



UNIVERSITY of HAWAII[®]

Ke Kulanui o Hawai'i

Wendy F. Hensel
President

DEPT. COMM. NO. 83

December 9, 2025

The Honorable Ronald D. Kouchi,
President and Members of the Senate
Thirty-Third State Legislature
Honolulu, Hawai'i 96813

The Honorable Nadine K. Nakamura, Speaker
and Members of the House of Representatives
Thirty-Third State Legislature
Honolulu, Hawai'i 96813

Dear President Kouchi, Speaker Nakamura, and Members of the Legislature:

For your information and consideration, the University of Hawai'i is transmitting one copy of the Report by Hawai'i EPSCoR on Hawai'i State Science and Technology Plans (Act 137, Session Laws of Hawai'i 2009) as requested by the Legislature.

In accordance with Section 93-16, Hawai'i Revised Statutes, this report may be viewed electronically at: https://www.hawaii.edu/govrel/docs/reports/2026/act137-slh2009_2026_epscor_report_508.pdf.

Should you have any questions about this report, please do not hesitate to contact Stephanie Kim at (808) 956-4250, or via e-mail at scskim@hawaii.edu.

Sincerely,

A handwritten signature in blue ink that reads "Wendy F. Hensel".

Wendy F. Hensel
President

Enclosure

UNIVERSITY OF HAWAI‘I SYSTEM

REPORT



REPORT TO THE 2026 LEGISLATURE

Report by Hawai‘i EPSCoR on Hawai‘i State
Science and Technology Plans

Act 137, Session Laws of Hawai‘i 2009

December 2025

A REPORT TO THE STATE OF HAWAI'I LEGISLATURE ON THE IMPLEMENTATION OF ACT 137, SLH 2009

As required in Section 4 of Act 137, Session Laws of Hawai'i 2009, Hawai'i EPSCoR is submitting a report on the status of the State of Hawai'i's Science and Technology Plan. The original Plan was submitted to Governor Linda Lingle and the leadership of both chambers of the Hawai'i State Legislature on January 27, 2010. This report covers the five-year period from 2021-2025 and provides updates on research accomplishments, economic impacts, and strategic direction for Hawai'i's science and technology ecosystem.

1. Background and Context

1.1 Act 137 History

In 2008, the state was working on multiple fronts to promote and incentivize the science and technology sectors of the Hawai'i economy. Adjustments were being made to the Act 221 high technology tax credit, the Hawai'i Science & Technology Council was building a network of technology companies in the state, and the University of Hawai'i (UH) was preparing proposals to the National Science Foundation's Established Program to Stimulate Competitive Research (EPSCoR) program's Research Infrastructure and Improvement (RII) solicitation.

The EPSCoR program's importance lies in its direct connection to the strong research capacity of UH as a driving force for supporting a growing science and technology industry through pursuit of basic knowledge, technology transfer, commercialization of discoveries, and education of a STEM workforce. This increased Research and Development (R&D) capability was expected to provide key research infrastructure and further stimulate Hawai'i's economic development, including a diverse, well-prepared, STEM-enabled workforce. Moreover, EPSCoR designation by the National Science Foundation (NSF) allows Hawai'i researchers to participate in EPSCoR-like programs with other federal agencies including the National Institutes of Health (NIH) Institutional Development Award (IDeA) program and the U.S. Department of Energy and National Aeronautics and Space Administration EPSCoR programs.

Following passage of HB610 Relating to Science and Technology by the 25th Legislature, Governor Linda Lingle signed it into law as Act 137 on June 19, 2009. The final bill required Hawai'i EPSCoR, with the assistance of the Hawai'i Technology Development Corporation (HTDC), to develop a Hawai'i State Science and Technology (S&T) Plan.

The initial deliverable of Act 137 was to provide a plan to the legislature no later than 20 days prior to the 2011 regular session that included:

1. An evaluation of the effectiveness of past and current science and high technology legislation, including legislation relating to industry development, incentives, oversight, and sustainability;
2. A plan for the direction of Hawai'i's science and high technology sector, including:
 - a. A list of goals established for the science and high technology sector in the state;
 - b. A plan to reach the established goals; and
 - c. A timeline for implementation and completion
3. Criteria to measure the growth of emerging growth industries in the science and high technology sector;
4. Guidelines for future science and high technology legislation to assist the legislature in maintaining an overall framework to guide the development of science and high technology in the state; and
5. Recommendations or proposals for science and high technology legislation to meet the goals established in the plan.

1.2 State Science and Technology Plans and EPSCoR Funding Cycles

Since the initial framework report in 2010, Hawai'i's EPSCoR RII Track-1 NSF program has been successfully renewed through multiple five-year cycles, each accompanied by a new iteration of the S&T Plan. The former Track-1 program delivered large, five-year, statewide awards (often up to \$20M) to historically underfunded jurisdictions to build sustainable research infrastructure, strengthen core facilities, promote multi-institution collaboration, and enhance competitiveness for mainstream federal research funding while aligning with state science and economic priorities. Across cycles, the supporting Statewide Committee's membership evolved but consistently included academic leaders and researchers, educators, legislators, state and federal agencies, and representatives from the non-profit and business community.

Table I. Editions and Titles of Hawai'i Statewide Science and Technology Plans

| Year | Plan Title | Focus Area |
|-------------|----------------------------|-------------------|
| 2012-2016 | Sustaining Quality of Life | Diversification |
| 2016-2020 | Supporting Innovation | Infrastructure |
| 2020-2025 | Harnessing Data Revolution | Data Science |

2. EPSCoR Track-1 Programs 2021-2025: Change HI

2.1 Change HI Overview

The Change HI project (NSF Award OIA-2149133), launched in 2022, builds on the achievements of the previous 'Ike Wai project by applying data science to understand and adapt to environmental and social change. The project leverages computational modeling, big data, and community engagement to strengthen Hawai'i's resilience to climate variability and natural hazards. Change HI is organized around four interconnected research themes:

1. **Monitoring and Visualizing Change:** Development of sensor networks and visualization tools to track environmental conditions in real-time
2. **Simulating Change:** Advanced computational models to predict future scenarios under different climate and land-use conditions
3. **Ecohydrology of Change:** Understanding water-ecosystem interactions in changing environments
4. **Land-Use Change:** Analyzing impacts of development, agriculture, and conservation on island ecosystems

2.2 Key Research Accomplishments

Major accomplishments of the Change HI project from 2022-2025 include:

Infrastructure Development:

- Establishment of the Hawai'i Climate Data Portal, providing high-resolution datasets for rainfall, temperature, and sea level rise accessible to researchers and policymakers
- Integration of multiple data streams including satellite imagery, ground-based sensors, and historical records
- Development of advanced visualization tools enabling stakeholders to explore climate scenarios interactively

Research Findings:

- High-resolution climate projections for all Hawaiian Islands showing increased rainfall variability and temperature extremes
- Identification of critical watershed areas vulnerable to climate change impacts

- Documentation of land-use change patterns across the state over the past 50 years
- Integration of Indigenous Hawaiian knowledge with Western science methodologies for holistic environmental understanding

Community Engagement:

- The Change HI Opportunity for Research Experience (CORE) internship program trained more than 100 students in climate data analytics, machine learning, and Indigenous data practices
- Partnerships with local communities to co-develop research questions and ensure findings are actionable and culturally appropriate
- Regular stakeholder workshops with water managers, agricultural producers, and conservation organizations

2.3 Workforce Development and Education Impacts

From 2021 through 2025, EPSCoR-supported programs engaged more than 1,200 students in research experiences, internships, and professional development activities. The program's outreach extended to over 6,000 K-12 students statewide, with particular focus on Neighbor Island and Native Hawaiian participation.

Table II. Impacts of the Change HI award

| Metric | Count (2021-2025) |
|------------------------------|-------------------|
| Graduate Students Supported | 67 |
| Undergraduate Researchers | 284 |
| Postdoctoral Fellows | 18 |
| Faculty Participants | 45 |
| K-12 Students Reached | 6,000+ |
| Native Hawaiian Participants | 412 |

Through partnerships with the Department of Education, Hawai'i Community College, and Pacific International Space Center for Exploration Systems (PISCES), students participated in hands-on learning related to renewable energy, data science, and planetary exploration. These experiences help prepare the next generation of scientists and engineers for Hawai'i's evolving innovation economy.

2.4 Research Productivity

Change HI participants have demonstrated strong research productivity:

1. 89 peer-reviewed publications in high-impact journals
2. 127 conference presentations at national and international venues
3. \$22.4 million in leveraged funding from NSF and other federal agencies
4. 11 PhD dissertations and 19 Master of Science theses completed
5. 8 new faculty hires at the University of Hawai'i at Mānoa (UH Mānoa), University of Hawai'i at Hilo (UH Hilo), and Chaminade University

3. Technology Transfer and Innovation Ecosystem (FY 2021-2025)

3.1 University of Hawai'i Office of Innovation and Commercialization

The Office of Innovation and Commercialization and Office of Technology Transfer have played pivotal roles in turning research into real-world economic benefits. Between FY 2021 and FY 2025, significant progress was made in commercializing UH research.

Table III. Commercialization Metrics

| Metric | FY21 | FY22 | FY23 | FY24 | FY25 |
|---------------------------|---------|---------|---------|---------|---------|
| Invention Disclosures | 52 | 48 | 46 | 45 | 48 |
| Patent Applications Filed | 11 | 9 | 10 | 12 | 13 |
| Patents Issued | 6 | 5 | 7 | 8 | 7 |
| New License Agreements | 9 | 7 | 8 | 9 | 8 |
| Active Licenses | 142 | 145 | 147 | 151 | 155 |
| Royalty Income (\$) | 158,000 | 172,000 | 195,000 | 224,000 | 241,000 |

Five-Year Totals:

- 239 invention disclosures received
- 55 patent applications filed
- 33 patents issued
- 41 new license and option agreements executed
- \$990,000 in technology royalties generated
- 15 new startup companies supported

The integration of EPSCoR research outcomes into the local economy demonstrates the value of long-term investment in research infrastructure. Inventions were generated by diverse units across UH including the John A. Burns

School of Medicine, UH Cancer Center, College of Engineering, School of Ocean and Earth Sciences and Technology, and the College of Tropical Agriculture and Human Resilience.

3.2 Entrepreneurship and Innovation Programs

The University expanded its suite of innovation programs during this reporting period:

Patents2Products (P2P): Provides UH graduate students and postdocs opportunities to develop entrepreneurial skills while advancing the development and commercial potential of UH technologies. The second P2P cohort completed the program in 2025, with 18 participants advancing technologies in areas including renewable energy, agricultural technology, and medical devices.

NSF Innovation Corps (I-Corps): UH is part of the NSF I-Corps Hub Desert and Pacific Region. Thirty-nine faculty and students from UH Mānoa, University of Hawai‘i Maui College, and UH Hilo completed the program from 2021-2025. The experiential training helps advance research-based innovations by testing the market and developing business strategies.

Faculty Fellows Program: Provides UH faculty members with opportunities to incorporate innovation and entrepreneurial skills into their curriculum. The first cohort completed the program in Fall 2023, with an enhanced second cohort scheduled to launch in 2026.

Ideation Studios: A new program planned to launch in 2026 will help researchers, students, and UH-affiliated companies bring deep tech innovations to market through tailored training, mentorship, and networking.

Pacific Asian Center for Entrepreneurship (PACE)

PACE at UH Mānoa has become the systemwide hub for innovation and entrepreneurship, serving students and faculty across all UH campuses through more than 20 experiential programs. Over the past five years, PACE has significantly expanded its impact, supporting hundreds of students annually, catalyzing 100+ new ideas in a single academic year, and distributing more than \$250,000 in awards and scholarships in 2023–24 alone. The opening of the Walter Dods, Jr. RISE Center has provided a purpose-built, award-winning home for these activities, with modern co-working, makerspace, and collaboration facilities that visibly anchor UH’s innovation ecosystem. PACE’s programs, including the long-running UH Venture Competition and student venture funding initiatives, have strengthened Hawai‘i’s startup pipeline and helped student teams move from concept to commercialization. National and global recognition as one of the world’s leading university entrepreneurship programs underscores PACE’s value as a strategic asset for workforce development, economic diversification, and community resilience in Hawai‘i.

3.3 Hawai‘i Technology Development Corporation Programs

HTDC continued its critical role in supporting Hawai‘i’s innovation ecosystem throughout the 2021-2025 period. In FY 2024 alone, HTDC programs helped clients generate more than \$900 million in revenue.

Manufacturing Assistance Program (MAP)

In FY 2024, INNOVATE Hawai‘i facilitated 62 projects through MAP, awarding more than \$1.79 million in matching grants. These funds matched more than \$16 million in company investments and supported the creation of 466 new full-time jobs and 429 part-time jobs.

A significant milestone was the award of \$1.5 million from the U.S. Department of Energy to promote smart manufacturing technologies in Hawai‘i, further enhancing local manufacturing processes through automation and data-driven solutions.

Hawai‘i Small Business Innovation Research Program

The Hawai‘i Small Business Innovation Research program awarded \$2.5 million to businesses in FY 2024, enabling them to access further funding through federal Small Business Innovation Research (SBIR) awards. The program remains the longest-running state-funded SBIR matching program in the U.S. since its inception in 1988.

Accelerator and Small Business Training

The Accelerator and Small Business Training Program ran more than 20 cohorts in FY 2024, training and assisting over 450 companies and creating more than 900 jobs. The program received \$2 million in legislative funding to support local organizations offering structured business and technical training for entrepreneurs.

Tax Credit for Research Activities

More commonly known as the R&D Tax Credit, this program provides vital financial incentives for research and development. In 2024, the \$5 million tax credit was fully allocated within 65 seconds of the application window opening, highlighting the high demand. Efforts are underway to increase the tax credit allocation to \$15 million.

Hawai‘i Capital (HI-CAP)

The HI-CAP program is a \$62 million, seven-year initiative funded by the U.S. Treasury’s State Small Business Credit Initiative and jointly managed by HTDC and the Hawai‘i Green Infrastructure Authority to expand access to capital for Hawai‘i small businesses, startups, and entrepreneurs. It offers a mix of venture capital investment (HI-CAP Invest), collateral support, direct loans, and Community Development Financial Institution loan pools—plus a developing technical assistance grant program, to especially support small and socially and economically disadvantaged businesses and transformative projects in areas like

renewable energy, innovation, local agriculture, manufacturing, and creative industries.

4. Jurisdictional Steering Committee and Science and Technology Plan Development (2025-2026)

4.1 Re-establishment of the Jurisdictional Steering Committee (JSC)

In 2025, the EPSCoR JSC was formally re-structured to provide strategic oversight of Hawai'i's EPSCoR activities and coordinate the development of the S&T Plan 2025-2030. The JSC represents a critical governance evolution, bringing together leaders from academia, government, and industry to prioritize research areas that will shape Hawai'i's economic future and ensure alignment with national federal priorities.

The JSC membership includes representatives from:

1. University of Hawai'i System
2. State government agencies (DBEDT, DOE, DLNR, Office of Enterprise Technology Services)
3. County government agencies
4. Hawai'i Technology Development Corporation
5. Private sector technology and innovation companies
6. Community stakeholders

4.2 Community-Based Strategic Planning Process

The re-structuring of the JSC represents a significant shift toward a more inclusive, community-based governance model. The new JSC emphasizes:

Stakeholder Integration: The JSC structure has been intentionally designed to include diverse perspectives beyond traditional academic and government leadership. This ensures that science and technology planning is grounded in local knowledge, cultural values, and the actual needs of Hawai'i's residents.

Jurisdictional Authority and Independence: The JSC operates as an independent group representing the broader research, business, and government interests of the State of Hawai'i. This independence allows the committee to provide objective analysis of Hawai'i's research strengths and gaps, advocate for strategic investments, and maintain focus on long-term competitiveness rather than short-term political considerations.

5.3 Science and Technology Plan 2025-2030: Development Process

The new S&T Plan is being developed through a collaborative process that emphasizes stakeholder engagement and data-driven priority setting. The development process includes:

Phase 1: Data Collection and Stakeholder Input (September-October 2025)

The JSC distributed a comprehensive questionnaire to state and federal agencies, private sector partners, educational institutions, community organizations, and other stakeholders. This questionnaire solicited information about research priorities, workforce needs, infrastructure requirements, and barriers to innovation in key sectors. By October 2025, the JSC had begun aggregating responses to identify emergent themes and priority areas.

Phase 2: Research and Analysis (November 2025)

During November 2025, stakeholder input was reviewed to identify Hawai'i's existing research capabilities and infrastructure, and assessed alignment with national priorities and NSF strategic initiatives. This analysis formed the basis for the first draft of the S&T Plan.

Phase 3: Committee Review and Feedback (January 2026)

The JSC will reconvene in January 2026 to review the first draft of the S&T Plan, provide feedback, and work toward a finalized version. This review process included discussion of research priorities, evaluation of proposed metrics and goals, and refinement of implementation strategies.

The completed S&T Plan will provide a strategic roadmap for Hawai'i's research and innovation investments over the next five years. The plan emphasizes the following strategic priorities:

1. Data Science and Artificial Intelligence for Island Resilience
2. Ocean, Coastal, and Freshwater Systems
3. Climate Adaptation and Environmental Sustainability
4. Agriculture, Food Security, and Aquaculture
5. Astronomy, Space Science, and Earth–Ocean–Space Systems
6. Advanced Materials, Sensors, and Intelligent Systems
7. Health Equity, Biomedical Research, and AI-Enhanced Healthcare
8. Indigenous Knowledge, Innovation, and Community-Engaged Research

6. Federal Program Transitions and Future Directions

6.1 NSF EPSCoR Program Evolution

In 2023, NSF introduced a major restructuring of the EPSCoR program, replacing Track-1 with two new mechanisms:

EPSCoR Collaborations for Optimizing Research Ecosystems (E-CORE):

Supports long-term infrastructure building and multi-jurisdictional collaborations to enhance research competitiveness. E-CORE awards provide up to \$10 million for initial 4-year periods, with renewal opportunities for additional funding.

EPSCoR Research Incubators for STEM Excellence (E-RISE): Fosters smaller, targeted research incubators focused on emerging research areas and building capacity in specific domains. E-RISE awards provide up to \$8 million for 3-year periods with potential renewal.

Hawai‘i is preparing to compete in this new framework by leveraging its EPSCoR experience to create a cross-sectoral strategy that supports data-intensive science, renewable energy innovation, and island resilience. The JSC will play a central role in guiding these efforts and aligning them with state and federal priorities.

7. Conclusion

The 2021-2025 period demonstrated substantial progress in building Hawai‘i's science and technology capacity. The Change HI EPSCoR project advanced understanding of climate change impacts and adaptation strategies while training a new generation of data scientists. Technology transfer activities generated economic returns through patent licensing and startup company formation. HTDC programs supported job creation, manufacturing growth, and entrepreneurship across the state.

The re-establishment of the JSC in 2025 represents a significant evolution in Hawai‘i's approach to science and technology governance. By adopting a more inclusive, community-based model that incorporates Native Hawaiian perspectives and island-specific needs, the state is better positioned to ensure that scientific research and technological innovation serve the needs of all Hawaiians and contribute to long-term resilience and prosperity.

However, the transition to NSF's new E-CORE and E-RISE programs presents both challenges and opportunities. To maintain Hawai‘i's competitiveness and continue leveraging federal research investments, sustained state support is essential.

The vision articulated in the S&T Plan 2025-2030 positions Hawai‘i as a data-rich, data-responsive, and data-empowered state capable of addressing its unique challenges while contributing to global solutions. Achieving this vision requires continued partnership among the UH, HTDC, state agencies, the legislature, and the private sector. Together, these stakeholders can build a more resilient, diversified, and prosperous economy grounded in science, technology, and innovation that reflects Hawaiian values and serves all people of the islands.

EPSCoR, the JSC, and Hawai‘i's universities stand ready to advance this agenda and look forward to working with the legislature to secure Hawai‘i's future as a leader in research, innovation, and sustainable development.