WATER SUPPLY PLANNING & RECLAIMED WATER

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PNWS-AWWA
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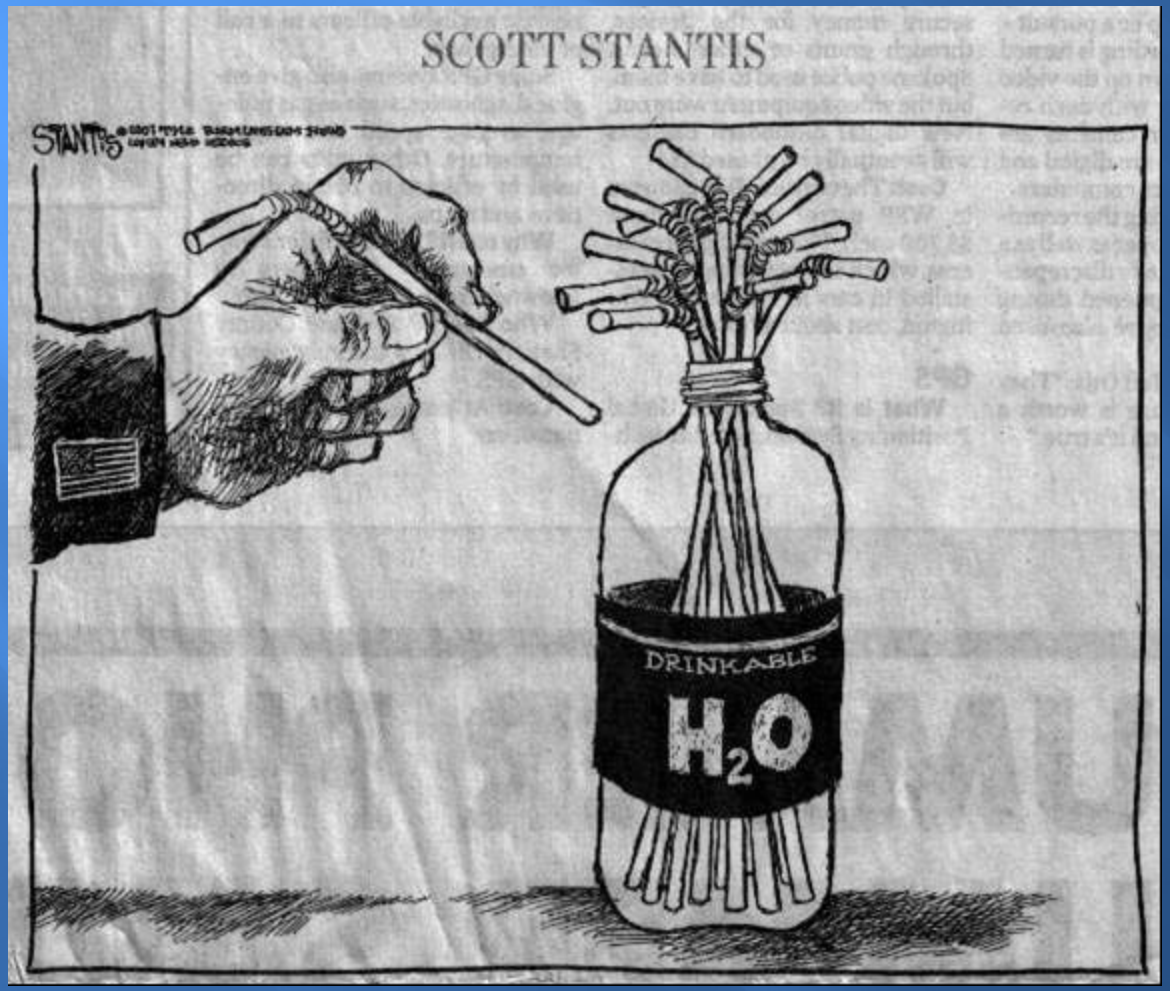
Washington State Dept of Health

WATER SUPPLIER'S BIGGEST CHALLENGE



NOT ENOUGH WATER

Solutions?

- New treatment plants
- More wells
- Buy water rights
- Leaky pipe replacement
- Conservation programs
- Watering restrictions
- Low flow fixtures & appliances
- Inclining block water rates
- Reclamation & Reuse

WATER SUPPLY PLANNING

Climate change to exacerbate West's water woes, report finds

By Matthew Daly
Associated Press

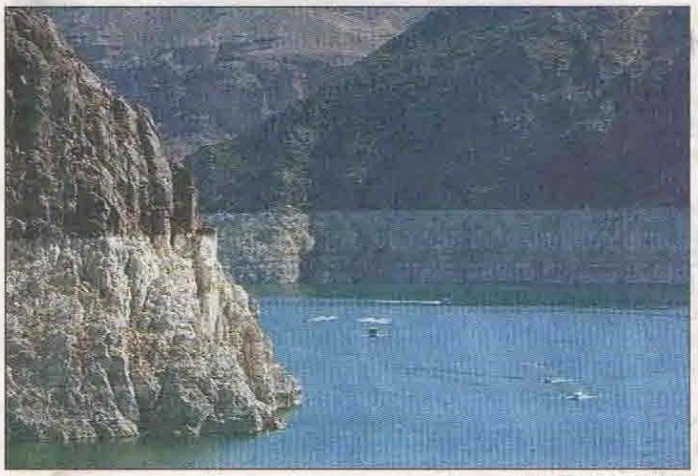
WASHINGTON – Climate change is likely to diminish already scarce water supplies in the Western United States, exacerbating problems for millions of water users in the West, according to a new government report.

A report released Monday by the Interior Department said annual flows in three prominent river basins – the Colorado, Rio Grande and San Joaquin – could decline by as much 8 to 14 percent over the next four decades. The three rivers provide water to eight states, from Wyoming to Texas and California, as well as to parts of Mexico.

The declining water supply comes as the West and Southwest, already among the fastest-growing parts of the country, continue to gain population.

Interior Secretary Ken Salazar called water the region's "lifeblood" and said

See **WATER, A10**



FILE Associated Press

This July 2009 picture shows markings on the shoreline of Lake Mead indicating the water level has dropped considerably. The Colorado River, which forms Lake Mead behind the Hoover Dam, is among the rivers studied to determine the impact of climate change on water supplies in the Western U.S.

Water supply planning process

Quality

Type

Water uses

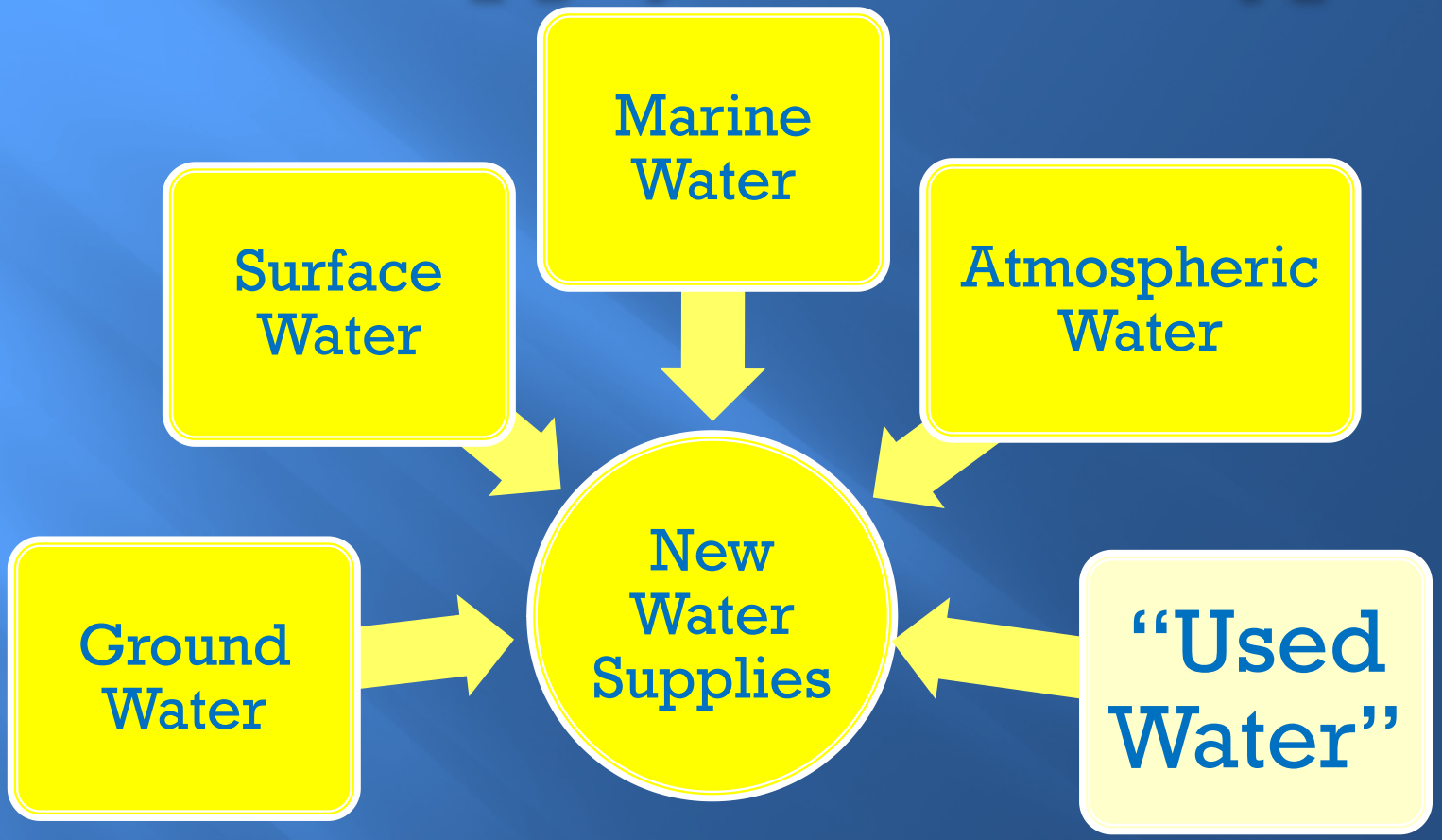
Availability

Quantity

New Supply

Economics

Water supply – Source Type



Availability / access

Planning Focus – Four Basic Questions

- Source – Reclaimed or recycled water

- 4 main questions
  - How much is needed?
  - How much is available?
  - How much does it cost?
  - Is it available?

The planning process

- Planning period
  - Short term – 5 / 6 yrs
  - **Long term -20 + yrs**
    - **Minimum time necessary to develop supply**
- Potable – non-potable demands
  - Storage capacity
  - Distribution sizing
  - Replacement pipe capacity
- Major users
  - Target market
- Non-potable uses
  - Irrigation
  - Industrial
  - Municipal
  - Commercial
- Local common use types
  - Trade raw supply quantities – compatible uses
- Water rights assessment
  - Limits on legal access to supplies

Water supply needs

- Quantity
  - Long term
  - Short term
  - instantaneous
- Legal access - water rights
  - Inchoate rights
  - Claims
  - Acquisition
    - Purchase / Lease / Trade
  - REUSE!

Water supply availability

- Resource capability
  - Drought
  - Precipitation patters
  - Storage – ground & surface
- Legal access
  - Inchoate rights
  - Claims
  - Acquisition
    - Purchase /Lease Trade
  - REUSE!

Planning to reuse

- Market analysis – first step
- Quality
  - Driven by uses and market
- Uses
  - Market driven
  - Replace – substitute for potable supply in non-potable uses
  - Replenish
    - Aquifer recharge
    - Surface source augmentation
  - Direct use
    - California / Texas / New Mexico

An Example

		Water System Planning Data			
	Population Data:		2030 Population Growth Estimates		
Year		2007	Low	Medium	High
Population:		54,000	92,010	110,192	133,168
Net Growth:			38,010	56,192	79,168
Average daily percapita water demand (gpcd):					205
Wastewater Contribution (gdcd):					75
Total exisiting water rights - Qa, MGD:					10.24
Total exisiting water rights - Qa, Acre-ft/yr:					11,469
Future demands - low population estimate					
				MGD	Acre-ft/yr:
Average annual water demands -2030 :				18.86	21,129
Water Rights *Deficits* -2030:				8.62	9,660
Reclaimed Water Available Supply 2030:				6.90	7,730
Net Additional Water Rights Required:				1.72	1,930

Water Right Purchase vs. Water Reclamation Development

Water Right Purchase Price $/Ac-ft	Cost to Purchase Additional Water Rights	Value of Reclaimed Water - Water Right Reduction	Net Cost - Water Rigths Deficit / Reclaimed Water Mitigation
$ 250	$ 2,415,067	$ 1,932,210	$ 482,857
$ 500	$ 4,830,134	$ 3,864,420	$ 965,714
$ 750	$ 7,245,201	$ 5,796,630	$ 1,448,571
$ 1,000	$ 9,660,268	$ 7,728,840	$ 1,931,428
$ 1,310	$ 12,654,952	$ 10,124,780	$ 2,530,171
$ 1,500	$ 14,490,403	$ 11,593,260	$ 2,897,143
$ 2,500	$ 24,150,671	$ 19,322,100	$ 4,828,571
$ 3,000	$ 28,980,805	$ 23,186,520	$ 5,794,285
$ 5,000	$ 48,301,342	$ 38,644,200	$ 9,657,142
$ 10,000	$ 96,602,684	$ 77,288,400	$ 19,314,284

Reclaimed Water – Water Rights

- Question: What's the most important factor in a reclamation project?
- Answer: Access to the water

- Question: Who has legal access?
- Answer: "it depends"

Legal access

- Laws unique to each state
  - Commonality – few major limitations covered by law
- Common limitations
  - Impairment / injury
  - Instream flow needs
  - Service area / use areas
- Resource "ownership"
  - Legal control over wastewater – e.g. who owns the contents of the sewer?
  - Control after the plant
  - Control instream?

WATER RIGHTS

State requirements

Challenges

California

- Treatment plant owner has the exclusive right to treated waste water against water supplier of sewage
- Regional system priority access to flow in sewer
- Regional water quality control board - approve changes to "any change in the point of discharge"
- Board approval doesn't apply if no flow decrease
- License only to producer/owner - water discharged for 'stated intention of maintaining or enhancing fishery, wildlife, recreational or instream uses';
- Holders of existing / original water right not allowed to use water

Washington

- Owner of treatment plant granted exclusive right to distribute & use reclaimed water
- Use of reclaimed water exempted from water rights application requirements – no application – no 'water' right
- *Facility* cannot impair 'existing downstream water right without agreed upon mitigation or compensation
  - Impairment not defined
  - Existing not defined
  - Downstream not defined [distance, ground water]

Oregon

- Treated effluent reused without acquiring water right
- Process requires registration form
- Provides for process to reduce claims in injury made by other water rights holders; water right *may* be affected if:
  - Municipal discharge > 5 years
  - Discharge > 50% of average stream flow
  - Discharge would cease due to use
- Use by water right holder for same use and same location / service area as original right
- New water right if does not comply with above 2 requirements

Idaho

- Follows 'expanded common-law right to reuse without case law or legislation
- Court decisions – surface waste & seepage may be appropriated subject to right of owner to cease waste
- Allows [in good faith] change place / manner of waste or recapture provided water applied to beneficial use
- Right to reuse limited to original use & sight as initial withdrawal
- Recapture must be prior to re-entering public water
- Idaho municipal H2O rights – considered fully consumptive
  - **Allows reuse w/o enlarging original right or impairing downstream rights**
- Prohibits sale/ reuse on other property w/o new right

Due diligence

- Understand underlying water rights for initial withdrawal
- Understand minimum instream flow requirements
- Determine downstream water rights potentially dependent on wastewater return
- Define process to determine impairment or injury to dependent users
- Assure limits of access to sewage or reclaimed water [from sewer or after treatment, prior to discharge, after environmental discharge]

Impairment / injury

- State rules / accepted guidance on determination?
- Measurable?
- Economic limits?
- Effluent dominated vs. effluent dependent stream
  - What is the difference, how is it determined & does it matter?
- How is dependence on return waste demonstrated?
  - Accepted / supported by state law/ statute?

Minimum instream flow what to know

- How are instream flows determined?
  - Multiple methods – which I use in your state?
- Effected species
  - What are they and do the different seasonal hydrologic needs?
- Effluent dominated vs. effluent dependent stream
  - What is the difference?
  - How do you tell?
- Effects due to removal of return flow
  - Actual vs. theoretical?
  - Measurable?

Summary

- Water supply management – critical
- Reclaimed water – hidden asset
- Reclaimed water planning – market driven
- Planning & development –complex
- Availability & legal access – key
- Water rights – expensive to purchase
- Reclaimed water – valuable supply *if available*
- Access to reclaimed water – complex, unique
- Projects planning <u>requires</u> due diligence re: water rights issues – even if reclaimed water exempted

Questions

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