



# USU WATER RESEARCH LABORATORY ACCOUNTABLE BUDGET REVIEW

HIGHER EDUCATION APPROPRIATIONS SUBCOMMITTEE

ISSUE BRIEF

## SUMMARY

Joint Rule [3-2-501](#) requires each appropriations subcommittee to “create an accountable process budget for approximately 20% of the budgets that fall within the subcommittee’s responsibilities” ensuring “that each of the budgets for which the appropriations subcommittee has responsibility is the subject of an accountable budget process at least once every five years.” Subcommittees first implemented this rule during the 2019 Interim. During the 2020 Interim, the Legislature suspended the rule due to the heightened scrutiny budgets were already receiving in the pandemic.

The Higher Education Appropriations Subcommittee (HED) hears and considers the budgets of the Utah Board of Higher Education (UBHE) and Commissioner’s Office; degree-granting institutions -- Salt Lake Community College (SLCC), Snow College, Southern Utah University (SUU), University of Utah (UU), Utah State University (USU), Utah Tech University (UTU), Utah Valley University (UVU), and Weber State University (WSU); and technical colleges -- Bridgerland, Davis, Dixie, Mountainland, Ogden-Weber, Southwest, Tooele, and Uintah Basin. The committee has selected non-core education line items and programs for accountable budget reviews during the 2022 Interim.

This brief is intended to assist HED members review USU’s Water Research Laboratory line item by starting from zero and answering questions about policies and funding items that drive the budget. In HED’s August meeting we will provide recommendations on the extent to which funding should be included in a base budget bill for FY 2024.

## OVERVIEW

The mission of the [Utah Water Research Laboratory](#) is to conduct practical research in Utah, the nation, and the world directed at solving water-related problems, to inform water policy and management, and to train the next generation of water experts. The laboratory employs water faculty, engineers, scientists, laboratory technicians, and students from a variety of engineering and water science disciplines who are currently conducting about 250 funded research projects.

Please see the appendix for a budget deep dive checklist for this line item.

## FY 2024 BASE BUDGET

Per Joint Rule [3-2-402](#), if FY 2024 ongoing revenue estimates are equal to or greater than the FY 2023 ongoing appropriations, the laboratory’s FY 2024 base budget will be \$2,450,800 from the Education Fund. As of the 2022 General Session (GS) the university estimated it would end FY 2022 with approximately \$2,165,800 in nonlapsing balance or about 50.8 percent of its ongoing appropriation.

- As of the 2022 General Session the university budgeted \$4,235,800 of FY 2023 appropriations for salary and benefits for six budgeted full-time equivalent (FTE) employees and \$27,200 for current expense (an expenditure category which includes general operational expenses such as consultants, contracts, building maintenance, and small office supplies).

# USU WATER RESEARCH LABORATORY ACCOUNTABLE BUDGET REVIEW

## FIVE-YEAR BUDGET AND EXPENDITURE HISTORY

The following tables provide a five-year history of the laboratory's budgets and expenditures.

	19 Actual	20 Actual	21 Actual	22 Rev App	23 Approp
<b>Financing</b>					
General Fund	1,323,900	1,323,900			
General Fund, One-time		(1,060,400)			
Education Fund	854,300	939,600	2,259,000	2,293,800	2,450,800
Education Fund, One-time		(939,600)	1,944,000		
Federal Mineral Lease	1,471,400	1,093,000	999,600	1,745,800	1,745,800
Land Exchange Distribution	14,000	9,100	7,200	66,400	66,400
Beginning Nonlapsing	2,713,200	2,521,900	438,600	2,165,800	2,165,800
Closing Nonlapsing	(2,521,900)	(438,600)	(2,165,800)	(2,165,800)	(2,165,800)
Total	38,54,900	3,448,900	3,482,600	4,106,000	4,263,000
<b>Expenditures</b>					
Personnel Services	3,276,100	3,177,900	2,941,200	3,094,800	4,235,800
In-state Travel	59,000	45,900	3,700		
Current Expense	464,000	201,200	286,200	989,700	27,200
Capital Outlay	37,500		96,700		
Other Charges/Pass Thru		23,900	154,800	21,500	
Transfers	18,300				
Total	38,54,900	3,448,900	3,482,600	4,106,000	4,263,000

Over the past five years the Legislature increased ongoing appropriations for compensation and benefits. The Legislature appropriated \$50,000 one-time in FY 2019 to enhance operations and services and it reduced appropriations by \$56,000 in FY 2022 in conjunction with the onset of the COVID-19 pandemic. The table below shows appropriations by funding item for this period (appropriations are ongoing unless highlighted).

	FY 19	FY 20	FY 21	FY 22	FY 23
<b>Funding Item</b>					
Ongoing Appropriation	3,911,700	3,970,100	4,057,100	4,071,200	4,106,000
Compensation & Benefits	99,000	103,200	19,000	90,800	178,500
Reallocations & Adjustment	(40,600)	(16,200)	(4,900)		(21,500)
2.5% General Reduction				(56,000)	
Total	3,970,100	4,057,100	4,071,200	4,106,000	4,263,000

## PERFORMANCE MEASURES

Performance measures are “meant to tell the story of investments of taxpayer dollars, help stakeholders navigate and understand state government, and facilitate data-driven decision making within agencies” ([State of Utah Performance Measure Playbook](#), p. 3). Questions that may be helpful when assessing the quality of a performance measure include:

- Is it meaningful? Does it tie to the mission of the division/agency?
- Is it focused on customer needs and demands?
- Is it simple enough to understand? Does it avoid ambiguous concepts?
- Are the data available, accurate, and reliable?
- Is it cost effective to collect and report the data?

- If the measure captures an output, does it influence an outcome?
- Do you have a meaningful target (reasonable, not stretch or too conservative)?
- For new funding item performance measures, can the data be collected and reported within a year?

Beginning in the 2017 General Session through the 2020 General Session the Legislature approved intent language in appropriations bills requiring USU to report performance measures to HED as follows:

- Peer-reviewed journal articles published (target = 10);
- Number of students supported (target = 150); and
- Research projects and training activities (target = 200).

The Legislature has not included performance measures intent language for the laboratory in the past two general sessions.

Recommendation: consider the previous measures or new measures to include in appropriations bills in the 2023 General Session.

## **APPENDIX: BUDGET DEEP DIVE CHECKLIST (SUBMITTED BY INSTITUTION)**

**Purpose:** Budget deep dives are intended to allow legislators a more thorough review of program outcomes, spending, and finance in the legislative interim session. But deep dives answer four broad questions: What are we in government attempting to accomplish? How are we organized to accomplish it? What are we buying? How are we paying for it?

NAME OF FUNCTION: Utah State University – Water Research Laboratory – Water Research Laboratory

### **What We Are Attempting to Accomplish**

1. What authorizes delivery/provision of the function (statute, intent, rule)?

The Utah legislature authorized the establishment of the Utah Water Research Laboratory (UWRL) at Utah State University (USU) in 1959 as an important component of the State of Utah's commitment to water resources research, assuring cutting-edge solutions to the State's water problems. The opening of the UWRL building in 1965 provided the State and USU with a world-class research facility to support the work of faculty, students, and water professionals from across the state and around the world. Today, the UWRL continues its service as one of the most respected university-based facilities performing research and providing practical solutions to the most pressing water related problems facing Utah, and indeed our nation and the world.

The mission of the UWRL is to conduct practical research in Utah, the nation, and the world directed at solving water-related problems, to inform water policy and management, and to train the next generation of water experts. The laboratory employs water faculty, engineers, scientists, laboratory technicians, and students from a variety of engineering and water science disciplines.

These are the relevant statutes:

<https://le.utah.gov/xcode/Title53c/Chapter3/53c-3-S203.html>

<https://le.utah.gov/xcode/Title59/Chapter21/59-21-S2.html>

2. What other activities are undertaken without explicit authority?

None.

3. What alternative government and non-government resources exist to achieve these outcomes? Why is the state involved?

Utah is a dry state where water is a precious, critical, and limited resource. Expertise is needed to generate the knowledge, grow the workforce needed, and to manage this precious resource. While there are many organizations that are involved with water issues across the state (e.g., state agencies such as the Departments of Natural Resources and Environmental Quality and river basin conservancy districts) as well as private organizations, the combination of research, higher education, and outreach that are part of and supported by the land grant mission of USU makes it a unique and capable organization to host the research, knowledge generation, and workforce development services provided by the UWRL. The UWRL is a diverse center of excellence for generating knowledge related to water challenges. It fills an important role in Utah, the U.S., and as part of a global community of water research facilities, with the interdisciplinary expertise to develop better ways to measure, monitor, model, understand, and manage 21st century water resources. Good water management recognizes the value of information from many disciplines—from how a single water molecule behaves to the constraints and opportunities created by state or national water laws and policies. Through its support of the UWRL, Utah is investing in solving current Utah Water problems, the creation of new knowledge through research, and in educating the next generation of water engineers and experts that are critical to the ability of our state and the nation to deal with these water challenges now and the future.

### **How We Are Organized**

4. What organizations are associated with this function?

The UWRL is a research facility operated by USU, with primary affiliation with USU's College of Engineering and Department of Civil and Environmental Engineering. The research programs of the UWRL directly address current and future water resources needs of the state, and most are relevant to national and worldwide issues as well.

The UWRL's projects are organized into five major research program areas:

- Environmental Engineering
- Hydraulics
- Measurements, Sensing, and Information Systems
- Water Education, Outreach, and Technology Transfer
- Water Resources

In order to focus research on problems and needs that are both relevant and current, UWRL engineers and scientists work closely with state and local government agencies and are actively involved with and serve on many state and local organizations, committees, and boards, as well as a wide range of local, state, national and international professional organizations. The UWRL Director, Associate Directors, and faculty members meet periodically with state and federal agency managers and personnel from local water organizations to discuss research needs and identify opportunities for the UWRL to respond to these needs. These meetings and state, national, and international associations give UWRL researchers influence in and a greater understanding of critical water-related research efforts around the nation and the world that are applicable to Utah.

The State of Utah provides state-appropriated funds (SAF) and Mineral Lease funds (MLF) for research at the UWRL. UWRL Faculty also compete for and receive extramural funding from other federal, state, and private sources, much of this in response to research grants submitted to agencies such as the National Science Foundation, or through contacts based on the reputation of faculty and the lab. This unique funding portfolio enables the UWRL and the Department of Civil and Environmental Engineering at USU to maintain one largest and most technically diverse water-related faculty in the country. This depth of expertise enables researchers at the UWRL to tackle large, interdisciplinary research problems, and also provides unique opportunities for our students to receive a depth of education in water science and engineering that they cannot receive elsewhere. The UWRL's reputation also helps USU attract talented students and accomplished faculty who contribute to the UWRL's mission.

UWRL faculty actively participate in professional water and environmental organizations, which helps bring recognition to the lab and sustain its reputation while providing exposure to worldwide research and best practices. This helps the UWRL identify current and future research needs that will affect Utah and to identify and develop projects that will help to assure Utah's ability to meet the water needs of its citizens and economy in the future. Broadly, meeting our future water needs requires deep understanding of surface and groundwater resources in the context of climate change and environmental variability, the complex physical and biological processes that affect water quantity and quality, and the dynamic interaction of human activity in land and water use in our arid environment. At the UWRL we work hard to recruit and retain the best faculty with expertise to identify and address upcoming problems and to fund their research through state and extramural funding.

5. What are the missions of the organizations associated with that function?

The mission of the Utah Water Research Laboratory is to conduct practical research in Utah, the nation, and the world directed at solving water-related problems, to inform water policy and management, and to train the next generation of water experts. You can learn more about our mission and activities at <https://uwrl.usu.edu/>.

6. What outcomes are achieved by the organization associated with this function?

- a. Highly trained and capable students who graduate with advanced degrees and water-related engineering and research experience.
- b. Advances in state of the science water education and research reported in scholarly publications in peer reviewed journals and scholarly presentations at professional conferences.
- c. Completed research projects with delivered results relevant to Utah water resources, water management, and water issues.
- d. Short courses and training workshops delivered for water professionals.
- e. Extramural research funding from federal, state and private sources that produces additional research outcomes enabled by the specialized expertise and unique research facilities at the UWRL.
- f. Expertise contributed to state and local organizations, committees, and boards, as well as a wide range of local, state, national and international professional organizations.

7. What data is collected/reported to document/demonstrate progress toward the outcome?

The UWRL considers the following metrics to demonstrate progress and impact:

- a. Number of active research projects.
- b. Scholarly publications in peer reviewed journals.
- c. Scholarly presentations at professional conferences.
- d. Number of short courses and training workshops along with number of attendees.
- e. Graduate research assistantships funded and students supported.
- f. Undergraduate students supported to work on research projects.
- g. Graduate degrees granted associated with UWRL research.
- h. Extramural funding received.
- i. Service of UWRL faculty and professional staff with local organizations, committees, boards, and other professional organizations.

8. How are appropriations structured to accomplish this function?

State appropriation, mineral lease and state institutional trust lands revenue are used to support the salaries of 19 faculty jointly appointed with academic departments at USU, primarily the Civil and Environmental Engineering Department; and the salaries of 11 support staff who provide business services, communications and administrative assistance. Funds also support the operation of the lab facilities.

9. In what units of measure are outputs reported, how and why have those outputs changed over time?

The units of measure for the outputs are counts, or dollars for extramural funding received.

Output changes for the last 5 years are given below

UWRL Outcomes by Fiscal Year	2017	2018	2019	2020	2021
Number of active research projects	224	251	239	193	176
Scholarly publications in peer reviewed journals.	153	102	68	101	68
Scholarly presentations at professional conferences	164	126	152	47	72
Short courses and training workshops	15	11	12	8	34
Graduate research assistantships funded	43	48	48	50	63
Undergraduate students supported to work on research projects	78	65	66	83	47
Graduate degrees granted associated with UWRL research	19	20	23	10	27
Extramural funding received	\$3,420,000	\$4,930,000	\$3,350,000	\$7,660,000	\$3,831,729

Outcomes have remained generally steady with year to year variability. There has been a decline in the count of projects as projects have become larger and due to the COVID-19 pandemic. There was a decline in conference presentations and short courses in 2020 due to the COVID-19 pandemic, but these are picking up now and are anticipated to return to pre-pandemic levels.

10. Are there standards (industry, national, etc.) for output or output per unit of input? How do they compare to this?  
 The UWRL is one of largest and most technically diverse university-based water research facilities in the United States and is considered one of the most respected facilities of its kind. The combination of physical hydraulic modeling, environmental quality, field and computer-based research makes it well suited to tackle the interdisciplinary challenges of modern water research. The UWRL serves as the Utah state water institute within the National Institutes for Water Resources (NIWR) and UWRL leadership (director, business services and communications staff) participate in NIWR activities to keep up on national trends and opportunities. UWRL engineers and scientists work closely with state and local government agencies and are actively involved with and serve on many state and local organizations, committees, and boards, as well as a wide range of local, state, national and international professional organizations. This service aligns UWRL work with industry and agency needs.

The UWRL is part of USU, with faculty output expectations consistent with the norms of a land grant University. USU has just achieved the Carnegie R1 Classification indicating that overall USU joins institutions in the U.S. with the highest level of research productivity. Faculty at the UWRL are, through an annual review process conducted through the UWRL, Department of Civil and Environmental Engineering, and College of Engineering along with rigorous evaluation via tenure and promotion processes, held to the norms for output of an R1 research university in terms of scholarly publications, extramural research funding, and research impact. These same processes are used to ensure effectiveness in teaching and service, consistent with established roles for faculty members affiliated with the UWRL.

11. To whom is performance data reported?  
 The UWRL prepares an annual Mineral Lease Fund report that is transmitted to the state office of the Legislative Fiscal Analyst. This report details the use of MLF funding in compliance with House Bill 103 passed in 1993. All UWRL mineral lease funding reports are available online at <https://uwrl.usu.edu/research/mlf-reports>. These reports include performance data as well as additional details on how the UWRL’s research programs are organized. They also include details of the UWRL’s information dissemination and professional service activities. The UWRL also prepares an annual report (<https://uwrl.usu.edu/research/annual-report>) and twice yearly newsletter (<https://uwrl.usu.edu/research/newsletter>). These highlight specific and noteworthy research outcomes and are disseminated widely to a mailing list that includes many in the Utah state legislature, state government, and state agencies involved in water related issues. UWRL mineral lease and annual reports are also provided to USU’s administration.

Within USU, faculty and staff performance data is reported within USU to leadership in appropriate departments and the College of Engineering.

12. What decisions are based on reporting data?  
 UWRL research programs are planned to assure Utah’s ability to meet the water needs of its citizens and economy in the future. The professional service associations of UWRL researchers helps the UWRL to identify current and future research needs that will affect our state and is used in project planning to assure that projects are relevant to Utah.

Faculty and staff performance data is used by UWRL leadership for promotion and career advancement decisions as well as staffing adjustments.

13. How might you recommend the authorization, mission, or performance measurement change?  
 We do not recommend changes in these items at this time.

**What We Are Buying**

14. What is the largest category of expenditure for the organization and how big is it?  
 The largest category of expenditure for the UWRL is in compensation, including salaries, wages, and fringe benefits. These expenditures are totaled by year below. Included in these numbers are support for faculty salary, graduate research assistantships to support graduate students working on water-related research at the UWRL, and staff who provide the support for our researchers to be productive.

2017	2018	2019	2020	2021
3,571,098	3,420,593	3,276,131	3,177,927	3,070,960

15. How does this expenditure support the above justification/authorization?

Impactful research requires creative and talented people. Expenses to support faculty, staff, and students are fully consistent with the research mission and authorization.

16. What is that category of expenditure buying (how many/costs per unit)?

The expenditure is buying research solutions to water problems, educational, and training outcomes comprising new knowledge, a highly trained and productive workforce through students trained and graduated, and better management and stewardship of water resources through the practical application of the research outcomes produced at the UWRL.

17. How does the above relate to units of output?

The UWRL remains at the forefront of water research. Faculty are highly accomplished and productive in outcome units of scholarly publications and presentations as well as degrees granted. They are also engaged within the state, nationally and internationally.

18. How has the expenditure changed over five years relative to the units of output?

The following is the UWRL's total annual research expenditure for each of the past 5 years. Variability is due to extramural grant productivity and fluctuations in the mineral lease funding received. For every dollar of state funding, we get two dollars in research funding as a return on investment that adds value to the research we do for the state.

2017	2018	2019	2020	2021
\$7,904,781	\$7,719,954	\$8,611,764	\$7,982,717	\$8,386,868

19. Are there any outliers/anomalies in current or budgeted spending in this category?

The UWRL line item experienced reductions – onetime and ongoing – due to the pandemic. The mineral lease funding received is also significantly variable and in recent years has been less than budgeted. This requires holding funds in reserve in anticipation of differences between what is budgeted and received.

	2017	2018	2019	2020	2021
State Appropriation funding budgeted and received	\$2,003,600	\$2,099,500	\$2,159,600	\$2,306,400	\$2,250,400
Mineral Lease + SITLA funding received	\$1,609,010	\$1,486,510	\$1,471,551	\$1,092,998	\$1,003,197
Mineral Lease + SITLA funding budgeted	\$1,812,200	\$1,812,200	\$1,812,200	\$1,812,200	\$1,812,200
Shortfall in MLF+SITLA received	\$203,190	\$325,690	\$340,649	\$719,202	\$809,003

20. Does the amount of expenditure for a category change significantly in accounting period 12 or 13? Why?

No.

21. How might you recommend this expenditure category change based on the above?

No recommendation.



**How We Are Paying For It**

22. What is the largest fund or account from which resources are drawn to support the above expenditures and how big is it?  
 FY22 Budget      Education Fund    2,293,800

23. What are the revenue sources for that fund or account and what are their relative shares?

	<u>Tax funds</u>	<u>Mineral Lease</u>	<u>Other</u>
FY22 Budget	2,293,800	1,745,800	66,400
	55.9%	42.5%	1.6%

24. Is the source one-time or ongoing and do ongoing sources match or exceed ongoing expenditures?  
 Ongoing. The sources match the budgeted expenditures each year.

25. How has the source changed over time relative to expenditures and units of output?  
 The leadership of the lab has managed expenditures within the budget provided and has continued to secure grants and contracts to accomplish its mission. The leadership has kept costs as low as possible without losing effectiveness.

26. Are there any outliers/anomalies in current or budgeted periods for this source?  
 This line item experienced reductions – onetime and ongoing – due to the pandemic.

27. Are there unencumbered balances in a source that relate directly to his function/organization? If so, how have those balances changed over time?  
 Yes. See data in #32. The balances in this line item are encumbered, just not by purchase orders. The Lab’s research mission requires it to commit funds to multi-year projects. These funds are expended for research projects that span 2 to 5 years.

28. What is a reasonable balance and why?  
 According to policies & procedures of the Utah Board of Higher Education, USU is allowed (encouraged) to maintain balances in the range of 4% to 7%. <https://public.powerdms.com/Uta7295/tree/documents/2022262>.

29. Is the availability of sources (grants or previous “building blocks”), rather than mission or objective, driving expenditures?  
 Both the availability of funds and the mission drive expenditures. The UWRL only expends funds that are available, and outcomes in terms of scholarly publications, scholarly presentations, support for students in pursuit of the mission, etc. are constrained by the availability of funds and the success of faculty in obtaining extramural funding.

30. Are other sources available to support the same expenditure?  
 No.

31. How might you recommend this revenue category change based on the above?  
 No change recommended.

**Do We Balance?**

32. What are total expenditures and total sources? Do they equal one another?

	FY17	FY18	FY19	FY20	FY21	FY22 Budget
Sources CF	3,367,964	2,970,345	2,713,202	2,521,913	438,657	2,165,839
Sources Budgeted	3,612,933	3,605,255	3,663,632	1,365,628	5,209,813	4,106,000
Expenditures	4,010,552	3,862,398	3,854,921	3,448,884	3,482,631	4,106,000
Difference	2,970,345	2,713,202	2,521,913	438,657	2,165,839	2,165,839

33. Have all appropriated or authorized sources been expended at year-end?  
See data in #32.

34. How have nonlapsing appropriation balances (if any) changed over time?  
See data in #32.

35. Are fees or taxes supporting a function, and are those fees or taxes reasonable?  
N/A