Survey of Irrigation Organizations (SIO)

Research Plan

History

The 2019 Survey of Irrigation Organizations (SIO), to be conducted in early 2020, is a new survey based on the 1978 Census of Irrigation Organizations, which was last conducted in 1979 referencing 1978 by the U.S. Department of Commerce, Bureau of the Census

Research and Publication Plans

This document provides an overview of the planned uses of data from the USDA 2019 Survey of Irrigation Organizations. This survey will collect detailed information about a broad range of topics organized into nine sections. The data collected will address six research functions. Table 1 provides a cross-walk between the content of each section and research functions.

Table 1: Research Purposes and Content

Section	Water Budgets	Knowledge Transfer	Cost Function	Farmer Incentives	Drought Resilience	USDA Conservation Programs
1: Organization Overview		X	X			X
2: Delivery of Off-farm Water	X	X	X	X	x	X
3: On-farm Groundwater		X		X		X
4: Measurement of Water	X	X		X		X
5: Drought Planning and Response		X		X	X	X
6: Water Conservation and Environmental Concerns	X	X		X	x	X
7: Assets, Liabilities and Investments	X	X	X			X
8: Revenue and Price Structure		X		X	X	X
9: Costs of Operation and Maintenance		X	X			X

Research Topics

Water Budgets:

Federal research on water resources uses data on both water withdrawals from surface water bodies and groundwater aquifers for different uses. At the watershed and national level, these withdrawals need to be translated into consumptive use for water, which allows for modeling the return flows of withdrawals back into the hydrologic systems. The SIO data will support improved estimates of these withdrawals and return flows – the water budgets – by providing estimates of district-scale water allocations and associated conveyance losses. The findings

may also provide insight on how regional water budgets may adjust under varying water supply conditions. This research use of the SIO involves primarily statistical analysis.

Knowledge Transfer

With over 5,000 irrigation organizations in the U.S., there are no comprehensive data sources of organization characteristics and practices. Every section of the SIO questionnaire includes some questions that capture important management decisions ranging from water price structure, metering systems, drought planning, organization voting, conservation investments (e.g. canal lining), managed recharge, and labor allocations. The SIO data, and particularly the public data tables, will allow water organizations to see how their own practices compare to others in the industry. This information will support knowledge transfer between the organizations when addressing key management goals such as reducing costs, dealing with water shortages, and integrating surface water and groundwater uses.

Cost Function Estimation

Irrigation delivery organizations are, essentially, a form of utility. Like electric and water treatment utilities, irrigation organizations have large capital costs and complex annual operating costs. While a large literature estimating the cost functions for electric and water utilities provides key input into policy relevant research on these industries, there is not such literature for irrigation organizations. The SIO data will allow for the estimation of cost functions for irrigation delivery organizations.

Farmer Incentives

USDA regularly collects data on farm and ranch irrigation management decisions in the Irrigation Water Management Survey (IWMS) formerly called the Farm and Ranch Irrigation Survey (FRIS). Research based on IWMS and FRIS regularly uses basic information on incentives such as average water prices and weather. The SIO data will allow for greatly improved analysis of farm and ranch irrigation decisions by providing better information about the incentives underlying farm-level behavioral decisions: including marginal prices, water rights, metering, turnout scheduling restrictions, local conservation programs, land fallowing programs, and water trading opportunities.

Drought Resilience

Irrigation organizations play a critical role in allocation of water to farms and ranches during times of drought. The SIO data will provide insight on short-term drought response measures, including water source substitution and land idling, and the extent of current drought resilience

involving water storage and conveyance facilities, drought plans, managed aquifer recharge, water allocation and scheduling rules, price structures, and land fallowing programs.

USDA Conservation Programs

The 2018 Farm Act allows for NRCS to contract directly with irrigation organizations through the working lands conservation programs. The SIO data will allow for studies on the current array of conservation practices in place, and numbers of organizations that have varying needs for conservation efforts and investment. In addition, information on cropland idling and land retirement could potentially inform FSA and NRCS conservation initiatives.

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Proposed Tables and Topics for Publication

Tables to Be Included In Publication

These tables are expected to be the basis for the primary output from the survey.

- Count and acres of organizations
- Count and acres of groundwater organizations
- Supply quantities
- Delivered quantities
- Water Transfers
- Reservoirs
- Conveyance
- Wells on farm
- Managed recharge
- Use of federal data resources
- Drought risk and planning
- Fallowing program
- Capital investment
- Price structure

Potential Tables to Be Included In Publication

These tables could be included in the primary report if enough resource are available. However, it is more likely that they would be produced for specific research reports at a later data.

- Organization functions (count, or acres)
- Governance structure (Count, or acres)
- Turnouts and Rotation schedule
- Reasons for unlined conveyance
- Conservation investments
- Vegetation management
- Price adjustments
- Energy expenditure

Research Topics

Other questions will be used for statistical analysis and research studies on water delivery, groundwater overdraft, water quality concerns, water quantity measurement methods, system capacity constraints, and economic analysis related to revenue, costs, investments, and debt.