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December 12, 2025

The Honorable Ronald D. Kouchi
President and Members
of the Senate
Thirty-Third State Legislature
State Capitol, Room 409
Honolulu, Hawai'i 96813

The Honorable Nadine K. Nakamura
Speaker and Members of the
House of Representatives
Thirty-Third State Legislature
State Capitol, Room 431
Honolulu, Hawai'i 96813

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

For your information and consideration, I am transmitting a copy of the Office of Planning and Sustainable Development's 2025 Relating to Sea Level Rise Adaptation Annual Report, as required by Act 178, SLH 2021. In accordance with Section 93-16, Hawai'i Revised Statutes, I am also informing you that the report may be viewed electronically at: http://dbedt.hawaii.gov/overview/annual-reports-reports-to-the-legislature/.

Sincerely,

James Kunane Tokioka
DBEDT Director

Enclosure

c: Legislative Reference Bureau

ACT 178, SLH 2021: RELATING TO SEA LEVEL RISE ADAPTATION

2025 Annual Report
Report to the Legislature
Regular Session of 2026

Prepared pursuant to Act 178, Session Laws of Hawai‘i 2021

by

Office of Planning and Sustainable Development

Department of Business, Economic Development and Tourism

State of Hawai‘i

December 2025

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List of Acronyms

DAB	DEPARTMENT OF AGRICULTURE & BIOSECURITY
CCMAC	HAWAIʻI CLIMATE CHANGE MITIGATION AND ADAPTATION COMMISSION
DAGS	DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
DBEDT	DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT, AND TOURISM
DHHL	DEPARTMENT OF HAWAIIAN HOME LANDS
DHS	DEPARTMENT OF HUMAN SERVICES
DLNR	DEPARTMENT OF LAND AND NATURAL RESOURCES
DLNR-DOBOR	DEPARTMENT OF LAND AND NATURAL RESOURCES - DIVISION OF BOATING AND OCEAN RECREATION
DOD	DEPARTMENT OF DEFENSE
DOE	DEPARTMENT OF EDUCATION
HSPLS	HAWAIʻI STATE PUBLIC LIBRARY SYSTEM
DOH	DEPARTMENT OF HEALTH
DOT	DEPARTMENT OF TRANSPORTATION
GIS	GEOGRAPHIC INFORMATION SYSTEM
HI-EMA	HAWAIʻI EMERGENCY MANAGEMENT AGENCY
OPSD	OFFICE OF PLANNING AND SUSTAINABLE DEVELOPMENT
OPSD-CZM	OFFICE OF PLANNING AND SUSTAINABLE DEVELOPMENT – COASTAL ZONE MANAGEMENT PROGRAM
ORMP	HAWAIʻI OCEAN RESOURCES MANAGEMENT PLAN
SLH	SESSION LAWS OF HAWAIʻI
SLR	SEA LEVEL RISE
SLR-VAT	SEA LEVEL RISE VULNERABILITY ASSESSMENT TOOL
SLR-XA	SEA LEVEL RISE EXPOSURE AREA
UH	UNIVERSITY OF HAWAIʻI

1. Introduction

This report describes the Office of Planning and Sustainable Development (OPSD)'s activities and progress related to the implementation of Act 178, Session Laws of Hawai'i (SLH) 2021, Relating to Sea Level Rise Adaptation. This report includes a description of activities and progress to date, as well as a discussion of next steps.

This annual report fulfills the requirement in Act 178, SLH 2021 for the Office of Planning and Sustainable Development to report annually to the Governor, the Legislature, and the Hawai'i Climate Change Mitigation and Adaptation Commission regarding vulnerability and mitigation assessments for state facilities and progress in implementing sea level rise adaptation in future plans, programs, and capital improvement needs and decisions.

1.1 2025 Major Accomplishments

In 2025, OPSD-CZM accomplished several tasks in continuing to move forward the Act 178, SLH 2021 initiative. Key accomplishments and takeaways include (Detailed descriptions of the completed activities can be found in **Section 3**):

- Development of a sea level rise (SLR) vulnerability assessment methodology
- Development of a SLR Vulnerability Assessment Tool (SLR-VAT) and User Guidance for state facilities
- Development of guidance on how to turn vulnerability assessment results into adaptation action
- Official launch of SLR-VAT and associated guidance and resources to make them available to all state agencies

1.2 Act 178, SLH 2021 Summary

The State's Thirty-First Legislature recognized that climate change and sea level rise "pose significant, dangerous, and imminent threats to the State's social and economic well-being, public safety, nature and environment, cultural resources, property, infrastructure, and government functions and will likely have a disproportionate impact on low-income and otherwise vulnerable communities." Act 178, SLH 2021 was passed to begin the long-term planning needed to effectively address climate impacts.

The purpose of this Act is to:

Require OPSD, in coordination with state agencies with operational responsibilities over state facilities, to:

- Identify existing and planned facilities that are vulnerable to sea level rise, flooding impacts, and natural hazards;
- Assess options to mitigate the impacts of sea level rise to those facilities; and
- Submit annual reports to the Governor, Legislature, and the Hawai'i Climate Change Mitigation and Adaptation Commission regarding vulnerability and mitigation assessments for state facilities and progress toward implementing sea level rise adaptation in future plans, programs, and capital improvement needs and decisions.
- Update and reaffirm the role of OPSD to coordinate climate change adaptation and sea level rise

adaptation among all state agencies to improve the interagency coordination of these activities; and

- Amend the Hawai‘i State Planning Act to include sustainable development, climate change adaptation, and sea level rise adaption as objectives for facility systems.

1.3 Hawai‘i CZM Program

Within OPSD, the Coastal Zone Management Program (OPSD-CZM) has been charged with coordinating the objectives for Act 178, SLH 2021. This aligns with OPSD-CZM's role as the lead coordinating entity for the implementation of the 2020 Hawai‘i Ocean Resources Management Plan: Collaborative Coastal Zone Management from Mauka to Makai (ORMP), that similarly identifies the need to inventory and analyze critical facility assets threatened by chronic and episodic coastal hazards and future sea level rise projections.

2. Phased Approach

Adaptation planning takes place over decades and is constantly evolving as conditions and data change and progress. In order to move towards statewide, coordinated action, OPSD-CZM has identified an approach which includes three phases of implementation.

Figure 1. Flow chart of three main phases

2.1 Past Major Accomplishments

Since 2021, the first year of the initiative, OPSD-CZM has completed the following tasks under Phases 1 and 2 of the implementation approach:

✓ **State Facilities Inventory (2021):** OPSD created a GIS layer identifying the physical locations of all facilities owned and managed by the State. Pursuant to the Act language, this initiative focuses on state-operated facilities (i.e., buildings).

✓ **Sea Level Rise Exposure Assessment (2021):** OPSD conducted an analysis to identify which state owned and managed facilities were located within various sea level rise scenarios.

✓ **StoryMap webpage (2021):** OPSD created an online resource to share activities and findings with

the public. (LINK)

- ✓ **Literature Review (2022):** OPSD evaluated guidance documents and tools from 11 different coastal states and municipalities to understand the range of strategies used to assess vulnerability to sea level rise. Findings from the Literature Review, as well as feedback from agency partners, informed OPSD's decision to pursue the development of a standardized process and methodology that could be used by all state agencies with facilities management responsibilities.

- ✓ **Data Refinement for Sea Level Rise Exposure Assessment (2023):** OPSD aggregated existing county GIS data to update the GIS layer identifying the physical locations of all state-managed facilities. The updated layer used building footprints, as opposed to points, to represent facilities.

- ✓ **Received Funding from Legislature (2023):** The Legislature allocated $400,000 'CIP in operating' to OPSD in the State budget (Act 164, SLH 2023) for the development of guidance and a standardized process for conducting vulnerability assessments for state-managed facilities. This was reduced to $360,000 due to fund diversion for fire recovery.

- ✓ **Sea Level Rise Vulnerability Assessment Tool – Project Initiated (2024):** OPSD worked with a multi-agency stakeholder group to develop a scope of services to develop a sea level rise vulnerability assessment tool and associated guidance. OPSD completed the procurement process and executed a contract with the selected vendor, ICF Incorporated, L.L.C., on July 25, 2024.

The completed 2021 – 2024 Annual Reports can be found on the Act 178, SLH 2021 StoryMap. (LINK)

3. 2025 Activities and Accomplishments

In July 2024, OPSD executed a contract with ICF Incorporated, L.L.C. (ICF), to develop a standardized process for assessing the vulnerability of state facilities to sea level rise. In 2025, OPSD continued to manage this project and worked with ICF to ensure that project goals and deliverables were met. The following sections outline the project's completed major milestones.

3.1 Development of a SLR Vulnerability Assessment Methodology

The first major deliverable was the development of a methodology for assessing the vulnerability of state facilities (ie. buildings) to sea level rise. The methodology was informed by a literature review of example processes, frameworks, and methodologies from across the country (completed in 2024). The development of a standardized vulnerability assessment methodology was a critical first step as it served as the foundation for the tools and guidance resources that were developed and provided to state agencies. There are several examples of existing policy structures in the State that deal with multi-jurisdictional approaches to multi-dimensional problems, however, there is not a single statewide approach for sea level rise planning. The methodology developed under this initiative sets a standardized approach that all agencies can take. Agencies are at different stages of their sea level rise assessment and adaptation planning journey, and the proposed methodology provides an opportunity for all agencies to join the same path toward a resilient future regardless of the agency's capacity or current stage.

The proposed SLR vulnerability assessment methodology used the framework:

'exposure x sensitivity x adaptive capacity = vulnerability'

This approach is based on the Intergovernmental Panel on Climate Change's (IPCC) widely used characterization of vulnerability, and is also in line with '2022 Recommended Action 1.4' from the Hawai'i Climate Change Mitigation and Adaptation Commission's (CCMAC) 2022 Hawai'i Sea Level Rise Vulnerability and Adaptation Report: "Conduct an updated and more detailed vulnerability assessment." The recommendation specifically proposes including "*a detailed analysis of socio-economic factors including community sensitivity and adaptive capacity*" (Hawai'i Climate Commission, 2022).

The proposed vulnerability assessment methodology has five components with the following topic areas (also depicted in Figure 2):

Rapid Screening

- Exposure to either 3.2 feet sea level rise exposure area (SLR-XA) or 6 feet (passive flooding of sea level rise (Note: this aligns with the 2022 Hawai'i SLR Vulnerability and Adaptation Report's '2022 Recommended Action 1.7' recommended planning benchmarks)

1. Exposure

- Coastal flooding history
- Flooding depth
- Nearest coastline

2. Sensitivity

- Impact on Building Function
- System dependencies
- Building condition
- Building age

3. Adaptive Capacity

- Flooding resilient building codes
- Existing engineered adaptation measures
- Existing behavioral or temporary adaptation measures
- Functional redundancy
- Cascading impacts

4. Criticality

5. Additional Considerations

- Equity and social vulnerability
- Internal and external funding
- Compounding hazards
- Adaptation needs

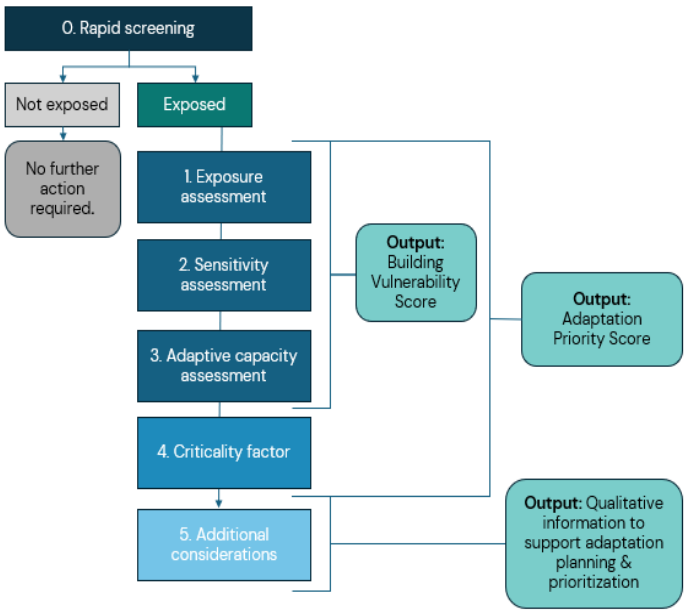

Figure 2. Overview of the SLR Vulnerability Assessment Methodology.

For each component of the vulnerability assessment a series of questions will guide agencies to score and rank buildings of interest. The proposed vulnerability assessment methodology will allow individual agencies to assess the vulnerability of their buildings to sea level rise and prioritize buildings that are most in need of adaptations to mitigate and reduce impacts.

As part of this project, an Adaptation Cycle model (Figure 3) was developed to encompass all aspects of a vulnerability assessment and prioritization process while also providing resources for agencies to plan, fund, and implement adaptation measures. In the context of this broader Adaptation Cycle, the proposed vulnerability assessment methodology will support agencies in accomplishing Phases 1 through 3 (Screen, Assess, and Prioritize):

Phase 1 Screen identifies which buildings are exposed to sea level rise and should undergo a full-scale vulnerability assessment.
Phase 2 Assess includes a detailed vulnerability assessment for buildings that are identified through the screening.
Phase 3 Prioritize includes ranking of facilities based on their overall vulnerability to prioritize buildings that are most vulnerable to sea level rise and present the best opportunities for agencies to plan and implement adaptation measures.

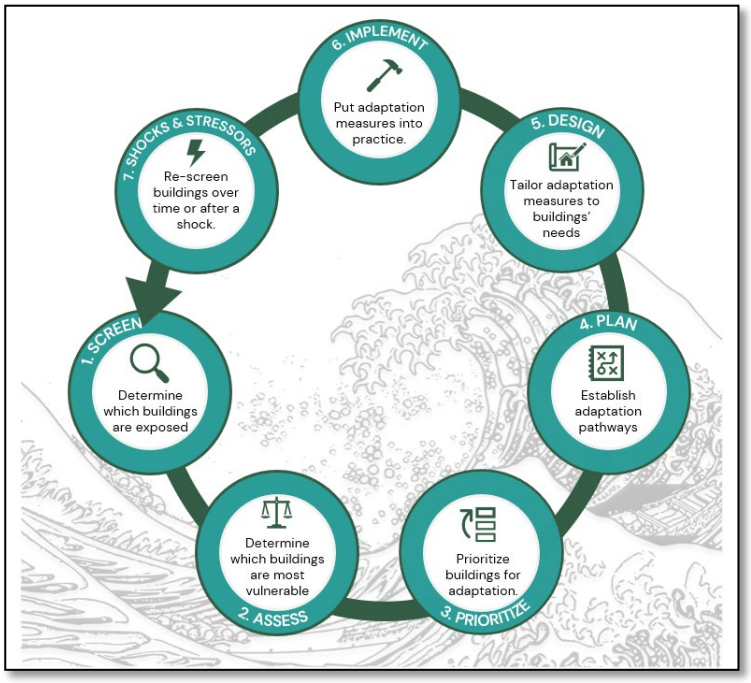

Figure 3. Adaptation Cycle model

3.2 Development of a SLR Vulnerability Assessment Tool (SLR-VAT) & User Guidance

The proposed methodology was used to underpin the development of a SLR Vulnerability Assessment Tool (SLR-VAT) and accompanying User Guidance. While the methodology describes the process and theory behind the vulnerability assessment and prioritization, the SLR-VAT is the tool to administer and execute this process. State agencies can use these materials to evaluate a building's vulnerability and prioritize buildings across the agency's portfolio for planning adaptation measures.
The following key principles guided the development of the SLR-VAT to ensure the process was easy and efficient for users:

- ***User-friendly design*:** A clear, easy-to-use tool that can be completed in-house by agency staff.

For a building that is exposed to sea level rise, the assessment should take less than 30 minutes. The tool is available as a PDF, or via Microsoft Forms

- ***Applicability to various building types*:** Ensure that the form is applicable to most building types while ensuring versatility across varying State-managed facilities
- ***Integrated Data Sets and Tools:*** All relevant datasets, map viewers, and references are provided via embedded links. OPSD worked closely with UH Sea Grant & DLNR to ensure that all required data would be available on the Hawai'i Sea Level Rise Viewer
- ***Future-Proof Design*** – Ensure that the tool can be easily updated or added to as new hazards are incorporated into the assessment
- ***Tech-Forward Approach*** – Create an easy-to-use digital version of the tool so that results can be quickly processed and analyzed. A 'State Facilities & SLR Portal' was created as a central location to house links to the SLR-VAT, Power BI (for SLR-VAT output visualization), and guidance documents.
- ***Availability of Guidance and Trainings****:* Accompanying the SLR-VAT is a User Guide, a step-by-step guide to each question in the tool, as well as a recorded video training for completing the tool. Additionally, agencies are provided with guidance on how to integrate SLR-VAT results into adaptation strategies and long-term planning.

The development of the SLR-VAT and User Guidance was informed by regular engagement with State agencies to ensure final products reflected agency needs. Five agencies/divisions with large facility asset portfolio, coastal facilities and/or experience with natural hazard risk management were selected to provide more detailed review and feedback of the tool. The five agencies/divisions selected for in-depth consultation were:

- Dept of Accounting and General Services (DAGS),
- Dept of Education (DOE),
- Dept of Land and Natural Resources (DLNR) – Engineering Division,
- Dept of Land and Natural Resources (DLNR) – Division of Boating & Ocean Recreation (DOBOR),
- Dept of Transportation (DOT) – Harbors Division

Agency feedback was collected through various methods including:

Draft Review and Initial Feedback (March 2025): The selected agencies were provided draft versions of the SLR-VAT for testing. Zoom meetings were held with each agency to get their feedback on the clarity of questions, ability to access information to accurately answer questions, general flow, etc.

Action Team Meeting: SLR-VAT "Soft Launch" (May 15, 2025): Members of the SLR & State Facilities Action Team (multi-agency working group) gathered for a "soft launch" of the SLR-VAT. During this meeting, ICF presented the SLR vulnerability assessment methodology and the SLR-VAT. Agency feedback was collected. The Action Team meeting was attended by 29 individuals representing 11 different agencies

- DAGS
- DBEDT (FTZ, HHFDC)
- DCR
- DHHL
- DHS
- DLNR (DOBOR, Engineering, Parks)
- DOD (HIENG, HIEMA)
- DOT (Airports, Harbors)
- HSPLS
- DOE
- OPSD

Agency Walk-Thru (June 2025): The Project Team (OPSD and ICF) held in-person meetings with the

selected agencies. During these meetings, agencies practiced completing the SLR-VAT for a test building. By hearing the agencies' thought processes in completing the tool, the Project Team identified additional areas for improvement in clarity and streamlining. Additionally, the Project Team discussed with agencies (a) various ways that the SLR-VAT could be integrated into existing processes or asset management systems, and (b) what types of resources or guidance would be helpful to agencies to support adaptation planning.

In addition to meeting with the selected agencies, the Project Team held coordination meetings with entities working on related initiatives. City & County of Honolulu (Dept of Design and Construction & Office of Climate Change, Sustainability and Resiliency) is developing a similar climate hazard screening tool for city facilities. OPSD has been coordinating with C&C throughout this project to share lessons learned and ensure tools provide similar guidance on planning benchmarks, data sources, etc. During this time period, University of Hawai'i, Sea Grant College Program, in collaboration with DLNR was in the process of updating the Hawai'i State Sea Level Rise Viewer. OPSD coordinated with UH Sea Grant to include features and data layers relevant for answering questions within the SLR-VAT. As a result, users of the SLR-VAT only need to visit one source (State Sea Level Rise Viewer) to find all the spatial and SLR projection-related data necessary to complete the tool. The Project Team also met with the CCMAC to discuss opportunities to bring awareness to the Tool and the need for more coordinated adaptation planning.

Final Testing (September-October 2025): After incorporating the feedback from the Agency Walk-Thru, OPSD worked with DLNR-DOBOR to test out the connectivity of the final SLR-VAT, the Power BI Dashboard (platform to visualize SLR-VAT results), and the online portal that houses the SLR-VAT and other resources.

3.3 Development of guidance on how to incorporate vulnerability assessment results into adaptation action

While the focus of this project was to support State agencies in their ability to screen, assess and prioritize buildings for adaptation measures, ICF did develop a brief guidance document on how agencies can transition from vulnerability assessments to adaptation action. Specifically, the guide recommends applying an adaptation pathways approach in order to build resilience over time. Adaptation pathways are an approach to adaptation planning and decision making that incorporates flexibility and allows for accommodation of future uncertainties. Broadly, they can be understood as a sequence of measures that are intended to be implemented progressively once certain conditions or "triggers" occur (Werners, Wise, Butler, & Totin, 2021). A pathway thus consists of a series of planned adaptation measures where a new measure is triggered or activated once its predecessor is unable to meet its prescribed goals (Kwakkel, Haasnoot, & Walker, 2016). Monitoring and evaluation are critical elements of adaptation pathways that inform implementation, continual improvements, and learning.

Pathways allow planners to break adaptation actions into manageable steps over time, starting with near-term options that are flexible and avoid maladaptive consequences (Muccione, et al., 2024). It allows planners to adjust implementation decisions as either new information on climate risks becomes available or as new exposure conditions emerge. For example, as time passes and different thresholds are reached, planners can decide what measures to take depending on actual sea levels at the time, building functions and needs, and other relevant triggers.

3.4 Presentations

To build awareness about the project, as well as receive feedback from a wider audience, the Project Team presented the vulnerability assessment methodology and tool in several forums, including:

- Hawai'i State Climate Change Mitigation and Adaptation Commission quarterly meeting (July 16, 2025)
- Hawai'i Congress of Planning Officials, 2025 Conference (August 20, 2025)
- Kauai County Adaptation Planning Hui (September 30, 2025)
- Marine and Coastal Zone Advocacy Council quarterly meeting (November 6, 2025)

3.5 Official Launch

On November 25, 2025, OPSD Director Mary Alice Evans transmitted letters to Directors/Chairs of all agencies to alert them to the availability of the new tool and resources. A virtual Action Team meeting was held on December 3, 2025, to introduce agency staff to the State Facilities & SLR Online Portal and its contents. The meeting was attended by 25 individuals representing 7 agencies/entities:

- DAGS
- DHHL
- DLNR (DOBOR, Engineering, Parks)
- DOD (HIENG, HIEMA)
- DOT (Airports, Harbors, Statewide Transportation Planning)
- OPSD
- UH Sea Grant

3.6 Summary of Final Deliverables:

The following final products were developed as part of this project:

- Background Research/Literature Review Report (completed in 2024)
- Vulnerability Assessment Methodology Memo
- Sea Level Rise Vulnerability Assessment Tool (SLR-VAT)
- SLR-VAT User Guidance
- SLR-VAT Training Video
- Power BI Dashboard
- Adaptation Pathways Planning Guide

OPSD created a Sharepoint website – State Facilities & SLR Online Portal – which serves as a central location to house links to the SLR-VAT, Power BI Dashboard, User Guidance and Adaptation Pathway Planning Guide. (Note: access to the Online Portal is limited to users within the hawaii.gov MS Office organization)

4. Next Steps & Anticipated Activities for 2026

In 2026, OPSD will focus on supporting the use of the SLR-VAT and its integration into existing decision-making and planning processes. The OPSD will be available to agencies and anticipates regular engagement to support agencies in the use of the SLR-VAT, gather feedback and identify opportunities for adaptation action. While the responsibility for completing and using the SLR-VAT is with the agencies themselves, OPSD will continue to serve in a coordinating role through potential actions, including:

- On-call technical support to agencies for troubleshooting the SLR-VAT or any associated

resources, as needed

- Making edits/adjustments to the SLR-VAT and associated resources, as needed
- Coordination of regular multi-agency Action Team meetings to facilitate knowledge exchange across agencies
- Monitoring of vulnerability and adaptation priority scores for facilities across all agencies to identify potential 'hot spots' (geographic areas with multiple high adaptation priority facilities) where cross-agency coordination for planning would be beneficial
- Facilitate discussions via the State Climate Change Mitigation and Adaptation Commission and Hawai'i Ocean Resources Management Plan (ORMP) Coordinated Working Group, to further awareness of the SLR-VAT, and continue identifying opportunities to integrate adaptation planning into existing state processes

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