/maintenance

© Rain Bird Corporation

Water Conservation through Efficient Irrigation

© Rain Bird Corporation

History of Irrigation

- **Earliest irrigation followed river flooding**
- **Channels dug to move river water to crops**
- **Still the most common method of agricultural irrigation used today**
- **Only about 15% of crops worldwide grown with more efficient irrigation**

Illustration by Mark Peppe, © 2002 World Book, Inc

© Rain Bird Corporation

History of Irrigation

- December 1933, Orton Englehart filed patent for “spring-activated horizontal arm driven sprinkler”
- Durable, distributed water farther and more evenly and efficiently
- Foundation that evolved into modern sprinkler irrigation

© Rain Bird Corporation

Irrigation Applications

Agriculture

Golf Courses

Landscapes

© Rain Bird Corporation

The Value of Landscaping

- **Provides safe, high-quality play and exercise areas**
- **Increases real estate market values**
- **Beauty and relaxation for family, employees and visitors**

© Rain Bird Corporation

The Value of Landscaping

- **Eight average front lawns have the cooling effect of 70 tons of air conditioning**
- **Turf, shrubs and trees reduce noise pollution by up to 50%**
- **One tree removes 26 pounds of carbon dioxide and produces 13 pounds of oxygen annually - enough to support a family of four**

© Rain Bird Corporation

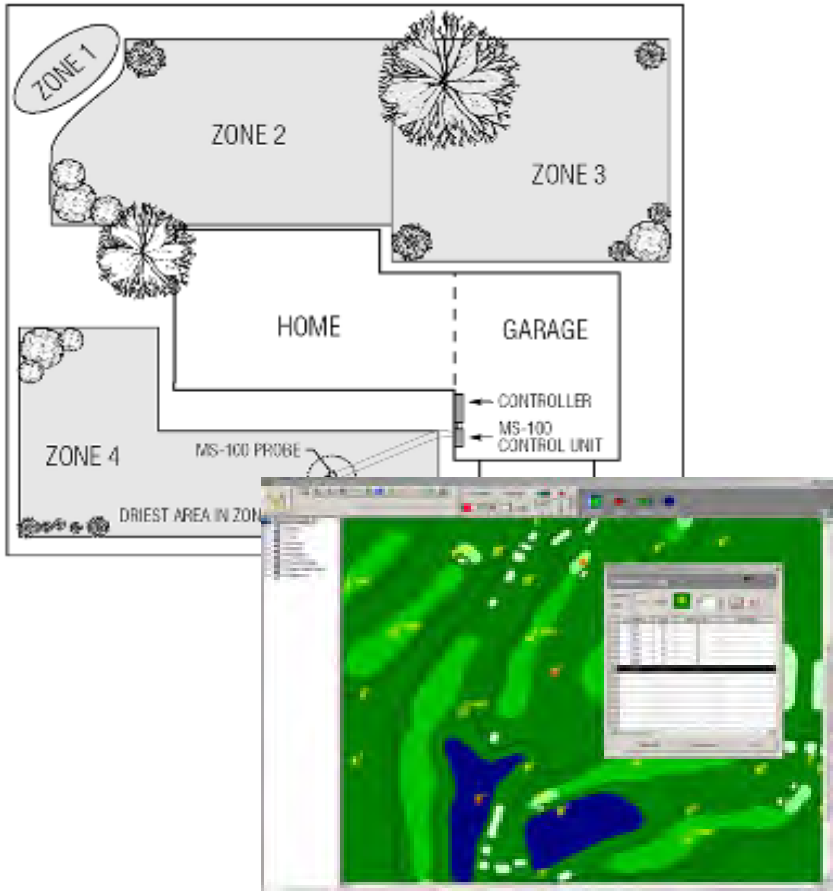
Key Steps to Implement Water-Efficient Irrigation

- Proper irrigation system design
- Use the most water-conserving products
- Proper system installation
- Proper maintenance and usage

© Rain Bird Corporation

Proper Irrigation Design

- Different plants require different amounts of water
- Understand exactly what will be irrigated
- Divide by zones
- Use the right products for the right applications
- Consult a licensed professional



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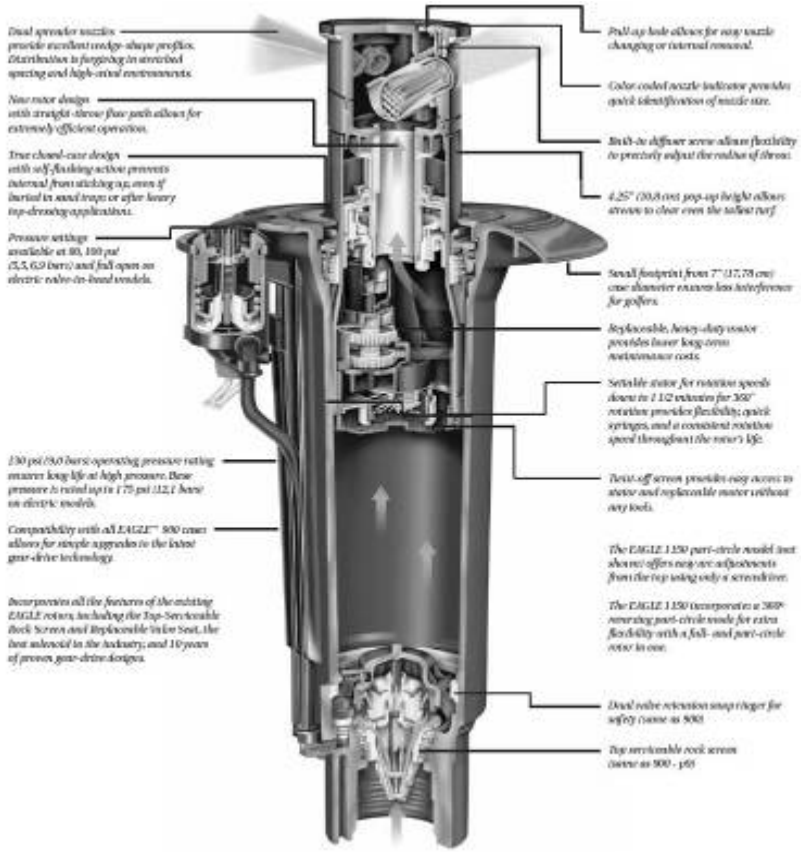
Use of Water Conserving Products

- **Significant recent advances in irrigation technology**
- **Automated systems can be more efficient than hand watering**
- **Can be set to deliver exactly the amount of water needed**



© Rain Bird Corporation

Automatic Controllers with Water Conserving Features

- **Multiple start times and multiple independent programs**
- **Cycle+Soak™**
- **Water budget**
- **ET Programming**
- **Rain Delay**

© Rain Bird Corporation

Add an Automatic Shut-Off Device

- **Rain and moisture sensors automatically suspend watering**
- **15-20% or more in water savings**
- **Some cities considering or passing legislation**

© Rain Bird Corporation

Use Low Volume Irrigation

- Very efficient for non-turf applications
- Apply precise amounts of water slowly and evenly at the root
- Helps reduce weeds and plant disease
- Helps eliminate runoff
- Helps plants thrive

© Rain Bird Corporation

Provide Optimum Water Pressure

- Use pressure regulating devices in high pressure situations
- Every 5 psi reduction results in 6-8% lower water usage
- Prevent misting & fogging
- Use booster pumps in low pressure environment

© Rain Bird Corporation

Use High Efficiency Nozzles

- Provides uniform coverage
- Can reduce water usage by up to 30%
- Provides even watering at close-in, medium and far distances
- Without uniform coverage, some areas get overwatered to compensate for dry spots

© Rain Bird Corporation

Proper Installation

- **Systems must be properly installed and configured to achieve the most efficient use of water**

- **Use Certified Irrigation Contractors (WaterSense program)**

© Rain Bird Corporation

Proper Maintenance and Operation

- Set systems to operate in early morning
- Periodic monitoring is important
- Routine inspections to discover problems
- Adjust schedules when the seasons change
- Adjust schedules when plants change

© Rain Bird Corporation

Encouraging Water Conservation

© Rain Bird Corporation

Encouraging Water Conservation

- Essential to ensure adequate water for future generations
- First reactions tend to be “shut off the taps”
- Creates confusion
- Leads to increased water consumption when bans are lifted
- Doesn’t change long term behavior

© Rain Bird Corporation

Government Incentives

- **Loans, grants, rebates and incentives**
- **Conservation incentives and disincentives can change behavior**

© Rain Bird Corporation

Education and Awareness

- Change perception of water as an "unlimited commodity"
- Professional education programs
- Public education and awareness

© Rain Bird Corporation

Looking Ahead

- Solving the crisis will take collaboration
- All methods have promise
- Water-efficient irrigation can make a significant impact
- Encourage policymakers to act now
- Let's all work together to be a part of the solution

www.rainbird.com

© Rain Bird Corporation

Thank You

RAIN BIRD

Water is one of Earth's most precious resources. However, in most cases it is being consumed as if a limitless supply existed.

At Rain Bird, we feel it is our responsibility to increase awareness of the growing threats posed by global water scarcity. Our white papers, entitled *Irrigation for a Growing World*, are just that, an effort to educate readers on the importance of using water efficiently and ways to incorporate these practices into their daily lives.

Since 1933, our research, marketing and manufacturing resources have been committed to developing products and technologies that use water efficiently – we call it *The Intelligent Use of Water*™. It is a commitment that extends to education, training and services for our industry and our communities.

The need to conserve water has never been greater. We want to do even more, and with your help, we can.

Anthony LaFerra
President

Rain Bird Corporation
[illegible] North Grand Avenue • Glendora, CA 91741 USA • (626) 963-9311 • Fax (626) 963-4287
www.rainbird.com

"The need to conserve water has never been greater. We want to do even more, and with your help, we can."

© Rain Bird Corporation

Stormwater Management

Rain Gardens
Rain Harvesting
Rain Barrels

Moderator
Arden Wallum
Mission Springs Water District
Desert Hot Springs, CA

Suzanne Wade

University of Wisconsin Extension
Jefferson, WI

- Rock River Basin Educator for Natural Resources
- Specializes in storm water, groundwater, and land use education
- Author of Wisconsin Rain Garden Education Kit

Cathy Lotzer

Marshfield Area, WI Groundwater Guardians

- Human Resources Generalist for Marshfield Utilities
- Coordinates activities of the Marshfield Groundwater Guardian team since 1996

In your experience, how effective are these types of source water management – rain gardens, rain harvesting, and rain barrels?

How can you motivate citizens to implement community-wide programs?

And, how have you been able to fund these programs?

Why should these be considered over other options?

Questions?

Going Green

One Community At A Time

Moderator
Mike Ekberg
Miami Conservancy District
Dayton, OH

Cathy Lotzer

Marshfield Area, WI Groundwater Guardians

- Human Resources Generalist for Marshfield Utilities
- Coordinates activities of the Marshfield Groundwater Guardian team since 1996

Norb Salamonski

Walgreens Pharmacy, Marshfield, WI

- Graduate of the University of Illinois College of Pharmacy
- Hospital Pharmacy Manager for five years
- Practiced nuclear pharmacy for eight years
- Community pharmacist for 14 years
- Clinical instructor for the UW College of Pharmacy

Ross Penhallegon

OSU/Lane County Extension, Eugene, OR

- OSU Extension Horticulture Agent
- Worked in agriculture for 48 years, 24 as an Extension agent
- Provides water quality programs to commercial growers
- One of eight world-wide researchers on the “lingonberry project.”

Deborah Boadway

Sanitation Districts of Los Angeles County, Los Angeles, CA

- 18 years at the Sanitation District
- Promote/expand water reclamation projects
- Works in the Industrial Waste Section on emerging contaminants
- Representative to the Multi-agency "No Drugs Down the Drain Campaign"

Give a four minute description of your program.

Groundwater Guardians for the Marshfield Area, Wisconsin

R_x Round-Up

Pharmaceutical Take Back Program

A prescription for protecting our water

"An initiative of Groundwater Guardians for the Marshfield Area"

Groundwater Guardians for the Marshfield Area, Wisconsin

One Day Collections

May 2006

418 pounds of uncontrolled substances

35 pounds of controlled substances (250 line items)

February 2007

193 pounds uncontrolled substances

17 pounds of controlled substances (104 line items)

May 2007

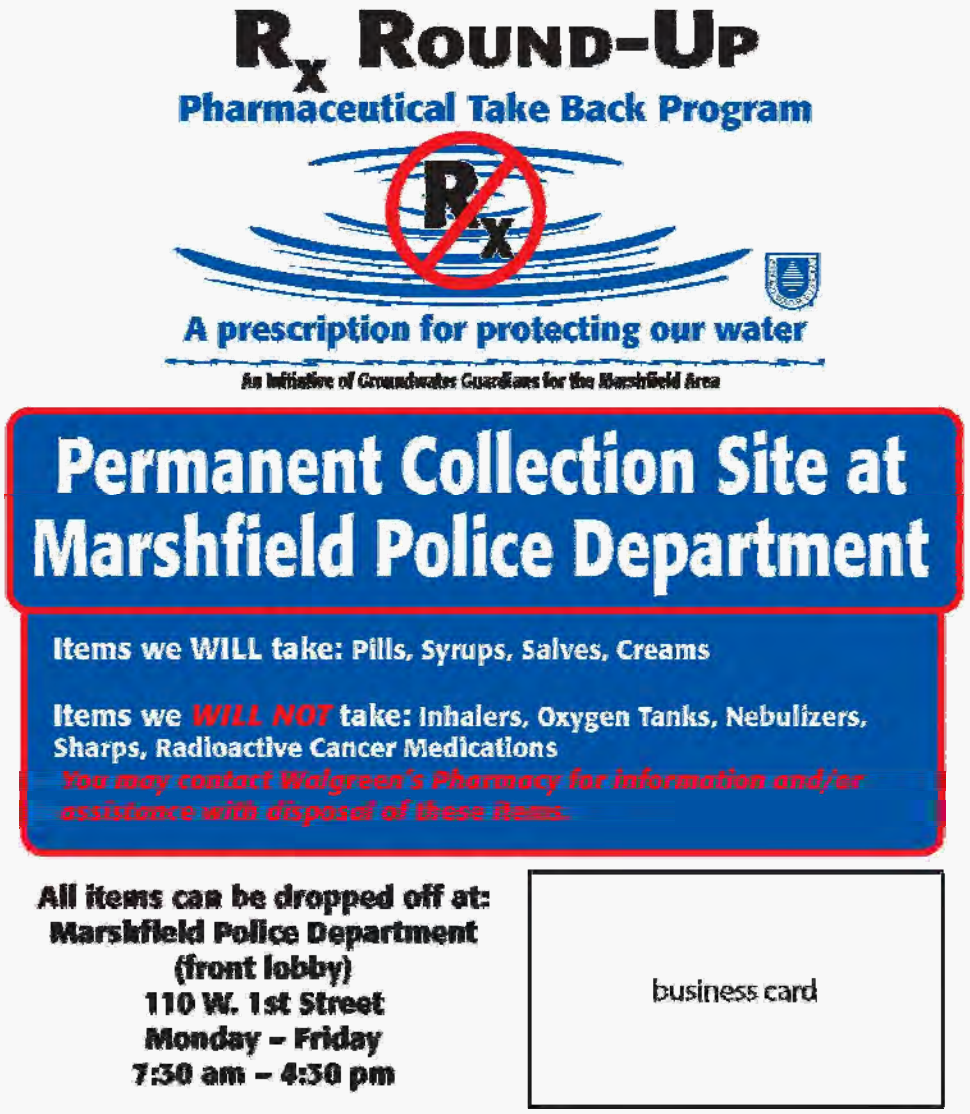
335 pounds of uncontrolled substances

26 pounds of controlled substances (269 line items)

October 2007

247 pounds of uncontrolled substances

25 pounds of controlled substances (265 line items)



Permanent Collection Site and the Police Dept.

<u>May 2008</u>

350 pounds collected and transported to incineration

<u>November 2008</u>

350 pounds collected to date

Oregon State University
Lane County Extension Service
Lane County Water Quality Affiliate Group

2006-2007

Legacy Pesticide Collection

Chlorid
MISCIBLE
Gallons

Mist-O-Ma

LIQUID SEED DISINFE

MERCURY

FOR BARLEY • OATS • SORGHUM • COTTON • WHEAT • FLAX

A non-volatile liquid formulation for seed-treating to control smuts, seed decay, and seedling blights.

ACTIVE INGREDIENT:

Phenyl Mercuric Ammonium Acetate (Mercury Equivalent 2.0%)	3.5%
INERT INGREDIENTS	96.5%
	100.0%

DANGER

PO

ANT

EXTERNAL:

INTERNAL:

TREATED SEEDS

ANGER
UTHORIZED
SONNEL ONI
ND THIS PO
80W

NO DRUGS DOWN THE DRAIN CAMPAIGN

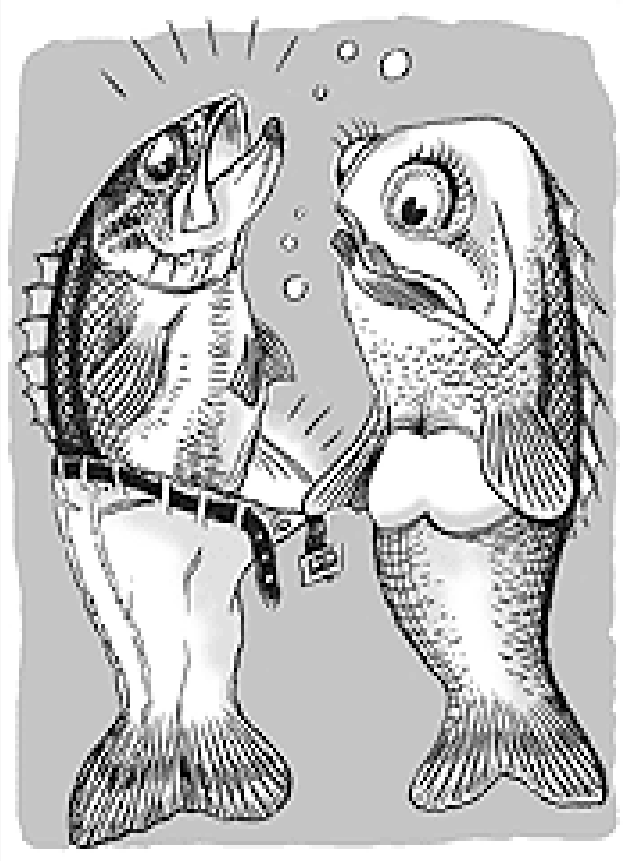
PROMOTING PUBLIC STEWARDSHIP

Deborah Boadway
November 19, 2008

Los Angeles County Sanitation Districts

Background

- U.S. Geological Survey (2002): 80% of U.S. waterways tested contained one or more pharmaceutical compound.
  - 17alpha Ethynyl Estradiol
    - Synthetic estrogen present in 16% of rivers in USGS study
    - Effect: feminization of male fish
  - Acetaminophen (24%)
  - Steroids and hormones (16%)
  - Diltiazem (blood pressure medication) (13%)
  - Codeine (11%)
  - Antibiotics and antimicrobials (10%)
  - Ibuprofen (10%)
- Associated Press study (2008) indicates drinking water supplies in some areas contain pharmaceutical compounds.



NO DRUGS DOWN THE DRAIN

UNUSED MEDICATIONS SHOULD BE

1. Taken to a household hazardous waste collection center or event (no controlled substances allowed) or
2. Put in a sturdy, securely sealed container, then in a trash can where children and animals can't reach them.

Unused prescription and over-the-counter medications that are put in drains or flushed down the toilet pollute the environment, so please take as prescribed and dispose of unused portions properly.

www.nodrugsdownthedrain.org

In case of overdose or accidental poisoning, call the poison center at 1-800-222-1222 24 hours/day

CALIFORNIA POISON CONTROL SYSTEM

california pharmacists association

NO TIRE MEDICAMENTOS EN EL DESAGÜE

LOS MEDICAMENTOS NO UTILIZADOS SE DEBEN

1. Llevar a un evento o centro para la recolección de desechos domesticos peligrosos (substancias controladas no serán permitidas), o
2. Poner dentro de un recipiente resistente, sellar y tirar a la basura fuera del alcance de niños y animales.

Todo medicamento recetado o no recetado que sea desechado en el desagüe, lavabo o excusado, contamina el medio ambiente. Tome sus medicamentos como recetados por su doctor, y favor de deshacerse de medicamentos no utilizados de la manera apropiada.

www.nodrugsdownthedrain.org

En caso de sobredosis o envenenamiento accidental, llame al centro de envenenamientos al 1-800-222-1222 las 24-horas

CALIFORNIA POISON CONTROL SYSTEM

california pharmacists association

www.nodrugsdownthedrain.org

NO DRUGS DOWN THE DRAIN

| MEDICATIONS IN THE ENVIRONMENT | DISPOSAL INSTRUCTIONS | FURTHER INFO |

| HOME | ABOUT US | PARTNERS | SPONSORS | GLOSSARY | CONTACT US |

Disposing of unused, unwanted, and expired medications
Once it was common practice to flush these **medications** (also known as **pharmaceuticals**) down the toilet. Your doctor or pharmacist may have directed you to do this. We now know that these substances are bad for our environment - the ground, water, and air around us.

So, what should you do?
There is no one answer that applies to all people in all parts of the United States. The **disposal instructions** presented on this Web site are intended only for areas served by the **wastewater agency** sponsors listed in the **'About Us'** section. One very important thing everyone can begin with, however, is to take medications as directed and finish the prescription when directed to do so by your doctor. Use the links below to learn more.

Medications, also called pharmaceuticals, include prescription drugs such as hormones, antidepressants, and antibiotics; over-the-counter medicines such as pain relievers, cold/flu remedies, and antiseptics; and veterinary medicines.

Medications in the Environment

Disposal Instructions

Further Information

In case of overdose or accidental poisoning, call the poison center at
1-800- 222-1222
24 hours/day

What were your biggest obstacles and how were they overcome?

In addition to the large amounts of potential pollutants that have been properly disposed of – have there been other unforeseen rewards or positive impacts?

If so, what?

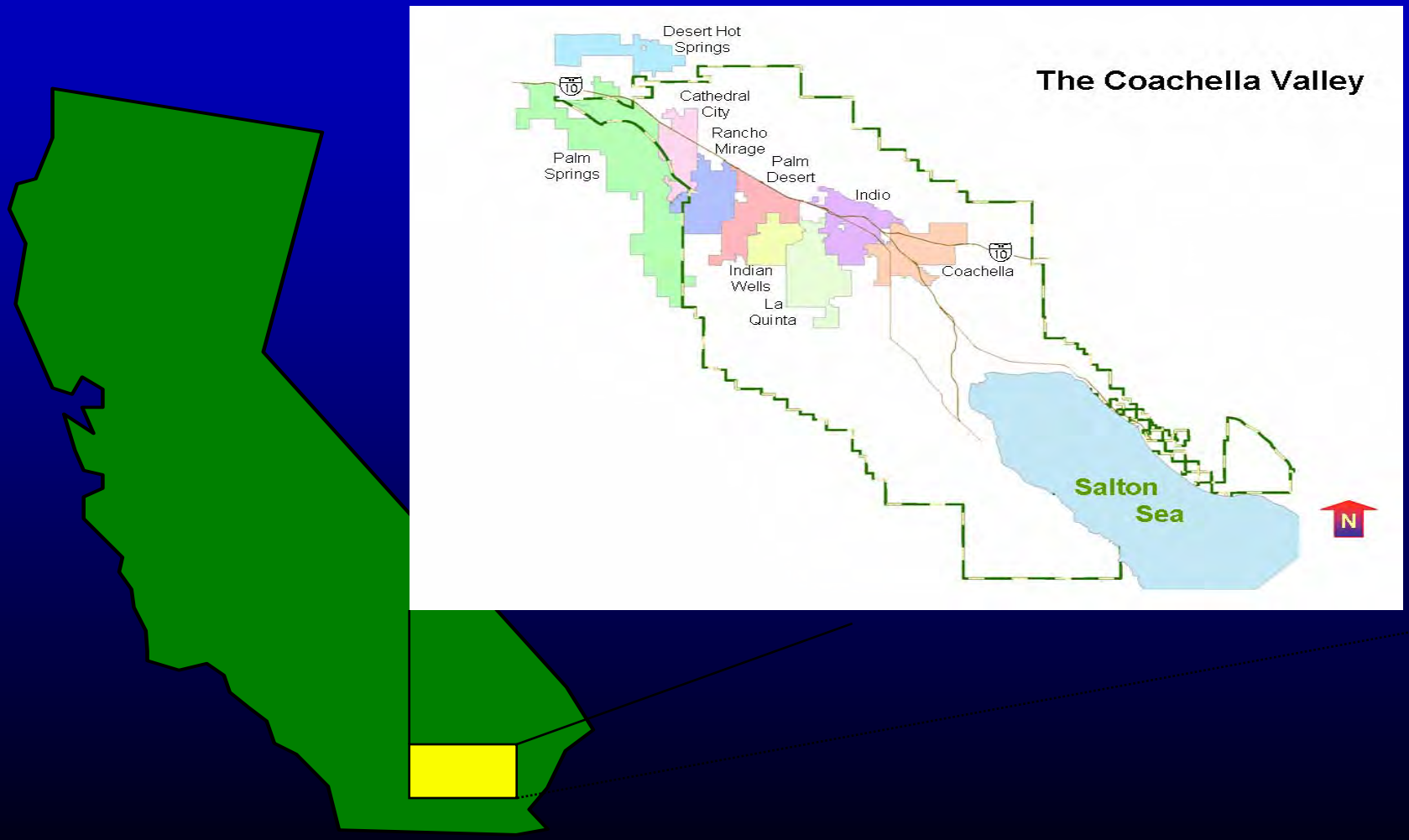
Questions?

“Green” in the Desert

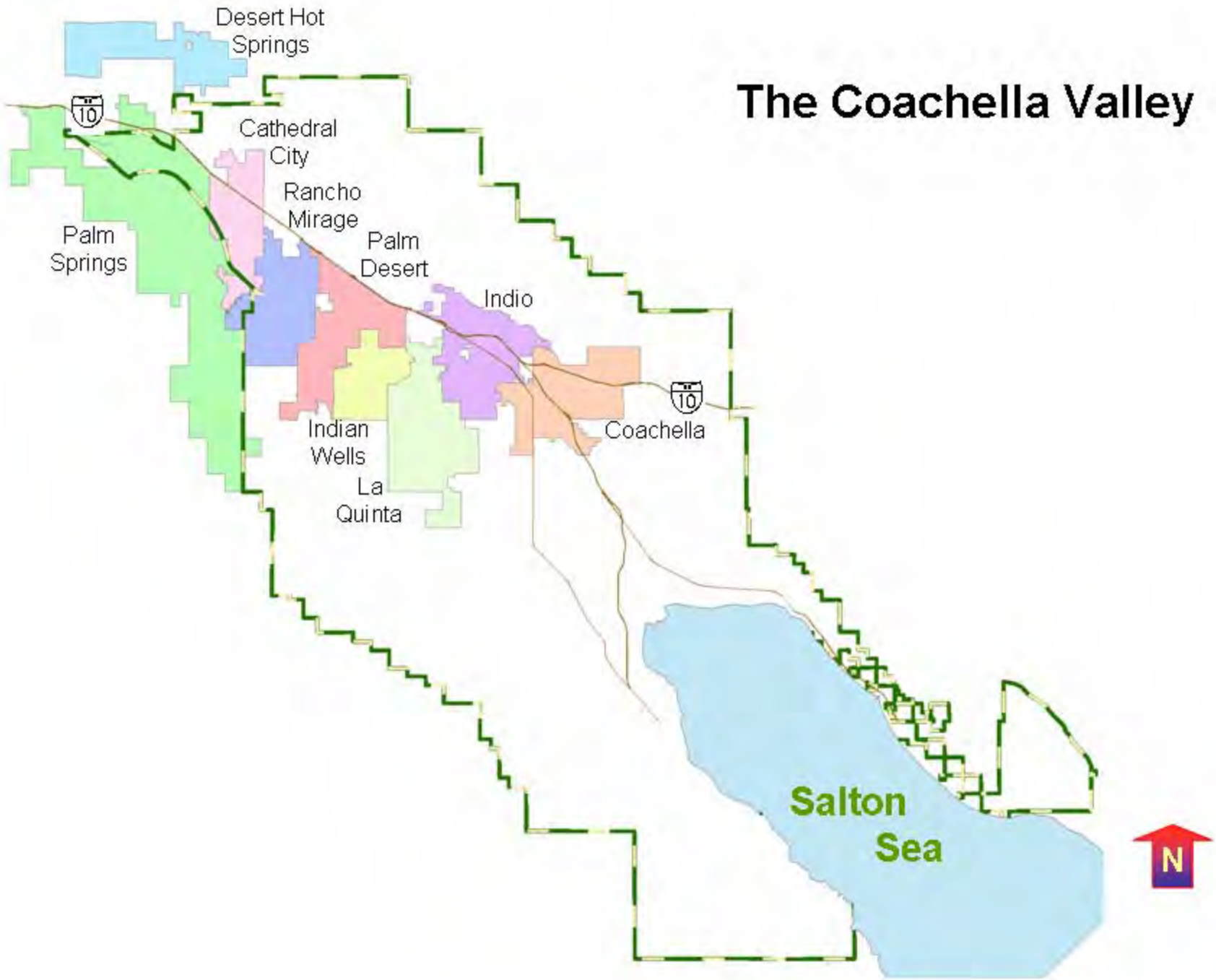
By Dave Koller
Conservation Coordinator

Coachella Valley Water District

Coachella VWD: water, wastewater, irrigation, flood Control in 1,000 sq. mi. (2600 sq. km.)



The Coachella Valley



Coachella Valley is a desert; it gets three inches of rain annually (75 mm)
Annual water use of 700,000 acre-feet (870,000 megaliters)

Coachella Valley Water District

- District Boundaries Encompass 1,000 Square Miles
- Provide Drinking Water to More Than 100,000 Homes and Businesses
- Aquifer Capacity Estimated at 39.2 Million Acre Feet
- Average Home Uses One Acre Foot per Year

Traditional “Green”
Turfgrass System

Is this necessary?

Why grass here?

50+ gallons per minute

Desert landscapes use, on average
70% to 80% less water than
traditional turf landscapes.

Desert landscapes cost, on average
50% to 70% less to maintain.

Drip irrigated desert landscapes
reduce groundwater pollution.

Spray-irrigated grass setback

Ordinance 1302.1

Landscape and Irrigation System Design Criteria

MAIN OBJECTIVES

Reduce overall landscape water use

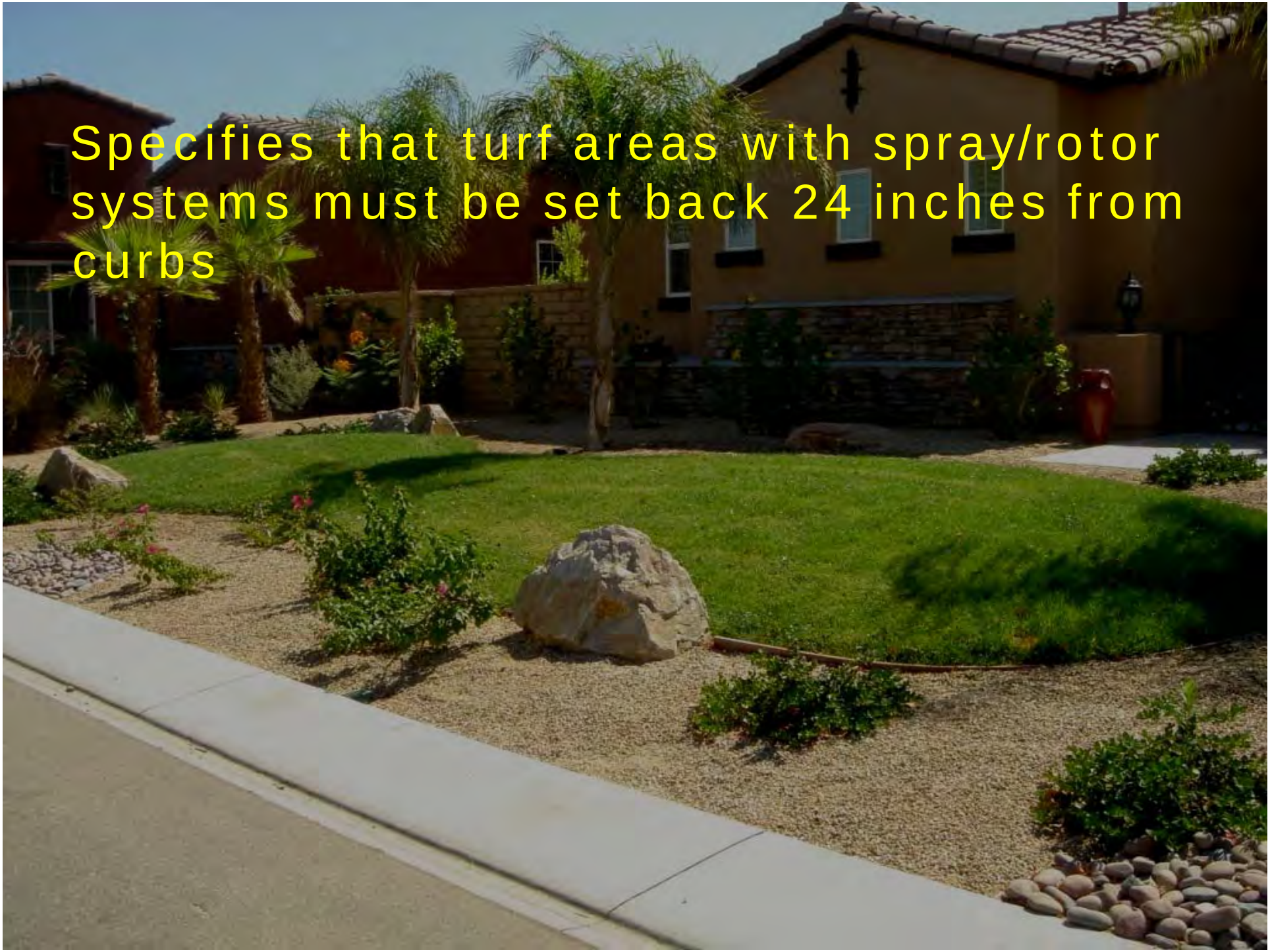
MAIN OBJECTIVES

Reduce overall landscape water use

Reduce or eliminate water in the streets

MAIN OBJECTIVES

- Reduce overall landscape water use
- Reduce or eliminate water in the streets
- Establish turf allowances for golf courses


Specifies that turf areas with spray/rotor systems must be set back 24 inches from curbs

Smart controllers shall be specified for all projects.

AQUA Conserve
ET-8B
More
Test
Previous
7 Days
Next
Today
Less
Rain
Manual Single Station
Time & Date
Water Days
Start Time
Station Watering Times
Run
Settings
Off
In Run Mode You Can...
Example of ETo for a Year
Run-Time Percent
Sensor Ports Under
1.5A Max Fuse
24 VAC
RAIN
SET THIS CONTROLLER FOR SUMMER WATERING RUN-TIMES ONLY!
The controller automatically makes adjustments based upon plant water use.
AQUA Conserve
Try to conserve water by reducing run times
Aqua Conserve Inc. (877) 922-2782
IT8-1112

Reduces ET adjustment factor
(ETAF) from 0.60 to 0.50.

Limits golf course irrigated turf to
four acres average per golf hole

Conservation Programs

- Smart Controllers
- Landscape Irrigation Evaluations
- Low Interest Loans
- Curbside Turfgrass Replacement
- Tiered Rates
- Education/Outreach

Going Green

It's a Growing Industry

Moderator
Nancy Wright
Mission Springs Water District
Desert Hot Springs, CA

Mark Johnson

Golf Course Superintendents Assn. of America
Lawrence, KS

- Senior Manager for Environmental Programs for GCSAA
- Co-project leader of the Golf Course Environmental Profile
- Member of Lower-Kansas River Watershed Restoration and Protection Strategy leadership team

Jeff Tiemann

Cargill, Blair, NE

- Natural Resource Process Development Group Water Engineer
- Works to reduce the water and wastewater impact for Cargill Corn Milling
- Serves on local Groundwater Guardian team

Jennifer Crain

Nolte Associates, San Diego, CA

- Registered engineer and certified floodplain manager
- Manages water quality work, and involved in stormwater regulations, and water quality treatment
- LEED accredited professional in the New Building Construction category

Briefly describe what you consider to be your industry's most innovative "green" action.

Mission

Deliver Sustainable Solutions for Civil Infrastructure

Education is the Key!

SUSTAINABLE DESIGN NEWS

George's Corner

As engineers, we play a significant role in shaping our communities through the services we provide. Our everyday design decisions have incremental, yet profound, effects on the environments where we live and work. These effects are lasting. We have the ability to make choices that will cause negative or positive impact. We want to do good work.

'Good work' has to consider more than short-term design criteria. 'Good work' weighs the short-term ramifications of our choices against long-term influences on our surroundings and the community as a whole. Good work is economically feasible. It provides value.

Aldo Leopold wrote, "Now we face the question whether a still higher 'standard of living' is worth its cost in things natural, wild, and free." We believe engineers need to learn to significantly lower the natural cost of our actions in order to raise the overall net benefits of our work.

George S. Nolte, Jr.

Sustainability Web Links

- Sustainable Design Guide
- Did You Know? (Pervious Concrete)
- Business Practices
- U.S. Green Building Council

Sustainable Success Story: Rubberized Asphalt Concrete

Congratulations to Kanda Raj and his Walnut Creek Office Civil/Transportation group for their success in convincing the City of Pittsburg, California to use RAC-G for the City's 2005-2006 pavement rehabilitation program instead of using a conventional asphalt overlay. Nolte is currently completing 50 percent design documents with RAC-G. In order to convince City staff, who were very hesitant to try RAC-G, Raj did the following:

- Presented advantages of RAC-G at the kick-off meeting
- Provided cost comparisons for both RAC-G and conventional overlays
- Provided actual bid pricing for several Bay area projects using RAC-G
- Arranged for a presentation by a vendor
- Provided information on other local projects and agencies who are using RAC-G
- Identified a local RAC-G manufacturing plant

READ COMPLETE ARTICLE

Revitalizing Downtown Manitou Springs

Nolte Incorporates Sustainable Features in Downtown Revitalization Project

For the past two and a half years, the Colorado Springs office has helped the City of Manitou Springs complete their revitalization business plan, secure the necessary funding for their planned redevelopment initiatives, develop preliminary plans for the downtown, prepare final construction documents and provide construction management for the first redevelopment phase.

Nolte staff participated with community representatives and City staff members in a "walk-about" through the town to identify key revitalization needs and opportunities. The process included recommendations creating a total plan for implementation, management, sustainability and funding opportunities for the entire revitalization project. This work includes addressing above and below ground utilities, other surface infrastructure and urban design improvements from face of building to face of building along the main roadway through downtown.

READ COMPLETE ARTICLE

Sustainable Offices: SA/CE

The Sacramento/Corporate office made the move to a new building with a sustainable and functional space this past May. Office growth motivated the move, but the "green" perspective defined the transition to larger and more effective headquarters. We worked to be as compliant with LEED's Commercial Interiors as possible without certification, the goal being to balance sustainable design and practical economics.

Click here to view the sustainable highlights that the Sacramento/Corporate office handed out to guest at their open house!

READ COMPLETE ARTICLE

Sustainable Business Practices

While keeping in stride with Nolte's commitment to sustainable design and practices, the company has issued new sealable beverage containers and implemented reusable kitchenware.

With the help of Nolte employees we are able to reduce the amount of waste and help Nolte lead the way in sustainable design and practices.

EDITOR
Larry Shaw

DESIGNER
Josh Jensen

CONTRIBUTORS
Laura Bonich
Chuck Meridith
George Nolte
Kanda Raj

NOLTE

How valuable is being “green” to your company in terms of public relations and how do you utilize your “green” image?

Public Relations

Awards

- Certified Sustainable Business - Sacramento
- Certified Green Office – San Jose
- City of Fort Collins Climate Wise - Gold Partner Award
- Kennecott Land – Sustainable Contractor Award – Salt Lake City
- City of San Diego Recycling and Waste Reduction Awards

Presentations

- ULI's Developing Green Conference Spring 2008) – LEED
- Land Development West – "Sustainability and Infrastructure – Making Sustainability Pay"
- ULI's Master Planned Community Conference 2008 – "Sustainability and the Bottom Line"

City of San Diego
ESD
Environmental Services Department
Recycler of the Year

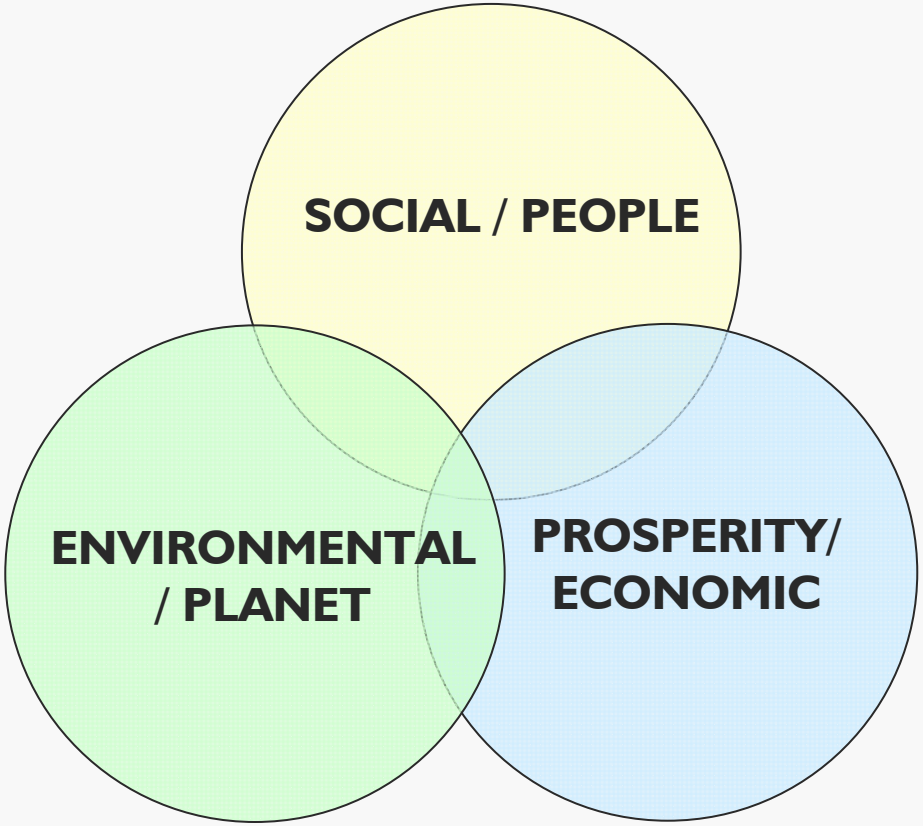
2006

CITY OF SAN DIEGO
ESD
ENVIRONMENTAL SERVICES DEPARTMENT
RECYCLER OF THE YEAR

2007

In your opinion, why should companies invest in “green” options?

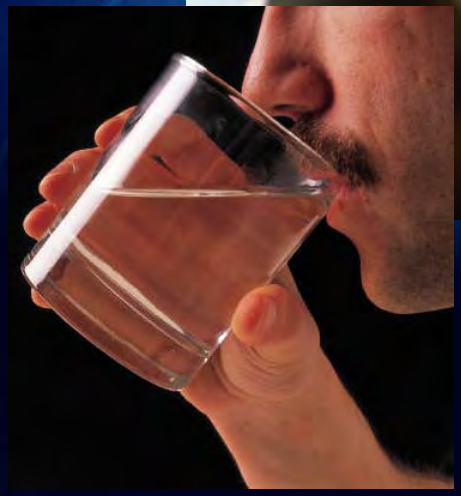
Benefits of Green



Questions?

Communicating the Value of Water

Groundwater Foundation's National Conference
November 20, 2008



Ed Means

Malcolm Pirnie, Inc.

Why Communicate the Value of Water?

- Ensure long-term investment in water services & resources
- Ensure/Build community confidence in the water utility, its leadership, & its employees
- Promote & support the wise use of water

The Literature

- Key to service firm success = keep customers happy
- Utility credibility is essential to sustain business
- Credibility requires:
  - Maintaining open & transparent communication
  - Protecting physical, financial, & human resource assets
  - Treating customers as owners
  - Being environmentally sensitive
- Utility must internalize community values of
  - Build a positive social image
  - Treat natural environment as community asset
  - Deploy financial resources productively

The Literature: Brand

Branding is not the same as advertising

- Branding includes investments to communicate value & encourage people to adopt specific perceptions
  - Volvo = Safe cars

- Branding is based on judgments
  - A positive & consistent branding campaign can overcome negative impressions

The Literature: What's in a Good Brand?

- A good brand defines what you can count on
  - Keep it simple & memorable
  - Communicate it consistently
  - Live up to the brand
  - Target the audience
- The process is dynamic - market research defines & refines the campaigns

Branding: Brita vs Tap Water – Canada 2006

Greater Vancouver Regional District asked Brita to remove the ads. Brita refused.

Branding: Bottled Water

A young man, tired from his vigorous workout, peers into his empty bottle of Aquafina. As the last drop trickles out, the super reads...

...flawlessly. Super: 'Pure genius.' Cut to a couple, the man is cascaded with chilled water as the super appears, 'Pure ecstasy.'

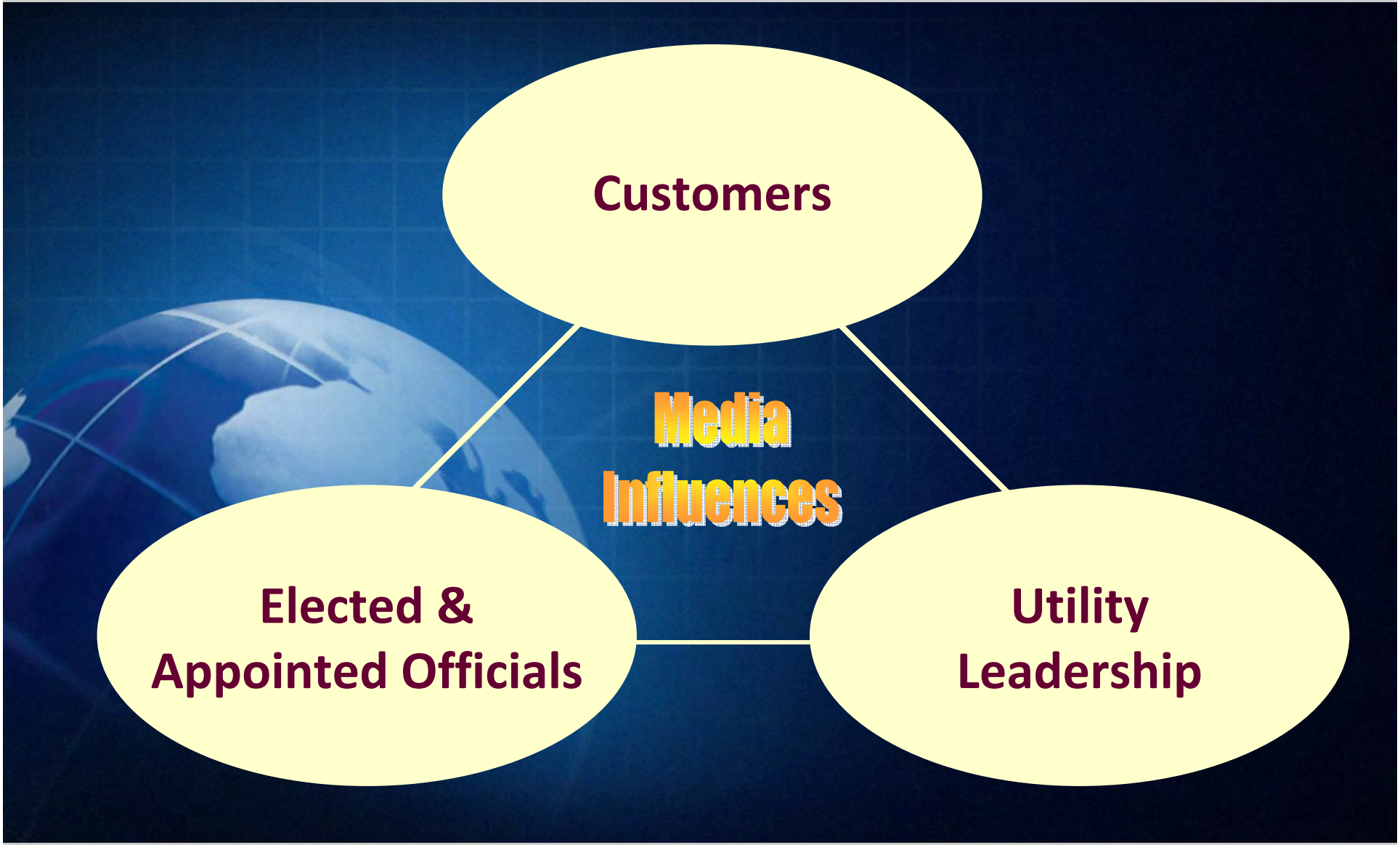
...'Pure frustration.' Cut to a boat, on which an attractive woman holds up a bottle and gestures alluringly. Super: 'Pure temptation.'

Super on the screen reads, 'Aquafina. Pure water.'

The camera moves on to a man, as he mulls over the Aquafina bottles scattered around. He stacks them one on top of the other...

The MVO adds, "Aquafina. The purest part of you."

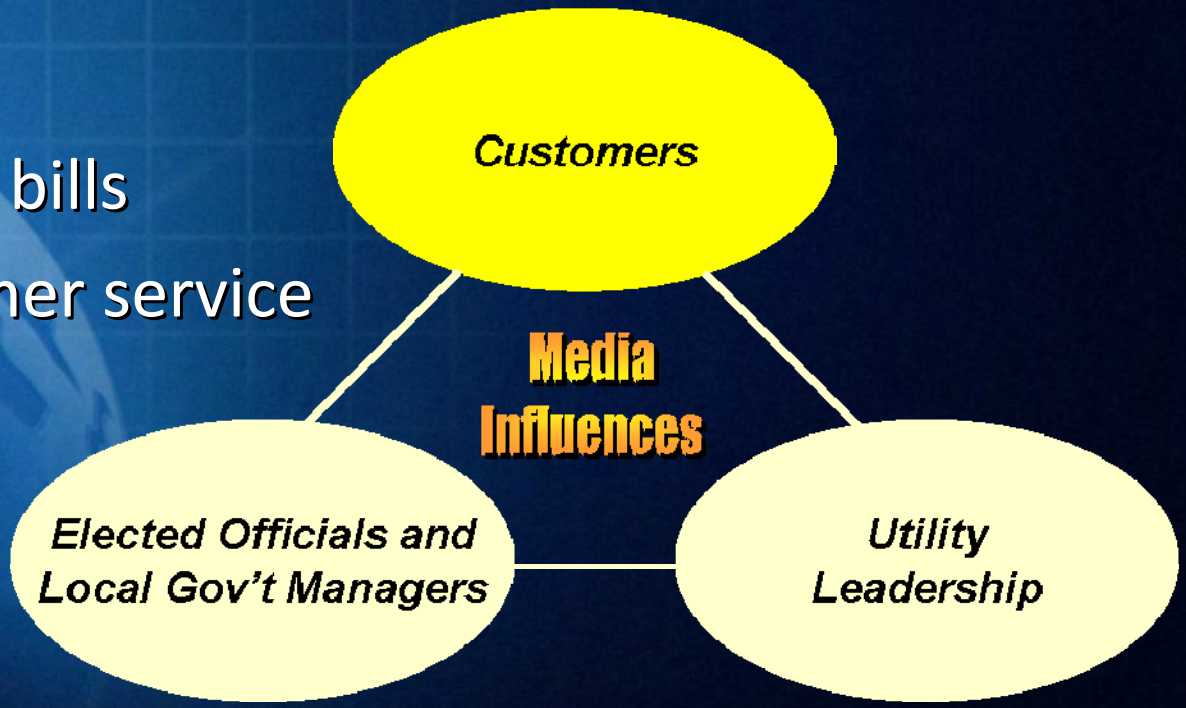
Multiple Perspectives



Summary of Perspectives

Customers want:

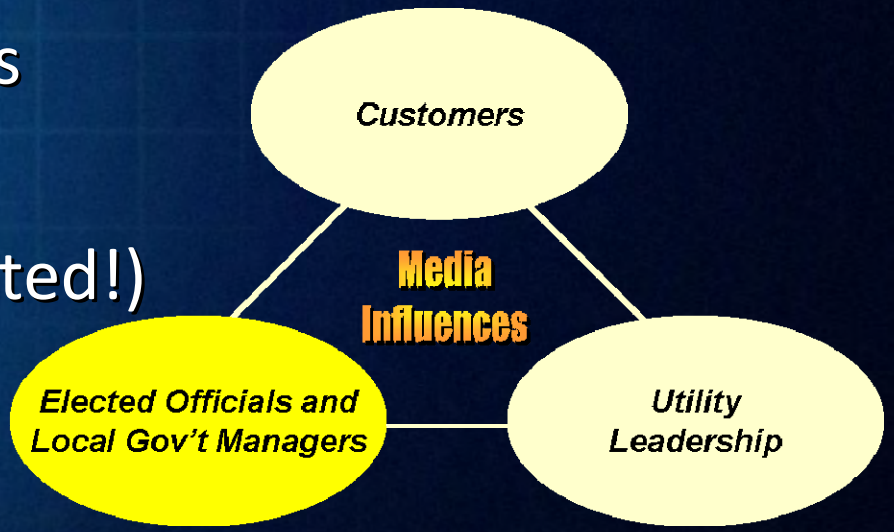
- Safe water
- Reliable water
- Fair & accurate bills
- Efficient customer service



Summary of Perspectives

Elected Officials want:

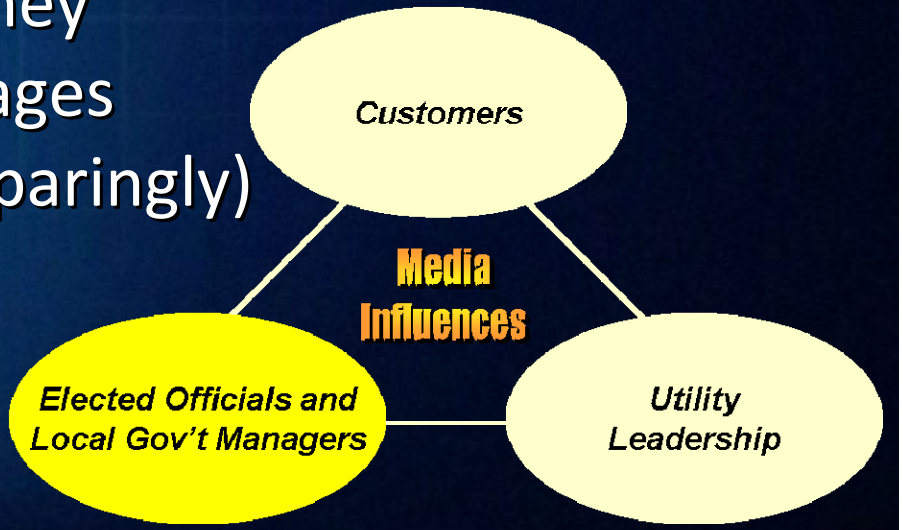
- Services for entire community
  - e.g., water, roads, parks
- Community engagement
- Parity w/ other communities
- Education for children
- To do a good job (get reelected!)



Summary of Perspectives

Local Government Managers want:

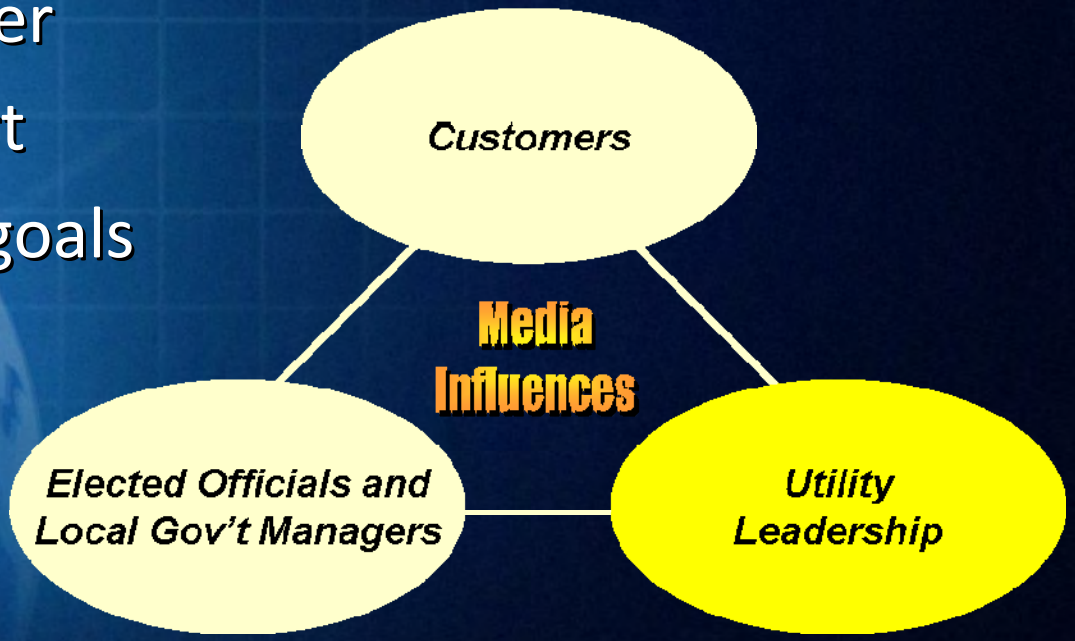
- Effectively demo value of water product/service
- Emphasize environment & need for water ethic
- Information from Utility leaders:
  - Explain why rates rise w/ conservation; Give ideas for saving water/money
  - Simple & consistent messages
  - Have high-tech info (use sparingly)
  - How money will be used
  - Affect on bills/comps
- Relentless communication



Summary of Perspectives

Utility Leaders want:

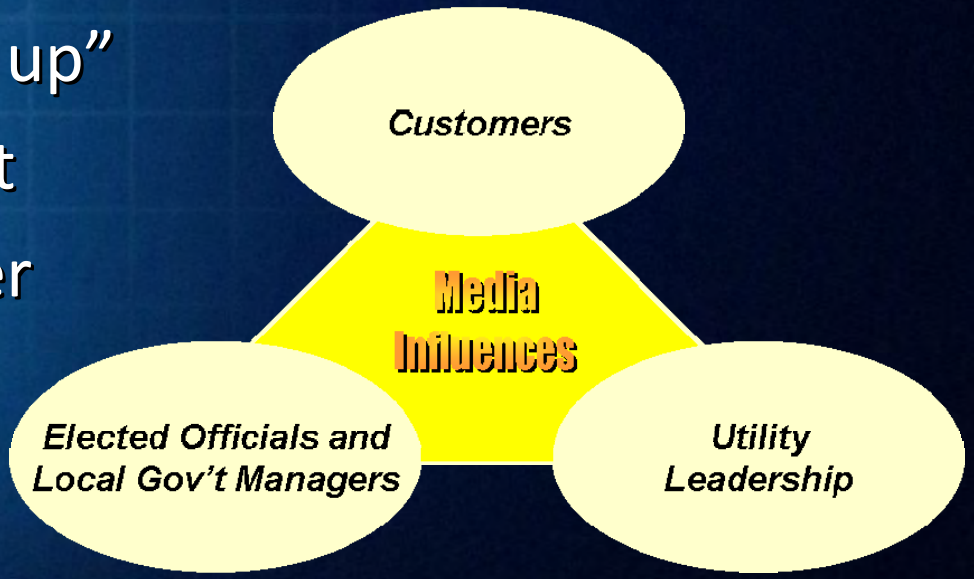
- Trust & credibility with all stakeholders
- To deliver safe water
- Community support
- Money to achieve goals



Summary of Perspectives

Media want:

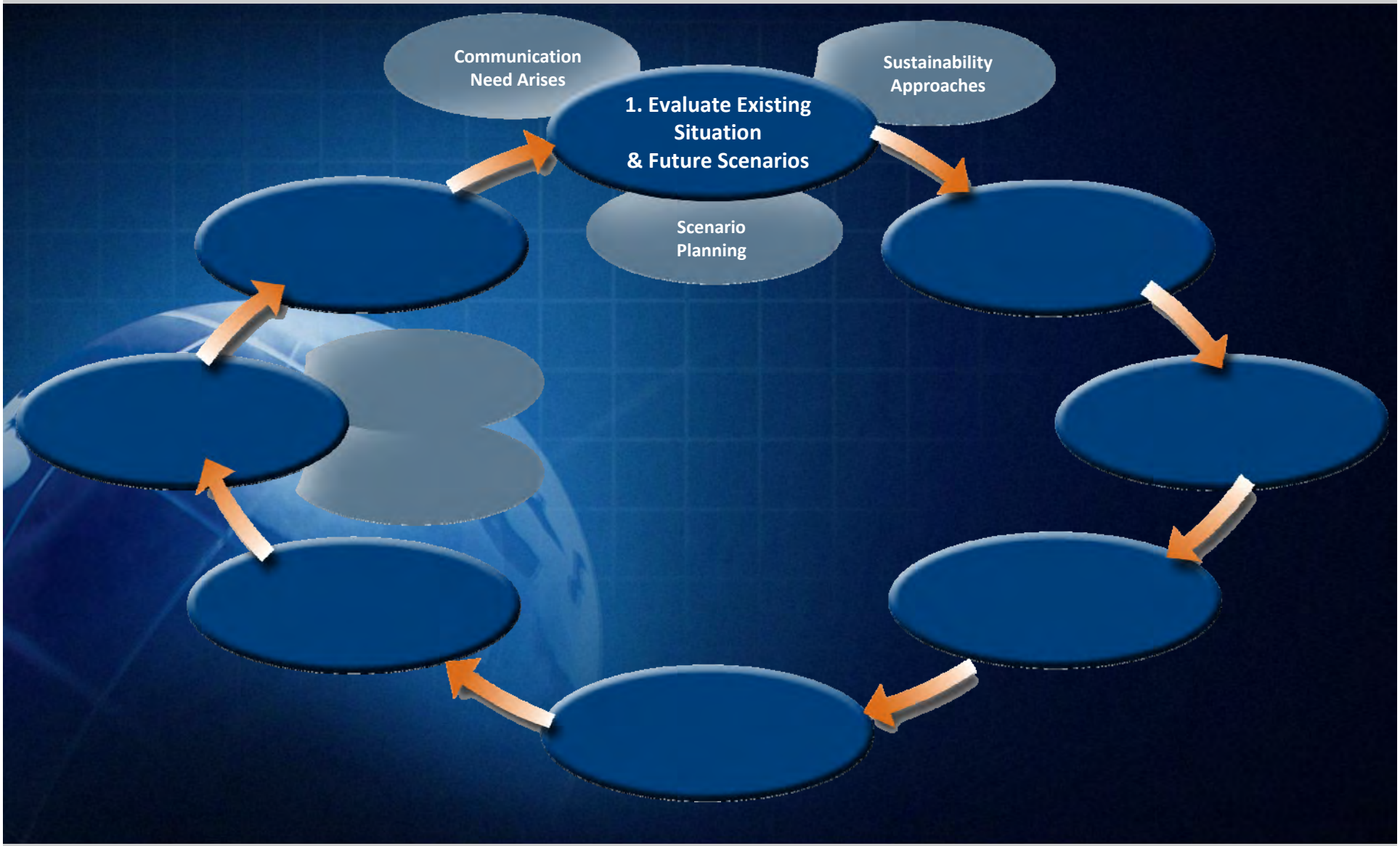
- Utility website
- Access to knowledgeable spokesperson
- NGOs viewed as trustworthy
- 2-3 days news "heads up"
- Their reputation intact
- Method to make water stories interesting



Plan Must Communicate Value

- Plan varies by size of utility & resources
- Leverages every opportunity to reinforce the desired brand (value proposition).
- What are people getting for their money?
- Discussion basis for utility leaders, elected & appointed officials, & customers

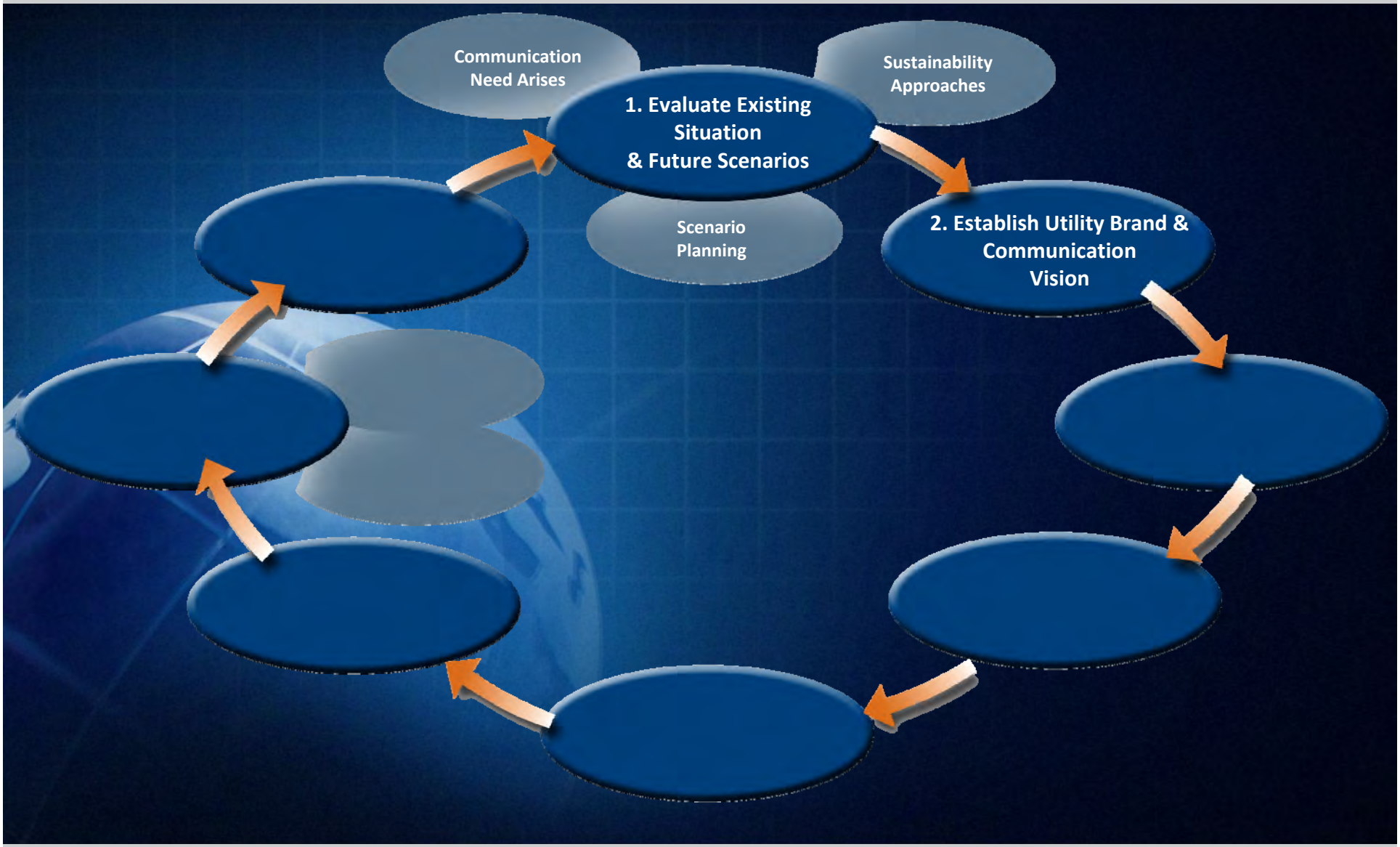
Communication Planning Model



1. Evaluate Existing Situation/Future Scenarios

- Address issues
  - How is utility perceived? How *should* it be perceived?
  - What are obstacles?
  - Who is leader?
  - Who will execute communications plan?
- Use scenario planning
  - Involved utility leaders & stakeholders
  - What are the risks of not engaging?
- Consider Utility Sustainability Posture

Communication Planning Model



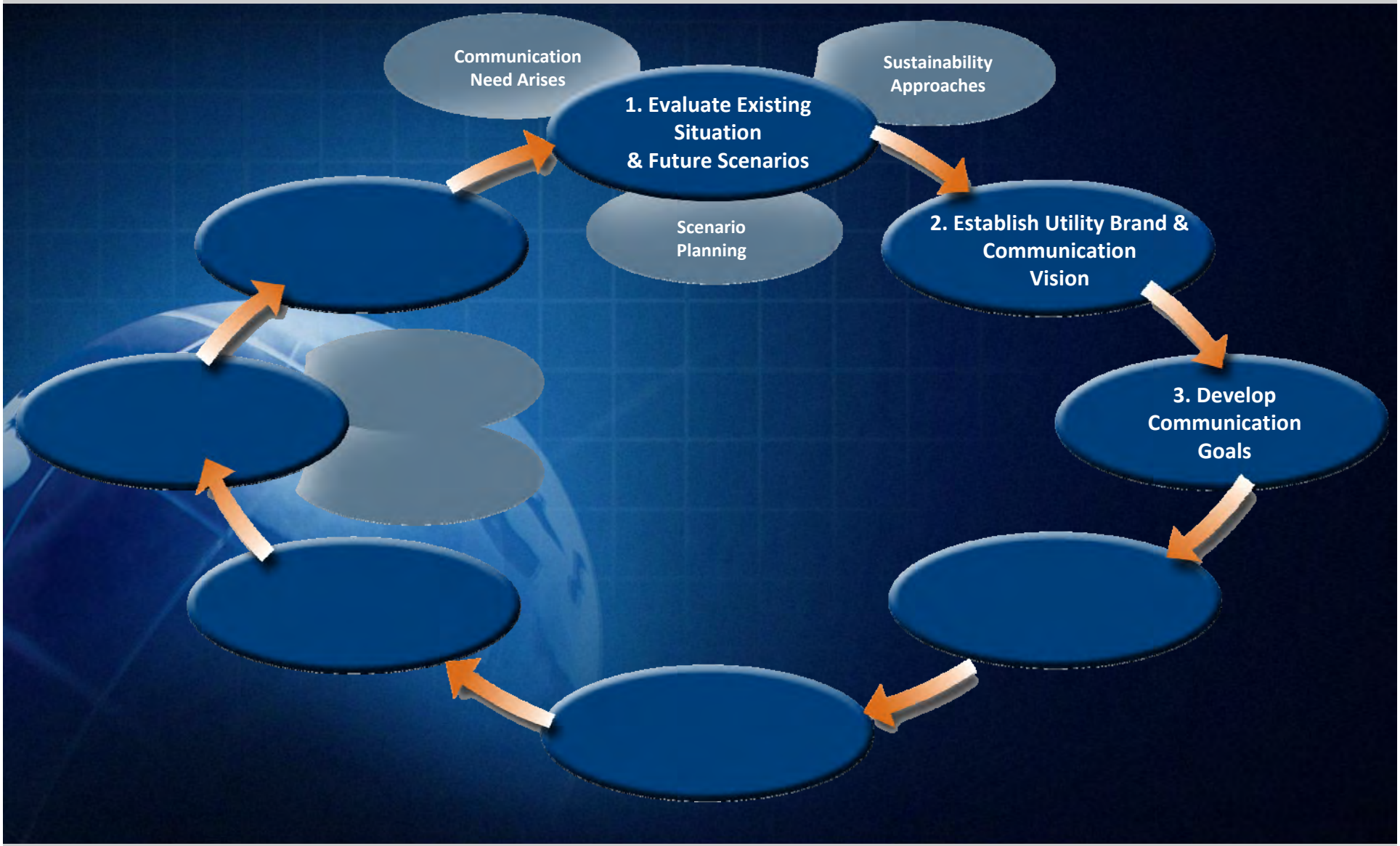
2. Establish Utility Brand & Communication Vision

- Define ideal image
  - Review national branding info
- Define utility brand that reflects utility vision
  - Illustrates what the public can count on from you
  - Makes a public statement about commitments

Tucson Water Mission: To ensure customer satisfaction by consistently delivering high quality water and service in a cost-efficient, environmentally responsible manner today and for the future

Tucson Water Brand: Committed to sustainability, reliability, long-term planning, appropriate investments, sound financial management, and quality

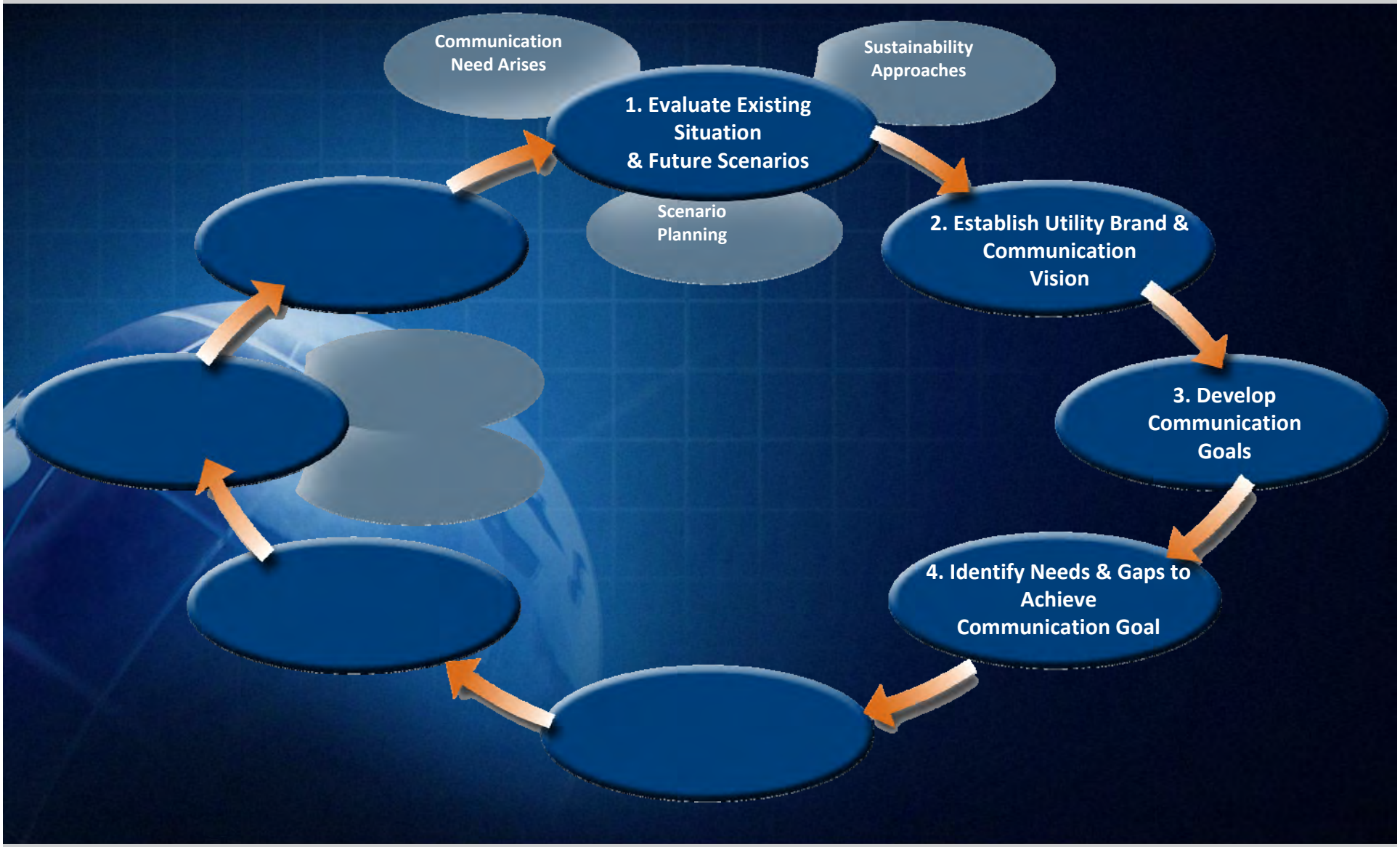
Communication Planning Model



3. Develop Communications Goals

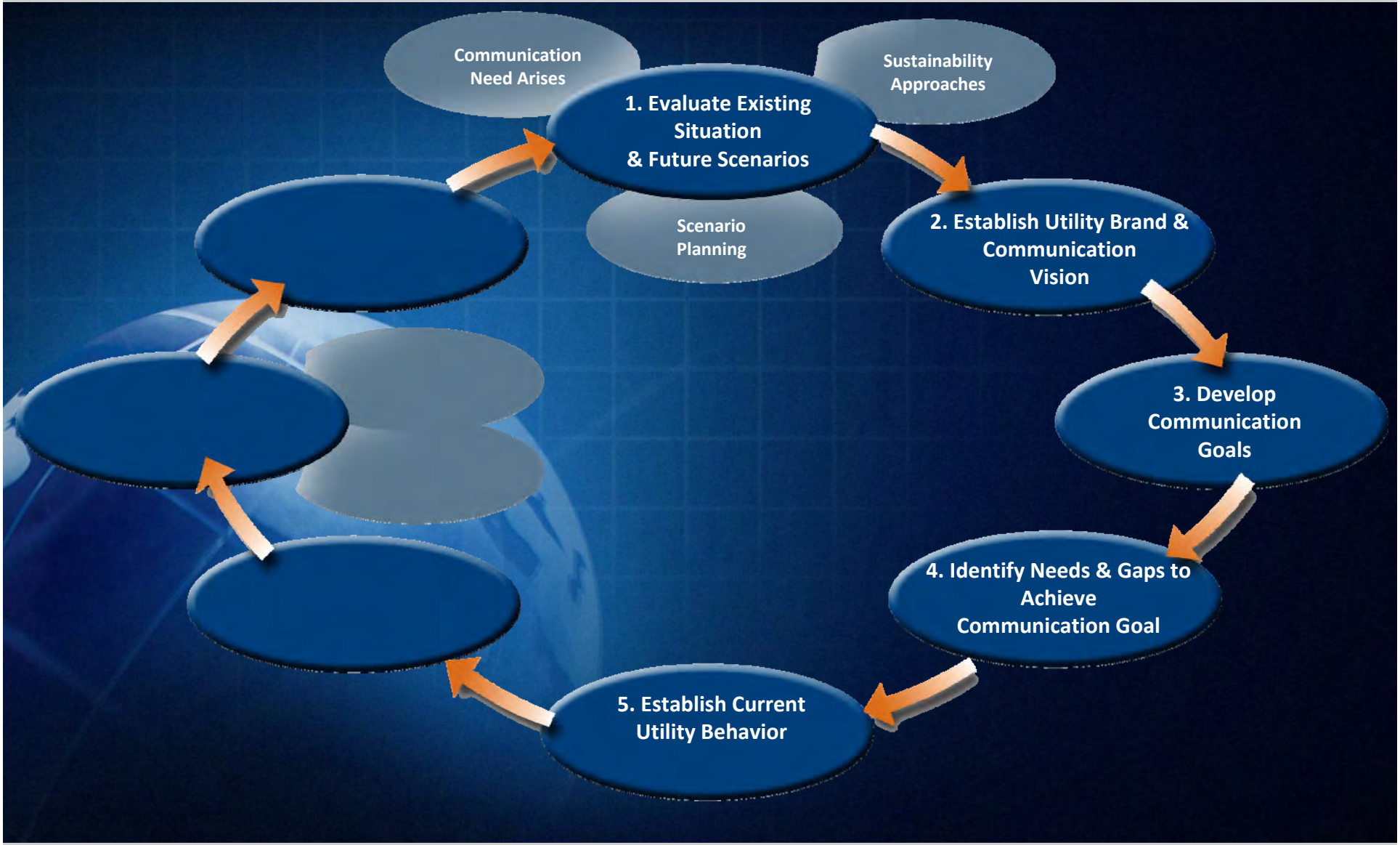
- Define specific 5-10 year goals
- Include utility values & beliefs
  - High quality service, sustainability, public health, & quality of life
  - Earning of trust & respect
  - Recognition of customers as owners
- Example goals:
  - Generate public support for programs/rates
  - Create positive image & enhance visibility
  - Plan for crisis management
  - Generate positive media coverage

Communication Planning Model



4. ID Needs & Gaps to Achieve Communications Goals

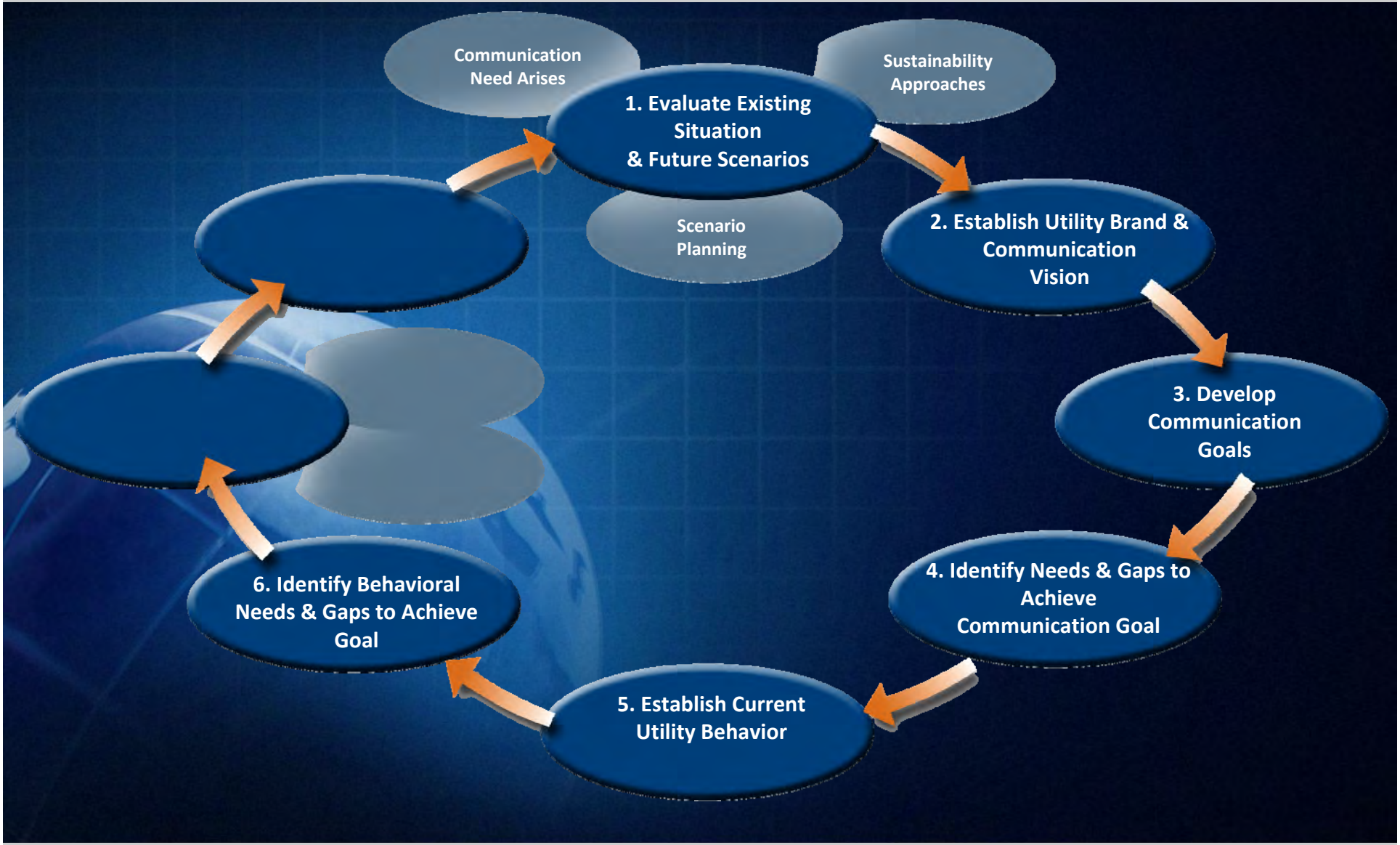
- Difference between current situation & goals
- Use interviews, surveys, focus groups, study teams, workshops, review of media history
- Gaps relate to communications audiences
  - Preferred communication methods vary (radio, TV, newspapers)


Communication Need Arises
Sustainability Approaches
1. Evaluate Existing Situation & Future Scenarios
Scenario Planning
2. Establish Utility Brand & Communication Vision
3. Develop Communication Goals
4. Identify Needs & Gaps to Achieve Communication Goal
5. Establish Current Utility Behavior

5. Establish Utility Behavior

- Assessment of current utility & staff behaviors
- Based on perceptions
- Every interaction leaves an impression
- Value of communications only as good as the trust the recipient has in the utility
- Trust & respect earned over time

Water officials run up a tab: Travel expenses cost districts over $1 million
By Jennifer McLain, Staff Writer
Article Launched: 02/24/2008 10:50:23 PM PST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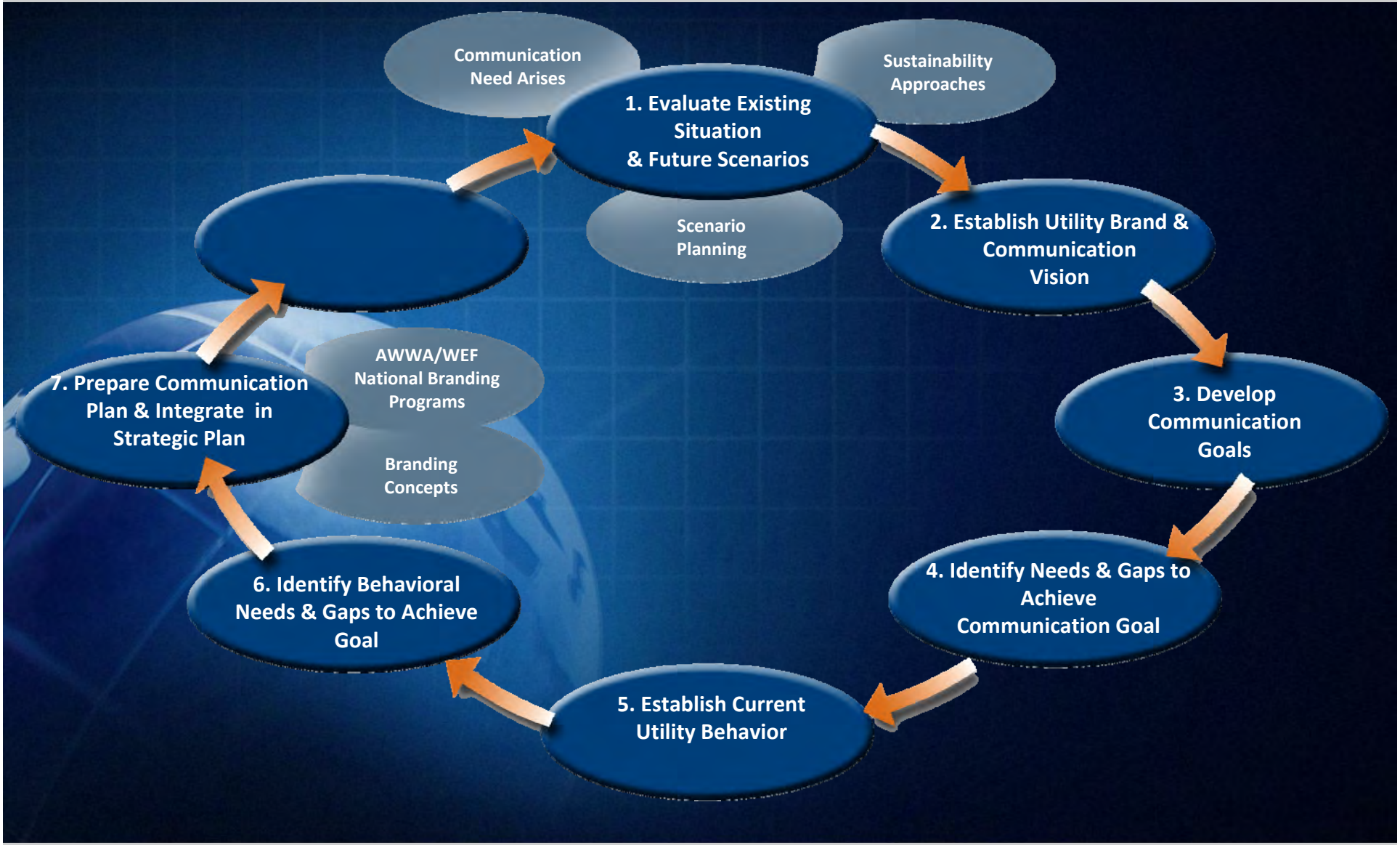
4. Identify Needs & Gaps to Achieve Communication Goal
5. Establish Current Utility Behavior
6. Identify Behavioral Needs & Gaps to Achieve Goal

6. ID Needs & Gaps to Achieve Behavioral Goals

- Gut check
- Difference between existing situation (Step 5) & vision (Step 2) & goals (Step 3)
- Use Interviews, surveys, focus groups, study teams, workshops, to ID gaps
- Gaps relate to communications audiences
  - Preferred communication methods vary (radio, TV, newspapers)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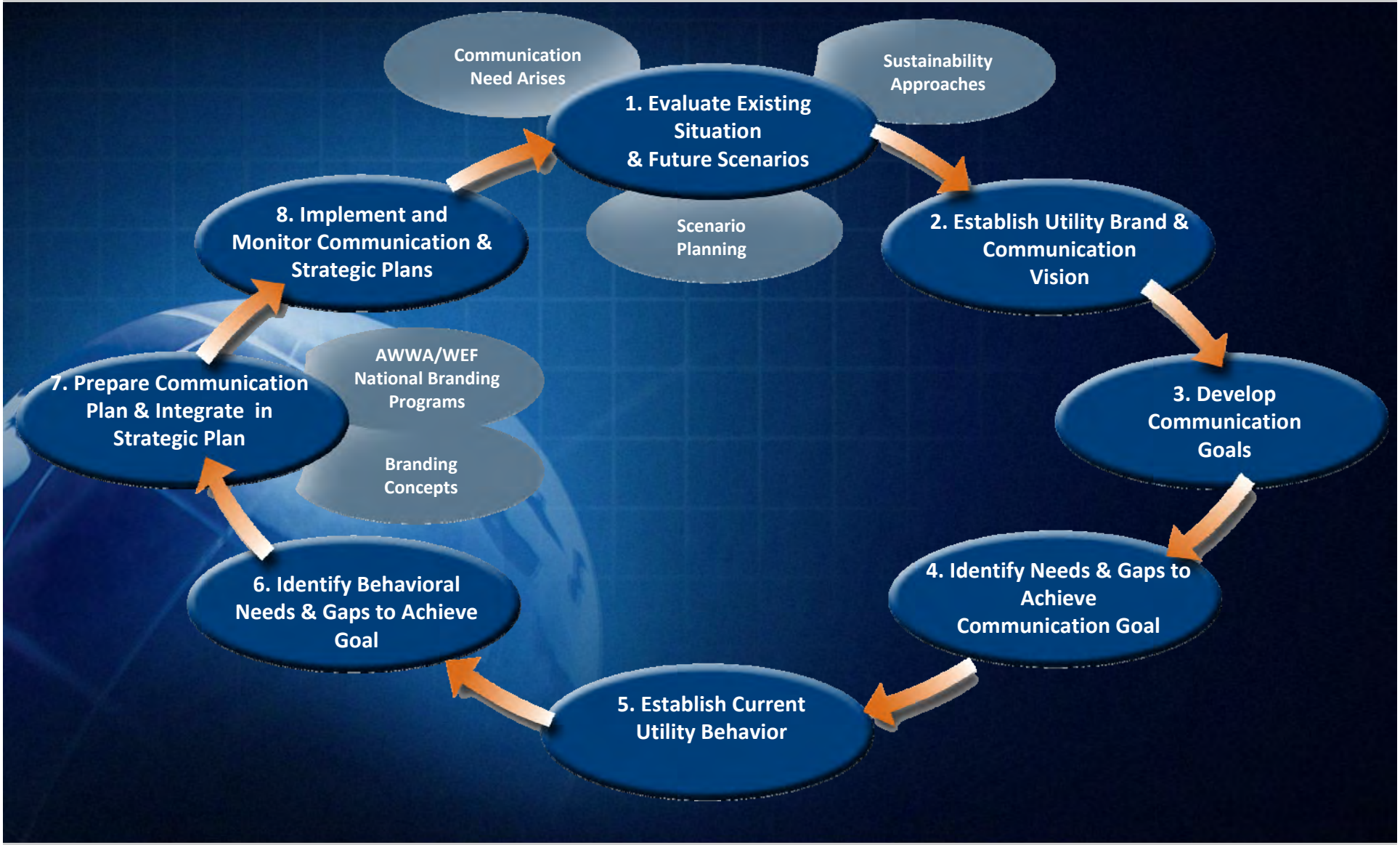
5. Establish Current Utility Behavior
6. Identify Behavioral Needs & Gaps to Achieve Goal
7. Prepare Communication Plan & Integrate in Strategic Plan
AWWA/WEF National Branding Programs
Branding Concepts

7. Prepare Communications Plan & Integrate in Strategic Plan

- Limited number of well-defined strategies
- May be short-term, mid-term, & long-term
- Targeted and focused multi-media
- Recognizes & includes elements from AWWA & WEF branding campaigns
- Actions to increase + media coverage
- Uses examples from toolkit as starting point


Communication Need Arises
1. Evaluate Existing Situation & Future Scenarios
Sustainability Approaches
Scenario Planning
2. Establish Utility Brand & Communication Vision
3. Develop Communication Goals
4. Identify Needs & Gaps to Achieve Communication Goal
5. Establish Current Utility Behavior
6. Identify Behavioral Needs & Gaps to Achieve Goal
7. Prepare Communication Plan & Integrate in Strategic Plan
AWWA/WEF National Branding Programs
Branding Concepts
8. Implement and Monitor Communication & Strategic Plans

8. Implement & Monitor Plan

- Method for executing the plan
  - Specific timelines &responsibilities
  - Metrics
  - Time frames for periodic review
  - Budget resources
  - Assigns responsibility

How to Communicate the Value of Water?

- Equate ALL your actions with value through your communications plan
- Know & address stakeholders needs
- Define your brand
- Live the brand
- The stronger the brand, the easier it is to survive the bumps

Communications Guidance Manual – final report of AwwaRF project

Guidance Manual includes

- Background research
- The model
- Case studies
- *Toolkit* (on CD) with example communications material

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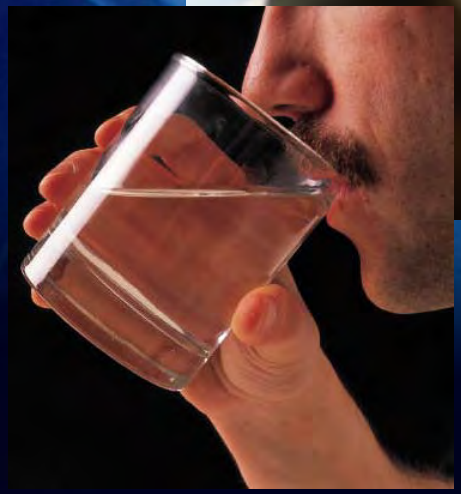
Communicating the Value of Water



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Meeting Media Challenges

Case Studies

Moderator
Frank Allen
Institutes for Journalism and Natural Resources
Missoula, MT

John Soulliere

Coachella Valley Economic Partnership
Palm Desert, CA

- President and CEO of the Coachella Valley Economic Partnership
- Previously Deputy City Manager and Interim City Manager for City of Desert Hot Springs
- Worked for Mission Springs Water District for 10 years

Christine Spitzley

Tri-County Regional Planning Commission
Lansing, MI

- Environmental Programs Planner for Tri-County Regional Planning Commission
- Creates effective, economical programs to protect the environment
- Member of Michigan Section AWWA
- Groundwater Guardian Team Leader

Tell us briefly about the strategy for your most successful media campaign: What made this campaign successful?

What is the most difficult challenge you have faced in working with news media?

How have you dealt with this challenge?

Questions?

Greener Communities

Significance of Individual Efforts

Moderator
Jay Beaumont
Eustance & Horowitz, P.C.
Walden, NY

Lee Drummond

City of Dayton, OH

- Environmental Compliance Coordinator with Dayton's Source Water Protection Program
- Ohio Water Supply Class III and Wastewater Treatment Class III certified
- Groundwater Guardian Team Leader

Tracy Hemmeter

Santa Clara Valley Water District, San Jose, CA

- Prepared District's First Groundwater Management Plan
- Leads District's Integrated Water Resources Plan Update
- Groundwater Guardian Team Leader

Catherine Chertudi

City of Boise, ID Public Works Dept.

- Environmental Programs Manager
- Supervises work group dealing with a broad range of environmental issues including garbage and recycling, groundwater protection, and hazardous materials management
- Groundwater Guardian Team Leader

Marge Cook

Desert Hot Springs, CA Groundwater Guardians

- Executive Director for all three Desert Hot Springs Groundwater Guardian Teams
- Recruited first high school Groundwater Guardian Campus
- Recruited seven Groundwater Guardian Green Sites in Desert Hot Springs

Briefly describe the community “green” efforts in which you are involved.

Going Green for Groundwater in Dayton, Ohio

"Take Back the Tap" Campaign Encourages the use of City of Dayton tap water in preference to bottled water. Over 5,000 refillable bottles have been given free to the public at numerous "green" events.

Live Green Fest – 8/24/2008

"COOL" RECYCLING

Recycle paper (including periodicals and junk mail), cardboard, glass, plastic, and metal.

The Policy states City offices will recycle at least 25% of waste.

Recycling is available in all City of Dayton offices…..

Use it!!

In your opinion, why is it important to get citizens involved?

What measures or techniques have you used to get people to change behaviors and how successful have they been?

Questions?