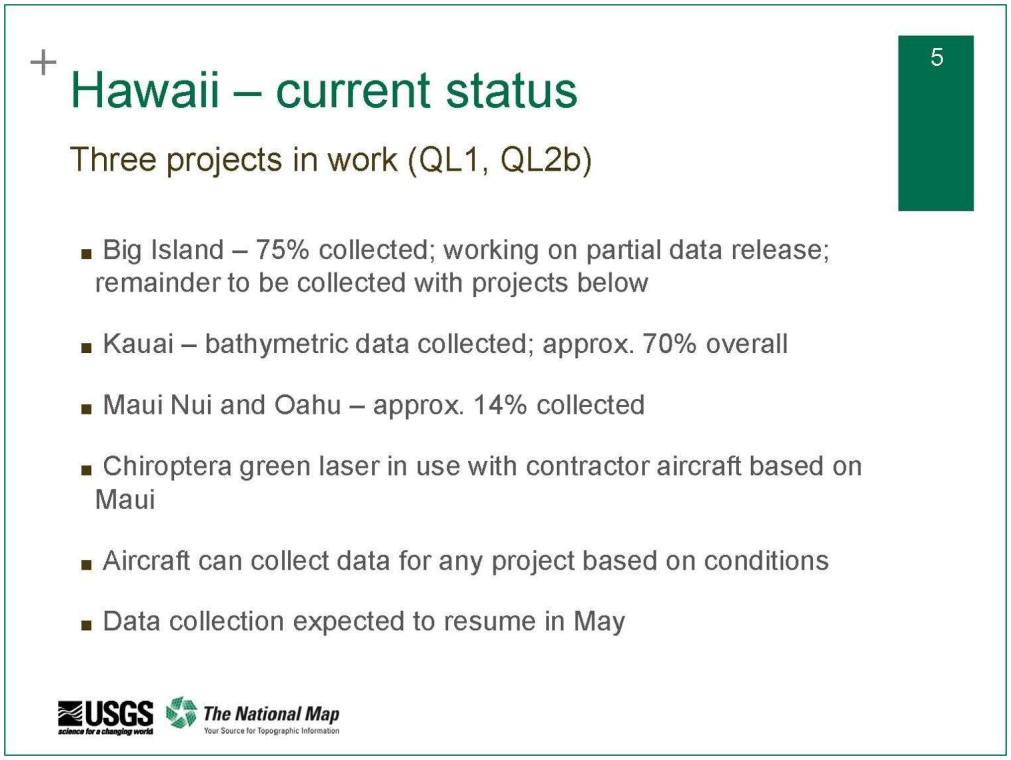
HIGICC Newsletter - May 2021

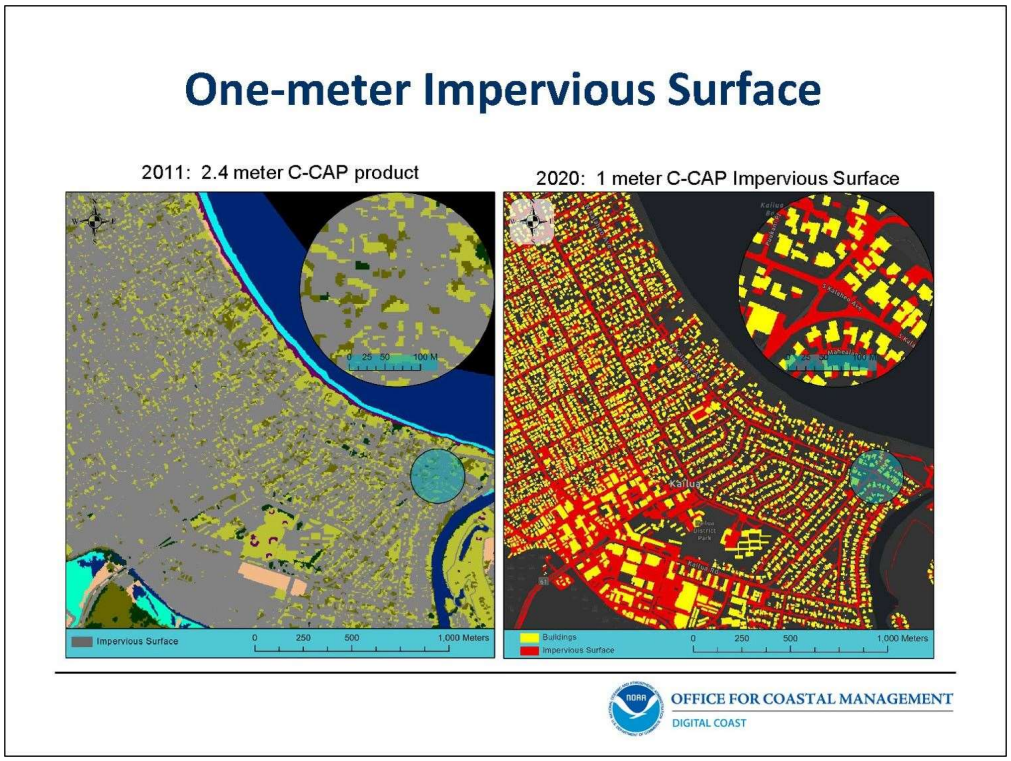
HIGICC Geospatial Data Brown-bag Webinar

HIGICC hosted an informative and well-attended geospatial data brown bag webinar on April 19th. Over 50 members of Hawaii's geospatial community tuned in to learn about new data and geospatial initiatives taking place in the state.

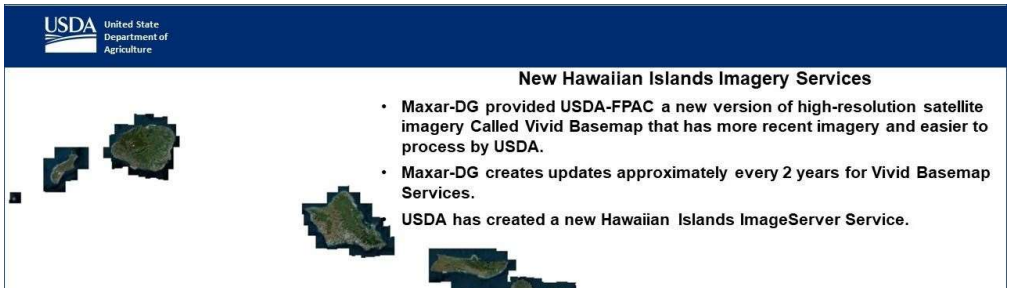
The webinar started off with USGS National Map Liaison Drew Decker explaining the USGS 3D Elevation Program (3DEP) and the 3D Nation Elevation Requirements and Benefits Study. He followed this with a status update of various lidar collection initiatives taking place in Hawaii (see below). He also announced the availability of NHDPlus HR for Hawaii, which is an enhanced version of the National Hydrography Dataset.

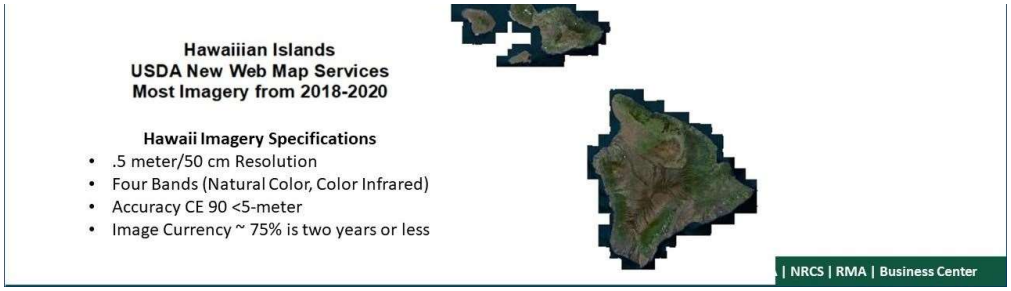


Next, Andrew McGowan, Geospatial Analyst and Coordinator, of Lynker Technologies on contract to NOAA, gave an update on the next release of NOAA's C-CAP (Coastal Change Analysis Program) data. He discussed the status of the impervious surface data release, as well as a planned partnership with the US Forest service to model tree canopy statewide. He noted that the next C-CAP release will be a 1-meter product.

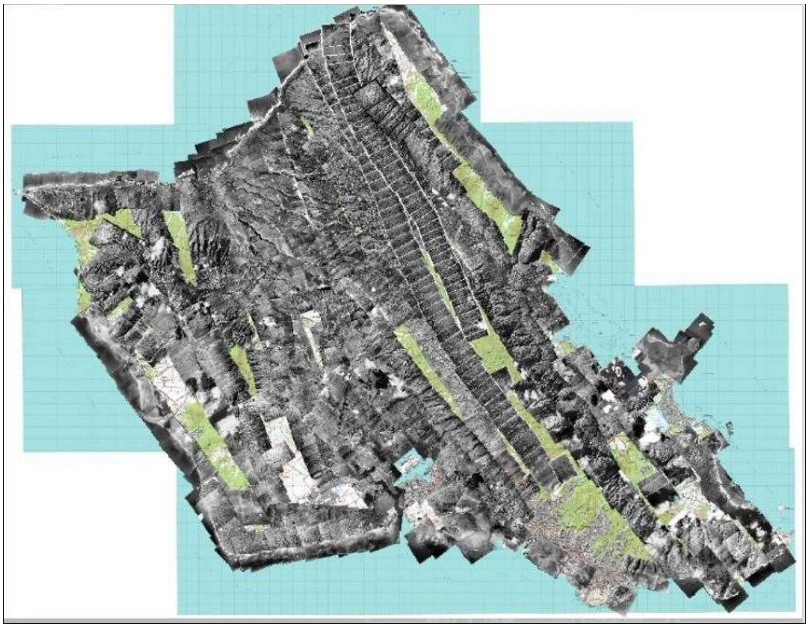


Our next presenter was Tony Kimmet, National Imagery Leader at USDA. He talked about a new, high-resolution imagery service for Hawaii that USDA will be releasing soon. Most imagery is from 2018-2020. And all is 4-band with 0.5 meter resolution. With the new service, a user will be able to change the display type, from natural color to color infrared, for example, and will be able to click on an area to determine the date of the imagery as well as the satellite that acquired it.





Tony was followed by Benton Ching, Acting Chief of the Technical Integration Branch of the Honolulu District of the US Army Corps of Engineers. Benton related the history of a volunteer georeferencing project that began in 2005 with the objective of georeferencing 2,200 aerial photos of Oahu from 1927-1928 - the first major imagery acquisition in the Hawaiian Islands. Volunteers from a variety of organizations have georeferenced over 1,600 photos to date! Benton is looking for volunteers to complete this interesting project. While most of the photos that were originally flown are available in various repositories at UH, etc., some are missing. If you are aware of photos in your office, in hard copy or digital format, or would like to help complete the scanning and georeferencing of the remaining photos, please contact Benton at 808-264-1698 or Benton.Y.Ching@usace.army.mil. Upon completion, the data will be made publicly available.



Click here to view a recording of the webinar!

GIS in Community Planning

Sarah Harris, M.S., Planner, BCH Design

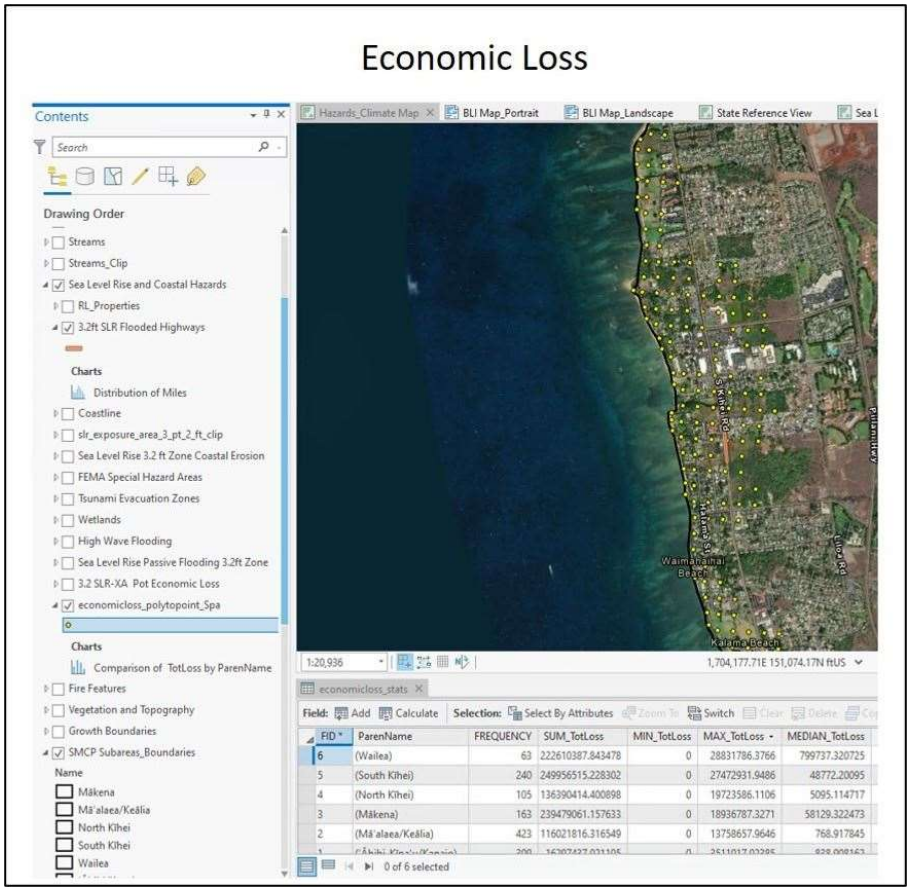
Sarah Harris, a Planner with BCH Design, a Bowers+Kubota Company, recently completed an exciting project in Hawaii using GIS in community planning. Sarah completed her Master's degree in Applied Geospatial Science, with Planning and Recreation Emphasis at Northern Arizona University. Her practicum project was to recreate and expand a hazards and climate change technical resource paper as part of the community engagement process for the forthcoming South Maui Community Plan update.

Natural hazards like storm events, tidal flooding, and coastal erosion are ever present issues for island communities like South Maui, Hawai'i. A new modern-day challenge facing island communities is the threat of climate change. Recent studies indicate climate change is already affecting Hawaii and South Maui by contributing to hazards like sea level rise, extreme heat events, and drought. These natural and climate change hazards present serious risks to South Maui residents' health, safety, and welfare. To plan and prepare for existing and new hazards, the Long-Range Planning Division (LRD) of the Maui County Department of Planning is updating the South Maui Community Plan (formerly the 1998 Kihei-Makena Community Plan) to include climate change impacts.

South Maui Community Plan Update

Image Source: Flickr, Kirt Edblom, Courtesy of Maui County

Sarah's project conducted an extensive review of natural hazards and climate change impacts on Hawai'i and the South Maui region. She used a geographic information system (GIS) and spatial analysis tools to analyze potential future impacts. These analyses were used to support infographics and data-driven information relayed in the report to address a common issue known as the "language gap" that occurs between climate scientists and stakeholders, like government officials and community members. GIS was also used to support recommended adaptation strategies based on identified impacts to help support greater long-term resiliency of the South Maui community.



Sarah will be presenting the project in an upcoming webinar. Stay tuned for details if you'd like to learn more!

2021 HIGICC Mark Lierman Memorial Scholarship

Are you a student using geospatial technologies to further your studies? HIGICC is pleased to announce that we are now accepting applications for the 2021 Mark Lierman

pleased to announce that we are now accepting applications for the 2021 Mark Lienman Memorial Scholarship. This $1,000 scholarship is awarded annually to a current college student who has demonstrated an appreciation for and understanding of geospatial data and GIS. The applicant must be enrolled at an accredited college or university and either be attending in Hawaii or have graduated from a high school in Hawaii.

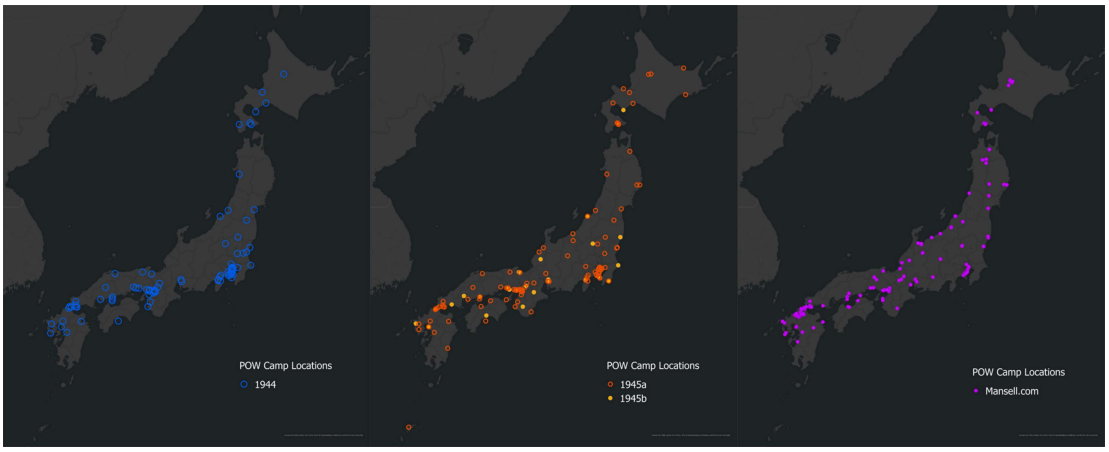
Last year's recipient, Gina McGuire, a PhD student focusing on geospatial data and visualizations at UH Manoa, planned to apply her scholarship to the purchase of research equipment in support of her graduate work.

The scholarship application deadline is June 11 . Visit the HIGICC website at www.higicc.org/awards for more information!

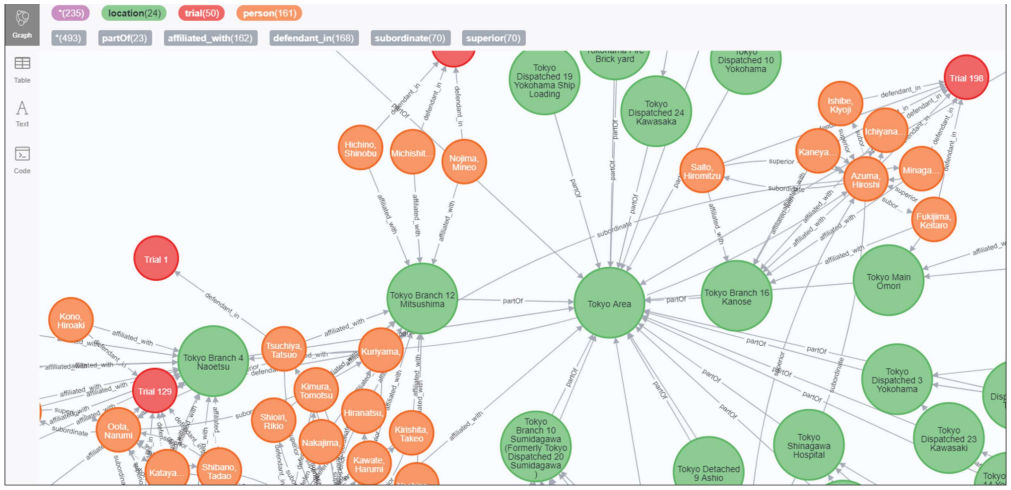
War Crimes Documentation Initiative (WCDI)

Yuma Totani (Professor of History), Theodore Kwok (Geospatial Librarian), David Gustavsen (Humanities Librarian), Mahany Lindquist (GIS Coordinator)

The War Crimes Documentation Initiative (WCDI) is a digital humanities laboratory led by a team of historians, librarians, and GIS specialists at the University of Hawai'i at Mānoa since the spring of 2019. WCDI seeks to experiment, develop, and make available to a broad audience innovative digital resources that help promote the teaching and research of World War II-era war crimes committed by the Japanese in the Asia-Pacific region (1931-1945).



WCDI uses geographic information systems (GIS) and graph analysis to document, across space and time, the nexus between Japanese military operations, government and military power structures, and the patterns of war crimes. WCDI's objective is to make available to students and scholars across the globe digital tools that empower users to discover, analyze, and assess the Japanese conduct of war and military occupation, and find answers to a number of questions on accountability that remain unresolved to this day.



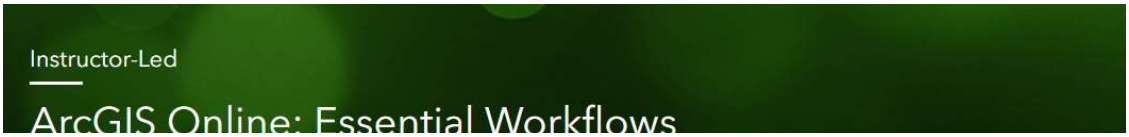
WCDI posits that, while there were numerous isolated cases of atrocity, a significant portion of Japanese-perpetrated war crimes was carried out as an integral part of Japanese military actions. The systematic use of Allied prisoners of war and the Asian civilian population for forced labor, and the systematic exploitation of women for military sexual slavery, are but a few examples in which the members of the Japanese armed forces, government agencies, and private sector are known to have pooled their diverse organizational skills and capabilities as well as brute force to achieve these large-scale war crimes and massive human rights violations. By using GIS and graph analysis, WCDI aims at providing visualization and documentation of the known instances of war crimes as comprehensively as possible, and helping establish the complex links among the crimes, the individuals, and the organizations.

In April 2021, WCDI launched its website, and the digital exhibit entitled **"Justice in Asia and the Pacific Region, 1945-1952"**. For this exhibit, WCDI uses ArcGIS Online and ArcGIS StoryMaps to present and visualize historical information related to WWII in Asia and the Pacific. Here is the pilot project developed by WCDI in 2019: Documenting Japanese War Crimes at Tokyo: The International Military Tribunal for the Far East, 1946-1948.

For more information, please visit **http://manoa.hawaii.edu/wcdi.**

Esri Instructor Led Training to be Held in June

Gretchen Chiques, Esri



Are you interested in increasing your knowledge of ArcGIS Online? Esri is offering the “ArcGIS Online: Essential Workflows” course in Hawaii Standard Time (HST). This one-day course introduces you to web maps, apps, and other authoritative content that may be available through your ArcGIS Online organizational site.

You will learn how to discover, use, create, and share content that infuses projects with geographic context, additional business intelligence, and visual impact. Course concepts also apply to ArcGIS Enterprise portals.

Who Should Attend?

Knowledge workers, managers, and other professionals who have access to an ArcGIS Online organizational site.

Learn How To

- Find and create content in an ArcGIS Online organizational site that meets your project needs.
- Create and style a web map.
- Style and configure a web app.
- Use web maps in Microsoft Office applications.
- Share maps and other content.

When

Wednesday, June 9th | Hawaii Standard Time

For more information or to register, visit: https://bit.ly/3aLb9jw

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Mapping the Risk Reduction Benefits of Coral Reef Conservation

Ashley Hoke

According to the USGS report, Rigorously Valuing the Role of U.S. Coral Reefs in Coastal Hazard Risk Reduction, the degradation of coastal habitats, particularly coral reefs, increases the risk of flooding in coastal communities. However, the protective services of natural infrastructure like coral reefs are not often quantified in rigorous economic terms and are therefore not often considered alongside artificial defenses (such as seawalls) during mitigation

prioritization. FEMA's Building Community Resilience with Nature-Based Solutions: A Guide for Local Officials, published in 2020 and based on the National Mitigation Investment Strategy, identifies nature-based solutions as a cost-effective approach to prevent natural hazards from becoming costly disasters. FEMA's Hazus Program provides geospatial risk assessment tools and data for communities interested in analyzing the risk reduction benefits of nature-based solutions. Niyam IT's GIS Team, as part of the Hazus Program, recently worked with the U.S. Coral Reef Task Force to map flood losses avoided due to coral reef protection across Hawai'i (Figure 1), and results from this project can help guide future nature-based mitigation initiatives.

Figure 1: Coral Reef Habitat in Hawai'i

The study area includes coral reef habitat along the coastlines for five Hawaiian Islands: Kaua'i, O'ahu, Moloka'i, Hawai'i, and Maui. Red and orange dots indicate areas that would benefit from coral reef protection.

Learn More

The U.S. Coral Reef Task Force is an interagency organization tasked with conserving coral reef habitats along U.S. coasts. Learn more about their mission at www.coralreef.gov.

The U.S. Geological Survey (USGS) documented the risk reduction benefits of coral reefs across Hawai'i in 2019 using census block exposure information to compare flood losses with full and reduced coral reef habitat. The Hazus Team built on this study by completing a detailed structure-level flood analysis using the Hazus Flood Assessment Structure Tool (FAST) to identify areas where coral reef conservation would lead to the highest economic benefit for the five main islands of Hawai'i. FAST is an open source and simplified method for calculating flood losses using depth and structure data provided by a user. The U.S. Army Corps of Engineers National Structure Inventory (NSI v2, combined with tax assessor data for the island of O'ahu) was used for input structure data, and USGS depth

grids for 10-, 50-, 100-, and 500-year wave-energy return periods for scenarios with full and reduced coral reefs (top 1 meter of reef lost) were used for input flood hazard data. The availability of NSI data with vulnerability attributes required by FAST allows state and local planners to more accurately estimate flood risk by identifying potential flood depths at the exact location of a structure. The multi-return period, with- and without-reef scenario depth data allow planners to average total flood risk by year – an important metric for communicating risk to diverse stakeholders. (Please note that loss *results* from this study are aggregated for display purposes, but *input data* were site-specific.)

Learn More

Interested in using FAST for risk assessment? Check out a recent webinar demonstrating the tool and download the tool here.

Flood losses were calculated at every structure – first using generalized Hazus attributes, then using CoreLogic Results from this study estimate an annual value of over $300 million for reef protection across the five main islands of Hawai'i (Table 1). The exposed building value reduced by coral reef protection is over $600 million, indicating a 50% flood loss ratio in Hawai'i's reef-adjacent coastal communities. The statewide reef protection value estimated by this analysis is 10% smaller than the value estimated by the previous USGS study, a difference driven by the new use of site-specific inventory data. Flood losses estimated using previously aggregated inventory data are both over- and underestimated across the state depending on the census block geometry of each island. These results emphasize the importance of detailed structure data for flood risk assessment.

Table 1: Risk Reduction Benefits of Coral Reef Protection in Hawai'i by Island and Type of Analysis

Island	Annual Losses Avoided(Site-Specific Inventory)	Annual Losses Avoided (Aggregated Inventory)
Maui	$71,975,099	$112,716,317
Hawai'i	$125,254	$23,997,824
O'ahu	$210,365,606	$200,942,259
Moloka'i	$25,169	$42,071
Kaua'i	$24,451,385	$5,854,742
Total	**$306,942,513**	**$343,553,213**

Risk reduction benefits of coral reef protection estimated using site-specific data are compared with a

Risk reduction benefits of coral reef protection estimated using site-specific data are compared with a previous USGS study using aggregated data. Aggregated inventory may overestimate statewide risk reduction benefits by 10%, but underestimate benefits in some areas.

The use of site-specific inventory also provides the opportunity to identify “hot spots” where the cost savings from coral reef protection would be maximal (Figure 2). Mapped risk reduction “hot spots” can serve as an important tool to help mitigation planners select sites for funded projects or additional study. Results from three such locations on the island of Maui demonstrate the significant reduction in 10-year flood extent driven by coral reef protection and highlight neighborhoods where the annual risk reduction value of coral reef protection reaches nearly $5 million (Figures 3a-3c).

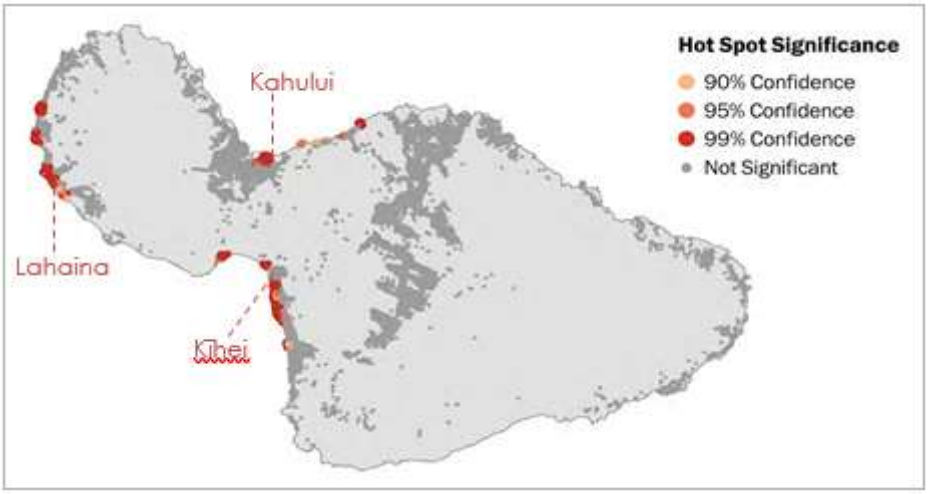

Figure 2: Optimal Locations for Coral Reef Protection on Maui

A Getis-Ord Gi* hot spot analysis identifies statistically significant spatial clusters of high and low risk reduction benefits by comparing losses avoided at each structure with its neighbors. Clusters of high benefits indicate areas optimal for mitigation investment through coral reef protection.

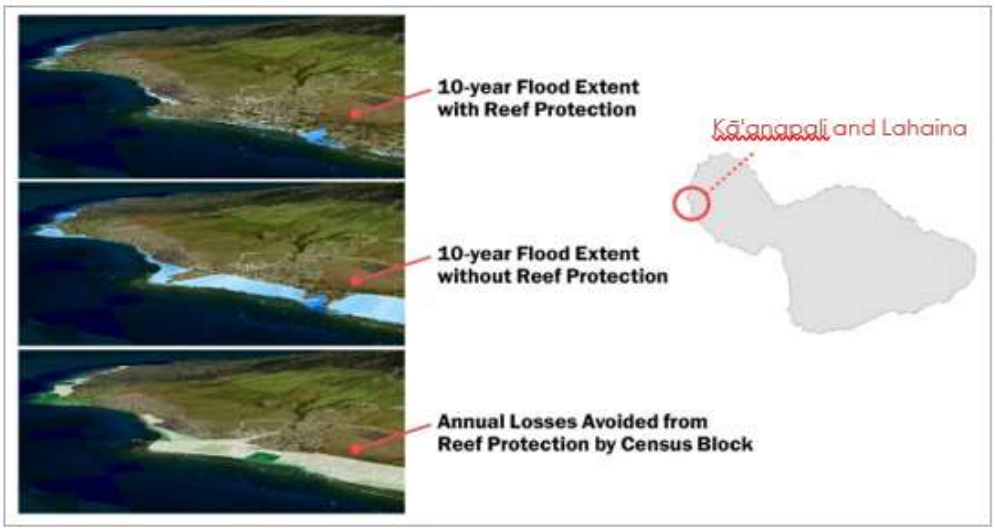

Figure 3a: Risk Reduction Benefits of Coral Reefs on Maui – Kā‘anapali

Changes in flood extent and annual flood losses avoided due to coral reef protection at Kā‘anapali and Lahaina identified as optimal for reef mitigation investment by a hot spot analysis.

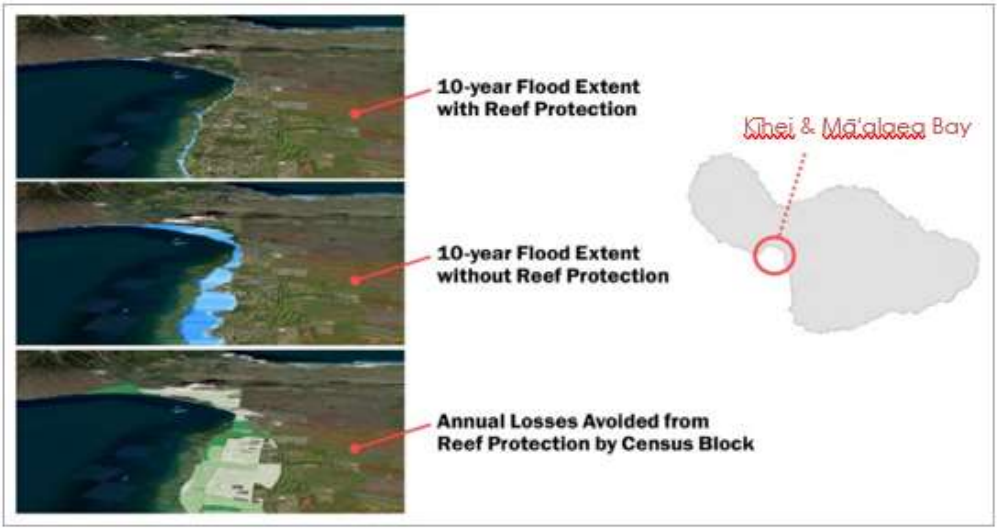

Figure 3b: Risk Reduction Benefits of Coral Reefs on Maui – Kīhei

Changes in flood extent and annual flood losses avoided due to coral reef protection at Kīhei Mā'alaea Bay identified as optimal for reef mitigation investment by a hot spot analysis.

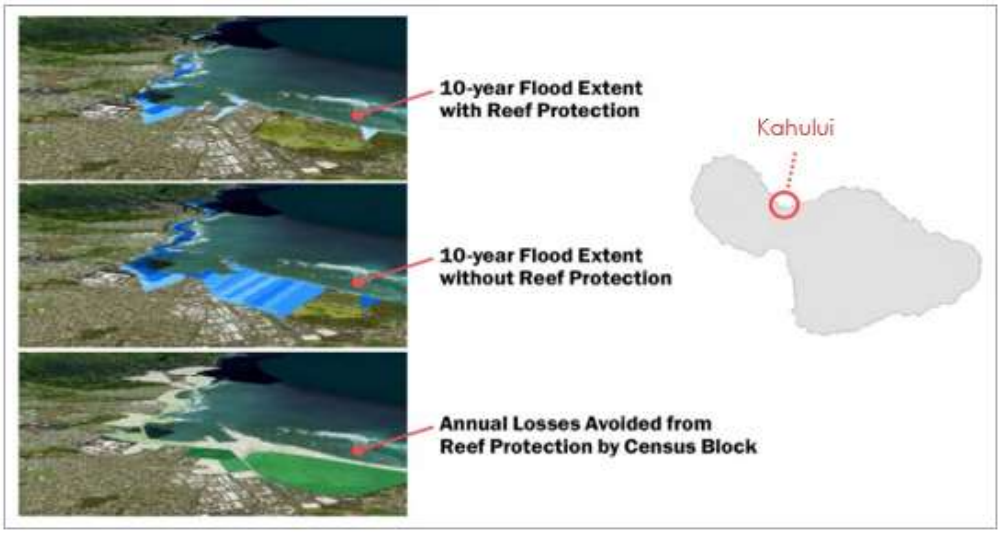

Figure 3c: Risk Reduction Benefits of Coral Reefs on Maui – Kahului

Changes in flood extent and annual flood losses avoided due to coral reef protection at Kahului identified as optimal for reef mitigation investment by a hot spot analysis.

FEMA's Hazus Program will continue working with the U.S. Coral Reef Task Force to quantify the benefits of coral reef conservation for risk management across U.S. states and territories, with an emphasis on using site-specific inventory data wherever possible. Communities with coral reef habitats can combine the methods from this study with more accurate local building information to significantly improve the accuracy of risk assessment results. The Hazus Team provides tools and guidance to support communities interested in identifying the benefits of similar nature-based solutions, especially for those interested in mitigation funding opportunities through FEMA programs like Building Resilient Infrastructure and Communities (BRIC),

the Hazard Mitigation Grant Program (HMGP), and Public and Individual Assistance (PA, IA).

Learn More

Interested in trying this analysis yourself? Keep an eye out for the FAST tool download and example data for O'ahu here.

Mahalo to our Sponsors!