STATE OF CALIFORNIA
Budget Change Proposal - Cover Sheet
DF-46 (REV 03/25)

Fiscal Year	Business Unit Number	Department
2026-2027	3480	Department of Conservation

Hyperion Budget Request Name	Relevant Program or Subprogram
3480-006-BCP-2026-GB	2420-Earthquake Engineering, Strong Motion Instrumentation

Budget Request Title
Maintaining and Strengthening Resilience of California's Seismic Network

Budget Request Summary
The Department of Conservation's California Geologic Survey (CGS) requests $2,126,000 in fiscal year 2026-27 and $1,870,000 in 2027-28, 2028-29, and 2029-30 from the Strong Motion Instrumentation and Seismic Hazard Mapping Fund and 10 permanent positions to maintain and upgrade the state's strong motion network, the largest seismic network in California.

Requires Legislation (submit required legislation with the BCP)	Code Section(s) to be Added/Amended/Repealed
☐ Trailer Bill Language ☐ Budget Bill Language ☒ N/A	

Does this BCP contain information technology (IT) components? ☐ Yes ☒ No	Department CIO	Date

For IT requests, specify the project number, the most recent project approval document (FSR, SPR, S1BA, S2AA, S3SD, S4PRA), the approval date, and the total project cost.

Project No. **Approval Date:**

Project Approval Document: **Total Project Cost:**

If proposal affects another department, does other department concur with proposal? ☐ Yes ☐ No

Prepared By	Date	Reviewed By	Date
Jeremy Lancaster	1/8/2026	Clayton Haas	1/8/2026
Department Director	**Date**	**Agency Secretary**	**Date**
Jennifer Lucchesi	1/8/2026	Wade Crowfoot	1/8/2026

Department of Finance Use Only

Additional Review: ☐ Capital Outlay ☐ ITCU ☐ FSCU ☐ OSAE ☐ Dept. of Technology

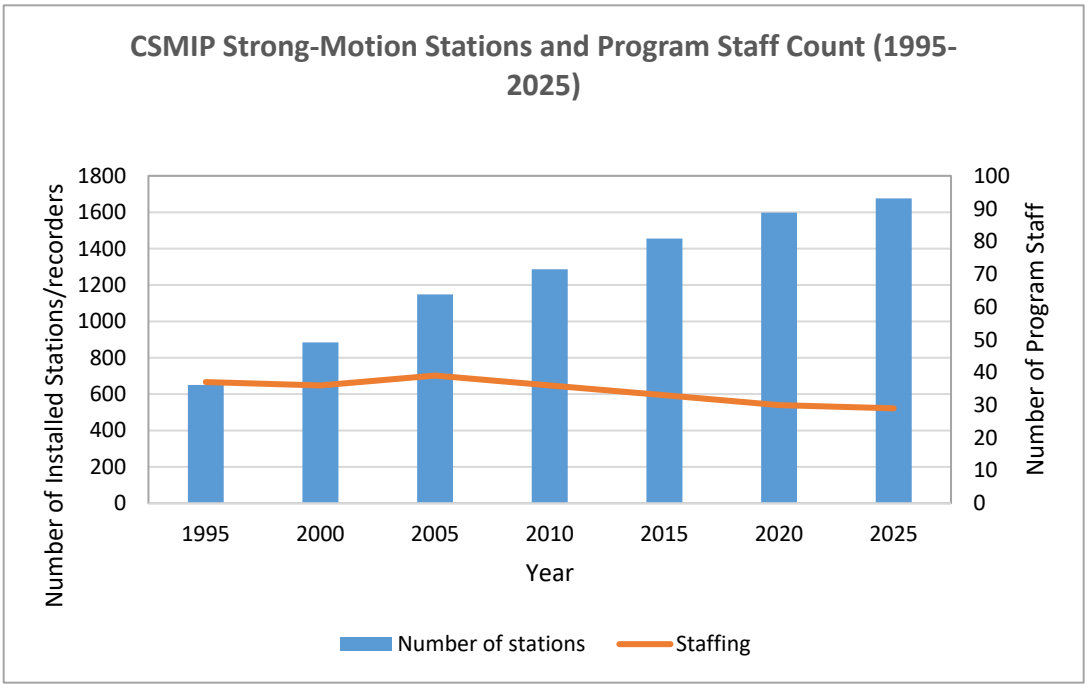
Principal Program Budget Analyst	Date submitted to the Legislature
Vy Nguyen	1/9/2026

A. Problem Statement

The Department of Conservation lacks sufficient staffing and funding to maintain, operate, and modernize the nearly 1400 seismic monitoring stations and over 10,000 seismic sensors. Specifically, approximately 30 percent of sensors are overdue for maintenance inspections and over 20 percent of stations are inoperable, creating a significant vulnerability in the state's ability to monitor and respond to seismic events. The Department's California Geologic Survey (CGS) requests $2,126,000 in 2026-27 and $1,870,000 in 2027-28, 2028-29, and 2029-30 from the Strong Motion Instrumentation and Seismic Hazard Mapping Fund and 10 permanent positions to maintain the state's strong motion network, the largest seismic network in California.

In 2022-23 and 2023-24, the California Strong Motion Instrumentation Program (CSMIP) received one-time funding to replace over 1,100 obsolete and outdated seismic recorders at 820 stations across California. This is roughly 78 percent of the 1,400 seismic recorders deployed across the state. As of August 15, 2025, the SMIP has upgraded 482 (59 percent) of those stations. The program has designated a project lead and supporting staff to replace the remaining obsolete recorders over the next three years. In addition, the Department has engaged two contractors to assist with upgrading equipment in structures that require extra resources due to the complexity of installation. For example, a complete instrumentation project for a structure (building, bridge, or dam) would take a CSMIP team of three or four staff a minimum of five to six weeks to complete. This includes pre-work planning and post-work documentation. CGS staff will also be responsible for inspecting and approving the reinstallation of seismic recorders at each of these stations. Having the contractor take on these larger projects from the 2022 instrumentation upgrade project, CSMIP staff can complete a greater number of station upgrades within the same timeframe. The CSMIP, a critical component of the California Earthquake Early Warning system (ShakeAlert®) and earthquake planning, response and recovery, requests these additional positions to accelerate the replacement of the remaining obsolete instruments and to maintain the recommended maintenance schedule for the entire network.

Over the past two decades, CSMIP has significantly expanded its seismic monitoring network. Since 2000, the number of strong-motion stations has grown from approximately 800 to nearly 1,400 instruments across California, including over 940 ground response sites (272 of which support the California Earthquake Early Warning), 274 buildings, 129 lifeline structures (such as bridges, dams, wharves, and tunnels), and 41 geotechnical arrays. These stations encompass more than 10,000 seismic sensors. While this expansion has greatly enhanced the state's seismic monitoring capabilities, it has also introduced major challenges. Chief among these is the lack of sufficient staffing to maintain, operate, and modernize this growing infrastructure. Despite the increased number of stations and sensors, staffing levels have not kept pace. As a result, approximately 30 percent of instruments are currently overdue for maintenance inspections, and over 20 percent of stations are inoperable. This has created a substantial vulnerability in California's seismic monitoring and emergency response systems.



In addition to maintenance challenges, the rapid evolution of data recording and transmission technologies over the past two decades has placed further strain on CSMIP operations. Strong motion instrumentation has shifted from film-based systems to high-resolution digital systems capable of continuous recording. Data transmission methods have also evolved, moving from analog phone lines to modern digital technologies such as cellular, satellite, and radio telemetry. Furthermore, the analog modems were also limiting the speed and volume of data transfer from field stations. These outdated systems cannot meet the demands of current applications, including ShakeAlert®, emergency response coordination, or rapid post-event assessment of structural damage. While CSMIP has secured funding for upgrading equipment through the prior BCP, the program lacks the staff necessary to implement these upgrades timely and support ongoing maintenance and operations of the entire network.

Resource History

(Dollars in thousands)

Program Budget	**PY – 4**	**PY – 3** **21-22**	**PY – 2** **22-23**	**PY-1** **23-24**	**PY** **24-25**	**CY** **25-26**
Authorized Expenditures	$2,579	$2,645	$2,815	$2,851	$3,032	$3,140
Actual Expenditures	$2,176	$2,406	$2,427	$2,805	$2,805	$3,032
Revenues	N/A	N/A	N/A	N/A	N/A	N/A
Authorized Positions	30.0	30.0	30.0	29.0	29.0	29.0
Filled Positions	27.0	25.0	23.0	26.0	26.0	26.0
Vacancies	3.0	5.0	7.0	3.0	3.0	3.0

Workload History

Workload Measure	PY - 4	PY - 3	PY - 2	PY-1	PY	CY
Total number of regular maintenance inspections per year	276	248	246	332	374	38
Total number of obsolete recorders upgraded	88	79	124	169	155	20

B. Justification

Despite all the program's achievements, CSMIP currently lacks sufficient staff resources to maintain and operate this critical statewide network at the level required by statute and partner expectations. Presently:

- Over 340 stations still require replacement as the instruments are outdated or obsolete and no longer supported by the manufacturer.
- Within the next five years, the remaining 300 seismic recorders from the original 1,400 stations will reach end of life and require replacement.
- Approximately 30 percent of seismic instruments are overdue for maintenance inspections, resulting in more than 20 percent of stations being inoperable. Also 25 percent of the stations that contribute to the CEEWS have a data transmission delay (latency > 5 seconds) for transferring data to the ShakeAlert® server. This delay makes the station data ineffective for early warning. Additional staff would allow for more detailed investigation to determine the cause and possible solutions of the CEEWS latency.

Year	Active Stations	Stations Overdue for Routine Maintenance	Percentage of Stations Overdue for Routine Maintenance
2010	1150	46	4%
2015	1257	190	15%
2020	1366	350	25%
2025	1382	423	30%

- These staffing shortages hinder CSMIP's capacity to deliver timely earthquake data to the Governor's Office of Emergency Services (Cal OES) and other state partners and constrain our ability to fully support the California Earthquake Early Warning System (CEEWS).
- The program's technician-to-sensor ratio is 1:500, more than twice that of comparable partner networks, limiting the ability to maintain, troubleshoot, and upgrade equipment in a timely manner.

In addition to maintaining its own stations, CSMIP's collaborative workload with state and federal partners has expanded dramatically. Partnerships with Cal OES, the Department of Health Care Access and Information (HCAI), Caltrans, the Department of Water Resources (DWR), and other governmental agencies have driven significant growth in network size and operational responsibilities. For example:

- In collaboration with Cal OES, CSMIP has established a new real-time data system capable of receiving and processing data from up to 1,500 real-time recorders.

- Advancements in monitoring technology now enable closer engagement with stakeholders, providing near-real-time structural health information to support rapid post-earthquake decision-making and expedite the return to service of critical infrastructure.

- CSMIP operates and maintains 272 seismic stations dedicated to the CEEWS, a mission established by Government Code sections 8585–8587, which designates Cal OES as the lead agency for earthquake emergency and disaster response services.

Beyond ongoing regular maintenance and operations, CSMIP is in the midst of the Statewide Strong Motion Instrumentation Upgrade Project, launched in 2022 and expected to span over five years. This initiative involves replacing obsolete seismic equipment at more than 820 stations statewide and 1,400 recorders, modernizing the network to enhance accuracy, reliability, and operational efficiency. Currently, CSMIP staff are balancing this large-scale upgrade effort with their original responsibilities, creating an unsustainable workload that threatens network performance if left unaddressed.

CSMIP also manages several active contracts with state partners to instrument critical infrastructure, such as essential facilities, lifeline systems, and major conveyance networks—to strengthen California's seismic resilience. These contracts are vital for improving data coverage, advancing engineering research, and enabling evidence-based policy and design decisions that directly benefit public safety and community resilience.

This proposal includes the following positions to maintain the state's strong motion network:

- Six (6) Seismological Instrument Technicians (SIT) (two each at the SIT I, II, and III levels). These positions are primarily field positions to test, repair, and replace seismic instruments across the state. Their role is to remove and replace outdated and obsolete seismic instruments and troubleshoot and repair seismic instruments through remote access and while in the field when communication is lost.

- One (1) Civil Engineer to support emergency management teams in assessing the condition of critical structures to ensure their timely return to service after earthquakes. Assist in the planning and design of sensor placement of new and existing structures and processing structural data for engineering interpretation.

- One (1) Research Data Specialist I and one (1) Research Data Analyst. These positions support the operation of the Strong Motion Automated Recovery and Analysis (SARA) System and real-time data systems and their applications. They process strong motion data received after an earthquake and in real-time ensure the strong motion data are properly formatted and exchanged with our stakeholders and collaborators.

- One (1) Precision Electronic Specialist. This is a specialist level position that manages SMIPs larger instrumentation projects. They act as a technical expert in the instrumentation of ground stations and structures and will often direct the work of the SITs.

The requested staff resources are essential to:

- Restore full maintenance cycles, ensuring optimal network performance and data availability.

- Reduce the number of inoperable stations and improve technician-to-sensor ratios in line with industry-best practices.

- Fully support the operational and data requirements of CEEWS and other partner-driven initiatives.

- Maintain momentum on the Statewide Strong Motion Instrumentation Upgrade Project without compromising ongoing maintenance and monitoring obligations.

- Enhance responsiveness to post-earthquake events, providing critical information to emergency managers, engineers, and policymakers.

This investment directly supports statewide resilience and safety priorities, including the California Multi-Hazard Mitigation Plan and the California Resilience Challenge.

In summary, without these additional resources, CSMIP cannot sustain its expanded mission, meet statutory obligations, or deliver the high-quality, timely earthquake data that California's emergency management, infrastructure resilience, and public safety systems depend on. With them, CSMIP will be positioned to operate at full capacity, safeguard lives, protect infrastructure, and uphold California's global leadership in earthquake monitoring and engineering science.

C. Departmentwide and Statewide Considerations

California lives with a constant and unavoidable earthquake threat capable of disrupting the state's economy, damaging critical infrastructure, and endangering lives. Historical events such as the 1989 Loma Prieta and 1994 Northridge earthquakes demonstrated how a single seismic event can cause billions of dollars in damage, displace thousands, and require years of recovery. Today, the growing interconnectedness of our infrastructure, transportation, utilities, health systems, and communications means that the impact of a major earthquake could be even more far-reaching.

CGS works to reduce these risks by providing actionable geologic hazard and climate adaptation information that informs policy, planning, resource development, and infrastructure investment at the state, county, and local levels. This mission directly aligns with statewide strategic goals such as California's Multi-Hazard Mitigation Plan, the Strategic Growth Council's Climate Resilience Framework, and Cal OES' Resiliency Initiatives.

Within CGS, CSMIP is critical to advancing these goals. CSMIP collects and delivers earthquake data that:

- Powers the California Earthquake Early Warning system, enabling alerts that give people and organizations precious seconds to take protective action before shaking begins.
- Evaluates the structural health of essential facilities including hospitals, bridges, dams, and emergency operation centers supporting rapid and safe return to service.
- Provides engineers and researchers with high-quality seismic data for dynamic structural analysis, helping them design more resilient buildings and retrofit vulnerable structures.
- Informs updates to seismic design codes, ensuring that California's building standards remain among the most advanced in the world for earthquake safety.

This work has a direct and measurable equity impact. Vulnerable and underserved communities, often in rural areas or older urban neighborhoods face the highest risk due to aging infrastructure, limited access to retrofitting resources, and fewer recovery options. By strengthening seismic monitoring and delivering accurate, accessible data, CSMIP ensures that building codes, emergency planning, and infrastructure investments account for the needs of these communities. This reduces the disproportionate harm they experience after major earthquakes, speeds recovery, and helps close the resilience gap between well-resourced and under-resourced regions.

However, staffing restrictions have hindered CSMIP's ability to fully meet its mandate. Current limitations prevent the program from maintaining, upgrading, and deploying instruments at the pace required to keep up with California's evolving infrastructure and seismic risk profile. This proposal would remove those barriers, enabling CSMIP to:

- Expand the monitoring network in high-risk and underserved areas.
- Maintain and upgrade instruments for maximum data reliability.
- Respond rapidly to earthquake events with post-earthquake assessments.
- Continue collaborating with universities, state agencies, and the engineering community to improve earthquake safety statewide.

Fully funding and staffing CSMIP is not only a technical need it is a strategic investment in public safety, statewide economic security, and equitable disaster resilience. With these resources, CSMIP can operate at full capacity, strengthening California's readiness and ensuring that every

community - regardless of geography or income - has access to the protections and benefits of world-class seismic monitoring and engineering science.

D. Outcomes and Accountability

Increasing staffing levels within the CSMIP will directly improve network performance, earthquake data delivery, and statewide seismic resilience. The requested positions will enable CSMIP to meet statutory obligations, fulfill commitments to partner agencies, and align with statewide safety and resiliency priorities such as the California Multi-Hazard Mitigation Plan and the CEEWS.

Expected Outcomes

1. Accelerated Replacement of Outdated Equipment
    - Expedite the removal and replacement of outdated seismic recorders across California's network of about 1,400 instruments.
    - Fully leverage manufacturer warranties for new equipment, reducing long-term maintenance costs.
    - Support the multi-year Statewide Strong Motion Instrumentation Upgrade Project, replacing more than 820 stations with state-of-the-art recorders and sensors.
2. Improved Real-Time Earthquake Response Data Delivery
    - Provide rapid, high-quality seismic data to partner agencies, including Caltrans, HCAI, DWR, and Cal OES.
    - Reduce data delivery latency to ensure decision-makers have actionable information during the earliest moments of earthquake response.
3. On-Schedule Maintenance Cycles
    - Achieve full compliance with recommended inspection and calibration schedules for all seismic stations, reducing the proportion of overdue maintenance from the current 30 percent to less than 5 percent within two years.
    - Extend equipment life cycles and reduce unplanned downtime.
4. Restoration of Lost Communication Links
    - Repair and restore communication to the ~20 percent of stations currently offline or inoperable due to delayed maintenance.
    - Increase operational readiness from the current 80 percent to over 95 percent network availability.
5. Enhanced Data Processing for Earthquake Early Warning
    - Expand the processing capacity and application of earthquake data for CEEWS, improving accuracy and reliability of alerts.
    - Reduce the time from seismic detection to public alert issuance, directly supporting Government Code sections 8585–8587 requirements.
6. Stronger Support for Post-Earthquake Structural Assessments
    - Enable CSMIP engineers to provide emergency management teams with faster, more detailed assessments of hospitals, bridges, dams, and other critical facilities.
    - Reduce the time required for "return to service" determinations following major earthquakes, minimizing economic and societal disruption.

Accountability and Reporting

Performance against these targets will be tracked quarterly and reported to the Department of Conservation leadership, Cal OES, and other state partners. Progress will also be documented in CSMIP's annual public report and made available via the program's public data portal, ensuring transparency and accountability to the public and partner agencies.

Projected Outcomes

Metric	Current Level	Target Level (with proposal)	Timeline
Complete BCP Instrumentation Upgrade Project	59% complete	100%	36 months
Percentage of overdue seismic equipment maintenance	30%	5%	24 months
Percentage of inoperable seismic stations	20%	<5%	24 months
Percentage of core CEEWS stations with < 5 second latency to contribute to ShakeAlert®	75%	90%	12 months
Network operational readiness	80%	>95%	Ongoing
Real-time structural data delivery to partners	1-2 business days	< 5 minutes	24 months, ongoing
Routine maintenance schedule	>5 years	3 years	Ongoing
Number of stations inspected for routine maintenance	~300	400 per year	Ongoing
Number of station repairs per year	125	150	Ongoing
Upgrades of recorders that have reached end of life since the 2022 BCP	N/A	100 per year	Ongoing
New installations per year	13	15	Ongoing

E. Implementation Plan

Upon receiving budgetary approval and in alignment with this proposal and the CSMIP mandates, the Program will begin immediate implementation, which will include hiring staff and training, completing the 2022 BCP Instrumentation Upgrade Project, developing and maintaining a long-term maintenance plan, and repairing or replacing obsolete instruments. Please see the workload table below:

Workload Measure	CY	BY	BY+1	BY+2	BY+3	BY+4
Applications Received, Applications Processed, Call Volume, Site Visits, Audits, Stakeholder Meetings, Hearings, etc.	Current 2022 BCP Upgrade Project.	Develop hiring plan, and maintenance prioritization and schedule, begin hiring	Continue the Instrumentation upgrade project of obsolete recorders across the state.	Complete the Instrumentation upgrade project of an additional 340 stations.	Ongoing maintenance and operations of the entire seismic network.	Ongoing maintenance and operations of the entire seismic network.

F. Supplemental Information (If Applicable)

None.

BCP Fiscal Detail Sheet

(Dollars in Thousands)

BCP Title: Maintaining and Strengthening Resilience of California's Seismic Network

BR Name: 3480-006-BCP-2026-GB

Budget Request Summary

Personal Services

Personal Services	FY26 Current Year	FY26 Budget Year	FY26 BY+1	FY26 BY+2	FY26 BY+3	FY26 BY+4
Positions - Permanent	0.0	10.0	10.0	10.0	10.0	10.0
Total Positions	**0.0**	**10.0**	**10.0**	**10.0**	**10.0**	**10.0**
Salaries and Wages Earnings - Permanent	0	833	833	833	833	0
Total Salaries and Wages	**$0**	**$833**	**$833**	**$833**	**$833**	**$0**
Total Staff Benefits	0	417	417	417	417	0
Total Personal Services	**$0**	**$1,250**	**$1,250**	**$1,250**	**$1,250**	**$0**

Operating Expenses and Equipment

Operating Expenses and Equipment	FY26 Current Year	FY26 Budget Year	FY26 BY+1	FY26 BY+2	FY26 BY+3	FY26 BY+4
5301 - General Expense	0	188	90	90	90	0
5304 - Communications	0	40	40	40	40	0
5320 - Travel: In-State	0	20	20	20	20	0
5322 - Training	0	10	10	10	10	0
5324 - Facilities Operation	0	180	180	180	180	0
5344 - Consolidated Data Centers	0	50	50	50	50	0
5346 - Information Technology	0	48	20	20	20	0
5368 - Non-Capital Asset Purchases - Equipment	0	330	200	200	200	0
539X - Other	0	10	10	10	10	0
Total Operating Expenses and Equipment	**$0**	**$876**	**$620**	**$620**	**$620**	**$0**

Total Budget Request

Total Budget Request	FY26 Current Year	FY26 Budget Year	FY26 BY+1	FY26 BY+2	FY26 BY+3	FY26 BY+4
Total Budget Request	**$0**	**$2,126**	**$1,870**	**$1,870**	**$1,870**	**$0**

Fund Summary

Fund Source

Fund Source	FY26 Current Year	FY26 Budget Year	FY26 BY+1	FY26 BY+2	FY26 BY+3	FY26 BY+4
State Operations - 0338 - Strong-Motion Instrumentation and Seismic Hazards Mapping Fund	0	2,126	1,870	1,870	1,870	0
Total State Operations Expenditures	**$0**	**$2,126**	**$1,870**	**$1,870**	**$1,870**	**$0**
Total All Funds	**$0**	**$2,126**	**$1,870**	**$1,870**	**$1,870**	**$0**

Program Summary

Program Funding

Program Funding	FY26 Current Year	FY26 Budget Year	FY26 BY+1	FY26 BY+2	FY26 BY+3	FY26 BY+4
2420037 - Strong Motion Instrumentation	0	2,126	1,870	1,870	1,870	0
Total All Programs	**$0**	**$2,126**	**$1,870**	**$1,870**	**$1,870**	**$0**

Personal Services Details

Positions

Positions	FY26 Current Year	FY26 Budget Year	FY26 BY+1	FY26 BY+2	FY26 BY+3	FY26 BY+4
3130 - Civil Engineer (Eff. 07-01-2026)	0.0	1.0	1.0	1.0	1.0	1.0
5731 - Research Data Analyst II (Eff. 07-01-2026)	0.0	1.0	1.0	1.0	1.0	1.0
5742 - Research Data Spec I (Eff. 07-01-2026)	0.0	1.0	1.0	1.0	1.0	1.0
6926 - Precision Electronics Spec (Eff. 07-01-2026)	0.0	1.0	1.0	1.0	1.0	1.0
6991 - Seismological Instrument Techn I (Eff. 07-01-2026)	0.0	2.0	2.0	2.0	2.0	2.0
6992 - Seismological Instrument Techn II (Eff. 07-01-2026)	0.0	2.0	2.0	2.0	2.0	2.0
6993 - Seismological Instrument Techn III (Eff. 07-01-2026)	0.0	2.0	2.0	2.0	2.0	2.0
Total Positions	**0.0**	**10.0**	**10.0**	**10.0**	**10.0**	**10.0**

Salaries and Wages

Salaries and Wages	FY26 Current Year	FY26 Budget Year	FY26 BY+1	FY26 BY+2	FY26 BY+3	FY26 BY+4
3130 - Civil Engineer (Eff. 07-01-2026)	0	131	131	131	131	0
5731 - Research Data Analyst II (Eff. 07-01-2026)	0	90	90	90	90	0
5742 - Research Data Spec I (Eff. 07-01-2026)	0	94	94	94	94	0
6926 - Precision Electronics Spec (Eff. 07-01-2026)	0	100	100	100	100	0
6991 - Seismological Instrument Techn I (Eff. 07-01-2026)	0	126	126	126	126	0
6992 - Seismological Instrument Techn II (Eff. 07-01-2026)	0	140	140	140	140	0
6993 - Seismological Instrument Techn III (Eff. 07-01-2026)	0	152	152	152	152	0
Total Salaries and Wages	**$0**	**$833**	**$833**	**$833**	**$833**	**$0**

Staff Benefits

Staff Benefits	FY26 Current Year	FY26 Budget Year	FY26 BY+1	FY26 BY+2	FY26 BY+3	FY26 BY+4
5150900 - Staff Benefits - Other	0	417	417	417	417	0

Staff Benefits	FY26 Current Year	FY26 Budget Year	FY26 BY+1	FY26 BY+2	FY26 BY+3	FY26 BY+4
Total Staff Benefits	**$0**	**$417**	**$417**	**$417**	**$417**	**$0**

Total Personal Services

Total Personal Services	FY26 Current Year	FY26 Budget Year	FY26 BY+1	FY26 BY+2	FY26 BY+3	FY26 BY+4
Total Personal Services	**$0**	**$1,250**	**$1,250**	**$1,250**	**$1,250**	**$0**