

### **Category: Water Conservation**

### **Indicator: Urban Water Use Efficiency**

#### Methodology

Urban Water Use Efficiency is an indicator of water use efficiency and level of water waste in Texas cities. Two sub-indicators summarize this information. Daily Water Use per Person assesses water use efficiency in cities (Total Gallons Per Capita per Day) or residences within cities (Residential Gallons Per Capita per Day). Water Loss in Public Water Systems assesses the level of water waste in public water supply systems (PWS). These data are mapped for individual cities or PWS's and summarized at river basin and aquifer levels.

We measured Daily Water Use per Person, 2010 by summarizing the Texas Water Development Board's (TWDB) Historical Water Use Estimates data on urban water use efficiency. TWDB maintains data on Gallons Per Capita per Day (GPCD), a unit measuring the per capita daily water use, derived from their water use surveys. We summarized their data on both total GPCD and residential GPCD for cities and public water systems in 2010. Only cities with a population greater than 5,000 were selected for this analysis. Maps of city-level total GPCD and residential GPCD are included in the Explorer web viewer.

We also calculated basin average total GPCD and residential GPCD values, weighted by the population of each city. We multiplied the population by the GPCD value (total and residential separately) for each city, summing the resulting value for each basin and dividing by the total population of all cities in the basin. We then created maps depicting the average total GPCD and average residential GPCD for major river basins. We repeated this procedure for major aquifers to create maps depicting the average total GPCD and average residential GPCD values, weighted by population, for each aquifer. The resulting layers are included in the Explorer web viewer as the basin and aquifer level average total GPCD and average residential GPCD.

We measured Water Loss in Public Water Systems, 2010 by summarizing TWDB's data on water losses for municipalities in Texas. TWDB maintains a database of self-reported data on water use and water losses for all Texas PWSs. From this data for 2010 we calculated the Water Loss Rate for each PWS by dividing the Water Losses by the Total System Input Volume. TCEQ provided a spreadsheet with the coordinates of all PWS intakes. After removing PWS intakes that became inactive prior to 2010, we created a shapefile of these locations and joined the PWS water loss rate data to it. The resulting layer is included in the Explorer web viewer as the PWS-level Water Loss Rate sub-indicator.

We also calculated the average water loss rate for each river basin by totaling the System Input Volume and Water Losses for each basin and then dividing the total Water Losses by the sum of the System Input Volume. This data was joined to the major river basin shapefile to create a map of average water loss rate for each basin. We repeated this procedure for the major aquifers to create a map of the average water loss rate for each major aquifer. The resulting layers are included in the Explorer web viewer as the basin and aquifer level Water Loss Rate sub-indicator.

# Texas Water Explorer

## Methodology

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### Data Sources

Texas Water Development Board. Historical Water Use Estimates, 2010 GPCD Detail Report. Accessed July 1, 2014.

<http://www.twdb.texas.gov/waterplanning/waterusesurvey/estimates/index.asp>

Texas Natural Resources Information System. StratMap City Boundaries shapefile.

<https://www.tnris.org/data-catalog/entry/political-boundaries/>

Texas Water Development Board. 2010 Water Loss Audit data. Provided to TNC January 2014.

Texas Commission on Environmental Quality (Drinking Water Protection Team). Locations of Public Water Systems. Provided to TNC January 2014.

Texas Water Development Board. Precipitation shapefile.

<http://www.twdb.texas.gov/mapping/gisdata.asp>.

Texas Water Development Board. Major River Basins shapefile and Major Aquifers shapefile modified to eliminate overlap of aquifer polygons.

<http://www.twdb.texas.gov/mapping/gisdata.asp>.