

To Increase Net Benefits,  
Abolish or Limit Water Data Confidentiality to 1-5 Years

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Why water data confidentiality?

- Addressing Nitrate on California's Drinking Water, Harter and Lund et al. SWRCB Report
- Consulting experience
- Slow movement towards water markets over last 50 years as policy instrument to maximize net benefits of water resources
- Future Supply (drought and climate change) and Future Demand (population growth), California faces a future of increasing water scarcity and attendant impacts on water quality.

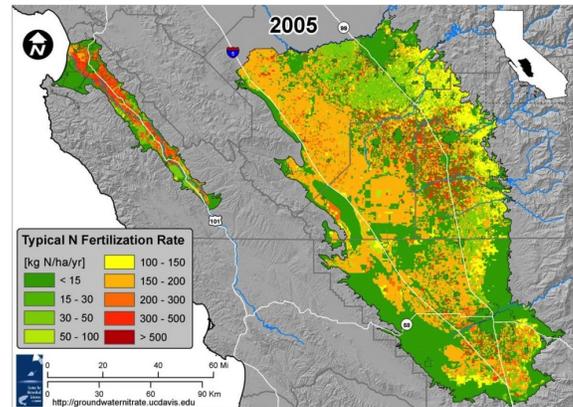
Why water data confidentiality?

Addressing Nitrate on California's Drinking Water,  
Harter and Lund et al. SWRCB Report:

"Inconsistency and inaccessibility of data from multiple sources prevent effective and continuous assessment....Throughout this study, we often faced insurmountable difficulties in gaining access to data already collected on groundwater and groundwater contamination by numerous local, state, and federal agencies....A statewide effort is needed to integrate diverse water-related data collection ...Comprehensive integration, facilitation of data entry, and creation of clear protocols for providing confidentiality as needed are key characteristics of such an integrated database structure."

Why water data confidentiality?

Consulting experience



The benefits to society from accessible data has routinely been dismissed or ignored at the local resource agency level

- **Salinas Valley, 1997-**  
SV Integrated Ground and Surface Water Model "accuracy...depends on the accuracy of calibration and host data and parameters" including "Estimates of ground water pumping and distribution..." + 8 other factors.  
Claim of "valley-wide accuracy of ±5 feet" by inspection of model residuals  
No analysis of accuracy of factor data was performed, no propagation of errors in final results  
Independent confirmation impossible without the data used in its construction and calibration.
- **Imperial Valley, 2002-**  
Imperial Irrigation Decision Support System (IIDSS) model used to estimate changes in all flows through the Imperial Valley  
"Data gaps were identified and assumptions were made to fill them"  
"professional judgment was used to determine the fractions of water deliveries that returned to the drainage system"  
"District does not have a sufficiently consistent and complete record of these individual field deliveries"

Why water data confidentiality?

Slow movement towards water markets over last 50

"If MWD were to suffer loss of any of its [provisional surplus] Colorado River entitlement...or as a source of additional supplies [for population growth], the MWD might consider the purchase of rights held by other users of Colorado River water, especially by irrigation districts in the Imperial area... Suppose that, for a given farm or irrigation district, 25 percent of the attached water were purchased. The farmer would almost certainly remain in business. He could either reduce the application of water to his initial crop, shift to a crop demanding less moisture, or cut back on his acres irrigated. Alternatively, he could make investments designed to eliminate waste by seepage and evaporation and thus indirectly recoup some of the water lost by sale. In any case, the net return to farming operations will have been somewhat reduced, in exchange for an increment in revenue from water sales. If the sale is voluntary, the gain to the farmer from water sales will exceed the loss in farming."  
Hirshleifer, Jack, James C. DeHaven, and Jerome W. Milliman, *Water Supply: Economics, Technology, and Policy*, RAND Corporation and University of Chicago Press, 1960, p. 321-330.

## Why water data confidentiality?

Future Supply (drought and climate change) and Future Demand (population growth) ⇒ California faces a future of increasing water scarcity and attendant impacts on water quality.

As water becomes more economically scarce, improvements in resource management will require

- 1) greater integration of surface and groundwater supply quantity and quality,
- 2) more extensive and accurate measurement of relevant water parameters, and
- 3) storage of this critical information in comprehensive databases available to state planners, affiliated and independent researchers, and the public.

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## Assumption of “confidentiality as needed”

In light of the pressure on current water institutions and how they are likely to evolve, **the time has come for a comprehensive state-level review of water data confidentiality policies** for all water end-users and water sources that considers the interests of all citizens.

- Are there any business gains to protecting 20-year-old data?
- Does society benefit at all by protecting 20-year-old data?
- What is the public benefit of making water data available?
- Are there business losses associated with releasing this claimed “proprietary information”?
- Is water data confidentiality socially beneficial or should it be abolished?
- If not abolished, should it be conferred for a limited time frame?

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## Physical and legal relationship between water diversion/extraction and public interest

- Physical properties of water flows and legal conventions governing its use only exist in relationship between the extractive user and other extractive users, which constitute the public at large, as well as in relationship to societal benefits from non-extractive uses and the public trust.
- GW extraction impacts gw levels and stocks available to other extractors.
- Percolation beyond the root zone of water containing unused fertilizer and pesticide residues eventually impacts water quality of other extractors.
- The right to extract groundwater is a correlative right between landowners overlying an aquifer, a right always in relation to other landowners.
- In situ groundwater values include buffering periodic shortages of surface water supplies, subsidence avoidance, water-quality protection and prevention of seawater intrusion.
- Natural groundwater discharge can also support natural environments and recreation.

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## Analogy to Patents:

### Private protections in service of public benefits

Economic theory of patents in its simplest form:

- The government confers a exclusive property right on an inventor for a limited period of time to encourage investment in innovations
- Patents require that the applicant publicly disclose the innovation for future public use, and
- Limits the time frame of the monopoly property right with the purpose of offsetting societal loss from monopoly with societal gains from innovation, thereby **increasing societal benefits** over the course of time. While the patent right assigns greater gains to the inventor, **its purpose is to increase innovation for society and societal well-being more generally.**

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## Existing Environmental Reporting and Public Access Data

- Requirements to disclose data on some aspects of business operations that impact public health, commerce or environment and grant public access are not new.
- EPA “Cap and Trade Essentials”: “The **accurate measurement and reporting** of emissions is essential, along with the rigorous and consistent enforcement of penalties for fraud and noncompliance. Also critical is **transparency**, such as **public access to source-level emissions and allowance data**. The coupling of stringent monitoring and reporting requirements and the **power of the Internet** makes it possible for EPA to **provide access to complete, unrestricted data on trading, emissions, and compliance**. This promotes **public confidence** in the **environmental integrity** of the program and business confidence in the **financial integrity** of the allowance market. It also provides an additional level of **scrutiny to verify enforcement and encourage compliance**. Finally, accountability requires ongoing evaluation of the cap and trade program to ensure that it is making progress toward achievement of its environmental goal.”

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## Public benefits from publicly accessible water data that apply to the management and administration of water rights, conservation agreements, water trades, pollutant loading and water quality.

- 1) Allows independent public review of water resource models to better manage existing resources (data available only to restricted club creates opportunities for mismanagement).
- 2) Accountability for water right holders, local water agencies and consultants.
- 3) Reporting data and making it publicly accessible encourages compliance with existing laws and regulations.
- 4) Public verification of compliance with water rights, pollutant loading, and water conservation achievements tied to water exchanges/trades.
- 5) Public vigilance of public trust elements of water rights including environmental uses.

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### Public benefits from publicly accessible water data ...cont.

- 6) Public confidence in the integrity of laws governing water use.
- 7) Transparency (discourages political rent seeking, discourages protecting administrative turf/principal-agent problem, and discourages inequitable favorable treatment by local water agencies)
- 8) Reduction in delay time of regulatory solutions (and the water supply and public health consequences of those delays) caused by those who use water data confidentiality as a barrier to development and implementation of socially beneficial regulation.
- 9) Reinforces mutual credibility between agricultural sector and M & I sector water users, strengthening mutual acceptance of voluntary or mandatory drought reductions.
- 10) More civic and democratic participation.

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### Proposed Measurement and Water Data Disclosure to Serve the Public Interest

- Limit disclosure to allow for observation of water policy, rights and management outcomes on water sources and environmental flows. Water quantity and quality interactions of any water user with both other users and non-extractive uses, and thus the public beyond the unit, satisfies this criterion.
- The proposed data requirement is the **location, timing, quantity and quality of any diversion/extraction and location, timing, quantity and quality of return flows**, whether surface runoff (tailwater) or deep percolation (also accounting for drain interception of percolation).
- Any other information about the practices on the farm would be unnecessary for the purposes of observing water quantity and quality resource management outcomes.

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### Proposed Measurement and Water Data Disclosure to Serve the Public Interest

- Since measurement of quantity and quality of return flows may incur substantial cost especially with respect to percolation, the farmer would have the option to report substitute information that could be used to estimate return flow location, timing, quantity and quality.
- Crop type, crop yield (to estimate ET), applied fertilizer and pesticides by type and quantity, irrigation technology, irrigation and fertilizer management processes, soil type, soil slope, and tailwater quantity measurement combined with available effective rainfall data would be a reasonable substitute for the minimal data requirements relating to return flows identified above.

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### Proposed Measurement and Water Data Disclosure to Serve the Public Interest

These reporting and database requirements are **robust** for achieving the identified public benefits under the most likely potential future evolutions of water institutions to relieve reallocation pressures:

- 1) more extensive use of water markets for exchange of conserved water to improve allocative efficiency through shrinking the gap between the marginal value of water in different uses or
- 2) more extensive administrative or judicial evaluations of waste and alternative beneficial uses and subsequent "transfers" to achieve the same purpose.

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### Reason for inclusion of return flow reporting requirement

- 1) Only actual return flow quantities can be diverted for subsequent use or left in-situ for environmental benefits. Increasing irrigation efficiency may not save any water, as consumptive use of water may increase even as water application decreases (more accurate timing and location of water in the root zone increases consumptive use and crop yield and reduces return flow). Therefore, conservation programs measured in terms of changes in applied water without accounting for changes in return flow can only overestimate the actual amount of conserved water.
- 2) Return flow quantity and quality are needed to assess water quality management outcomes. Both the quantity of pollutant loading and the dilution effect from increasing water quantity are needed to model later pollutant concentrations from multiple return flows.

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### Private Value of Water Data Confidentiality

The value of proprietary information to the holder and the ability to control the information depends on

- 1) any profit differential between those with the information and those without,
- 2) how widely the information is known by competitors, employees and suppliers,
- 3) the cost or ease to acquire or develop the proprietary information, and
- 4) the value of the proprietary information to competitors.

The two possible proposed data disclosure options allow for less disclosure if an owner is willing to pay for quantity and quality measurements of return flows. Thus, if the owner attributes a large profit differential to proprietary information, return flow measurements will be more affordable and more information can remain confidential.

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## Private and public benefits

Disclosure and public scrutiny may encourage better utilization of applied water and economic gains for other currently water inefficient farmers who do not possess that proprietary information, independent of any valuable proprietary information disclosure. (Peer effects or social norm effects)

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## Conclusions

Little done so far to balance the public and private interest with respect to water data confidentiality for all water users.

- + the need for greater coordinated management at the local and state level
- + unresponsiveness of local water agencies to data requests to review existing models and develop independent models
- ⇒ the time has come for a comprehensive state-level review of water data confidentiality policies for all water end-users and water sources that considers the interests of all citizens.

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## Conclusions

- Permanent confidentiality is not in the public interest.
- Disclosure of water data can produce societal gains through better public analysis, monitoring and transparency of the water institutions charged with managing extractive and non-extractive uses, leading to better performance, accountability, credibility and confidence in the integrity of laws governing water use.
- The scope of water data disclosure can be limited to that which most serves the public interest, thus mitigating potential profit losses from disclosure of proprietary information.

After consideration of the public and private interests, a state-level review could establish a limited water data confidentiality period of 1-5 years or perhaps abolish confidentiality altogether.

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## Questions

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