

US Geological Survey Next-Gen Water Use Information



Jaime Painter, USGS Water-Use Program Manager
August 16, 2022

USGS WMA Science Priorities

ESTIMATING WATER USE IN THE UNITED STATES

A New Paradigm
Inform

U.S. 146

Our Hundred Eleventh Congress
of the
United States of America

AT THE FIRST SESSION

Report and held in the City of Washington on Tuesday,
the sixth day of January, two thousand and nine

By Act

To estimate water use in accordance of the National Water Research
Survey, to estimate water resources and activities in the Department of the
Interior and the Department of Agriculture, and for other purposes.

Be it enacted by the Senate and House of Representatives of
the United States of America in Congress assembled,

SECTION 1. That the Secretary of the Interior, in consultation with the
Secretary of Agriculture, shall cause to be conducted, within a reasonable time, a
survey of the water resources of the United States, and shall report thereon to the
Senate and House of Representatives at the first session of the Congress next
after the date of the completion of such survey.

SEC. 2. That the Secretary of the Interior, in consultation with the
Secretary of Agriculture, shall cause to be conducted, within a reasonable time, a
survey of the water resources of the United States, and shall report thereon to the
Senate and House of Representatives at the first session of the Congress next
after the date of the completion of such survey.

SEC. 3. That the Secretary of the Interior, in consultation with the
Secretary of Agriculture, shall cause to be conducted, within a reasonable time, a
survey of the water resources of the United States, and shall report thereon to the
Senate and House of Representatives at the first session of the Congress next
after the date of the completion of such survey.

SEC. 4. That the Secretary of the Interior, in consultation with the
Secretary of Agriculture, shall cause to be conducted, within a reasonable time, a
survey of the water resources of the United States, and shall report thereon to the
Senate and House of Representatives at the first session of the Congress next
after the date of the completion of such survey.

SEC. 5. That the Secretary of the Interior, in consultation with the
Secretary of Agriculture, shall cause to be conducted, within a reasonable time, a
survey of the water resources of the United States, and shall report thereon to the
Senate and House of Representatives at the first session of the Congress next
after the date of the completion of such survey.

SEC. 6. That the Secretary of the Interior, in consultation with the
Secretary of Agriculture, shall cause to be conducted, within a reasonable time, a
survey of the water resources of the United States, and shall report thereon to the
Senate and House of Representatives at the first session of the Congress next
after the date of the completion of such survey.

SEC. 7. That the Secretary of the Interior, in consultation with the
Secretary of Agriculture, shall cause to be conducted, within a reasonable time, a
survey of the water resources of the United States, and shall report thereon to the
Senate and House of Representatives at the first session of the Congress next
after the date of the completion of such survey.

SEC. 8. That the Secretary of the Interior, in consultation with the
Secretary of Agriculture, shall cause to be conducted, within a reasonable time, a
survey of the water resources of the United States, and shall report thereon to the
Senate and House of Representatives at the first session of the Congress next
after the date of the completion of such survey.

SEC. 9. That the Secretary of the Interior, in consultation with the
Secretary of Agriculture, shall cause to be conducted, within a reasonable time, a
survey of the water resources of the United States, and shall report thereon to the
Senate and House of Representatives at the first session of the Congress next
after the date of the completion of such survey.

SEC. 10. That the Secretary of the Interior, in consultation with the
Secretary of Agriculture, shall cause to be conducted, within a reasonable time, a
survey of the water resources of the United States, and shall report thereon to the
Senate and House of Representatives at the first session of the Congress next
after the date of the completion of such survey.

SEC. 11. That the Secretary of the Interior, in consultation with the
Secretary of Agriculture, shall cause to be conducted, within a reasonable time, a
survey of the water resources of the United States, and shall report thereon to the
Senate and House of Representatives at the first session of the Congress next
after the date of the completion of such survey.

SEC. 12. That the Secretary of the Interior, in consultation with the
Secretary of Agriculture, shall cause to be conducted, within a reasonable time, a
survey of the water resources of the United States, and shall report thereon to the
Senate and House of Representatives at the first session of the Congress next
after the date of the completion of such survey.

SEC. 13. That the Secretary of the Interior, in consultation with the
Secretary of Agriculture, shall cause to be conducted, within a reasonable time, a
survey of the water resources of the United States, and shall report thereon to the
Senate and House of Representatives at the first session of the Congress next
after the date of the completion of such survey.

SEC. 14. That the Secretary of the Interior, in consultation with the
Secretary of Agriculture, shall cause to be conducted, within a reasonable time, a
survey of the water resources of the United States, and shall report thereon to the
Senate and House of Representatives at the first session of the Congress next
after the date of the completion of such survey.

SEC. 15. That the Secretary of the Interior, in consultation with the
Secretary of Agriculture, shall cause to be conducted, within a reasonable time, a
survey of the water resources of the United States, and shall report thereon to the
Senate and House of Representatives at the first session of the Congress next
after the date of the completion of such survey.

SEC. 16. That the Secretary of the Interior, in consultation with the
Secretary of Agriculture, shall cause to be conducted, within a reasonable time, a
survey of the water resources of the United States, and shall report thereon to the
Senate and House of Representatives at the first session of the Congress next
after the date of the completion of such survey.

SEC. 17. That the Secretary of the Interior, in consultation with the
Secretary of Agriculture, shall cause to be conducted, within a reasonable time, a
survey of the water resources of the United States, and shall report thereon to the
Senate and House of Representatives at the first session of the Congress next
after the date of the completion of such survey.

SEC. 18. That the Secretary of the Interior, in consultation with the
Secretary of Agriculture, shall cause to be conducted, within a reasonable time, a
survey of the water resources of the United States, and shall report thereon to the
Senate and House of Representatives at the first session of the Congress next
after the date of the completion of such survey.

SEC. 19. That the Secretary of the Interior, in consultation with the
Secretary of Agriculture, shall cause to be conducted, within a reasonable time, a
survey of the water resources of the United States, and shall report thereon to the
Senate and House of Representatives at the first session of the Congress next
after the date of the completion of such survey.

SEC. 20. That the Secretary of the Interior, in consultation with the
Secretary of Agriculture, shall cause to be conducted, within a reasonable time, a
survey of the water resources of the United States, and shall report thereon to the
Senate and House of Representatives at the first session of the Congress next
after the date of the completion of such survey.

SECURE
Water Act

USGS
science for a changing world

U.S. Geological Survey Water Science Strategy—
Observing, Understanding, Predicting, and
Delivering Water Science to the Nation

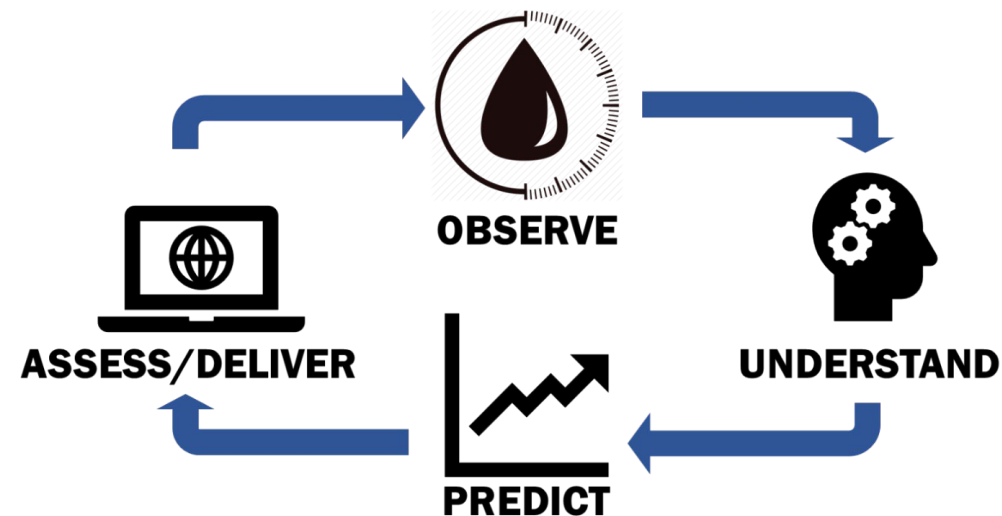


The National Academies of
SCIENCES • ENGINEERING • MEDICINE

CONSENSUS STUDY REPORT

FUTURE WATER
PRIORITIES FOR
THE NATION

Directions for the
U.S. Geological Survey
Water Mission Area



*Requires systematic advancement
of all four process components*

National Water Use Reporting Should Inform:

- How do we use water?
- Do we have enough water for future needs?
- How have we changed the way we use water, and why?
 - What impacts do land-use, climate, and socio-economic changes have on water needs?
 - What impacts do management decisions have on water use?
- How might our ways of using water change in the future?
 - How would that be affected by changes in water quality and quantity?



Program Priorities

Develop an operational system for estimating and forecasting water use and transfers nationally

Focusing in 4 critical areas:

1. Enhance the collection and completeness of water use information. Striving for automated transfer of necessary water use information, in coordination with partners
2. Build data driven and process driven models that establish nationally consistent estimation methodology and uncertainty in those estimates
3. Develop methods that quantify and trace the movement of water over the landscape
4. Integrate forecasting targets into models

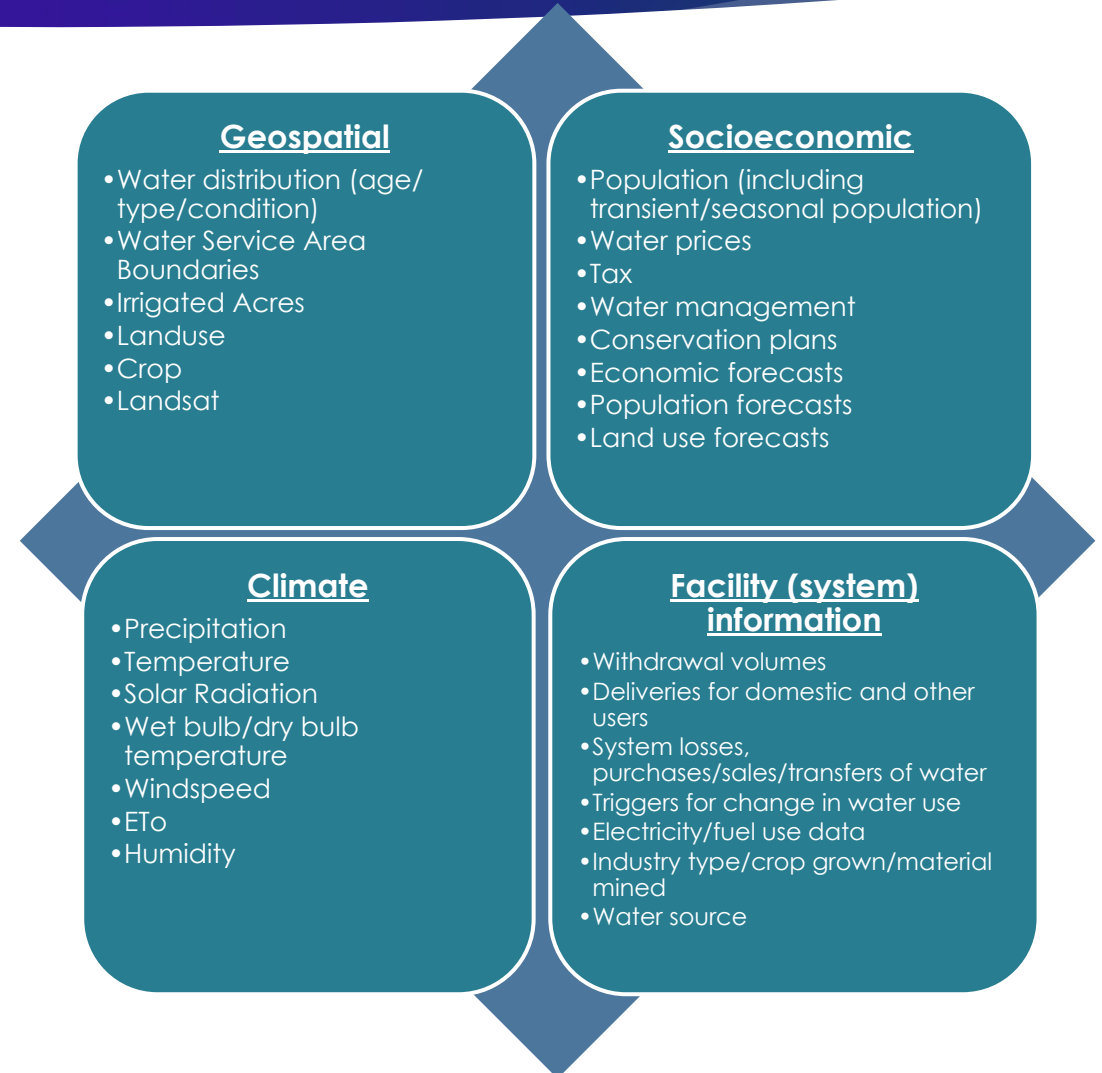
Collaborations are a must have!

- requires **collaboration with groups outside USGS**
- identifies opportunities where data and method development would be more efficiently performed through collaborations and investing in jointly aligning projects and products of other groups with USGS
- highlights data sharing challenges and limitations with current collections (data latency)



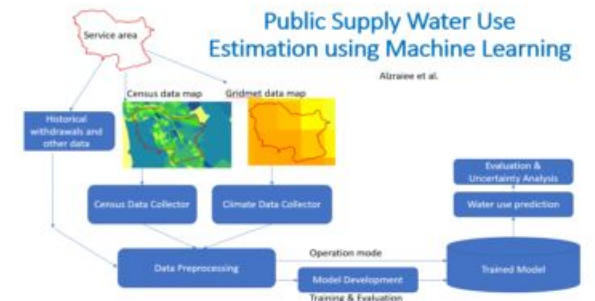
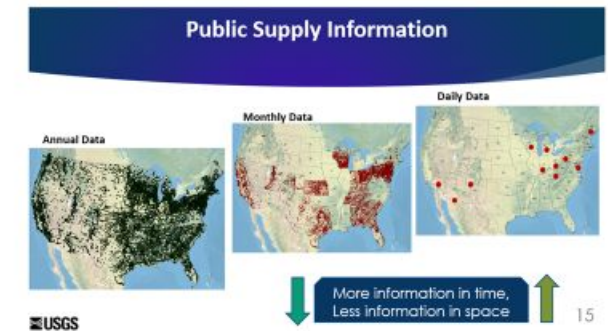
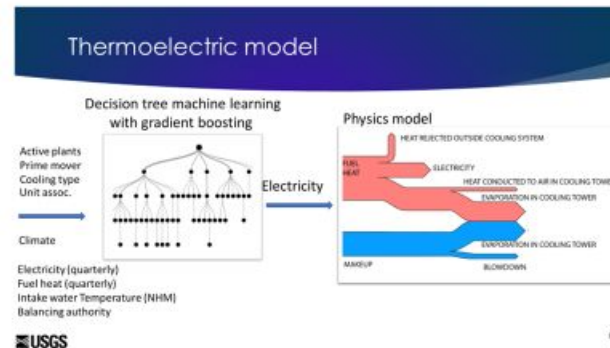
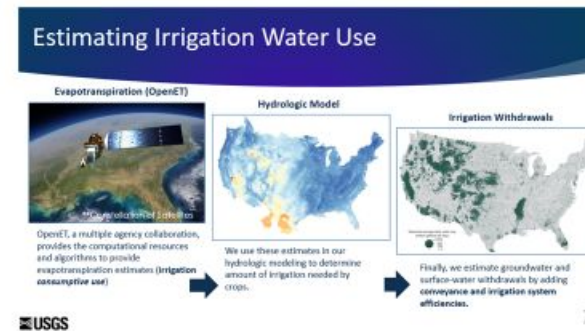
Water use information

- ▶ Daily facility/system/site-specific (by source GW-SW)
- ▶ Metadata
- ▶ Data to understand the timing, location, and quantity of water used
- ▶ Data evaluation
 - ▶ Gaps
 - ▶ Outliers
 - ▶ reporting differences
- ▶ Transferred in near-real time (automated)



Data driven and process driven models

- ▶ Nationally consistent methodology
- ▶ Reliance on local data: state agency and other federal partner data where available
- ▶ Withdrawals and consumptive use
- ▶ Sub-watershed resolution
- ▶ Monthly to daily resolution
- ▶ Historical, current, and seasonal to sub-seasonal forecasts
- ▶ Regularly refreshed
- ▶ Enhancements driven by uncertainty
- ▶ National in scope- CONSUS + AK, HI, PR-VI, other territories



Delivery of Water Use information

Near term

- Reanalysis of years 2000-2020 monthly withdrawals by HUC12 for TE, PS, IR
- Consumptive use for IR and TE (2000-2020)
- Spatial Products (regular refresh)
 - Water service areas spatial datasets
 - Irrigated lands (LANID)
 - Domestic per capita maps
- Visualizations communicating “state of science”

Longer term

- Withdrawal and consumptive use for *eight* categories (CONUS and AK, HI, PR-VI)
- Annual or finer refresh
- Enhancements to reduce uncertainty
- National Water Census
 - Routinely updated information of supply vs. demand.
- National IWAA Reports
 - Trends in use
 - Forecasts of use
 - Identify where there are challenges related to there not being enough water to meet demand

Thank you!

Jaime Painter, USGS Water Use Program Manager
jpainter@usgs.gov

