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Prioritizing Additional Water Use Research for Louisiana

USGS Water Use Data and Research Program

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Preface

The United States Geological Survey (USGS) has provided grant funds through its Water Use Data and Research program for additional research at the state level into water use research, reporting, and data collection. Each state has been authorized \$250,000 for such research over the span of several years, although access to this funding on an annual basis is through a competitive grant process. The Water Institute of the Gulf (the Institute) wrote this work plan at the request of the Louisiana Department of Natural Resources - Office of Conservation (LDNR-OC) to facilitate planning for the implementation of this program. The People, Resources, and Technology Program at the Institute authored the work plan. This research program focuses on water resources and their impact on society. For further information, please contact Ryan Clark at rclark@thewaterinstitute.org.



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List of Acronyms

Acronym	Term
ACEPD	Alachua County Environmental Protection Department
DOI	Department of the Interior
DMR	Discharge Monitoring Report
DSS	Domestic Self-Supplied
EIA	Energy Information Administration
GIS	Geographic Information Systems
gal/d	gallons per day
gpc/d	gallons per capita per day
HUC	Hydrologic Unit Code
JFA	Joint Funding Agreement
LDNR	Louisiana Department of Natural Resources
LDNR-OC	Department of Natural Resource – Office of Conservation
LDOTD	Louisiana Department of Transportation and Development
LDWF	Louisiana Department of Wildlife and Fisheries
LMA	Louisiana Municipal Association
LRWA	Louisiana Rural Water Association
LSU	Louisiana State University
NAS	National Academy of Sciences
NWUIP	National Water Use Information Program
Mgal/d	million gallons per day
PLSS	Public Land Survey System
QA/QC	Quality Assurance / Quality Control
SDWIS	Safe Drinking Water Information System
SIC	Standard Industrial Classification
USACE	U.S. Army Corps of Engineers
USDA	United States Department of Agriculture
USDOE	United States Department of Energy
USEPA	U.S. Environmental Protection Agency
ULL	University of Louisiana at Lafayette
USGS	United States Geological Survey
WUDR	Water Use Data and Research



Acknowledgements

LDNR provided funding through a cooperative agreement with the USGS Water Use Data and Research (WUDR) program to improve the availability, quality, compatibility, and delivery of water use data that is collected or estimated by states. Technical assistance was provided by Pierre Sargent of the USGS Lower Mississippi-Gulf Water Science Center. Several other team members of the Institute offered support during the development of this report, including Jeff Heaton. Matthew Reonas of the Louisiana Department of Natural Resources – Office of Conservation (LDNR-OC) provided guidance on the scope of work. This report was reviewed by Denise Reed and Chip Groat, and edited and formatted by Chincie Mouton of the Institute. The following subject matter experts were contacted during the development of this work plan. These individuals provided guidance on suggested approaches and data availability. They also expressed willingness to participate as needed in one or more of the research projects identified in the plan:

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Introduction

Louisiana is seeking to prioritize future studies to promote more accurate evaluations of water use for planning purposes. State water planning has become a topic of serious interest, study, and activity in recent years as population growth, economic development, droughts, floods, and the impacts of coastal land loss have impacted the way Louisiana citizens and officials think about water. LDNR-OC, through its statutory authority for groundwater sustainability, as well as its staffing and coordinating responsibilities for the Louisiana Water Resources Commission, has a strong interest in water resource planning. In conjunction with the Coastal Protection and Restoration Authority (CPRA), LDNR and the Institute recently completed a study project that established a framework for future state water resources assessment. The key to application of this framework is a continuation of efforts to refine the understanding of water use in the state. The USGS plays a vital part in this effort. This work plan serves as a roadmap for additional research that builds on the state wide water resources assessment framework.

The Institute, in consultation with LDNR-OC, has created this work plan that outlines the state's priorities for improvements to water use research, reporting, and data collection. Due to the competitive nature of annual funding from USGS, this work plan lays out a phased approach that parallels the improvement priorities previously identified by USGS. This work plan summarizes the selected approach for Louisiana's participation in the USGS Water Use Data and Research (WUDR) program, by providing detail on the following key elements:

- A description of the current Louisiana water use program, including a summary of current water use research, reporting, and data collection in Louisiana, with comparisons to national and regional reporting regimes and priorities;
- An outline of Louisiana's priorities for improving water use research, reporting, and data collection;
- A list of steps proposed to address priorities, with respect to USGS baseline data goals and standards. This includes justifications, cost estimates, and individual work plans for such improvements utilizing a phased approach, with each work plan capable of serving independently as LDNR-OC's annual application for additional grant funding from USGS, up to a maximum of \$224,000; and
- A description of collaboration with other state, federal, local agencies, and institutions, that was part of the work plan development. Authors of the work plan consulted subject matter experts across Louisiana to better determine the current status of research and data availability in identifying research topics for inclusion and prioritization in the plan. Contact information for those who provided input was included in the acknowledgements section.



Background

Water managers across the United States require more complete, timely, and accurate water availability information to support policy and decision-making, specifically, data associated with water withdrawals and consumptive use that are used to establish local and regional water budgets. State water resource agencies are the primary authorities responsible for regulating and collecting data on water supplies, allocations and rights. The USGS, through its National Water Use Information Program (NWUIP), is the only federal agency that explicitly collects water use data as a part of its mission. The NWUIP works with state, local, and federal partners to consolidate dozens of disparate data sets to create comprehensive reports of water use in the United States every five years. Because of differences in methodology and data quality, USGS water use compilations require significant effort to standardize (to the extent possible) such data among states. The NWUIP products form the basis of the water use component of the National Water Census as called for by the Omnibus Public Land Management Act of 2009 (Public Law 111–11) Title IX—Bureau of Reclamation Authorizations Subtitle F – Secure Water (also called the Secure Water Act).

Recognizing the limitations of current water use data, the SECURE Water Act authorized a program that supports activities related to data collection, methods research, and development at the state level. The USGS WUDR program provides financial assistance, through cooperative agreements with state water resource agencies, to improve the availability, quality, compatibility, and delivery of water use data that is collected and/or estimated by states. The Act requires that these state water use and availability data sets be integrated with appropriate data sets that are developed and/or maintained by the USGS.



Description of the Louisiana Water Use Program

This summary provides an evaluation of Louisiana's current water use research, reporting, and data collection program, noting areas of similarity and divergence with other national or regional reporting regimes. It notes strengths in the program, as well as weaknesses, and evaluates staff and budget allocations, collection procedures and practices, and areas for improvement that will benefit future water planning at the state level to the greatest extent possible, while also potentially informing regional and national reporting regimes.

The State of Louisiana has a robust water use data collection program in place that meets most of the Tier 1 baseline goals identified in the USGS guidelines for the NWUIP program. The program is coordinated through the Baton Rouge office of the USGS Lower Mississippi-Gulf Water Science Center. Water use summaries have been published by the Louisiana Department of Transportation and Development (DOTD) and USGS on a five-year basis since 1960. The most recent report is titled *Water Use in Louisiana, 2010* (Sargent, 2012). In addition, as part of an expanded statewide monitoring effort over a three-year period, USGS collected annual water use data in Louisiana for 2012, 2013, and 2014, which is available in aggregate form on-line at the Louisiana Water Science Center portal. In order to identify how the program could benefit from improved research, a comparison to other state water use programs around the southeast and the nation was conducted, and subject matter experts across the state were consulted.

COMPARISON OF NATIONAL WATER USE PROGRAMS

A National Academy of Sciences (NAS) survey distributed to USGS water use specialists in each state between 1999 and 2002 identified the status of water management in the states, and topics for further research (NAS, 2002). A summary of the general character of the responses to that survey is laid out here. Water use data is collected either to support an existing water registration or permitting process or to support water resources planning and management. States that do not have the legal authority to permit water use may collect water use data for water management purposes. The USEPA regulates public water supply through state agencies and provides more consistent procedures than provided to other water use categories. Typically, water use data are collected, stored, and updated annually. Water use programs that are considered “complete” by USGS collect site-specific water use data on a monthly basis, aggregate it into a database and update it annually. States that collect water use data often maintain a database of the results or rely on USGS to maintain their water use database. The majority of these databases are updated annually and the remainder are updated on a time frame relative to permitting renewals. Few states track the latitude and longitude of surface water intakes and groundwater wells. Spatial location of water use points is generalized using the Public Land Survey System (PLSS) for a majority of states.

A number of states have data collection requirements that vary across the state based on regional differences or management areas. In Florida, the five water management districts have different reporting requirements triggered by well diameter greater than six inches or users having the capacity to use greater than one Mgal/d. It is, however, more common for states to treat water use uniformly throughout the state. In most states, the laws governing water use are similar for groundwater and surface water. Western states are more likely to make a distinction between water use data collection programs for groundwater and surface water. Water use data for surface water features are collected to a greater extent than groundwater



data. Many states collect water use data, but do not check for consistency or verify through independent sources. In states where checks are done, the most common method is a site-specific comparison of current and previous annual water use. A few states compare permitted water use amounts to reported water use. The most common method for tracking changes to water use data is to look at year-to-year differences (NAS, 2002).

States that do not issue permits for water use, but still require users to report their water use totals monthly or annually have water use register systems, according to NAS 2002. Conversely, states that require permission to withdraw groundwater or surface water have water use permit systems. Permits can take one of two forms: (a) the site is permitted, but no annual withdrawal cap is enforced, or (b) the site and the monthly or annual withdrawal are specified in the permit. These minor distinctions are significant. A state that permits site locations and withdrawal amounts has the benefit of an increased data stream for quantifying water use. In Louisiana, the state has the right to register water well construction and evaluate groundwater withdrawals and enforce withdrawal limits in some cases, but as a “right to capture” state, does not have the right to deny use except in the most extreme cases of declaration of a groundwater emergency (one to date, declared in southern Caddo Parish [Northwest Louisiana] in 2011 and modified in 2014) or groundwater critical area of groundwater concern (none declared to date). Although in essence a permitting process, the term “permit” is not utilized in Louisiana statutory law with reference to groundwater. Following riparian law, the state also does not permit surface water withdrawals but does have a program in place for large volume users especially to enter into a voluntary agreement on the certification and reporting of such withdrawals to satisfy certain state Attorney General rulings. Still, the state collects quarterly data from users of more than 1 million gallons per day (Mgal/d). The data, collected through the USGS, are aggregated annually. Reporting for withdrawals smaller than 1 Mgal/d is voluntary and surveyed on a five-year basis.

STATE WATER USE DATA COLLECTION CATEGORIES

Water use data collection programs exist in various stages of development throughout the United States. The USGS has established a solid base of information through its state and national water use reports issued on a five-year basis. This information is useful for establishing a baseline but has acknowledged deficiencies. The strongest, most precise data collection programs exist in states with legal authority to register or permit water withdrawals. As of 2002, the NAS has categorized and ranked each state based on the status and development of their water use data collection programs. States such as Arkansas, New Jersey, Delaware, Kansas, and Louisiana have extensive data collection programs according to the NAS survey from 2002, and are considered Category 1 states. Category 1 states have authority to register and permit withdrawals throughout the state for all water users when the withdrawal rate exceeds 100,000 gal/d. States in this category collect data on a monthly basis and update database records annually. Category 2 is nearly identical to Category 1, with the exception that data is collected annually as opposed to monthly. Category 3 states have limited water use programs maintained by USGS or the state for some regions or specific use types. An overall view of the classification rankings as of 2002 is presented in Figure 1.



Florida has a water use permitting program managed by five water management districts that collectively cover the state. Rules regarding trigger levels for requiring permits and the degree of reporting of water use data vary from one district to another, with the rules being more stringent in areas deemed to be critical water use areas by state water managers. In general for all districts, permits are required for all users having the capacity to use 1 million gallons per day and for all wells greater than six inches in diameter. Water use data are reported monthly, quarterly, or annually, depending on the water management district, with the exception of agricultural water use, which is collected only in some areas of the state. A database of latitude and longitude of public water supply users has been compiled, but similar location data are not generally available for other water use categories. Some data checking is done by comparison with the past year's water withdrawals.

Georgia has a water use permitting program, requires the collection of data, and maintains separate databases for surface water and groundwater use. Data are compiled annually for all users withdrawing at least 100,000 gallons per day for public, industrial, commercial, and power water use, but not for irrigation, livestock, and domestic use. Laws apply state wide in the same manner for surface and groundwater.

Mississippi has a water use permit program for all users of surface water and groundwater. Permits are not required for groundwater wells less than six inches in diameter. Laws are applicable statewide. Annual water use is reported yearly on a voluntary basis. Public water supply withdrawal points are recorded by latitude and longitude, using global positioning system technology, and also are recorded by township, range, and section. All other permitted withdrawal points are indexed by township, range, and section. Withdrawal data are checked by comparison with the corresponding data for the previous year.

Tennessee does not have the legal authority to permit or register water withdrawals. Public water use data are reported to the state, and USGS maintains a public water supply database. Public water supply data are recorded monthly and are reported annually for all surface water withdrawals and for groundwater withdrawals for systems serving more than 50 people. Latitude and longitude coordinates of the withdrawal points are recorded both for wells and for surface water intakes.

Texas has legal authority to permit surface water use throughout the state, but groundwater use permits are required only in particular groundwater conservation districts. Water use data for municipal and industrial uses have been voluntarily submitted to the state for many years, but beginning in November 2001, water use data collection is mandatory for both surface water and groundwater users. Monthly water withdrawals are requested, but often only annual data are supplied. There has been no specified trigger level for water use data collection since data collection has been voluntary. The state maintains a water use database, which is updated annually. The locations of groundwater wells and surface water intakes are shown on maps. As part of a statewide water availability study, latitude and longitude coordinates of all permitted surface water diversion points are being determined. Changes in water use from year to year are tracked in a quality assurance process, and revisions to the data are made when necessary.



Louisiana has the legal authority to register and collect water use information from groundwater wells (R.S. 38:3097.3 [2003]), authorizes the state Commissioner of Conservation to, among other things, “Collect data with respect to water wells and water resources.” Through this authority, the state collects water use data for both surface and groundwater withdrawals, although no statute exists to cover surface water information specifically. Currently, the USGS collects state water use data per an agreement with, and under the authority of, the Commissioner of Conservation. Prior to the 2003 law, the USGS collected information on a voluntary basis, beginning with publication of the first state water use report in 1960 and following with a new report every five years.

Facilities using more than 1 Mgal/d report withdrawal information quarterly to USGS, under the authority of the Louisiana Commissioner of Conservation; and all other facilities receive a questionnaire every five years. Aggregate information, compiled by watersheds or politically defined units such as county or state, is also collected at five-year intervals. The reporting program is state wide in coverage for both surface and groundwater. Monthly water use data are collected in the Baton Rouge area by the Capital Area Ground Water Conservation Commission. The latitude and longitude location of the measuring points are provided when wells are registered. The state has an ongoing program to collect latitude/longitude information for other facilities. The state and USGS maintain a database that is updated completely every five years. Data from the major facilities (greater than 1 Mgal/d) are updated quarterly. Data are checked by comparison with previous years’ values, with typical use by similar facilities, and with data from other agencies or programs such as the Louisiana Department of Health and Hospitals, National Pollutant Discharge Elimination System permits, Louisiana Department of Agriculture Extension Service, and the USDA National Agricultural Statistics Service (NAS, 2002).

In comparison to other states in the region, Louisiana has a robust water use data collection program. The state has the legal authority to permit and collect some water use data, as well as the authority to specifically document locations of water withdrawal points. Where Louisiana falls short in comparison to other states is quantitative information regarding water withdrawn from ground and surface water sources. Louisiana’s threshold for reporting large water withdrawals is set higher than states with comparative levels of legal authority to register and permit water withdrawals. Reporting for withdrawals under this threshold is voluntary and done by survey on a five-year timeframe.



Collaboration

The Louisiana water use data and research program outlined in this work plan will be carried out with close collaboration between USGS researchers and Louisiana agencies, under the USGS WUDR program. State agencies are integral to data collection, methods development, and data management activities, working with local cooperators and other federal agencies to facilitate project development and data acquisition and management. Where applicable, especially in circumstances where water resources cross state boundaries, Louisiana will coordinate its activities with other states to better leverage efforts to improve water use methods, data, and data sharing. The LDNR-OC will coordinate Louisiana's interstate efforts, and will work with other agencies within the State to collect and standardize water use data. In addition, Louisiana will collaborate and coordinate with USGS personnel, at both the Regional and Water Science Center levels to ensure all program related activities are meeting USGS technical requirements. USGS will manage and develop all the technical requirements and guidance associated with this program. Together, USGS and State collaborators will refine existing water use databases, develop new techniques for estimating water use, and establish data management policies for sharing of water use data that adhere to baseline standards previously developed by the USGS for water use categories nationally (USGS, 2015). Data and information collected as part of this program will be stored electronically in existing USGS databases, but may be disseminated via a variety of means, including State series reports, graduate student theses, USGS series reports, and scientific publications that are jointly authored by USGS and their Louisiana partners.



Research Priorities

Beginning in FY 2016, and in subsequent years, Louisiana will apply through a competitive process to USGS for program funds . Louisiana will monitor USGS Annual Program Announcements, outlining research priorities. The nationwide research priorities identified below reflect the priorities outlined by the USGS National Water Use Information Program.

USGS IDENTIFIED RESEARCH PRIORITIES

- Water use reporting by USGS 8-digit Hydrologic Unit Code (HUC 8) ;
- Water-tracking and Interbasin transfer (between HUC 8 units);
- System uses (internal and other non-revenue uses) and losses from public supply systems;
- Irrigation: sources and volumes (including golf courses);
- Inventory of self-supplied industrial water use;
- Mining: withdrawals with source and commodity identified;
- Improvement of the domestic per capita coefficients;
- Groundwater use: Identifying aquifer and HUC of withdrawal, and further refining the definition of saline/brackish water;
- Estimation of public supply deliveries to customer groups or classes, such as commercial, industrial, and domestic;
- Public supply systems stratified by socioeconomic factors; and
- Improved data collection and delivery.

USGS BASELINE STANDARDS

USGS has identified baseline goals, and additional levels of data, for all major categories of water use (



Table 1), most of which have been estimated by USGS and published every five years since 1985. These guidelines are provided to assist state water resource agencies in determining areas in which to focus proposed work. States that currently meet the baseline standards outlined in Tier 1, for a specific water use category, would focus on Tier 2 and Tier 3. States are not required to meet the baseline goals (Tier 1) in all categories before addressing Tier 2 and Tier 3 data needs. Data collected and studies conducted in Tiers 1, 2, and 3 should be designed to benefit both local and national estimates and provide information for water availability studies by water managers, academia, federal, and or local agencies. The definitions of basic water use terms and categories as used by USGS can be found in USGS Circular 1405.

In addition to the standards listed in the table, baseline goals (Tier 1) for most categories of water use include:

1. Facility or system withdrawals for the following categories: Public Supply, Self-Supplied Industrial, Irrigation-Crop, Thermoelectric, Irrigation-Golf Course, Livestock (major facilities), Mining, and Aquaculture;
2. Withdrawals, deliveries or returns by water source -groundwater, surface water, reclaimed wastewater, wastewater effluent, and/or recycled water. For groundwater sources the aquifer should be identified; and
3. Withdrawals by water type -fresh or saline.



Table 1: USGS Baseline Goals and Additional Levels of Data for All Major Categories of Water Use.

Category	Baseline Goals (Tier 1)	Tier 2	Tier 3
Public Supply	<p>Monthly withdrawals reported by system, water source, and water type.</p> <p>Deliveries to domestic users from public-supply systems, and populations served.</p> <p>Report system information relevant to HUC-8 and county (parish), and groundwater withdrawals with aquifer designation.</p>	<p>Site-specific annual and monthly withdrawals (by intake, well, or well field) reported by water source, and by water type.</p> <p>Quantity of water purchased between systems, and source(s) of purchased water.</p> <p>Quantity of water sold between systems.</p> <p>Reporting and/or verification of water deliveries for domestic, commercial, industrial, thermoelectric and other use.</p>	<p>Interbasin transfers.</p> <p>System uses (internal and other non-revenue uses) and losses.</p> <p>Improve estimates of populations served by site (for example, by surface-water intake, well or well field).</p> <p>Use of reclaimed wastewater for public or landscape irrigation.</p>
Industrial	<p>Annual withdrawals by facility, reported by water source, by water type, and industry classification.</p> <p>Groundwater withdrawals reported with reference to aquifer.</p>	<p>Site-specific (by intake and/or well) annual and monthly withdrawals reported by water source, by water type, and industry classification.</p> <p>Deliveries from public supply to industrial facility, and deliveries from other sources, such as treated wastewater.</p>	<p>Site-specific consumptive use estimates.</p> <p>Site-specific discharges to surface water, or land application.</p>
Irrigation-Crop	<p>Aggregate annual withdrawals reported by water source, by water type, acres irrigated, and method of irrigation.</p> <p>Aggregate areas may be sub-county levels, but are feasible to summarize to county or HUC8.</p>	<p>Site-specific monthly withdrawals by well and/or diversion from surface-water feature, or delivery from reclaimed wastewater.</p> <p>Monthly withdrawals reported by water source, water type, with associated acres irrigated and <i>crop type</i>, and method of irrigation system.</p>	<p>Consumptive use and conveyance loss estimates by aggregate area (sub-county, county, HUC8, or up to HUC12).</p> <p>Site-specific return flows.</p>



Category	Baseline Goals (Tier 1)	Tier 2	Tier 3
Thermoelectric	Site-specific, annual and monthly withdrawals, and net power generation reported by cooling-system type (once-through or recirculating), by water source and by water type, and the source of the information (plant, govt. agency, etc.). Site-specific return flows.	Site-specific annual and monthly consumptive use.	
Self-Supplied Domestic	Self-supplied domestic populations, by HUC8 and county, and by water source.	Studies of actual metered domestic withdrawals, monthly by source. Improve estimates of self-supplied populations by utilizing property data and/or public water supply service areas, or other methods.	
Irrigation – Golf Courses	Site-specific annual and monthly withdrawals reported by water source, by water type, and acres irrigated. Groundwater withdrawals designated by aquifer.	Consumptive use estimates, by course, reported by month or annual. Acres irrigated by system type, by course.	
Livestock	Annual withdrawals for major facilities, reported by water source and by water type.	Site-specific annual and monthly withdrawals for all facilities reported by source of water, and by water type. Site-specific animal counts and animal type.	Improved and verified coefficients for water use per head for animal type, confined or open-range, seasonal variability, and other variables. Water withdrawals from sources supported by USDA programs to protect streams.



Category	Baseline Goals (Tier 1)	Tier 2	Tier 3
Mining	Annual withdrawals reported by HUC-8 and county, by source of water, and by water type.	Site-specific annual and monthly withdrawals. Site-specific commodity identified.	Evaluation/reporting on water use by process (commodity processing, dewatering, dust suppression, etc.). Reporting on return flows/discharge of water from dewatering.
Aquaculture	Annual withdrawals reported by HUC-8 and county, by source of water, and by water type.	Site-specific annual and monthly withdrawals. Site-specific facility information (method, species cultured, etc.)	
Commercial	Annual and monthly deliveries from public supply for commercial use.	Site-specific annual and monthly withdrawals for self-supplied establishments.	
Hydroelectric Power	Site-specific, annual and monthly water use (water use to spin turbines) by water source and water type, and the source of the information (plant, govt. agency, etc.).		
Wastewater Treatment	Annual and monthly deliveries from wastewater treatment plants to other users. Specify category delivered to (i.e. industrial, thermoelectric, irrigation, etc.)		



Prioritizing Research Topics

An analysis of the current water use program in Louisiana reinforces the approach to focus on several topics for potential improvement previously identified by the state in DNR-OC (2015) . These topics include research work in private, domestic water well use; community and public supply systems; analysis of public supply deliveries; and analysis of crop-specific agricultural irrigation. The research topics in this work plan were selected and prioritized based on a detailed evaluation of the current program, consultation with LDNR and USGS staff and other researchers, and identification of the greatest benefits to be accrued from full-funding of identified priority improvements. The prioritized list of Louisiana topics and their applicability to overall USGS baseline goals is presented in



Table 2. The selected priority areas include:

1. Detailed study of private (self-supplied) domestic water well use: Louisiana has more than 80,000 registered domestic wells that provide water for daily consumption. Current USGS methods for estimating water withdrawals from private domestic wells utilize population data from the Bureau of Census and a per capita use rate, typically 80 to 100 gallons per person per day. While that method provides a good starting point for estimating withdrawals from these wells, which generally have low-volume yields and limited impact on local aquifers, a more detailed study of water use from a sample/survey of withdrawals from such wells from the different regions of the state would yield a better understanding of actual vs. estimated use. In turn, such information would benefit water planners by providing more accurate coefficients for estimating domestic water use. USGS research priority met: Improvement of the domestic per capita coefficients; improved data collection and delivery;
2. Understanding the accuracy of metering and reporting from community and rural public supply systems: Small community and rural public supply systems provide water to hundreds of thousands of Louisianans. Understanding the accuracy of metering and reporting from these systems could be improved by a sample/survey project to gather additional data on quality assurance/quality control in these smaller systems, including actual transmission volumes and estimated system losses based on metering from the source to the end consumer. Water loss during the transmission process is an identified area of improvement and needs additional attention and study. USGS research priorities met: System uses and losses from public supply systems; improvement of the domestic per capita coefficients; estimation of public supply deliveries to customer groups or classes, such as commercial, industrial and domestic; public supply systems stratified by socioeconomic factors; improved data collection and delivery;
3. Analysis of public supply deliveries: There has been very little research into the relative volumes of deliveries from public suppliers to commercial, industrial, and domestic users in larger communities and urban areas in Louisiana or the nation. There is a definite need to better understand the volumes and types of deliveries for both resource planning and economic development purposes. Such study efforts would provide a more detailed understanding of demand and supply based on demographic and socioeconomic factors. USGS research priorities met: System uses and losses from public supply systems; estimation of public supply deliveries to customer groups or classes, such as commercial, industrial and domestic; public supply systems stratified by socioeconomic factors; and
4. Analysis of crop-specific agricultural irrigation: Louisiana is a major producer of livestock and agricultural products including cotton, rice, sugarcane, corn, soybeans, and fruits. These agricultural activities rely upon a seasonably high volume of water from both surface and groundwater sources. While the USDA through its various offices, including the National Agricultural Statistics Service and Natural Resources Conservation Service, has long understood the value of water use reporting, a sample/survey of crop specific water use would be another



critical piece of information for state water planners and would help refine water use analyses.
USGS research priorities met: Irrigation sources and volumes; groundwater use.



Table 2: Louisiana Subset of USGS Priorities for Further Investigation.

Category	Baseline Goals (Tier 1)	Tier 2	Tier 3
Public Supply: Analysis of public supply deliveries	Monthly withdrawals reported by system, water source, and water type. Deliveries to domestic users from public-supply systems, and populations served. Report system information relevant to HUC-8 and county, and groundwater withdrawals with aquifer designation.	Improves upon: Reporting and/or verification of water deliveries for domestic, commercial, industrial, thermoelectric and other use.	Interbasin transfers. System uses (internal and other non-revenue uses) and losses. Improve estimates of populations served by site (for example, by surface-water intake, well or well field). Use of reclaimed wastewater for public or landscape irrigation.
Public Supply: Understanding the accuracy of metering and reporting from community and rural public supply systems	Monthly withdrawals reported by system, water source, and water type. Deliveries to domestic users from public-supply systems, and populations served. Report system information relevant to HUC-8 and county, and groundwater withdrawals with aquifer designation.	Improves upon: Reporting and/or verification of water deliveries for domestic, commercial, industrial, thermoelectric and other use.	Interbasin transfers. System uses (internal and other non-revenue uses) and losses. Improve estimates of populations served by site (for example, by surface-water intake, well or well field). Use of reclaimed wastewater for public or landscape irrigation.
Irrigation- Crop: Analysis of crop-specific agricultural irrigation	Aggregate annual withdrawals reported by water source, by water type, acres irrigated, and method of irrigation. Aggregate areas may be sub-county levels, but are feasible to summarize to county or HUC8.	Site-specific monthly withdrawals by well and/or diversion from surface-water feature, or delivery from reclaimed wastewater. Monthly withdrawals reported by water source, water type, with associated acres irrigated and <i>crop type</i> , and method of irrigation system.	Consumptive use and conveyance loss estimates by aggregate area (sub-county, county, HUC8, or up to HUC12). Site-specific return flows.



Category	Baseline Goals (Tier 1)	Tier 2	Tier 3
Self-Supplied Domestic: Detailed study of private (self-supplied) domestic water well use – well metering analysis	Self-supplied domestic populations, by HUC8 and county, and by water source.	Studies of actual metered domestic withdrawals, monthly by source. Improve estimates of self-supplied populations by utilizing property data and/or public water supply service areas, or other methods.	



The overall goal of the work plan is to evaluate the above-listed priorities against the current Tier 1 and Tier 2 baseline goals and develop a refined list of priorities and associated projects that can be completed in the future. These projects will not only add to the understanding of Louisiana's water use necessary for planning purposes, but will also have regional or national applicability. The work plan identifies the goals, costs, and strategies for implementation of the final list of projects, as laid out below. The four priority research topics were examined for their relative importance in terms of their impact on groundwater use (Figure 2), surface water use (Figure 3), and total water use (Figure 4), as well as the relative level of uncertainty associated with each priority research topic.

In terms of relative impact of each priority topic on statewide water supplies, rice irrigation had the largest impact on groundwater. While rice irrigation utilized approximately 8% of the total water withdrawn in 2010 (Table 3) it used approximately 31% of the groundwater withdrawn in the years 2009-2010 (Sargent, 2012). Because public supply accounts for 24% of statewide groundwater demand, studies of public supply deliveries and metering and reporting could improve the estimate of this usage term. Rural domestic supply, although important at the local level, accounts for an estimated 3% of statewide groundwater demand, and less than 1% of total demand. Refinement of the estimate of rural domestic use would be useful to water managers at the local and aquifer scale.

Table 3: Summary of major water use types in Louisiana. Adapted from Sargent, 2012.

	Ground-Water (Mgal/d)	Surface Water (Mgal/d)	Total (Mgal/d)	Percent of Total State Ground-Water Use	Percent of Total State Surface Water Use	Percent of Total State Water Use
Public Supply	378.26	368.12	746.38	24%	5%	9%
Industry	244.09	1,831.44	2,075.53	16%	26%	24%
Power Generation	41.02	4,387.94	4,428.96	3%	63%	52%
Rural Domestic	41.01	0.00	41.01	3%	0%	0%
Livestock	4.17	3.86	8.03	0%	0%	0%
Rice Irrigation	486.84	201.08	687.96	31%	3%	8%
General Irrigation	182.81	57.00	239.81	12%	1%	3%
Aquaculture	190.72	112.00	302.72	12%	2%	4%
Total	1,568.35	6,961.44	8,529.79			

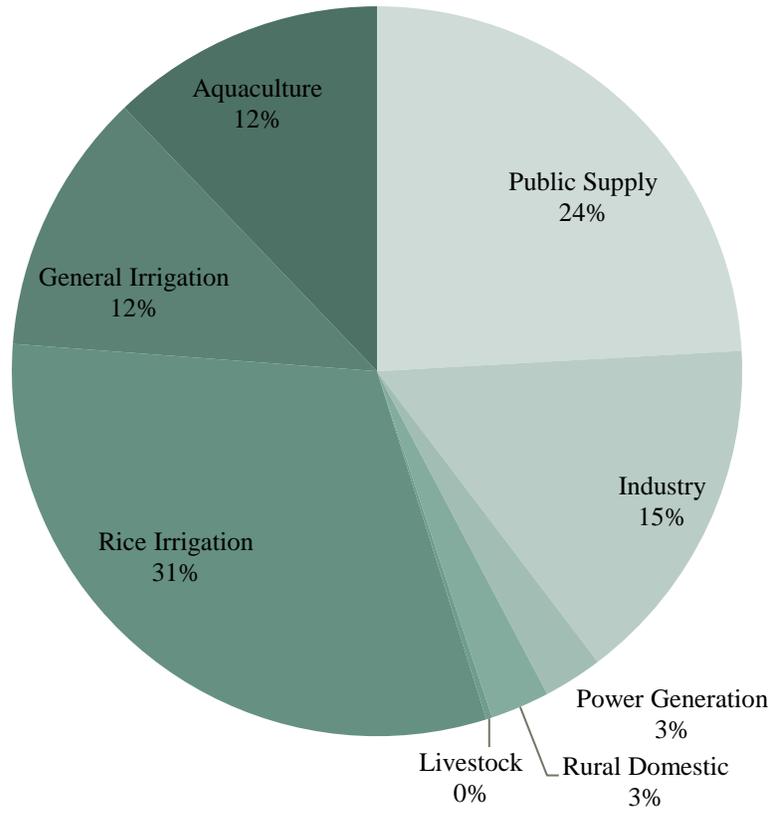


Figure 2: Groundwater Withdrawals in Louisiana by Water Use Category, 2010 (Sargent, 2012).

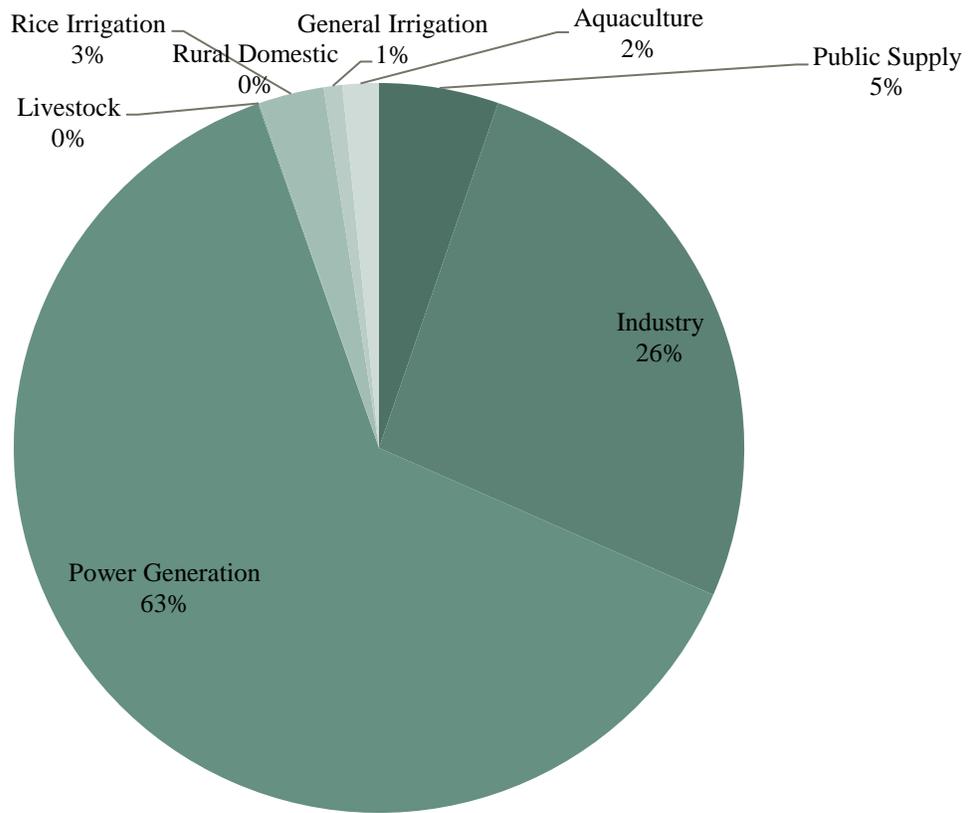


Figure 3: Surface Water Withdrawals in Louisiana by Water Use Category, 2010 (Sargent, 2012).

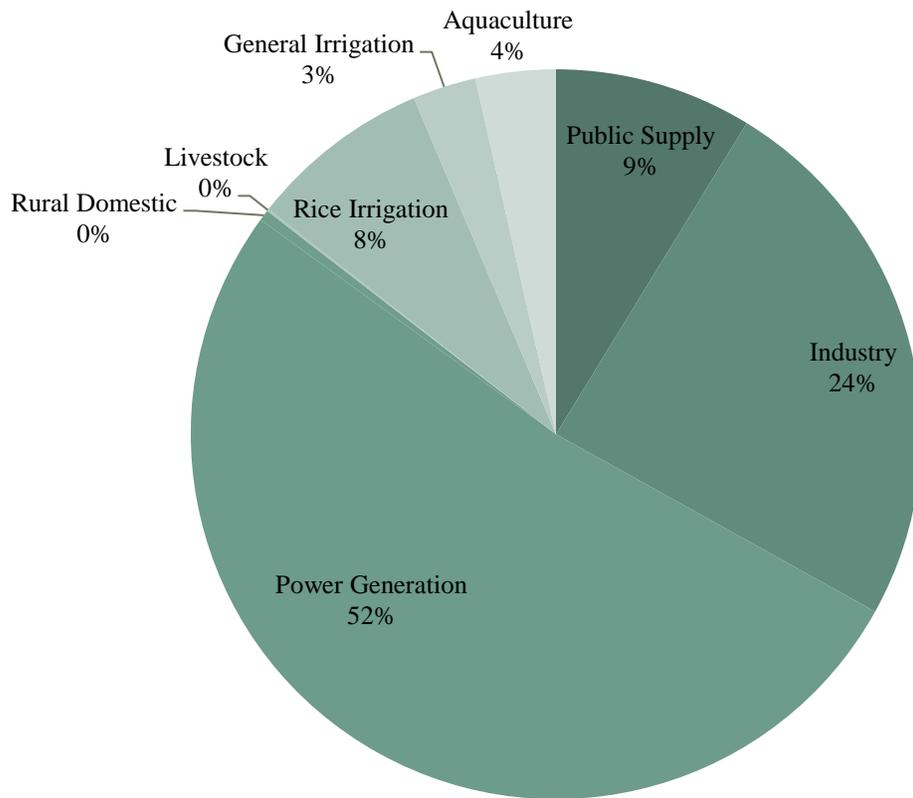


Figure 4: Total Water Withdrawals in Louisiana by Water Use Category, 2010 (Sargent, 2012).



Prioritized Research Topics

After consideration of the relative magnitudes of water uses in Louisiana, and the impacts the four research topics could have on reducing uncertainty of the estimates of those water uses, the proposed research topics were prioritized as shown in



Table 4. Because of the impact on groundwater resources, the Analysis of Crop-Specific Agricultural Irrigation was prioritized highest. Refinement of these estimates can elevate Louisiana's attainment of USGS Tier 2 goals by quantifying monthly withdrawals reported by water source, water type (with associated acres irrigated and crop type), and method of irrigation system. Understanding the accuracy of metering and reporting from community and rural public supply systems was determined to be the second priority research topic. This study will aid Louisiana's attainment of USGS Tier 3 goals by refining estimates of system uses (internal and other non-revenue uses) and losses. Refined estimates from that research will work with the third priority research study, the analysis of public supply deliveries. This research will elevate Louisiana's attainment of USGS Tier 2 goals by reporting and/or verification of water deliveries for domestic, commercial, industrial, thermoelectric and other use. A detailed study of private (self-supplied) domestic water well use, by well metering analysis, was determined to be the fourth priority. Refined estimates of this type of use will help Louisiana achieve USGS Tier 2 goals by studying actual metered domestic withdrawals, monthly by source.



Table 4: Prioritized Research Topics with Baseline Goals.

Priority	Category	Baseline Goals (Tier 1)	Tier 2	Tier 3
1	Irrigation- Crop: Analysis of crop-specific agricultural irrigation	Aggregate annual withdrawals reported by water source, by water type, acres irrigated, and method of irrigation. Aggregate areas may be sub-county levels, but are feasible to summarize to county or HUC8.	Site-specific monthly withdrawals by well and/or diversion from surface-water feature, or delivery from reclaimed wastewater. Monthly withdrawals reported by water source, water type, with associated acres irrigated and crop type, and method of irrigation system.	Consumptive use and conveyance loss estimates by aggregate area (sub-county, county, HUC8, or up to HUC12). Site-specific return flows.
2	Public Supply: Understanding the accuracy of metering and reporting from community and rural public supply systems	Monthly withdrawals reported by system, water source, and water type. Deliveries to domestic users from public-supply systems, and populations served. Report system information relevant to HUC-8 and county, and groundwater withdrawals with aquifer designation.	Improves upon: Reporting and/or verification of water deliveries for domestic, commercial, industrial, thermoelectric and other use.	Interbasin transfers. System uses (internal and other non-revenue uses) and losses. Improve estimates of populations served by site (for example, by surface-water intake, well or well field). Use of reclaimed wastewater for public or landscape irrigation.



Priority	Category	Baseline Goals (Tier 1)	Tier 2	Tier 3
3	Public Supply: Analysis of public supply deliveries	<p>Monthly withdrawals reported by system, water source, and water type.</p> <p>Deliveries to domestic users from public-supply systems, and populations served.</p> <p>Report system information relevant to HUC-8 and county, and groundwater withdrawals with aquifer designation.</p>	<p>Improves upon:</p> <p>Reporting and/or verification of water deliveries for domestic, commercial, industrial, thermoelectric and other use.</p>	<p>Interbasin transfers.</p> <p>System uses (internal and other non-revenue uses) and losses.</p> <p>Improve estimates of populations served by site (for example, by surface-water intake, well or well field).</p> <p>Use of reclaimed wastewater for public or landscape irrigation.</p>
4	Self-Supplied Domestic: Detailed study of private (self-supplied) domestic water well use – well metering analysis	<p>Self-supplied domestic populations, by HUC8 and county, and by water source.</p>	<p>Studies of actual metered domestic withdrawals, monthly by source.</p> <p>Improve estimates of self-supplied populations by utilizing property data and/or public water supply service areas, or other methods.</p>	



Plans for implementation of these four priority research projects are included as Appendices A-D of this report. The plans provide a justification, description of work activities, and cost estimate for each research effort.

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Appendices





APPENDIX A: ANALYSIS OF CROP-SPECIFIC AGRICULTURAL IRRIGATION – JUSTIFICATION, WORK PLAN, AND COST ESTIMATE

Justification

Locally -derived tools for crop water use estimation and irrigation scheduling are necessitated by regional variations in environmental conditions, cultivars, and management practices (Kumar et al., 2015). Recently, the significance of irrigation on the productivity of major crops in the southeastern United States has been documented. Vories et al. (2007) reported an increase in irrigated agriculture from 3% in 1975 to 58% in 2005 for three mid-south states, including Arkansas, Louisiana, and Mississippi. The increasing level of irrigation, however, is being challenged by the limited knowledge of crop water use in this region as well as excessive groundwater declines in some regions. Due to limited availability of local data on crop water use, research-based information on proper irrigation scheduling to improve crop productivity and water resource management is lacking in the region. USGS, in cooperation with LDOTD, studied water requirements for growing rice on two farms in Jefferson Davis Parish near Jennings, LA in 1986. It provides useful historical context and concluded that water required to grow rice at that time was about 30% greater than in the late 1940s and early 1950s (Covey et al., 1992). A recent study by Kumar et al. (2015) provided a new estimate of cotton-specific crop coefficients for irrigated cotton in clay soils in northeast Louisiana. But more research is needed to determine water use across the state for rice, cotton, corn, soybeans, and other crops.

Work Plan

This research will entail the following activities:

Element 1: Collection of existing data – the researchers will collect existing water use data (no new measurements will be taken) for rice, as well as soybeans, corn, and cotton. Focus should be on site-specific irrigation water withdrawals, collecting information about water source, water type (surface or groundwater), with associated acres irrigated and crop type, and method of irrigation system. Statewide coverage is preferred, but may not be possible due to data limitations. It is recommended that at least two USDA Plan Hardiness Zones be represented across the state, in an attempt to quantify regional differences in crop-specific water use within the state. Data may be collected from existing literature and from up to three LSU AgCenter Research Stations. Sources of data are not limited to existing literature and LSU AgCenter Research Stations, and researchers are encouraged to seek the best available data from any source available. The Rice Research and Red River Research Stations have expressed interest in the provision of data for the project. Contact information for the Research Stations is below:

Dr. Dustin Harrell, Associate Professor
LSU AgCenter Rice Research Station
1373 Caffey Road
Rayne, LA. 70578
O 337-788-7531 F 337-788-7553
dharrell@agcenter.lsu.edu

Dr. Stacia Davis, Adjunct Assistant Professor
Biological and Agricultural Engineering Department
LSU AgCenter Red River Research Station
262 Research Station Drive
Bossier City, LA. 71112
O 318-741-7430 F 318-741-7433
sdavis@agcenter.lsu.edu



Element 2: Data Analysis and Reporting– the researchers will analyze the data, and compile monthly withdrawals reported by water source, water type (with associated acres irrigated and crop type), and method of irrigation system. The researchers will compile a report, summarizing the data sources, methods of analysis, and results. Requirements for the report are listed under Product/Deliverable below.

Product/Deliverable: A report summarizing the data sources, methods of analysis, and results, will comprise the deliverable for this project. The report must undergo an established internal Quality Control/Quality Assurance process by the research organization, and be of high quality.



APPENDIX B: UNDERSTANDING THE ACCURACY OF METERING AND REPORTING FROM COMMUNITY AND RURAL PUBLIC SUPPLY SYSTEMS – JUSTIFICATION, WORK PLAN, AND COST ESTIMATE

Justification

Most public supply withdrawals are delivered to customers for domestic, commercial, and industrial needs. Part of the total is used for public services, such as public pools, parks, firefighting, water and wastewater treatment, and municipal buildings, and some is unaccounted for because of leaks, flushing, tower maintenance, and other system losses (Maupin et al., 2014). System losses and water used for public services also are difficult to estimate for large water suppliers through coefficients because of the variability inherent in these components of use (Kenny & Juracek, 2012). In 1995, USGS estimated that 15% of public supply water use accounted for strictly public use and water system losses. This percentage varies widely from 3-65% based on water system efficiency and infrastructure age (Solley et al., 1998). In general, systems that withdraw surface water have greater losses due to treatment than do systems that withdraw groundwater. Older systems and those that are undergoing repairs to lines or towers have greater losses due to leaks, flushing, and tower draining than systems with few problems (Hutson, 2007). In 2010, 87% of Louisiana's populations (roughly 4 million people) received their water from a public supply system. According to calculations done by USGS, the amount of water used for public supply in 2010 was 750 Mgal/d. A per capita use coefficient of 190 gcp/d was calculated using this data. Of the 750 Mgal/d used, roughly half of the use was surface water and half was groundwater (USGS, 2012).

Work Plan

This research will entail the following activities:

Element 1: Collection of existing data – the researchers will collect existing water withdrawal and end-use quantity data (no new measurements will be taken). Focus should be on water utility system-specific metered water withdrawals and deliveries, collecting information about water source, water type (surface or groundwater), system uses (internal and other non-revenue uses) and losses. Statewide coverage is preferred, but may not be possible due to data limitations. It is recommended that at least three community and rural public supply systems be analyzed, representing three different size categories. Researchers should identify and engage utilities that fit within the U.S. Environmental Protection Agency (USEPA) Safe Drinking Water Information System (SDWIS) public supply system size categories, based on population served: Very Small (0-500), Small (501-3,300), and Medium (3,301-10,000). Data may be collected from existing literature and from up to three public supply systems. Sources of data are not limited to existing literature and public supply systems, and researchers are encouraged to seek the best available data from any source available. The Louisiana Rural Water Association (LRWA) expressed interest in the provision of data, and aid in identifying appropriate and willing public supply systems for the project. Contact information for the LRWA is below:

Pat Credeur Jr, Executive Director
Louisiana Rural Water Association
1325 3rd Avenue
Kinder, LA, 70648
O 337-738-2896 F 337-738-5620
pclrwa@centurytel.net



Element 2: Data Analysis and Reporting– the researchers will analyze the data, and compile monthly metered withdrawals, end uses, and system uses reported by water source, water type, with associated acres irrigated and crop type, and losses for each system. The researchers will compile a report, summarizing the data sources, methods of analysis, and results. Requirements for the report are listed under Product/Deliverable below.

Product/Deliverable: A report summarizing the data sources, methods of analysis, and results, will comprise the deliverable for this project. The report must undergo an established internal Quality Control/Quality Assurance process by the research organization, and be of high quality.



APPENDIX C: ANALYSIS OF PUBLIC SUPPLY DELIVERIES – JUSTIFICATION, WORK PLAN, AND COST ESTIMATE

Justification

Public Supply Water Use

Public supply concerns water withdrawn from water sources by public and private water supply systems for distribution to consumers. In order to be classified as a public or private water supply system, the facilities must have at least 15 service connections or provide water to at least 25 people. It is important to note the public supply water use, like other distributive uses is subject to non-metered uses in the form of system leaks, firefighting, and infrastructure maintenance. (Hutson, 2007). The primary source for information on public water supply systems in the United States is the USEPA's SDWIS. This resource provides contact information for active water suppliers in a parish as well as denoting whether the supply source is groundwater or surface water (USGS, 2012). Other agencies or entities can also provide relevant information for estimating public supply water use. Some examples of these additional resources are: individual public suppliers; state agencies that administer water rights, allocate water to users, or collect water use data; state agencies that enforce the Safe Drinking Water Act and issue permits for water discharge; state public health agencies; state agencies that regulate utility rates, state, regional, county or community planning, development or zoning agencies; state natural-resource agencies; and consulting firms.

Work Plan

This research will entail the following activities:

Element 1: Collection of existing data – the researchers will collect existing water withdrawal and end-use quantity data (no new measurements will be taken). Focus should be on water utility system-specific metered water withdrawals and deliveries, collecting information about water source, water type (surface or groundwater), and user-type specific information on deliveries for domestic, commercial, industrial, thermoelectric, and other uses. Statewide coverage is preferred, but may not be possible due to data limitations. It is recommended that at least three public supply systems be analyzed, representing three different size categories. Researchers should identify and engage utilities that fit within these USEPA SDWIS public supply system size categories, based on population served: Medium (3,301-10,000), Large (10,001-100,000), and Very Large (100,000+). Data may be collected from existing literature and from up to three public supply systems. Sources of data are not limited to existing literature and public supply systems, and researchers are encouraged to seek the best available data from any source available. The Louisiana Municipal Association (LMA) expressed interest in the provision of data, and aid in identifying appropriate and willing public supply systems for the project. Contact information for the LMA is below:

Ronnie Harris, Executive Director
Louisiana Municipal Association
700 N 10th Street
Baton Rouge, LA 70802
O 225- 344-5001 F 225-344-3057
rharris@lma.org



At a minimum, the researchers should collect the names and locations of public water suppliers, the population served by each system, and the sources of water for the supply system. Individual suppliers of public water coupled with information from state agencies are good primary sources of data. Due to the variation in reporting, criteria strict quality assurance and quality control (QA/QC) might not be achievable. The level of detail compiled for a water use study depends entirely on data availability and resources necessary to collect the data. Useful data to include when conducting a survey are:

- Sources of water;
- Total withdrawals by year;
- Location of metering points;
- Names of connected water suppliers and amounts of water purchased or sold;
- Number of service connections by type;
- Amounts of water delivered to various sectors by year; and
- Location of retail service areas – Many public supply water systems serve customers in multiple parishes and outside of city limits.

Additional information to collect for industrial water users should include as much of the following as available:

- Facility name, mailing address, physical plant;
- Parish;
- Contact name, title, telephone and fax number, and e-mail;
- Industry description or principal products;
- SIC codes—primary and secondary;
- Total number of employees;
- Number of groundwater sources, aquifer names, number and depth of well(s);
- Number of surface water sources, names of streams or water bodies;
- Latitude and longitude of wells or intakes;
- Locations of water intakes;
- Name of public water-supply sources;
- Amounts of water withdrawn and time period of withdrawal for each source;
- Amount or percentage of total withdrawal that is freshwater or saline water, ground water or surface water;
- Method of determining withdrawals (meters, other);
- Percentage of total or amount of water used for cooling, processing, sanitary use, boiler feed, power generation, other;
- Amount of water recycled or reused;
- Wastewater discharge—average amount or percentage;
- Number of days operating each year;
- Average number of hours operating each day;
- Approximate age of the facility; and
- Confidentiality statement.

Essential data requirements for determining water use in thermoelectric power generation include ground and surface water withdrawals (fresh and saline) broken down by cooling system type (closed-loop or open-loop) and quantity of power generated broken down by cooling system type. Both of these data elements should be aggregated on the parish level. Optional data elements include but are not limited to:

- Deliveries from public supply by parish broken down by cooling system type;



- Consumptive use of ground and surface water (fresh and saline) by cooling system type by parish;
- Number of facilities by cooling system type by parish; and
- Reclaimed wastewater used for power generation broken down by cooling system type and parish.

Element 2: Data Analysis and Reporting– the researchers will analyze the data, and compile monthly metered withdrawals, end uses, and system uses reported by water source, water type, with associated user-type specific information on deliveries for domestic, commercial, industrial, thermoelectric, and other uses. The researchers will compile a report, summarizing the data sources, methods of analysis, and results. Requirements for the report are listed under Product/Deliverable below.

Product/Deliverable: A report summarizing the data sources, methods of analysis, and results, will comprise the deliverable for this project. The report must undergo an established internal Quality Control/Quality Assurance process by the research organization, and be of high quality.



APPENDIX D: DETAILED WELL METERING ANALYSIS OF PRIVATE (SELF-SUPPLIED) DOMESTIC WATER WELL USE – JUSTIFICATION, WORK PLAN, AND COST ESTIMATE

Justification

The Water Use in Louisiana, 2010 report written by the USGS Louisiana Water Science Center states that approximately 13 percent of the state’s population (roughly 560,000 people) utilize self-supplied groundwater. This use sector, defined as “rural domestic” by USGS withdrew an estimated 41 million gallons per day (Mgal/d) in the year 2010. An average of 80 gallons per day (gal/d) per person was used to estimate the withdrawals of self-supplied water use for the rural domestic sector. Due in part to the suitability and ease of capture, groundwater is predominately used by the rural domestic sector with little to no use of surface water. Every major aquifer located within Louisiana is used to supply groundwater for rural domestic uses (USGS, 2012). The majority of self-supplied domestic water in the United States comes from groundwater. Such uses are rarely metered as few states (including Louisiana) require permitting of domestic self-supplied water use. As such, self-served domestic water use is calculated on a spatial basis as the product of the population unserved by public supply and per capita water use coefficients. On a state by state basis, the estimated self-served population is calculated as the difference between the total population and the population served by public or private water suppliers. The 1990 Census is commonly used to estimate the percentage of the population that is self-supplied.

Water demand factors are variables known to influence water demand and include: climatic variability, household income, residential property size, and land-use specifics. Self-supplied populations may have lower per capita water use coefficients than populations served by public supply systems due to limitations of storage capacity, well productivity, and pumpage rates. Conversely, self-supplied populations might use more water per capita than public-supplied populations due to lack of water use restrictions and billing. Per capita use coefficients when calculated from spatially wide ranging samples are unlikely to reflect any seasonal or temporal trends in domestic water use. (Kenny & Juracek, 2012). Self-supplied water use coefficients can be determined in two ways, either through direct sampling, or conceptually, through comparison of public supply delivery data to the population not served by public supply systems. The advantage of the direct sampling method is that the developed coefficients are directly related to the actual rates of usage while at the same time capturing variability in regional use due to the effects of climate. The disadvantage to the direct sampling method is the temporal commitment. Long-term sampling requires significant investment in time and money.

A recent example of a similar study is being conducted by the Alachua County (Florida) Department of Environmental Protection, USGS, Florida Water Science Center, and the St. Johns River Water Management District. Alachua County is using the pilot project to determine the amount of water used by privately owned domestic wells, the range of per capita water use for this category, and the variations in seasonal use. USGS has been working with Alachua County since November 2011 on an effective and inexpensive way to monitor water usage from domestic wells. The objectives of this study are to: 1) estimate the total amount of water withdrawn for a small number of randomly selected privately owned domestic wells; 2) determine the seasonality of these withdrawals during a full year of use; and 3) derive a seasonal and annual per capita range for the county. A similar effort is suggested for the State of Louisiana. Although multiple years of data are preferred, nine months of monthly data will provide a snapshot of water use and per capita without being overly expensive.



Work Plan

This research will entail the following activities:

Element 1: Coordinate with well owners – the researchers will identify and coordinate with the owners of at least six private (self-supplied) water wells to voluntarily participate in this effort. Well owners should be willing to provide access to their wells, as well as electrical power for the operation of temporary, nonintrusive water flow meters for the duration of the study. Statewide coverage is preferred, but may not be possible due to data limitations. It is recommended that at least two USDA Plant Hardiness Zones be represented across the state, in an attempt to quantify regional differences in water use within the state. For each study area, three wells should be sampled. These wells should represent different sizes of individual users, from small, medium, and large households, possibly having some additional water usage for small agriculture, livestock, or other rural activities. Efforts should be made to identify peak or intermittent withdrawals, and consult with the well owner as needed to associate those with activities and use types.

Element 2: Prepare, deploy, operate, and recover sampling meters – the researchers will install a nonintrusive, clamp-on ultrasonic transit-time flow meter on each well. Each well should be monitored for a period of nine months, to capture as much water use information as possible within the one-year project schedule. The researchers will operate and maintain the meters as necessary during that period. The researchers should download and safeguard the water use data from the meters. Meters can have onboard data loggers for download by field personnel, or be telemetered wirelessly for remote data acquisition, to be determined by the researchers based on cost effectiveness and technical factors.

Element 2: Data Analysis and Reporting– the researchers will analyze the data, and compile monthly metered withdrawals, and end uses when identified with well owners. The researchers will compile a report, summarizing the data sources, methods of analysis, and results. Requirements for the report are listed under Product/Deliverable below.

Product/Deliverable: A report summarizing the data sources, methods of analysis, and results will comprise the deliverable for this project. The report should capture summary information about the wells themselves, including diameter, depth, age, aquifer, pump characteristics, and other pertinent information. The report should also include information about the property that the well serves, including home size, number of individuals served, latitude and longitude, parish, types of activities performed on the property, and other pertinent information. The report must undergo an established internal Quality Control/Quality Assurance process by the research organization, and be of high quality.





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Louisiana Water Use Research Plan Addendum, August 13, 2019

Need for Addendum

Based on comments received from the USGS WUDR review panel in response to the submission of Louisiana's first grant proposal for work (2016-WUDR-0022); comments received from various parties consulted over the past several years in an effort to contract for water use research; and an increased state-level emphasis on understanding the needs of small community and rural public supply systems, the Louisiana Department of Natural Resources/Office of Conservation is hereby submitting an addendum to the initial 2016 WUDR work plan.

The state's overall Research Priorities (below) remain the same as submitted in the original 2016 work plan. Table 1 (below, also from the original work plan) has been edited to include a column showing the source and/or collecting agency for different types of water use data in Louisiana. Again, as noted in the original work plan, this information is primarily collected by the USGS per agreement with, and under the authority of, the Louisiana Commissioner of Conservation.

This addendum includes several revisions to "Prioritizing Research Topics" section of the original work plan and to the relevant individual topic work plans found in the appendices of the original document. Please reference the original for the original list of prioritized research topics. The changes to that list are thus:

Topic 1 (Analysis of Private, Domestic Water Well Use): The state remains committed to refining our understanding of groundwater used for domestic purposes. This research topic, its work plan, and funding estimate remain unchanged.

Topics 2 & 3 (Understanding the accuracy of metering and reporting from community and rural public supply systems/Analysis of public supply deliveries): These research topics have been combined into a single research effort with a tighter focus on small systems, an expanded budget to account for USGS panel review comments regarding relevance and statistical viability, and in reflection of strong interest at the state level for the needs of such small systems in the future. In particular, this effort will provide significant statistical support to the recently created state Rural Water Infrastructure Committee (Act 126 of 2019 --- see Appendix A).

Topic 4 (Analysis of Crop-Specific Irrigation) has been deleted based on recent commitments by the regional USGS office to bolster such analytical efforts in Louisiana.

Research Priorities

The nationwide research priorities identified below reflect the priorities outlined by the USGS National Water Use Information Program.

USGS IDENTIFIED RESEARCH PRIORITIES

- Water use reporting by USGS 8-digit Hydrologic Unit Code (HUC 8) ;
- Water-tracking and Interbasin transfer (between HUC 8 units);
- System uses (internal and other non-revenue uses) and losses from public supply systems;
- Irrigation: sources and volumes (including golf courses);
- Inventory of self-supplied industrial water use;
- Mining: withdrawals with source and commodity identified;
- Improvement of the domestic per capita coefficients;
- Groundwater use: Identifying aquifer and HUC of withdrawal, and further refining the definition of saline/brackish water;
- Estimation of public supply deliveries to customer groups or classes, such as commercial, industrial, and domestic;
- Public supply systems stratified by socioeconomic factors; and
- Improved data collection and delivery.

USGS BASELINE STANDARDS

USGS has identified baseline goals, and additional levels of data, for all major categories of water use (Table 1), most of which have been estimated by USGS and published every five years since 1985. These guidelines are provided to assist state water resource agencies in determining areas in which to focus proposed work. States that currently meet the baseline standards outlined in Tier 1, for a specific water use category, would focus on Tier 2 and Tier 3. States are not required to meet the baseline goals (Tier 1) in all categories before addressing Tier 2 and Tier 3 data needs. Data collected and studies conducted in Tiers 1, 2, and 3 should be designed to benefit both local and national estimates and provide information for water availability studies by water managers, academia, federal, and or local agencies. The definitions of basic water use terms and categories as used by USGS can be found in USGS Circular 1405.

In addition to the standards listed in the table, baseline goals (Tier 1) for most categories of water use include:

1. Facility or system withdrawals for the following categories: Public Supply, Self-Supplied Industrial, Irrigation-Crop, Thermoelectric, Irrigation-Golf Course, Livestock (major facilities), Mining, and Aquaculture;
2. Withdrawals, deliveries or returns by water source -groundwater, surface water, reclaimed wastewater, wastewater effluent, and/or recycled water. For groundwater sources the aquifer should be identified; and
3. Withdrawals by water type -fresh or saline.

Table 1: USGS Baseline Goals and Additional Levels of Data for Major Categories of Water Use.

Category	Baseline Goals (Tier 1)	Tier 2	Tier 3	Source Availability
Public Supply	<p>Monthly withdrawals reported by system, water source, and water type. Deliveries to domestic users from public-supply systems, and populations served. Report system information relevant to HUC-8 and county (parish), and groundwater withdrawals with aquifer designation.</p>	<p>Site-specific annual and monthly withdrawals (by intake, well, or well field) reported by water source, and by water type. Quantity of water purchased between systems, and source(s) of purchased water. Quantity of water sold between systems. Reporting and/or verification of water deliveries for domestic, commercial, industrial, thermoelectric and other use.</p>	<p>Interbasin transfers. System uses (internal and other non-revenue uses) and losses. Improve estimates of populations served by site (for example, by surface-water intake, well or well field). Use of reclaimed wastewater for public or landscape irrigation.</p>	<p>Different agencies collect this information and would have to be consulted, including the USGS, the LA Department of Health/Office of Public Health, and the Capital Area Ground Water Conservation Commission (CAGWCC) for the Baton Rouge area.</p>
Industrial	<p>Annual withdrawals by facility, reported by water source, by water type, and industry classification. Groundwater withdrawals reported with reference to aquifer.</p>	<p>Site-specific (by intake and/or well) annual and monthly withdrawals reported by water source, by water type, and industry classification. Deliveries from public supply to industrial facility, and deliveries from other sources, such as treated wastewater.</p>	<p>Site-specific consumptive use estimates. Site-specific discharges to surface water, or land application.</p>	<p>Collected primarily by the USGS under the authority of the Commissioner of Conservation. Some regional information collected by the CAGWCC.</p>

Category	Baseline Goals (Tier 1)	Tier 2	Tier 3	Source Availability
Irrigation-Crop	Aggregate annual withdrawals reported by water source, by water type, acres irrigated, and method of irrigation. Aggregate areas may be sub-county levels, but are feasible to summarize to county or HUC8.	Site-specific monthly withdrawals by well and/or diversion from surface-water feature, or delivery from reclaimed wastewater. Monthly withdrawals reported by water source, water type, with associated acres irrigated and <i>crop type</i> , and method of irrigation system.	Consumptive use and conveyance loss estimates by aggregate area (sub-county, county, HUC8, or up to HUC12). Site-specific return flows.	Collected primarily by the USGS; USDA and NRCS, and local Soil & Water Conservation Districts may also have information.
Thermoelectric	Site-specific, annual and monthly withdrawals, and net power generation reported by cooling-system type (once-through or recirculating), by water source and by water type, and the source of the information (plant, govt. agency, etc.). Site-specific return flows.	Site-specific annual and monthly consumptive use.		Collected primarily by the USGS.
Self-Supplied Domestic	Self-supplied domestic populations, by HUC8 and county, and by water source.	Studies of actual metered domestic withdrawals, monthly by source. Improve estimates of self-supplied populations by utilizing property data and/or public water supply service areas, or other methods.		Estimated only.

Category	Baseline Goals (Tier 1)	Tier 2	Tier 3	Source Availability
Irrigation – Golf Courses	Site-specific annual and monthly withdrawals reported by water source, by water type, and acres irrigated. Groundwater withdrawals designated by aquifer.	Consumptive use estimates, by course, reported by month or annual. Acres irrigated by system type, by course.		Collected primarily by the USGS.
Livestock	Annual withdrawals for major facilities, reported by water source and by water type.	Site-specific annual and monthly withdrawals for all facilities reported by source of water, and by water type. Site-specific animal counts and animal type.	Improved and verified coefficients for water use per head for animal type, confined or open-range, seasonal variability, and other variables. Water withdrawals from sources supported by USDA programs to protect streams.	Estimated only.
Mining	Annual withdrawals reported by HUC-8 and county, by source of water, and by water type.	Site-specific annual and monthly withdrawals. Site-specific commodity identified.	Evaluation/reporting on water use by process (commodity processing, dewatering, dust suppression, etc.). Reporting on return flows/discharge of water from dewatering.	Collected by the Office of Conservation, particularly for energy development activities.
Aquaculture	Annual withdrawals reported by HUC-8 and county, by source of water, and by water type.	Site-specific annual and monthly withdrawals. Site-specific facility information (method, species cultured, etc.)		Estimated only.
Commercial	Annual and monthly deliveries from public supply for commercial use.	Site-specific annual and monthly withdrawals for self-supplied establishments.		No distinction in collection data from public supply.

Category	Baseline Goals (Tier 1)	Tier 2	Tier 3	Source Availability
Hydroelectric Power	Site-specific, annual and monthly water use (water use to spin turbines) by water source and water type, and the source of the information (plant, govt. agency, etc.).			Sabine River Authority- Louisiana is the only operator of hydroelectric power in Louisiana.
Wastewater Treatment	Annual and monthly deliveries from wastewater treatment plants to other users. Specify category delivered to (i.e. industrial, thermoelectric, irrigation, etc.)			Only one known source of wastewater re-use in Louisiana. Information readily available.

Revised Priority Research Topics

An analysis of the current water use program in Louisiana reinforces the approach to focus on several topics for potential improvement previously identified by the state in DNR-OC (2015) . These topics include research work in private, domestic water well use along with community and public supply system metering and reporting, including analysis of public supply deliveries by consumer base. The research topics in this work plan were selected and prioritized based on a detailed evaluation of the current program, consultation with LDNR and USGS staff and other researchers, and identification of the greatest benefits to be accrued from full-funding of identified priority improvements. The selected priority areas include:

1. Understanding the accuracy of metering and reporting from community and rural public supply systems and the nature of volume deliveries by consumer base: Small community and rural public supply systems provide water to hundreds of thousands of Louisianans. Understanding the accuracy of metering and reporting from these systems could be improved by a sample/survey project to gather additional data on quality assurance/quality control in these smaller systems, including actual transmission volumes and estimated system losses based on metering from the source to the end consumer. Water loss during the transmission process is an identified area of improvement and needs additional attention and study. Moreover, there has been very little research into the relative volumes of deliveries from public suppliers to commercial, industrial, and domestic users in larger communities and urban areas in Louisiana or the nation. There is a definite need to better understand the volumes and types of deliveries for both resource planning and economic development purposes. Such study efforts would provide a more detailed understanding of demand and supply based on demographic and socioeconomic factors. USGS research priorities met: System uses and losses from public supply systems; improvement of the domestic per capita coefficients; estimation of public supply deliveries to customer groups or classes, such as commercial, industrial and domestic; public supply systems stratified by socioeconomic factors; improved data collection and delivery.
2. Detailed study of private (self-supplied) domestic water well use: Louisiana has more than 80,000 registered domestic wells that provide water for daily consumption. Current USGS methods for estimating water withdrawals from private domestic wells utilize population data from the Bureau of Census and a per capita use rate, typically 80 to 100 gallons per person per day. While that method provides a good starting point for estimating withdrawals from these wells, which generally have low-volume yields and limited impact on local aquifers, a more detailed study of water use from a sample/survey of withdrawals from such wells from the different regions of the state would yield a better understanding of actual vs. estimated use. In turn, such information would benefit water planners by providing more accurate coefficients for estimating domestic water use. USGS research priority met: Improvement of the domestic per capita coefficients; improved data collection and delivery.

Priority Research Topic 1: Understanding the Accuracy of Metering and Reporting from Community and Rural Public Supply Systems and the Nature of Volume Deliveries by Consumer Base – Justification, Work Plan, and Cost Estimate

Justification

Public supply concerns water withdrawn from water sources by public and private water supply systems for distribution to consumers. In order to be classified as a public or private water supply system, the facilities must have at least 15 service connections or provide water to at least 25 people. It is important to note the public supply water use, like other distributive uses is subject to non-metered uses in the form of system leaks, firefighting, and infrastructure maintenance. (Hutson, 2007). The primary source for information on public water supply systems in the United States is the USEPA's SDWIS. This resource provides contact information for active water suppliers in a parish as well as denoting whether the supply source is groundwater or surface water (USGS, 2012). Other agencies or entities can also provide relevant information for estimating public supply water use. Some examples of these additional resources are: individual public suppliers; state agencies that administer water rights, allocate water to users, or collect water use data; state agencies that enforce the Safe Drinking Water Act and issue permits for water discharge; state public health agencies; state agencies that regulate utility rates, state, regional, county or community planning, development or zoning agencies; state natural-resource agencies; and consulting firms.

Most public supply withdrawals are delivered to customers for domestic, commercial, and industrial needs. Part of the total is used for public services, such as public pools, parks, firefighting, water and wastewater treatment, and municipal buildings, and some is unaccounted for because of leaks, flushing, tower maintenance, and other system losses (Maupin et al., 2014). System losses and water used for public services also are difficult to estimate for large water suppliers through coefficients because of the variability inherent in these components of use (Kenny & Juracek, 2012). In 1995, USGS estimated that 15% of public supply water use accounted for strictly public use and water system losses. This percentage varies widely from 3-65% based on water system efficiency and infrastructure age (Solley et al., 1998). In general, systems that withdraw surface water have greater losses due to treatment than do systems that withdraw groundwater. Older systems and those that are undergoing repairs to lines or towers have greater losses due to leaks, flushing, and tower draining than systems with few problems (Hutson, 2007). In 2010, 87% of Louisiana's populations (roughly 4 million people) received their water from a public supply system. According to calculations done by USGS, the amount of water used for public supply in 2010 was 750 Mgal/d. A per capita use coefficient of 190 gcp/d was calculated using this data. Of the 750 Mgal/d used, roughly half of the use was surface water and half was groundwater (USGS, 2012).

Work Plan

This research will entail the following activities:

Element 1: Collection of existing data – the researchers will collect existing water withdrawal and end-use quantity data (no new measurements will be taken). Focus should be on water utility system-specific

metered water withdrawals and deliveries, collecting information about water source, water type (surface or groundwater), system uses (internal and other non-revenue uses) and losses. Statewide coverage is preferred and it is recommended that up to two dozen (24) community and rural public supply systems be analyzed, representing different size categories and geographies/regions of the state. Researchers should identify and engage utilities that fit within the U.S. Environmental Protection Agency (USEPA) Safe Drinking Water Information System (SDWIS) public supply system size categories, based on population served: Very Small (0-500), Small (501-3,300), and Medium (3,301-10,000). Data may be collected from existing literature and from up to two dozen (24) public supply systems. Sources of data are not limited to existing literature and public supply systems, and researchers are encouraged to seek the best available data from any source available.

At a minimum, the researchers should collect the names and locations of public water suppliers, the population served by each system, and the sources of water for the supply system. Individual suppliers of public water coupled with information from state agencies are good primary sources of data. Due to the variation in reporting, criteria strict quality assurance and quality control (QA/QC) might not be achievable. The level of detail compiled for a water use study depends entirely on data availability and resources necessary to collect the data. Useful data to include when conducting a survey are:

- Sources of water;
- Total withdrawals by year;
- Location of metering points;
- Names of connected water suppliers and amounts of water purchased or sold;
- Number of service connections by type;
- Amounts of water delivered to various sectors by year; and
- Location of retail service areas – Many public supply water systems serve customers in multiple parishes and outside of city limits.

Additional information to collect for industrial water users should include as much of the following as available:

- Facility name, mailing address, physical plant;
- Parish;
- Contact name, title, telephone and fax number, and e-mail;
- Industry description or principal products;
- SIC codes—primary and secondary;
- Total number of employees;
- Number of groundwater sources, aquifer names, number and depth of well(s);
- Number of surface water sources, names of streams or water bodies;
- Latitude and longitude of wells or intakes;
- Locations of water intakes;
- Name of public water-supply sources;
- Amounts of water withdrawn and time period of withdrawal for each source;
- Amount or percentage of total withdrawal that is freshwater or saline water, ground water or surface water;
- Method of determining withdrawals (meters, other);

- Percentage of total or amount of water used for cooling, processing, sanitary use, boiler feed, power generation, other;
- Amount of water recycled or reused;
- Wastewater discharge—average amount or percentage;
- Number of days operating each year;
- Average number of hours operating each day;
- Approximate age of the facility; and
- Confidentiality statement.

The Louisiana Rural Water Association (LRWA) has expressed interest in the provision of data, and aid in identifying appropriate and willing public supply systems for the project. The LRWA is engaged currently in such a study in the Sparta Aquifer overlay of north-central Louisiana and is therefore in a position to help researchers expand this study to other rural parts of the state. Such work is sorely needed, as noted in recent media reporting, and as further evidenced by the creation of a Rural Water Infrastructure Committee by legislative act. It is expected that the Louisiana Municipal Association and Louisiana Police Jury Association will be of assistance as well.

Element 2: Data Analysis and Reporting– the researchers will analyze the data, and compile monthly metered withdrawals, end uses, and system uses reported by water source, water type, with associated acres irrigated and crop type, and losses for each system. The researchers will compile a report, summarizing the data sources, methods of analysis, and results. Requirements for the report are listed under Product/Deliverable below.

Product/Deliverable: A report summarizing the data sources, methods of analysis, and results, will comprise the deliverable for this project. The report must undergo an established internal Quality Control/Quality Assurance process by the research organization, and be of high quality.

Priority Research Topic 2: Detailed Well Metering Analysis of Private (Self-Supplied) Domestic Water Well Use – Justification, Work Plan, and Cost Estimate

Justification

The Water Use in Louisiana, 2010 report written by the USGS Louisiana Water Science Center states that approximately 13 percent of the state's population (roughly 560,000 people) utilize self-supplied groundwater. This use sector, defined as "rural domestic" by USGS withdrew an estimated 41 million gallons per day (Mgal/d) in the year 2010. An average of 80 gallons per day (gal/d) per person was used to estimate the withdrawals of self-supplied water use for the rural domestic sector. Due in part to the suitability and ease of capture, groundwater is predominately used by the rural domestic sector with little to no use of surface water. Every major aquifer located within Louisiana is used to supply groundwater for rural domestic uses (USGS, 2012). The majority of self-supplied domestic water in the United States comes from groundwater. Such uses are rarely metered as few states (including Louisiana) require permitting of domestic self-supplied water use. As such, self-served domestic water use is calculated on a spatial basis as the product of the population unserved by public supply and per capita water use coefficients. On a state by state basis, the estimated self-served population is calculated as the difference between the total population and the population served by public or private water suppliers. The 1990 Census is commonly used to estimate the percentage of the population that is self-supplied.

Water demand factors are variables known to influence water demand and include: climatic variability, household income, residential property size, and land-use specifics. Self-supplied populations may have lower per capita water use coefficients than populations served by public supply systems due to limitations of storage capacity, well productivity, and pumpage rates. Conversely, self-supplied populations might use more water per capita than public-supplied populations due to lack of water use restrictions and billing. Per capita use coefficients when calculated from spatially wide ranging samples are unlikely to reflect any seasonal or temporal trends in domestic water use. (Kenny & Juracek, 2012). Self-supplied water use coefficients can be determined in two ways, either through direct sampling, or conceptually, through comparison of public supply delivery data to the population not served by public supply systems. The advantage of the direct sampling method is that the developed coefficients are directly related to the actual rates of usage while at the same time capturing variability in regional use due to the effects of climate. The disadvantage to the direct sampling method is the temporal commitment. Long-term sampling requires significant investment in time and money.

A recent example of a similar study is being conducted by the Alachua County (Florida) Department of Environmental Protection, USGS, Florida Water Science Center, and the St. Johns River Water Management District. Alachua County is using the pilot project to determine the amount of water used by privately owned domestic wells, the range of per capita water use for this category, and the variations in seasonal use. USGS has been working with Alachua County since November 2011 on an effective and inexpensive way to monitor water usage from domestic wells. The objectives of this study are to: 1) estimate the total amount of water withdrawn for a small number of randomly selected privately owned domestic wells; 2) determine the seasonality of these withdrawals during a full year of use; and 3) derive

a seasonal and annual per capita range for the county. A similar effort is suggested for the State of Louisiana. Although multiple years of data are preferred, nine months of monthly data will provide a snapshot of water use and per capita without being overly expensive.

Work Plan

This research will entail the following activities:

Element 1: Coordinate with well owners – the researchers will identify and coordinate with the owners of at least six private (self-supplied) water wells to voluntarily participate in this effort. Well owners should be willing to provide access to their wells, as well as electrical power for the operation of temporary, nonintrusive water flow meters for the duration of the study. Statewide coverage is preferred, but may not be possible due to data limitations. It is recommended that at least two USDA Plant Hardiness Zones be represented across the state, in an attempt to quantify regional differences in water use within the state. For each study area, three wells should be sampled. These wells should represent different sizes of individual users, from small, medium, and large households, possibly having some additional water usage for small agriculture, livestock, or other rural activities. Efforts should be made to identify peak or intermittent withdrawals, and consult with the well owner as needed to associate those with activities and use types.

Element 2: Prepare, deploy, operate, and recover sampling meters – the researchers will install a nonintrusive, clamp-on ultrasonic transit-time flow meter on each well. Each well should be monitored for a period of nine months, to capture as much water use information as possible within the one-year project schedule. The researchers will operate and maintain the meters as necessary during that period. The researchers should download and safeguard the water use data from the meters. Meters can have onboard data loggers for download by field personnel, or be telemetered wirelessly for remote data acquisition, to be determined by the researchers based on cost effectiveness and technical factors.

Element 2: Data Analysis and Reporting– the researchers will analyze the data, and compile monthly metered withdrawals, and end uses when identified with well owners. The researchers will compile a report, summarizing the data sources, methods of analysis, and results. Requirements for the report are listed under Product/Deliverable below.

Product/Deliverable: A report summarizing the data sources, methods of analysis, and results will comprise the deliverable for this project. The report should capture summary information about the wells themselves, including diameter, depth, age, aquifer, pump characteristics, and other pertinent information. The report should also include information about the property that the well serves, including home size, number of individuals served, latitude and longitude, parish, types of activities performed on the property, and other pertinent information. The report must undergo an established internal Quality Control/Quality Assurance process by the research organization, and be of high quality.

Appendix A: Act 126 of 2019

2019 Regular Session

ACT No. 126

ENROLLED

SENATE BILL NO. 170

BY SENATORS THOMPSON, ALARIO, ALLAIN, APPEL, BARROW, BOUDREAUX,
CARTER, COLOMB, CORTEZ, ERDEY, FANNIN, GATTI,
HENSGENS, JOHNS, LONG, LUNEAU, MARTINY, MILLS,
MORRELL, PEACOCK, PRICE, RISER, WALSWORTH AND WARD

Prefiled pursuant to Article III, Section 2(A)(4)(b)(i) of the Constitution of Louisiana.

1 AN ACT
2 To enact R.S. 36:4(BB) and Part VII of Chapter 2 of Title 49 of the Louisiana Revised
3 Statutes of 1950, to be comprised of R.S. 49:220.31 through 220.33, relative to rural
4 water systems; to create the Rural Water Infrastructure Committee within the office
5 of the governor; to provide for membership of the committee; to provide relative to
6 terms, quorum requirements, and per diem; to provide for the functions of the
7 committee; to require the committee to make recommendations; and to provide for
8 related matters.
9 Be it enacted by the Legislature of Louisiana:
10 Section 1. R.S. 36:4(BB) is hereby enacted to read as follows:
11 §4. Structure of executive branch of state government
12 * * *
13 **BB. The Rural Water Infrastructure Committee (R.S. 49:220.31 et seq.)**
14 **is hereby placed within the office of the governor and shall perform its powers,**
15 **duties, and functions as provided by law.**
16 Section 2. Part VII of Chapter 2 of Title 49 of the Louisiana Revised Statutes of
17 1950, comprised of R.S. 49:220.31 through 220.33, is hereby enacted to read as follows:
18 **PART VII. RURAL WATER INFRASTRUCTURE COMMITTEE**
19 **§220.31. Purpose**
20 **The state of Louisiana recognizes the need to develop and implement a**
21 **comprehensive rural water infrastructure plan to address deteriorating public**
22 **water supply systems and protect the interests, health, safety, and welfare of the**
23 **citizens of Louisiana. This effort will require the cooperation and participation**

Page 1 of 5

Coding: Words which are ~~struck through~~ are deletions from existing law;
words in **boldface type and underscored** are additions.

1 of numerous federal, state, and local agencies. To further the development of the
2 plan, the state of Louisiana recognizes the necessity to establish the Rural Water
3 Infrastructure Committee for the purpose of providing advice and guidance to
4 the governor on all matters relative to rural water systems in Louisiana.

5 **§220.32. Rural Water Infrastructure Committee; creation and organization**

6 **A. The Rural Water Infrastructure Committee is hereby created within**
7 **the office of the governor and shall be composed of seventeen members as**
8 **follows:**

9 **(1) The State Director of United States Department of Agriculture Rural**
10 **Development in Louisiana or his designee.**

11 **(2) The State Director of the United States Economic Development**
12 **Administration or his designee.**

13 **(3) The governor or his designee.**

14 **(4) The governor's designee to the Delta Regional Authority.**

15 **(5) The secretary of the Louisiana Department of Health or his designee.**

16 **(6) The secretary of the Louisiana Department of Environmental Quality**
17 **or his designee.**

18 **(7) The executive director of the Louisiana Office of Community**
19 **Development or his designee.**

20 **(8) The director of the Governor's Office of Homeland Security and**
21 **Emergency Preparedness or his designee.**

22 **(9) The executive director of the Louisiana Rural Water Association or**
23 **his designee.**

24 **(10) The executive director of the Police Jury Association of Louisiana**
25 **or his designee.**

26 **(11) The executive director of the Louisiana Municipal Association or his**
27 **designee.**

28 **(12) The president of the Louisiana Association of Planning and**
29 **Development Districts or his designee.**

30 **(13) The president of the Senate or his designee.**

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(14) The speaker of the House of Representatives or his designee.

(15) The chairman of the Louisiana Rural Caucus or a member of the Louisiana Rural Caucus designated by the chairman.

(16) The commissioner of agriculture and forestry or his designee.

(17) The executive secretary of the Louisiana Public Service Commission or his designee.

B. Members shall serve terms concurrent with the governor.

C. The governor's designee to the Delta Regional Authority shall serve as chairman and shall develop procedures for the operation of the committee.

D. The committee shall meet as necessary at the call of the chairman. A majority of the members of the committee shall constitute a quorum for the transaction of business.

E. All official actions of the committee shall require the affirmative vote of a majority of the members in attendance.

F. The governor or the chairman of the committee may request employees of federal, state, or local agencies involved with rural water systems to participate as nonvoting members of the committee.

G. The committee may request administrative and technical support from the governor's office to carry out the committee's functions and responsibilities as provided in this Part.

H. Members of the committee shall serve without compensation. Legislative members of the committee shall receive such per diem and expenses as provided for legislators during attendance at legislative committees and from the same source.

I. The names of the members who will serve on the committee shall be submitted to the governor not later than August 15, 2019.

§220.33. Functions; recommendations

A. The committee shall have the following functions and duties:

(1) To advise the governor on all matters relative to rural water systems in Louisiana.

1 (2) To advise and provide technical assistance to rural water systems,
2 local governments, and nonprofit organizations to improve infrastructure and
3 ensure compliance with state and federal regulations.

4 (3) To work collaboratively to assess and prioritize rural water system
5 deficiencies.

6 (4) To offer emergency response assessments for rural water systems
7 during public health emergencies upon request.

8 (5) To foster cooperation among federal, state, and local governmental
9 agencies on all issues pertaining to rural water systems.

10 (6) To conduct such studies as are necessary to develop and implement
11 a comprehensive rural water infrastructure plan.

12 (7) To create a clearinghouse of educational materials to assist rural
13 water systems, local governments, and nonprofit organizations.

14 (8) To review programs, conditions, trends, and engineering findings
15 which affect rural water systems in order to make recommendations for
16 improvements.

17 (9) To assist in the identification of potential sources of funding for rural
18 water systems and to develop advice with respect to which expenditures are in
19 the best interest of the state.

20 B. The committee shall advise and make recommendations to the
21 governor on the following:

22 (1) Establishing funding criteria for rural water systems.

23 (2) Establishing a process to hold noncompliant water systems
24 accountable including legislative audits and mandatory management training.

25 (3) Increasing inspection and enforcement of rural water systems by
26 state agencies.

27 (4) Establishing a system for the review of engineering proposals for
28 infrastructure upgrades to rural water systems.

29 (5) Developing financial incentives for rural water systems to consolidate
30 when deemed appropriate.

1 (6) Developing recommendations for legislative action relative to rural
2 water systems.

3 C. The committee shall submit a written report to the governor by
4 March first of each year relative to the progress, challenges, and
5 recommendations concerning policy and possible legislation relative to rural
6 water systems.

7 Section 3. This Act shall become effective upon signature by the governor or, if not
8 signed by the governor, upon expiration of the time for bills to become law without signature
9 by the governor, as provided by Article III, Section 18 of the Constitution of Louisiana. If
10 vetoed by the governor and subsequently approved by the legislature, this Act shall become
11 effective on the day following such approval.

PRESIDENT OF THE SENATE

SPEAKER OF THE HOUSE OF REPRESENTATIVES

GOVERNOR OF THE STATE OF LOUISIANA

APPROVED: _____