Water Use in the United States: Is Our Precious Resource Being Over-tapped? •FURMAN

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Abstract

In the United States today, scarce water supplies are strained by burgeoning populations, industries, and agriculture. Several graphs were compiled in an effort to compare US precipitation patterns with population and water usage numbers by sector.

Materials and Methods

ESRI's ArcGIS versions 3.2 and 8.3 software were used to estimate and analyze water usage in the United States over the past 30 years. Data used was obtained from the United States Geological Survey website and Exploring Water Resources: GIS Investigations for the Earth Sciences, and viewed using Geographic (Decimal Degrees)/ NAD83 Datum and NAD27 Datum.

Results

Population levels in the West continue to grow exponentially (Fig. 1), yet water availability remains limited. Annual precipitation levels are lower in the West than the rest of the United States (Fig. 2), yet the majority of water usage is directed towards the agricultural sector in the West, versus the power sector in the East (Fig. 3). Five states alone, California, Texas, Idaho, Colorado, and Montana used 50% of the US irrigated water. Of irrigated water, half is lost to evaporation and substandard pipes¹.

Discussion

Water, one of the most common resources on earth, makes up 97% of the Earth's surface causing many to believe it is a renewable resource. However, of that 97%, less than three percent is fresh and even less is available for human consumption². Currently, the already limited amount of water available is being over-consumed. before aquifers have the opportunity the recharge and ecosystems to recover¹. Figure 1 indicates that the regions with the highest population increases are in the West, mainly in areas that receive the lowest precipitation annually. In addition, when comparing Figures 2 and 3, it is clear that the driest regions in the state are using well over half of their water on agriculture in an effort to support the growing population. Much of the water used in the western US is irrigated to support crops and livestock, and much of the water is lost to evaporation. To counteract the increases in population, industry, and agriculture measures need to be taken to alleviate the effects of over-consumption. Industries and the power sector should explore more efficient water uses. Agricultural regions should invest in better irrigation methods, such as drip irrigation, that minimizes evaporation. Personal steps should be taken to conserve water as well, no matter which region of the country you inhabit. Regardless, the authors believe at the current rates of water usage and population growth, water availability will become a pressing issue in the near future.

Steps towards water conservation3:



•Limit time in the shower and install reduced-flow shower heads: •Turn off the faucet while brushing your teeth;

•Fix leaky plumbing. This can conserve gallons of water in a day! •Only run dishwasher, washer, and other appliances when full;

•Check sprinklers to make sure they are not leaking, and invest in drip irrigation methods

•Fill a pitcher with drinking water and store it in the refrigerator. For more, visit http://www.wateruseitwisely.com/regions/100tips/se_index.html





Figure 2. Precipitation patterns of the continental United States from 1970-20001 in cm/yr. Driest regions are represented by the lower end of the scale and are found in the western half of the United States. The Southeastern portion of the US receives the greatest amount of precipitation



Figure 3. Man demonstrates water use by state. State colors denote total water usage in millions of gallons per day. Pie charts for each state represent each states total water usage allotted by sector. Data used is from 1995

Works Cited:

¹ Hall-Wallace, Michelle, C. Scott Walker, Larry P. Kendall, and Christian J. Schaller. Exploring Water Resources: GIS Investigations for the Earth Sciences. Thomas Learning Inc.: University of Arizona, 2003.

² Kole, William. "Water Crisis Developing for Billions, Experts Warn". 23 March 2002. Common Dreams News Center

³"100 Water-Saving Tips". <u>Water Use It Wisely</u>, http://www.wateruseitWisely.com/regions/100tips/se_index.html ⁴ Kerski, Joseph J. "Exploring A Century of Population Change Across the United States with GIS". Rocky Mountain Mapping Center. United States Geological Survey. http://rockyweb.cr.usgs.gov/public/outreach/sgu/popchangeusalesson_answers.html