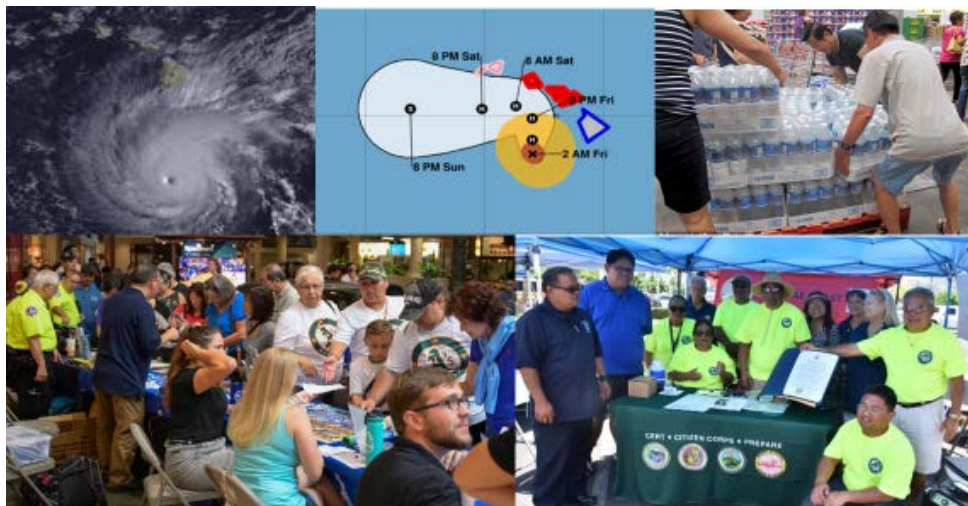


Communication Strategy & Outreach Plan To Prepare the Community for Natural Hazards



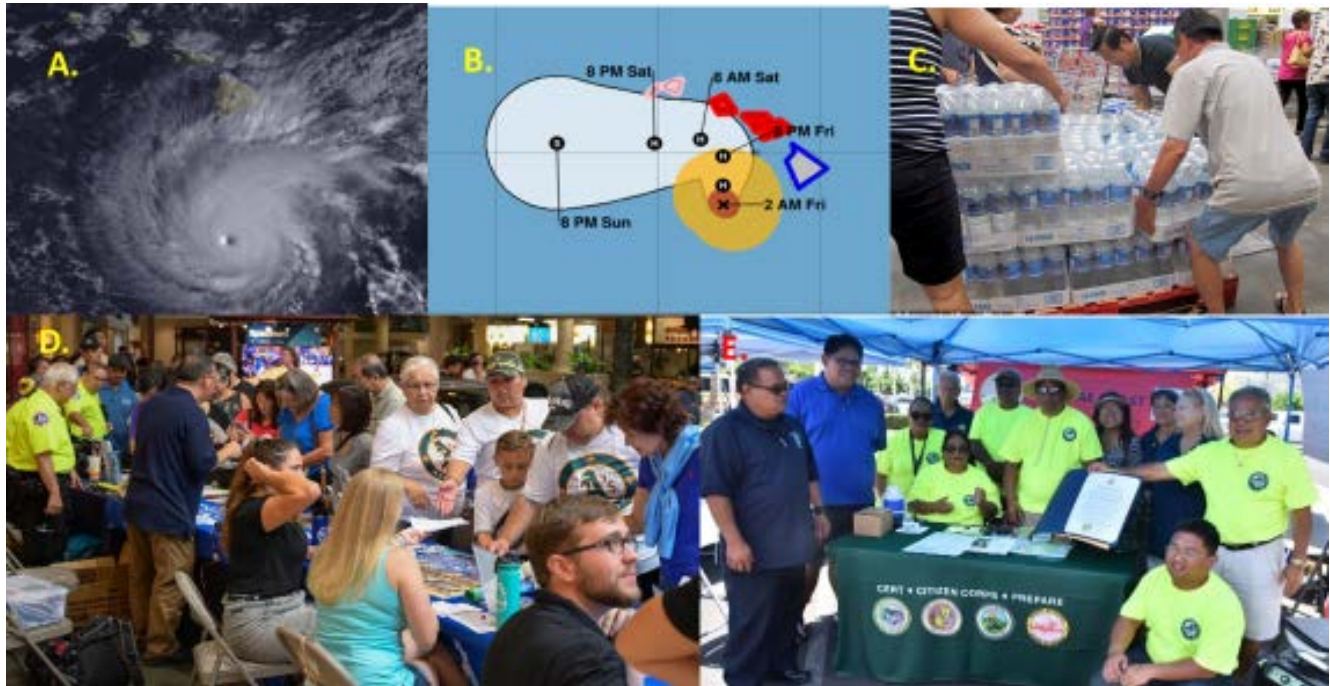
A Report to the Legislature on House Bill 571-2017
Proposed by Representative Mark Nakashima

Signed into Law as Act 61 - 2017
By Governor David Ige on June 23, 2017

By

University of Hawai'i Sea Grant College Program
December, 2019





- A. Hurricane Lane threatens the Hawaiian Islands in August of 2018.
- B. Approximately two days before a potential impact on O‘ahu, and other islands, Lane is a Category 3 hurricane. **A Pacific Disaster Center Study in 2018 estimates for a Category 2 strike on O‘ahu, 52,000 damaged or destroyed homes and 27.4 billion in damages with topographic wind speedup (real world conditions).** (See: <https://www.civilbeat.org/2018/11/analysis-lane-could-have-destroyed-thousands-of-honolulu-homes/> and attached PDC report – slides 7 & 17).
- C. Residents that are **Unprepared** for a hurricane, rush to the store for food and water, cleaning out the shelves for others.
- D. **Proactive** and **Receptive** citizens learn of preparation for a natural hazard at Windward Mall on O‘ahu before hurricane season 2019.
- E. **Proactive** citizens forming a Community Emergency Response Team on O‘ahu. It is only the **Proactive** citizens that can help the weak, infirm, handicapped and poor during the worst of times, such as after a hurricane.

This report combines traditional methods of education and outreach with new strategies that target the difficult to reach **Unreceptive/Skeptical/Unprepared** citizens so that they become **Receptive** and **Proactive**.

It is recommended that education and outreach be increased for traditional and nontraditional education and outreach efforts on a systematic and long-term basis.

EXECUTIVE SUMMARY

A 2018 Pacific Disaster Center Study estimates that if a Hurricane such as Lane hit as a Category 2 on O‘ahu, there would be **52,000 damaged or destroyed homes and 27.4 billion in damages** (See: <https://www.civilbeat.org/2018/11/analysis-lane-could-have-destroyed-thousands-of-honolulu-homes/> and attached PDC report – slides 7 & 17). There is a clear need for increased education, as most households have little knowledge of this potential risk and danger, let alone how to prepare for a severe event, or how to cope after. According to **the State of Hawai‘i’s 2018 Hurricane Behavioral Survey**, **“Residents have somewhat of a false sense of security . . . they continue not to have sufficient supplies in storage, not to have made hardening improvements to their homes, and not to have prepared for a hurricane.”** There is **“a need for increased levels of educating the public on many aspects of hurricane preparation.”** The number one suggestion by the respondents of the survey as to how the authorities can best help families prepare is: **“Provide more information/build a better website/educate/train and communicate more (43% response with the second most common response at 13% to “help us harden our homes.”)**

Data from the Behavioral Study does show education and outreach have significantly changed the communities views on preparedness. This is a slow process, but it does occur (See change in attitudes over a ten-year period to the concept of “Sheltering in Place.”) Given the cited hurricane risk, it is **the thrust of this report that education and outreach should proceed at a significantly accelerated rate over a continuous sustained period.**

This Communication Strategy & Outreach Plan (“CSOP”) Report is one of **three requirements** under House Bill 571-2017, which was signed into law by Governor David Ige on June 23, 2017. The other two were: (i) update the Homeowner’s Handbook to Prepare for Natural Hazards (Version 3.2 was printed in 2018 and Version 4.0 was released in November 2019), and (ii) Participate in communication and outreach efforts throughout the State (Sea Grant has been involved in 67 events in the year 2018 and over 40 through 2019).

This CSOP Report is based on:

- (i) Concepts of Social Science through published reports from FEMA and NOAA;
- (ii) Interviews with key stakeholders such as at the State and County Emergency Management and Civil Defense Agencies and the Department of Education;
- (iii) The 2018 Hurricane Behavioral Survey prepared for the Hawai‘i Emergency Management Agency, FEMA and the US Army Corps of Engineers with 2,488 responses out of a sampling of 13,677 (18% response);
- (iv) Limited informal surveys conducted during Hurricane workshops and seminars on the level of preparedness for attendees; and
- (v) Lessons Learned in conducting outreach from 2007 to 2019 (over 300 outreach events of widely varied formats).

The Traditional method of communication/outreach (**Strategy 1**) targets the characteristics of various target individuals and organizations. There were 27 categories identified as a rough generalization (e.g., homeowners, renters, businesses, workforce, families, tourists, etc.) **Education and outreach throughout the State has been successful in reaching many of these groups and the recommendation is to increase and build upon the level of this outreach/education with the partnerships and initiatives currently established.** One weakness of this strategy alone, are individual or organizational groups that fall through the cracks and most importantly, a large percentage of citizens who are skeptical or dismissive of the hazard risk (“it won’t happen to me”). Therefore this group is unlikely to attend targeted learning sessions such as seminars, workshops, emergency fairs, or implement any preparedness actions.

Strategy 2 is based on the behavioral characteristics of the individual. Four categories of individuals are identified as follows: (i) **Proactive/Prepared**, (ii) **Receptive** to the message, (iii) **Skeptical/Unreceptive** to the message, and (iv) the **Assisted** (weak, infirm, handicapped, poor, etc.). In **Strategy 2**, the goal is to move individuals up the Preparedness ladder in small steps so the **Skeptical/Unreceptive** become **Receptive**, and the **Receptive** become **Proactive/Prepared**. Only the **Proactive/Prepared** individuals can help the **Assisted** (e.g., Put your air mask on first before helping others). **Strategy 2** is designed not to replace **Strategy 1** but supplement it. The key target in this Strategy are reaching the difficult to reach **Skeptical/Unreceptive** group.

Eight approaches to reach the **Skeptical/Unreceptive** are: 1) **Mandatory vs. Voluntary Education** – through the use of short videos (e.g. 5-10 minutes); 2) **Continuing Education Credits** for many professions with hazard preparation messages woven into the curriculum; 3) Using the **School Setting and Curriculum** with various strategies for principals, teachers, students and parents; 4) **Financial Incentive Programs** so that Grant Programs proposed by the Legislature in 2019 (e.g., HB799 - 2019 to implement a home retrofit program) can be paid for with relatively little State funding, but provide a large incentive to retrofit for hurricane & earthquakes; 5) Expand and increase the State’s **Hawai‘i Hazard Awareness and Resilience Program (HHARP)**; 6) Expand and increase **Community Emergency Response Teams**; 7) Increase the use of **media such as TV, Radio and Newspaper**; and 8) **Legislative Monitoring and Action** – to continuously assess progress and provide appropriate action related to items 1 through 7. This is not the total list of all options as this report is meant to be a living document with interactive monitoring and adjustment. There is no one silver bullet that provides the solution, unless the broad term of education and outreach and the multiple facets can be considered one solution. It is likely some of the eight strategies listed will be more effective than others.

After discussion with all Emergency Management and Civil Defense Agencies, it is proposed six new communication/outreach/education officers be hired on a long-term basis (one in the emergency management or civil defense office for each of the four counties, one at the State HIEMA, and one at Sea Grant to work on: (i) outreach in businesses and the community, (ii) public education assistance in the schools, and (iii) volunteerism (building HHARP and CERT). Quarterly meetings would help to coordinate and implement items 1 through 8 over the next 3 years, with some items on a 1 - 2 year track to implementation (1, 2, 5, 6 & 7) with others on a 2 - 3 year track to implementation (3 & 4). Once established outreach, education and training would continue on a long-term basis with continual monitoring and adjustment.

To assess progress and goals, five levels of individual preparedness are identified with an approximate baseline in parenthesis based on assumptions made from the Hurricane Behavioral Study:

- (1) Aware & Understands Hurricane Risk (54%);
- (2) Have recommended two week supply of food and water (40%);
- (3) Have a realistic evacuation plan (37%);
- (4) Retrofitted home to make stronger (36%); and
- (5) Plans to assist others – friends, relatives [CERT & HHARP] (<36%).

The preparedness numbers are likely an overestimate since the 18% responding in the Hurricane Behavioral Study are likely to skew the percentages to make communities appear more proactive. Nevertheless because each successive level is more difficult to attain, the percentage of participation at the higher levels (e.g., retrofitted their homes) gives an indication if progress is being made at the lower levels.

Through the third quarter of 2019, an estimated 3,103 homes have been retrofitted through past and existing education and outreach programs. **The goal of this strategy is to inform all homeowners of hurricane risk and retrofit an additional minimum 5,000 homes over five years.** Because retrofitting is one of the most difficult items to do in the preparedness ladder (Level 4), a given percentage increase in this parameter would be indicative of a higher increase at the lower levels of preparedness (Levels 1-3). Furthermore, many proactive homeowners who have retrofitted have plans to shelter not only their family, but many families (One citizen who retrofitted planned to shelter 20 people in their house – relatives and neighbors – and convinced 6 neighbors on their block to retrofit with hurricane clips and window protection).

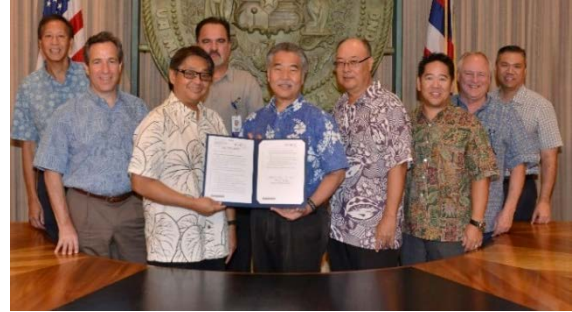
Using the PDC estimate of 52,000 homes damaged or destroyed and 27 billion in damages for a Category 2 strike on O‘ahu, saving 5,000 homes (or roughly 10%) could perhaps reduce damages by roughly 10%, or 2.7 billion as a ballpark. This is a good investment for the approximate 1 million per year proposed annualized budget to significantly increase education, outreach and volunteerism throughout the State. **Over time, with continued education and outreach, even more homes could be retrofitted and a culture of preparedness could become significantly more pervasive throughout the State.**

CHRONOLOGY

April 28, 2017 - House Bill 571, H.D.1, S.D.1 was passed in the 2017 Legislative Session. The Bill requires: (i) Systematic Education & Outreach around the State on hazard risk and preparation, (ii) Update of the Homeowner's Handbook to Prepare for Natural Hazards, and (iii) a Communication Strategy & Plan (this report).

June 23, 2017 – House Bill 571 – 2017 is signed into Law as Act 61-2017 by Governor David Ige

January 1, 2018 – Funding released by the University of Hawai‘i



January to December, 2018 – Sea Grant begins work for the Update of the Homeowner's Handbook, developing and reviewing new: (i) retrofit options for post & pier foundations on single-wall houses (See: <http://seagrant.soest.Hawaii.edu/wp-content/uploads/2019/02/2018-Post-and-Pier-Retrofits-February-5.pdf>); (ii) retrofit options with structural screws to add a continuous load path connection for double-wall house (See: <http://seagrant.soest.Hawaii.edu/wp-content/uploads/2018/06/Structural-Screw-Installation-and-Testing-June-2018.pdf>); and (iii) shelter in place guidance with the Hurricane Evacuation Shelter-in-Place Table (See: <http://seagrant.soest.Hawaii.edu/wp-content/uploads/2018/06/HomeownersHandbook-version-3.2.pdf> at Appendix A – page 101 and to the right). Consultants are hired for review. Concurrently, community education and outreach proceed, while meetings and work are conducted on developing the Communication Strategy & Outreach Plan (this report).

April 15, 2018 – Record flood events on Kaua‘i and O‘ahu lead to the damages of over 500 houses. Sea Grant conducts reconnaissance and assists homeowners with best practices for cleanup. Provides information on cleanup for mold.

ABILITY TO SHELTER IN PLACE DURING A HURRICANE					
PLEASE READ INSTRUCTIONS BEFORE USING THIS TABLE					
Safe room					FEMA or Hawai'i Residential Safe Room
Concrete or CMU wall house	Concrete CMU wall house in poor condition	Concrete CMU wall house in good condition	Concrete CMU wall house with hurricane clips	Concrete CMU wall house with hurricane clips & window protection	Concrete CMU wall house with hurricane clips exceeding code & window protection
Double wall house	Double wall house in poor condition	Double wall house in good condition	Double wall house with hurricane clips	Double wall house with hurricane clips & window protection	Double wall house with hurricane clips, window protection, garage & roof reinforced
Single wall house	Single wall house in poor condition	Single wall house in good condition	Single wall house with hurricane clips	Single wall house with hurricane clips & window protection	Single wall house with complete load path, window protection, garage & roof reinforced
Suggested Action	Unsafe Evacuate! Do Not Shelter in place	Marginal Shelter in place up to a Tropical Storm	Good Shelter in place up to Category 1 hurricane	Better Shelter in place up to Category 2 hurricane	Best Shelter in place up to Category 3 hurricane

April 28, 2018 – Preparedness fair in Pahoa of the Puna District for Representatives Joy San Buenaventura and Mark Nakashima. Cover with residents preparing for hurricanes and other hazards, retrofits for hurricane and earthquakes, emergency supplies, and evacuation planning.

May 3, 2018 – Record lava flow activity begins in the East Rift Zone of the Puna District, and eventually destroys 720 houses by the time it stops in early August of 2019. Associated with the lava flow activity are magnitude 5 earthquakes, almost on a daily basis disrupting the lives of residents in Volcano Village and causing structural damage. Sea Grant conducts reconnaissance of housing with FEMA and provides information through public meetings to residents of Volcano Village on structural retrofits for homes on post & pier foundations.

July 2018 – For the 2018 hurricane season, printing of the Homeowner’s Handbook to Prepare for Natural Hazards **Version 3.2**, with new measures for window protection, updated emergency contact information and vetted hurricane Shelter-in-Place Table (footnote 3).



August 24, 2019 – Hurricane Lane threatens O‘ahu and other islands as a Category 3 storm before veering sharply to the west. A 2018 Pacific Disaster Center Report estimates 3,800 homes displaced if Lane hit as a Category 1, which is an underestimate since topographic wind speed up was not considered. **With topography representing real world conditions, a Category 2 is estimated to displace 52,000 households and cause 27.4 billion in damage** (See: <https://www.civilbeat.org/2018/11/analysis-lane-could-have-destroyed-thousands-of-honolulu-homes/> and the attached PDC report – pages 7 & 17). Sea Grant participates in 8 TV, radio and newspaper interviews for Lane regarding preparation and informing residents not to tape or open windows and how to protect openings (Think Tech Hawai‘i, Hawai‘i News Now (KGMB, KHNL), KHON, Hawai‘i Public Radio and Star Advertiser).

September 9, 2018 – Tropical Storm Olivia makes landfall on Maui with sustained winds of 40 mph after having weakened from a Category 3 hurricane 5 days earlier. Sea Grant participates in another round of TV and radio interviews advising people what to expect and how to prepare.

January to December 2018 – Sea Grant participates in 67 workshops, fairs, seminars, media interviews, community meetings on preparation during the 2018 year. Different agents on Kaua‘i, Maui and O‘ahu are involved. The normal level of outreach participation since introduction of the Homeowner’s Handbook in 2007 has been 15 to 25 per year.

January - April 2019 – Homeowner’s Handbook 4th Edition is prepared and sent to Sea Grant Communications for complex layout and printing. The **4th Edition** is a total rewrite with new sections on volcanoes (with help from USGS) and climate change (with help from Sea Grant, NOAA) which cover heat, drought, wildfire, infectious disease, sea-level rise and erosion. New best practices cover aspects of hazard resilience, climate adaptation, and environmental sustainability. New retrofit options are included for single-wall houses with post and pier foundations and adding the continuous load path for double-wall houses with structural screws. An enhanced evacuation planning summary section is provided covering all hazards, (hurricane, tsunami, flood, wildfire and lava).



May - June 2019 – This Draft Communication Strategy & Outreach Plan is prepared for review.

October-November 2019 – Printing of the Homeowner’s Handbook to Prepare for Natural Hazards - Version 4.0. Although the book went from 120 to 176 pages, printing on thinner paper allows the book to maintain the same relative thickness. The digital version has over 140 interactive external resource links and is ADA compliant for this complex layout.

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I. INTRODUCTION

House Bill 571-2017 was passed by the Twenty-Ninth State Legislature during the Regular Session of 2017 and signed into law as Act 61-2017 by Governor David Ige on June 23, 2017. The Act required three tasks:

- (1) Develop a communication strategy and outreach plan for emergency management and disaster preparedness;
- (2) Update and publish the fourth edition of the Homeowner's Handbook to Prepare for Natural Hazards; and
- (3) Conduct a systematic and targeted education and outreach initiative throughout the State for emergency management and disaster preparedness.

This Legislative Report gives the status of all three tasks, while presenting the actual Communication Strategy and Outreach Plan. The reader is referred to the attached Chronology to assist in understanding the timing of the three individual tasks.

Status of the Communication Strategy and Outreach Plan – This report contains the Communication Strategy & Outreach Plan. It is anticipated that this Strategy and Plan will be updated on a periodic basis and can be considered as a living document.

Status of the Homeowner's Handbook Updates - The Homeowner's Handbook was updated twice. The first was Version 3.2 which included a new Hurricane Shelter-in-Place Table which was prepared specifically for the 2018 hurricane season. This table required review by several committees and consultants and was used to guide the public during the threats of Hurricane Lane in August and Tropical Storm Olivia in September of 2018.

The writing for Version 4.0 was completed in April of 2019 and was laid out by the Sea Grant Communications Department in the summer of 2019. Printing is taking place in October and November of 2019. Version 4.0 is an extensive rewrite with new major retrofit options dealing with: (i) post and pier foundations for single-wall houses (especially vulnerable during a hurricane or earthquake) and (ii) adding connections to older double-wall houses to complete a continuous load path using structural screws. It was not possible to put these new retrofit options in Version 3.2 since they were still being refined and reviewed. Version 4.0 also has new sections on volcanoes (written with the assistance of the USGS), and on Climate Change (heat, drought, wildfire, infectious disease, sea-level rise and erosion). The book has an extensive update on evacuation planning, which is so important given new hazard maps the public should be aware of (e.g., extreme tsunami zones and new hurricane storm surge maps). In the 4th Edition, there will be a new emphasis not only on resiliency from natural hazards, but environmental sustainability and climate adaptation. It is anticipated that over 20,000 copies of the 4th Edition will be printed. The book has gone from 120 pages in Version 3.2 to 176 pages in Version 4.0 and is now also ADA compliant. In addition, Version 4 has over 140 interactive external links on key resources for preparation from all hazards applicable to the State. Because of the new print and digital requirements, the 4th Edition has taken over two months to lay out.

Status of Education and Outreach throughout the State- The status of education and outreach throughout the State, in terms of what Sea Grant has done or can do is broken into three parts: (i) Since 2007 with the first printing of the Homeowner's Handbook, (ii) After passage of House Bill 571 and Act 61 in 2017, and (iii) after finalization and review of the Communication Plan and Strategy. Ever since the Handbook was printed in 2007, Sea Grant has participated in 15 to 25 outreach events per year for free for the community, in the form of workshops, emergency fairs, seminars, media interviews and or meetings. In 2018, with a dedicated budget for the first time, this led to additional staff and hours for the community education and outreach effort. This along with the flood emergency on O'ahu and Kaua'i (April 15), the volcano on Hawai'i County (May to August), and the threats from Hurricane Lane and Olivia (August and September), resulted in Sea Grant participating in 67 outreach events in 2018. In 2019, Sea Grant participated in 45 outreach events at the time of this writing. In the future, it is anticipated, unless driven by more hazard events, the level of outreach will be slightly less and will be guided more by the Communication Strategy and Plan.

It should also be noted that the State Hawai'i Emergency Management Agency and the County Emergency Management and Civil Defense Agencies also conduct significant education and outreach. However all of these agencies have limited budgets for education and outreach, let alone for proper staffing to carry out their mission. Sea Grant typically partners with these agencies on numerous emergency workshops and fairs and has done so since 2007, when the first edition of Homeowner's Handbook was published. These fairs and workshops are more effective when a number of partners participate and share organizational as well as financial duties.

II. METHODOLOGY

This Communication Strategy & Outreach Plan is based on the following:

- 1) **Concepts of Social Science**– Social Science reports were utilized with a list of references that appear in the text or as footnotes. No actual social science research was conducted, except for reports and resources published by FEMA, NOAA and other government or non-profit organizations.
- 2) **Interviews**– Interviews were conducted with the HIEMA, the Emergency Management or Civil Defense Agencies for all four counties, and the Department of Education. The suggested implementation action is based partly on these interviews.
- 3) **Hurricane Behavioral Study** - This report made extensive use of a 2018 Hurricane Behavioral Survey funded by FEMA, the Hawai'i State Emergency Management Agency ("HIEMA") and the US Army Corps of Engineers. This survey is based on 2,488 responses from a sampling of 13,677 (18% response). The Study is a ten-year follow up to a similar Behavioral Study conducted in 2008.
- 4) **Lessons Learned**– Most importantly, this report is primarily guided by Lessons Learned from conducting community outreach (emergency fairs, workshops, seminars, meetings, etc.) over the last twelve years beginning with the initial publication of the Homeowner's Handbook in 2007. From 2007 to 2017, Sea Grant has participated in about 15 to 25

outreach events per year. There was a significant spike in 2018 associated with the passage of House Bill 571 and Act 61-2017. This amounts to over 300 outreach events of widely varied formats. During some of these workshops and seminars, informal surveys were conducted to gauge the level of audience preparedness. Much has been learned from these past educational and outreach events. Here is some insight:

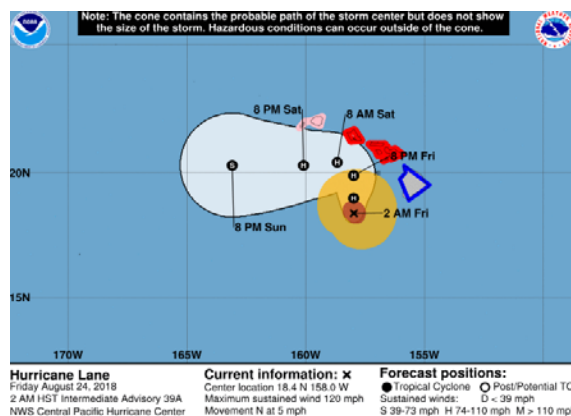
- a. Since 2007, there have been 9 print runs of the Homeowner's Handbook with approximately 74,000 copies. With the printing of the 4th Edition, there will be 10 print runs with over 100,000 copies.
- b. The book is given away for free but primarily to people that express a certain level of interest. For example, people who attend a seminar or workshop, or go to an emergency fair and visit a booth or ask questions are given free copies. The book is in high demand and generally more people ask for the book than are available given the historical budget. Sea Grant has been approached for outreach by communities, church groups, chambers of commerce, rotary clubs, neighborhood boards, companies, the insurance industry, the real estate industry, retirement groups such as AARP, and many non-profit organizations.
- c. The main objectives of the book are to: (i) inform homeowner's of the hazard risk, (ii) encourage them to gather their emergency supplies and evacuation kit, (iii) create an evacuation plan so they know where to go to save their lives during a hurricane and a tsunami, and (iv) strengthen their house through retrofits to minimize or eliminate damage from a hurricane or other natural hazards.
- d. In paragraph c. – The four items represent the first four steps in the preparedness ladder introduced later in this document. Item (i) is the easiest for homeowner's to follow and each successive step would be progressively more difficult. Intuitively, the percentage of homeowners learning about hazard risk and gathering their supplies will be greater than those that retrofit, because of the greater difficulty and cost in retrofitting. Since the books are screened for people with an interest, the percentage of homeowners more informed of hazard risk and gathering their supplies is expected to be high, because of the interest in reading the book.
- e. Regarding retrofits and strengthening houses here are a few statistics. From 2006 to 2008, data from the Department of Commerce and Consumer Affairs indicate 430 homes were retrofitted with hurricane connectors under the State Wind Resistive Devices Installation Grant Program, which provided grants of up to \$2,100 to strengthen houses (see House Bill 799 – 2019 testimony under the State Legislature website). Data from Simpson Strong Tie indicates from 2010 to the third quarter of 2019, an estimated 80,202 Hawai'i Plantation Tie ("HPT") hurricane clips were sold. **These clips are only used for retrofit and not new construction.** An average house needs about 40 HPT clips for a retrofit, which means approximately



2,005 homes were retrofitted. Also, assuming that 1/3 of the retrofitted houses can get by with the easier to install H3 hurricane clip, our best estimate for retrofits is 2,673 houses between 2010 and 2019, and 430 houses between 2006 and 2008 under the State Grant Retrofit Program, or 3,103 in total.

- f. While the handbook made a dent in helping homes to be strengthened, not all of it is attributed to the book but it was one of the major communication outreach drivers. While 3,103 homes retrofitted overall is significant (2,673 and 430 before the book with the State Grant Program), it pales in comparison to potential damage from a Category 2 strike on O‘ahu with an estimate loss of 52,000 houses damaged or destroyed. All the vulnerable homes on O‘ahu and all the other islands are the main target of this Strategy Plan.

- g. From the Pacific Disaster Center Study noted above, **the estimated losses are 52,000 displaced homes and 27 billion in damage** for a Category 2 hurricane hitting O‘ahu when topographic wind speed up is considered (i.e., real world conditions). Hurricane Lane in 2018 had the potential to cause such damage, as two days from O‘ahu it was a Category 3, but weakened and turned suddenly to the west after shear winds weakened the system. Hurricane Iniki in 1992 damaged or destroyed 6,300 to 7,000 homes on Kaua‘i, based on data from the office of Emergency Permitting. O‘ahu has roughly 8 times more structures than on Kaua‘i, so a ball park estimate of the damage if Iniki had turned north 6 hours earlier and struck O‘ahu instead of Kaua‘i provides



estimated losses in line with that of the 2018 PDC study. Thus this catastrophic scenario could easily have played out twice, in 1992 and 2018, so the threat should not be taken lightly that this scenario is highly unlikely. Furthermore, climate change with increased ocean temperatures, stronger El Nino Cycles only serve to increase the risk. It is believed that the record number of 16 tropical cyclones during the 2015 hurricane season in the Pacific was

caused by a “Super El Nino,” and that such conditions will be more common in the future with climate change.

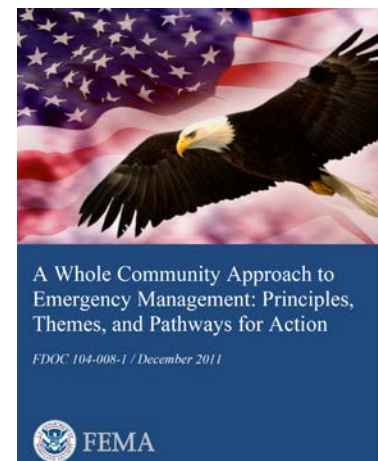
- h. The potential estimated loss are staggering and more can be done in a proactive manner to lessen this risk. There is no silver bullet, but numerous fixes can help to move the needle and reduce the risk. These include: i) stronger building codes to make new homes more resilient to hurricane force winds (specifically requiring window protection or a safe room for all counties with no loopholes for exceptions), ii) improved number and quality of hurricane shelters, and iii) a more educated and proactive public, which include homeowners who are better prepared and are receptive to strengthening their home. This report does not address the first two items, but it is this Communication Plan and Outreach Strategy which can directly help to address the third.

III. OBJECTIVES & STRATEGY

It is the objective of this report to make the community more resilient. In order to achieve this, it is necessary to engage the Whole Community. This concept of the Whole Community approach to engagement came into being after Hurricane Katrina in 2005 and the **massive loss of life and property damage (1,836 casualties, 300,000 damaged homes and \$125 billion in damages – See: <https://www.thebalance.com/hurricane-katrina-facts-damage-and-economic-effects-3306023>)**. The Federal government came to realize that the top down approach with Federal, State and local emergency response was insufficient as some hazards were too widespread and extreme (Katrina – Category 5 with 28 foot storm surge). Simply put, the government could not do everything in the face of some major hazards. It was necessary for the Whole Community to be involved in preparation, response and recovery.

By the Whole Community, it is meant **all individuals and all organizations** are engaged and involved in preparation, response and recovery for a natural hazard (See: <https://www.fema.gov/media-library/assets/documents/23781>). By realizing that all sectors of the community (individuals and organizations) need to be involved, this leads to the key communication strategies in this report. How exactly do we get **all individuals and all organizations** in the State to be better prepared to respond and recover from a natural hazard?

Two major strategies are presented in this report. **Both are recommended** as they reinforce the goal of preparation since they can be tailored to work in tandem to address the weaknesses of the other strategy. In addition, the severity of the hazard risk as indicated by the loss estimation values from the Pacific Disaster Center Study for a hurricane strike on O‘ahu, indicate a much more proactive and aggressive approach to educating the community is warranted. Imagine if Hurricane Lane did strike O‘ahu and the loss estimation numbers by PDC are accurate? This would catch tens of thousands of residents completely unaware of the severity, danger and damage possible from a hurricane strike. Observations made at various communities before Hurricane Lane, indicate there appeared to be little effort to protect windows. Fortunately, Lane veered away, and now the majority of residents continue to believe a hurricane will not strike the island and thus, will make little effort to prepare with the proper supplies, an evacuation plan, home retrofit measures, or property insurance (hurricane and flood).



Strategy 1 – Traditional Education and Outreach that Targets the Individual or Organization’s Specific Characteristics

A major tenant of communication with the public is to tailor the modes of communication and the message to the target audience.¹ But what is the target audience if the goal is to reach **all individuals and all organizations** in the State?

Below are general lists of target audiences (individuals and organizations) that can be targeted with preparation communication messages.

Target Individuals could include:

Businesses/Owners	Children
Homeowners	Minorities
Renters	Pet Owners
Workforce	Injured or Infirm
Families	Military Families
Tourists	Non-English Speaking
Elderly	Disadvantaged/Disabled

This is not a complete list and certainly generalized. For example, the Non-English Speaking group could further be broken down into (Hawai‘ian, Chinese, Japanese, Vietnamese, Ilocano, Tagalog, and Korean, Spanish or other). According to census data, there are at least 130 languages spoken in the State.²

Target Organizations could include:

Police	Food & shelter programs
Fire	Indigenous groups & tribes
Emergency Management	Businesses
Medical providers	Chambers of Commerce
Faith Based Groups	Colleges & Universities
Civic Clubs	Federal, State & County Agencies
Non-profit organizations	

Again this is a generalized list and could be considerably expanded.

The traditional strategy for preparing the community is with targeted messaging for targeted audiences. Targeting can come in the form of the communication mode or the message itself or both. Examples of targeting include:

¹“Risk Communication Basics” 2016 by the Office for Coastal Management, NOAA; “Citizen Corps Personal Behavior Change Model for Disaster Preparedness” 2013 by the Citizen Corps – Department of Homeland Security, FEMA; and “Community Resilience: Building Resilience from the Inside Out – Version 3.0, 2017 by the National Disaster Preparedness Training Center, University of Hawai‘i, and FEMA.

²http://files.Hawai‘i.gov/dbedt/census/acs/Report/Detailed_Language_March2016.pdf

1. Hawai‘i Electric Company’s Emergency “Preparedness Handbook” targets non-English speakers and children. The book is written in English, Cantonese, Ilocano, Korean, Vietnamese, and there is a Kiekie version. (<https://www.Hawai‘i.electric.com/safety-and-outages/storm-center/emergency-preparedness-handbook>).
2. University of Hawai‘i Sea Grant College Program’s “Homeowner’s Handbook to Prepare for Natural Hazards” is written for homeowner’s. (<http://seagrantsoest.Hawai‘i.edu/homeowners-handbook-to-prepare-for-natural-hazards/>).
3. Hawai‘i DLNR, HIEMA and UH Sea Grant’s “Hawai‘i Boater’s Hurricane and Tsunami Safety Manual” is written for boat owner’s. (<https://seagrants.noaa.gov/News/ArtMID/468/ArticleID/258/Hawai‘i-Boater’s-Hurricane-and-Tsunami-Safety-Manual>).
4. The State of Hawai‘i Emergency Management Agency provides specific guidance for individual with disabilities (<http://dod.Hawai‘i.gov/hiema/public-resources/special-needs-information/>); the elderly (<http://dod.Hawai‘i.gov/hiema/files/2016/03/seniorsafetyguide.pdf>); and parents with children in schools (<http://dod.Hawai‘i.gov/hiema/files/2016/03/HIEMAFactsheet02.pdf>).
5. The Kaua‘i Emergency Management Agency has preparation materials for businesses for a tsunami (<https://www.Kaua‘i.gov/Government/Departments-Agencies/Emergency-Management-Agency-formerly-Civil-Defense/Emergency-Preparedness>).
6. All of the County Emergency Management or Civil Defense Agencies have materials related to preparing families with the emergency supplies and evacuation kits. See: (<http://www.Hawai‘icounty.gov/emergency-preparedness>), (<https://www.mauicounty.gov/70/Emergency-Management-Agency>), and (<http://www.honolulu.gov/dem/getready.html>).

This targeted messaging Strategy is vital and should continue at an even greater level given the hazard risk identified. The advantages of this traditional targeted approach are:

- (i) Messaging that targets characteristics of the audience is a traditional method of outreach following established principles of social science.
- (ii) It is well established in the State with multiple organizations effectively collaborating as partners for emergency fairs and workshops.
- (iii) It is an effective strategy to target some of the larger target audiences, for example families or homeowner’s.

However, there are some limitations to Traditional Strategy 1 as noted below:

- (i) With limited funding it is not possible to target all the audiences. For example detailed specific guidance has been developed for homeowner's or boatowner's but not for renters or for companies concerned about business continuity. Given the large number of individual audiences and organizations identified above, many can fall through the cracks, especially for the smaller and mid-sized groups. It should also be noted that in the list above, there is significant generalization in the individuals and organizations making up the Whole Community. A more detailed breakdown may reveal even more groups that fall through the cracks. **In reality, it will be almost impossible to reach all individuals and all organizations in the State to achieve true resilience.** However, an effort to attempt to do so, instead of ignoring the problem, will lead to a greater number of individuals and organizations that are reached.
- (ii) The Traditional Strategy 1 strives to tailor the message and the mode of communication to the characteristics of a particular audience. While it is possible to customize the message, the delivery of the message in terms of the mode of communication (TV, media, workshops, emergency fairs in malls, seminars, brochures, handbooks, flyers, etc.) has its own challenges. All have been tried. This is complicated by audience behavior.
- (iii) Related to (ii) and most importantly, the Traditional Strategy does not account for audience behavior. In twelve years of outreach conducted by Sea Grant, it has been found that even though homeowners can be targeted successfully, many or possibly the majority are unreceptive to the message of preparedness for many reasons, but primarily for the belief that a hazard such as a hurricane will not happen to them ("It may be possible on Kaua'i but not on O'ahu"). Secondary reasons for lack of preparation are: i) "it won't be that bad"; ii) "there is nothing I can do"; iii) "I don't have the time"; iv) "it is too expensive to do anything"; and v) "government will come to the rescue." People who are unreceptive to the message of preparation can be in many different target audience groups (e.g., homeowners, renters, business, work force employees, etc.)

The traditional targeted approach can be improved in two ways. First, there is insufficient funding to address all target audiences. Many emergency management and civil defense agencies at the State and local level have limited staffing with barely enough manpower to carry out their emergency response duties, let alone their communication and outreach efforts. Greater assistance could be given to those organizations conducting community education and outreach. It is one of the greatest investments. Intuitively, it makes sense to better warn citizens of the community about the actual risk of hazards, especially when many believe it cannot happen while the risk is potentially dire. This attitude can lead not only to greater property damage but significant loss of life. Statistically, studies by FEMA show that for every dollar

spent on preparation related to building better, there was six dollars in future benefits.³ When using broader criteria, such as general education and preparation, the multiplier is 15 to 1.⁴

The second way to improve the traditional targeted audience approach is to supplement the education and outreach not only based on target audiences characteristics, but target audience behavior.

Strategy 2 – Education and Outreach Strategy that Targets the Individual’s Behavior

In Strategy 1, there was a list of 27 categories of individuals and organizations that could be targeted with preparation messages. These categories were highly generalized, and with more specificity, the list could be endless. **In Strategy 2, there are only four generalized categories** based on social science reports and lessons learned from conducting 12 years of outreach throughout the State. It should be noted that Strategy 2 does not replace Strategy 1, but should supplement it. If integrated properly, each Strategy can address the weak points of the other and lead to a more resilient community by reaching a greater percentage of the population.

As indicated previously, the four categories of behavior are developed from lessons learned in conducting 12 years of outreach with the Community in Hawai‘i under varied conditions that include:

Settings- workshops, emergency fairs, seminars, neighborhood board meetings, church functions, school classrooms, college courses, board meetings, etc.;

Media- TV& radio, news interviews & talk shows, newspaper, columns, webinars, social media, etc.;

Formats- books, brochures, flyers, demonstration projects, etc.; and

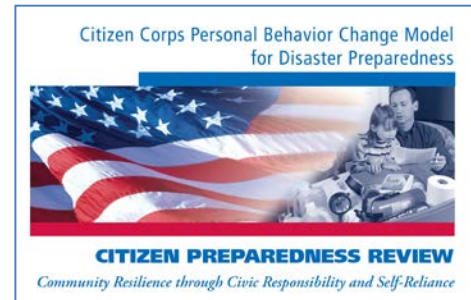
Organizations - businesses, rotary clubs, faith groups, AARP, insurance agents, realtors, attorneys, flood plain managers, architects, planners, county employees, medical groups, community groups, etc.).

Over the 12 year period from 2007 to 2019, Sea Grant has participated in over 300 communication, education and outreach events in the State with 67 in the 2018 year and over 30 in 2019.

³<https://www.nibs.org/page/mitigationsaves>

⁴https://www.researchgate.net/publication/228417598_Citizen_Competence_and_Government_Accountability_Voter_Responses_to_Natural_Disaster_Relief_and_Preparedness_Spending

The four categories in Strategy 2 are also partly based on social science studies and reports. See for example, “Citizen Corps Personal Behavior Change Model for Disaster Preparedness –Citizen Preparedness Review – Community Resilience through Civic Responsibility and Self Reliance” 2013 by the Citizen Corps – Department of Homeland Security, FEMA⁵ and also “Community Resilience: Building Resilience from the Inside Out – Version 3.0, 2017 by the National Disaster Preparedness Training Center, University of Hawai‘i, and FEMA.



The Citizens Corp’s Report identifies three Categories of Behavior – Prepared, Unprepared and Unaware. After conducting education and outreach for more than a decade, this report modifies the three categories to strategically define the audiences encountered in order to develop the communication plan and outreach strategy, **which relies on specific communication products and modes of delivery**. In addition, a fourth category is added to be more inclusive of members of the community.

The changes and modifications to the behavior categories are summarized in Table 1 and discussed below.

Table 1 – Comparison of Behavior Categories from Citizen Corps, 2006 Report and this Report

Behavior Categories from Citizen Corps Report 2006	Characteristics	Behavior Categories in this Report	Characteristics
PREPARED	Understands threat and has high belief in self and response efficacy.	PROACTIVE	Takes initiative to understand risk & prepare (supplies, evacuation plan, residence & family). Capability to help others.
UNPREPARED	Understands susceptibility & severity of threat, yet perceives varied barriers to preparedness.	RECEPTIVE	Receptive to preparedness messages but not fully aware of risk, or measures to prepare, or how to overcome barriers to preparedness. Receptive individuals are open to the message if there is the proper setting and materials provided.
UNAWARE	Unaware or dismissive of threat because of perceived low susceptibility, urgency, and/or severity. Unreceptive to preparedness messages.	UNRECEPTIVE/ SKEPTICAL	Unreceptive to preparedness messages. Perception of no risk, or not worth time, effort or cost to prepare. Will not attend emergency fairs or workshops. No effort to prepare family & residence, create an evacuation plan, or gather emergency supplies beforehand.
		ASSISTED	May or may not understand risk and could ask for help, but not capable of helping themselves. Infirm, or injured, poor, handicapped, disadvantaged, disabled.

Below is a more detailed description of the behavior audiences utilized in this report.

PROACTIVE – This reflects the fact that many individuals will take the initiative to learn of risk, methods to prepare and implement them. Individuals in this group have two important

⁵<https://www.nationalservice.gov/resources/disaster-services/citizen-corps-personal-behavior-change-model-disaster-preparedness>

characteristics. First, this group has the capability to help others. Because of this valuable characteristic, **the goal is to have as many people that are proactive as possible so instead of being a burden during an emergency, they can be an asset.** Second, because the Proactive individual will seek the proper information out and utilize it (i.e., do their own research) the mode of communication can be more diverse, from workshops, fairs, or seminars, to written materials such as guidebooks or computer based resources. In addition, the communication materials for this target audience can be more detailed (e.g., specific guidance on how to retrofit a single wall or double wall house to add a continuous load path connection or how to look up their hazard risk).

Examples of people in this category include the approximate 3,103 homeowners who retrofitted their homes to make them more resistant to wind forces, even though there was no requirement to do so. This could be an underestimate, as it only includes people who have essentially added hurricane clips to their house. Other Homeowners could have strengthened their house in other ways (stronger roof, window protection, etc.). While this number is significant and could be underestimated, it is a small fraction of the estimated losses if a Category 2 hurricane were to hit O‘ahu (52,000 as noted previously in the chronology).



to help others.

Other examples of individuals in the Proactive Category are people who work on volunteer teams such as the Community Emergency Response Teams (“CERT”) for each county, and those who participate in the Hawai‘i Emergency Management Agency’s Hawai‘i Hazards Awareness & Resiliency Program (“HHARP”). CERT and HHARP members take extensive training on preparation education to help the community. These groups should be properly supported because they train

PROACTIVE Members of the Waimanalo HHARP Program take classes in first aid, search & rescue, emergency response, hazard science and community planning. They conduct community outreach, and sometimes go block by block and house to house to reach out to prepare community members.





PROACTIVE individuals are likely to attend workshops or seminars held by the emergency response or civil defense agencies, or by building industry officials to learn about risk and the methods to prepare. This one is on Kaua'i hosted by community leaders and the Kaua'i Emergency Management Agency and

supported by NOAA National Weather Service and University of Hawai'i Sea Grant.



RECEPTIVE– There are many people who are unprepared for many reasons, such as lack of information on: (i) natural hazard risk, or (ii) the proper measures to prepare, or (iii) perceived barriers to implement the measures. These people, however, are receptive to preparedness messages or information on the actual hazard risk in the community. Good examples of these types are encountered during many educational outreach events such as emergency fairs at shopping malls or at food markets. While **Proactive** individuals will go to the event to gather information

related to preparedness, the **Receptive** Group will go to the mall or a farmers market to shop and seeing information on preparedness stop at a booth for more information. If the material is in the proper setting and format, they will be receptive to the preparation messages provided. Because these individuals are receptive, but not proactive, the preparedness messages must be delivered to them versus having them seek the information. Furthermore, the preparation messages may have to be simpler and in less detail versus for the **PROACTIVE** group. The strategy to reach community members through shopping malls and farmers markets is effective because it reaches both the **PROACTIVE** and **RECEPTIVE** audience.



UNRECEPTIVE/SKEPTICAL – Unfortunately, a large percentage of the population is unreceptive of preparation messages or skeptical of the risk. For these individuals the most common reasons we encounter by far are related to lack of appreciation of risk, such as: i) “a hurricane or hazard won’t happen to me,” ii) “it’s never happened here so why worry,” iii) “it

won't be that bad," iv) "hurricanes only hit Kaua'i," or v) "Mauna Kea and Mauna Loa will block the hurricane." Other common reasons in order of frequency include: a) "I don't have the time to deal with this," b) "it is too costly to prepare," c) "government will come to the rescue," and d) "there is nothing I can do."



UNRECEPTIVE/SKEPTICAL individuals are unlikely to go to an emergency fair, seminar or workshop. They are unlikely to gather their emergency supplies during hurricane season, and as a result, during a watch or warning, they may rush to the store to hoard supplies, resulting in long lines and empty shelves.



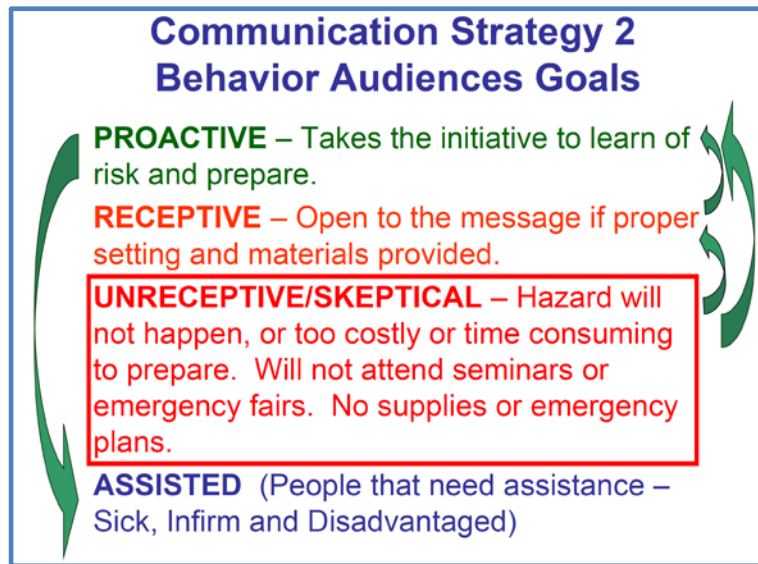
Because many of these people do not know how to properly prepare their supplies for the long term, they return the supplies if there is no event and thus place a burden on the vendors and others. The constant buying and returning of supplies can also lead to "hurricane fatigue," which may cause many to eventually let their guard down from future events.

The greatest concentration by percentage of **UNRECEPTIVE/SKEPTICAL** appear to be on O'ahu for two reasons: First, O'ahu has not had any recent hurricane, or tropical storm activity, unlike Kaua'i (Iwa – 1982, Iniki – 1992) or Hawai'i County (Tropical Storm Iselle 2014) or Maui (the weaker Tropical Storm Olivia 2018). Second, O'ahu has been more urbanized and has a greater percentage of businesses. This may result in residents being a little less in touch with Mother Nature and her potential ferocity. This is unfortunate as the previously cited Pacific Disaster Center study estimates 52,000 displaced homes and \$27.4 billion in damage for a Category 2 hurricane strike on O'ahu when topography is considered (i.e., real world situation) versus 6,300 homes damaged or destroyed on Kaua'i for the Category 4 Iniki. Thus the most vulnerable island has the most number of **UNRECEPTIVE/SKEPTICAL** individuals based solely on the greater population and even more so because of a greater percentage of individuals that are unreceptive/skeptical.

The **UNRECEPTIVE/SKEPTICAL** group is at great risk but there is also significant opportunity for improvement (e.g., 52,000 vulnerable houses on O'ahu alone from a Category 2 hurricane strike, yet almost every house in the State can be retrofitted with Hurricane clips). As previously cited, approximately 3,103 have been retrofitted to date. Education is key, yet how do we address this particular group in terms of the **communication message and mode of communication**, if so many are unreceptive and cannot be reached. More on this to come, but first we must introduce our last Category of individuals.

ASSISTED – The fourth category of individuals are those that need assistance during normal conditions, and even more so during a natural hazard. This includes the injured or infirm, poor, handicapped, disadvantaged, and disabled. There are numerous organizations that help with the assisted group. Many State and county agencies have dedicated programs for various organizations dealing with these groups. For this Group, the major tasks are to ensure individuals in the Assisted Category are informed of where to get help. Secondly, the people or organizations caring for the Assisted must themselves be Proactive and Prepared.

With the four categories of individuals identified, Strategy 2 in this plan provides targeted communication and outreach inputs to the different groups so that members advance up the preparedness ladder in steps (smaller easier to attain steps or preferably larger but harder to reach steps). So the goal of the communication plan is to convert the



UNRECEPTIVE/SKEPTICAL to **RECEPTIVE** and the **RECEPTIVE** group to **PROACTIVE**. The **PROACTIVE** group then can help the people in need. This Strategy has several strengths and thus can supplement the efforts in Communication Strategy 1 as will be shown shortly.

Some characteristics of Communication Strategy 2 are the following:

- 1) Whereas Communication Strategy 1 identified 27 highly generalized groups of individuals or organizations to target, Strategy 2 has four target groups in terms of messaging.
- 2) Communication Strategy 2 provides small and larger goals and objectives for each target group and also shows the interrelationship between the groups. For example:
 - a. A small goal would be for an **UNRECEPTIVE/SKEPTICAL** individual to change behavior and become **RECEPTIVE**. A larger goal would be for the **UNRECEPTIVE/SKEPTICAL** individual to become **PROACTIVE**. This could conceivably happen, but intuitively, it is easier and human nature for an individual to make small changes in behavior versus larger ones. Still this may be possible for a small percentage of people in this group. *The 2006 Citizen Corps Report indicates the most effective message for this group is to have them understand the true hazard risk in order to build a sense of urgency.* This has been Sea Grant's experience in conducting outreach for 12 years through all the islands. The number one reason this group will not act is because it is felt that the hazard will not happen to them. *Thus the message is risk based, but the key hurdle for this very large group is delivering the message when people in this group will not attend fairs, seminars, workshops or other educational or outreach events. The major thrust in this Report is reaching the Unreceptive/Skeptical group with the eight strategies presented in this report.*

This is viewed as the greatest need in terms of increasing overall resilience in the community.

- b. Another goal would be the **RECEPTIVE** person to become **PROACTIVE**. Here the current mode of message delivery, for example an emergency fair at the shopping mall or a food market are effective tools to reach this audience. Again the **PROACTIVE** person is likely to go to these events in order to prepare, while the **RECEPTIVE** person would go to the event to shop, but being approached by staff of various organizations, would stop to learn about preparedness. *Here the messages could be risk based to build the need for urgency. Simple messages are in order to spark interest and overcome perceived barriers to preparation (too costly, too difficult, too time consuming, etc.,)*
- c. It is only the **PROACTIVE** prepared people who can be counted on to help the **ASSISTED** individuals or any other citizens in need. This was demonstrated during Hurricane Katrina when hundreds of first responders could not report to work as they were dealing with their own family emergencies.⁶ A real life analogy are the instructions on an airplane that in case of an emergency, “put your air mask on first before helping others.” This is an important metaphor for all the people who run around taking care of others but themselves. Thus all the organizations and individuals that take care of the **ASSISTED** should be targeted so that their workers are personally and functionally prepared. Delivering messages to the **PROACTIVE** is the easiest as they will seek the information out whether it is in the form of books, reports, meetings, briefings, seminars, workshops, as well as the forums where we also reach the **RECEPTIVE**, such as at shopping malls and farmers markets. Regarding the message, it is not risk based or simple. The **PROACTIVE** person wants information so the information can even be technical, if written so they can understand it at a reasonably basic level.



Given the above, the goal is to move as many people as possible up the preparedness ladder so that there is a greater percentage of **PROACTIVE** and **RECEPTIVE** Individuals. This must be done with targeted messages for each behavioral target group. By far, the most difficult to reach is the **UNRECEPTIVE/SKEPTICAL** group since this is the group that will not be receptive to customary methods of outreach currently associated with Strategy 1 (Traditional Education and Outreach that Targets the Individual or Organizations Specific Characteristics). On O‘ahu, without conducting statistical surveys, it is estimated that this group is not only the most difficult to reach, but the largest in terms of percentage of the population. This is indicated by the many times there is limited attendance at education and outreach events even though hundreds or thousands of people may have been invited.

⁶<https://www.nytimes.com/2005/09/04/us/nationalspecial/law-officers-overwhelmed-are-quitting-the-force.html>

Before proceeding further, let's clarify four points.

- 1) Targeted messaging is meant the actual message itself **and the mode of delivery**. Each is important to induce behavior change. For the **UNRECEPTIVE/SKEPTICAL** a message and mode or modes of delivery must be utilized that reaches a group that historically has been the most difficult to reach with Education/Outreach Strategy 1.
- 2) While there are four behavioral categories in Education/Outreach Strategy 2, with specific characteristics, in reality, there is a gradation in each category. For example, there could be a significant difference in the level of preparedness for even people who are **PROACTIVE** – let's look at the potential gradations or five distinct levels of preparedness:
 - i. Know of natural hazard risk
 - ii. Have emergency supplies & evacuation kit
 - iii. Have i & ii & evacuation plan for tsunami and hurricane
 - iv. Have i - iii & hardening of their home for a hurricane
 - v. Have i - iv & participates in organizations or has plans to help the **ASSISTED** or other citizens of need in the Community.

Similar gradations can be made in the other categories so that in reality the most prepared people in the **RECEPTIVE** category would not be far different than the least prepared in the **PROACTIVE** category.

We will discuss levels of preparedness later in this Report (Section VI), in order to help us assess current conditions of preparedness and the goals in increased preparedness after implementation of the strategies in this report.

- 3) While the goal is for 100% of the population to be Proactive and Prepared, this is an almost impossible goal and the percentage that can attain this will vary with the severity of a hazard event. One individual who is prepared to help others for a Category 1 hurricane may all of a sudden not have a house for a Category 3, and thus not able to help anyone. Many people can help others during normal times, but it is only the truly prepared that can help others during the worst of times. While it is almost impossible to have 100% of the population truly prepared, the effort in this report can help to identify the low lying fruit or easier to implement efforts that will help move the needle to a more resilient State. This can begin by identifying the Target messages **and** Modes of Delivery for each behavior group, **especially the UNRECEPTIVE/SKEPTICAL**.
- 4) The **UNRECEPTIVE/SKEPTICAL** are the main focus of this Strategy 2 because: (i) they make the community the most vulnerable as they will be the least prepared and probably the most demanding in terms of request for government assistance after an event; (ii) in all likelihood they are the one of the largest of the behavioral category groups, if not the largest, especially on O'ahu; and (iii) they are the most difficult to reach because Traditional methods of outreach and education such as in Strategy 1 have not

been successful in reaching them. In order to be reached, non-Traditional methods of delivery and messaging are required. This is indicated in the Table below.

BEHAVIOR CATEGORY	Goal	Target Messages	Mode of Delivery
PROACTIVE	Become as Prepared as possible and help the ASSISTED community.	Provide information to enhance resilience. Facilitate providing community assistance. Information can and should be detailed if necessary.	Broad – Books, manuals, brochures, seminars, workshops, fairs, websites, media, etc. Individual will seek the information and digest it in many forms.
RECEPTIVE	Become PROACTIVE	Increase knowledge of risk and measures to implement preparedness including overcoming barriers. Simpler messages.	Brochures, emergency fairs at malls or markets. Media
UNRECEPTIVE/ SKEPTICAL	Become RECEPTIVE	Risk based messages to build sense of urgency. Simple preparedness measures with regard to saving own lives.	Media –and non-Traditional methods of delivery. Eight methods are presented below. There are many more alternatives.
ASSISTED	Become prepared as much as possible. Work with PROACTIVE Care Providers.	Risk based messages. Information to facilitate seeking assistance.	Work with organizations that help the ASSISTED group.

IV. KEY STRATEGIES TO REACH THE UNRECEPTIVE/SKEPTICAL

In Strategy 2, the key task is reaching members in the Unreceptive/Skeptical Behavior Category and once reached converting or moving them up the Preparedness ladder. There are eight strategies presented, which are derived primarily from conducting 12 years of outreach by Sea Grant with numerous formats and organizations (over 300 events). These eight strategies are not the only ones available. As noted previously, this is a living document and new efforts are certainly possible and should be tried and implemented. The Key Strategies to reach the Unreceptive/Skeptical are described below.

A. Mandatory vs. Voluntary Training

One strategy that has great potential to reach a higher percentage of individuals from all behavioral categories is to have mandatory training. While voluntary training is the most common and reaches mostly **Proactive** and some **Receptive** Individuals, it is the mandatory training that will reach a higher percentage of the **Receptive** and all the **Unreceptive/Skeptical**.

Over the years some of the best attended events Sea Grant has participated in were mandatory trainings. Hawaiian Electric Company held mandatory trainings for their line workers, who could be considered first responders, on hazard preparedness. This resulted in the training of 500 workers in 4 sessions. Some sessions were as large as 100-200 at a time. However when trainings were voluntary, for instance when the City and County of Honolulu asked Sea Grant to hold 4 sessions for their roughly 10,000 City employees, who also could be considered first responders, attendance averaged about 15-25 per session.



Mandatory trainings are common, especially for key issues facing an organization. Some examples are:

- All University of Hawai‘i Employees have been required to take Title IX – Related to Sexual Discrimination, VAWA - “Violence Against Women Act,” ethics, and University policies and procedures. This was required by law (ACT 208, Session Laws 2016). This was 2-3 hours of required training and offered live or on-line. Attendance was recorded and certificates provided.
- Hawaiian Electric Company – Corporate Compliance for Everyone – Safety training depending on the job. Hazard Preparedness for line workers.
- Financial Institutions – Cyber Security
- Some Companies – Sherman & Clayton Antitrust; Code of Conduct
- In our interviews with the Department of Education, we learned that all teachers are required to watch a 14 minute video on tsunami preparation and planning. A similar all hazards video can be created of shorter duration that forms the basis of this strategy.

There are many other examples of mandatory training for different organizations. Since this report was generated by the University of Hawai‘i Sea Grant College Program, we are most familiar with the mandatory trainings required for the University.

It is certainly within the realm of possibility to have mandatory trainings for hazard preparedness considering the great potential and risk for property damage, and even more importantly, loss of life. These issues would be equally as important, if not more than the other items listed above for which mandatory trainings have been required. Imagine if there was a life threatening event, and people did not know where to go for lack of training?

To facilitate these trainings – a very short video – e.g., 5 to 10 minutes could be created that covers key information, for example: 1) hurricane and tsunami risk to build the sense of urgency; 2) emergency supplies; 3) evacuation planning for a tsunami: critical because many counties now have two evacuation zones; and 4) evacuation planning for a hurricane - critical because citizens must now consider flood zones, new storm surge zones and also wind impacts. Education is needed! The targets: Proactive, Receptive, Unreceptive/Skeptical, and Assisted individuals. Because this video would cover the full gamut of behavioral characteristics, the message must be simple, and risk based to build a sense of urgency first. Thus the initial concentration on hazard risk.

The advantage of a short video is it would be more likely the head of an organization would make their staff watch. For example, it may be difficult for a CEO of a company to ask their employees to watch a 1 hour video, but more likely if it was 7 minutes long. A second video – perhaps longer and voluntary, could target the **Receptive** and **Proactive** group with messages about working and helping in the Community or strengthening their residence. Ideally, the initial short video, due its risk based message will convince others to become **Proactive** and watch and implement material in the second video. Thus the videos should be modular in format with a short mandatory one (5-10 minutes long) and a more detailed, voluntary one (e.g. 15-20 minutes).

Another advantage of a video, is it would not require training by the host organization's staff to hold the session for their employees. This has been a major concern when it was raised about the possibility of doing hazard preparation in classrooms. Teachers or their administrators raised concerns about the time it would take to train the teachers. However it is not the teacher that does the training, as the material is already prepared by video and presented. Questions regarding the material could be diverted to further resources online or a central office for communication. If the recommendations at the end of this report are followed, (e.g., hiring one person with each county Emergency Management or Civil Defense agency to conduct education/outreach and volunteerism activities, then that person would be ideal to answer questions whenever the short mandatory video is shown.

There is great potential in this strategy. If the President of the University of Hawai'i system asked as policy that their roughly 8,800 employees watch a 7 minute video on hazard risk, preparedness and evacuation planning, it could make a significant contribution to changing the community's resilience behavior. Under this strategy, all it takes is the policy directive from one organizational leader to reach thousands of employees. Here are the approximate number of employees for some of the larger organizations based from online data.

Governor/State – 85,000 employees according to 2018 data from the Department of Human Resources Development

Mayor/O'ahu – 10,000 employees

Chancellor/UH – 8,800 employees

CEO/First Hawaiian Bank – 2,250

CEO/Bank of Hawai‘i – 2,122

CEO/American Savings Bank – 1,123

CEO/Hawaiian Electric Co. – 2,723

Etc.

Two final notes on this strategy. Naturally the CEO’s of various businesses will all be different. Like individuals, some will be Proactive, some Receptive and some Skeptical. At the very least, all should be willing to have their employees watch a short 7 minute video on hazard risk that can save lives. For the more Proactive CEOs, they may be willing to devote more time to this issue and thus make the second more detailed video designed to be voluntary a requirement. Again this is the importance of having videos of different length in modular format.

Also the Legislature should monitor if companies are following with this policy directive. If there is lax participation, they can actually mandate the companies to follow this requirement by simply passing a law similar to ACT 208, Session Laws 2016, which mandated all University of Hawai‘i employees take Title IX Sexual Discrimination. This is within the police power of the State, for the health, safety and welfare of the community (i.e., saving lives), and of a very low burden (“to watch a 7 minute video,” for such an important topic. Some may feel that a potential mandate could occur only for State run organizations, such as the University, but legally, companies are formed under the laws of the State of Hawai‘i, so conceivably, and if needed, this potential mandate is a possibility.

In all likelihood, this strategy can begin on a low key, with the creation of the short term 5-10 minute video and a policy directive letter from the Governor, and/or all State and County Emergency Management and Civil Defense Agencies.

Legislative participation is vital in this overall Communication Strategy and Outreach Plan and will be discussed as the eighth item in strategies to address the **Unreceptive/Skeptical**.

B. Continuing Education Credits (CEC’s)

Another strategy which offers great potential to reach all of the behavioral categories is the use of continuing education credits. Sea Grant has participated in classes for insurance agents, realtors, attorneys, flood plain managers, planners, architects, and product and construction specifiers. All of these profession have continuing education requirements in which the hazard risk and preparation material can be woven into the course material as long as it relates to the professional’s work. Experience in helping to deliver these courses always indicates good attendance with a mix of all behavioral categories, because even the **UNRECEPTIVE/SKEPTICS** have to satisfy their licensing requirements if they want to work.

When CEC's are offered it boosts attendance as it is an indirect form of mandatory education. However, instead of the requirement being a hazard preparation course as in IV (A), it is the requirement of continuous learning in the profession, with a hazard preparation message woven into the course curriculum as a key element. On the right, architects, product and



construction specifiers attend a course and training by Simpson-Strong Tie with UH Sea Grant participation for 4 to 5 Continuing Education Credits.



Red Cross and Sea Grant.

The photo to the left is an example of a three hour course for insurance agents in which the speaker is from the NOAA/National Weather Service Weather Forecast Office-Central Pacific Hurricane Center and they are covering hurricane risk. Other speakers were from the City Emergency Management Office,

Similarly, the curriculum below has been approved by the Department of Commerce and Consumer Affairs Insurance Division to provide insurance agents four CEC hours by delivering four 50 minute modules. Only one of the modules directly relates to insurance. The other have an indirect link to insurance while helping people to prepare. For example, the first module on hurricane science explains risk (related to insurance) but also builds a sense of urgency (a vital message for the **Unreceptive/Skeptics**). Emergency preparedness follows and serves to prepare the audience but is also related to insurance since some policies cover contingencies after the storm unrelated to damage. The third module is on insurance features. The fourth module is on strengthening the home which helps people to prepare by reducing property damage, and making it more likely people can shelter in place. It is also related to insurance since home strengthening reduces insurance risk, and many companies also offer discounts for hurricane retrofits.

Four Hour Continuing Education Course for Insurance Agents

Hurricane Science, Mitigation and Insurance

Hurricane Science

10 Minutes - Hurricane Science - Formation
10 Minutes - National Weather Service Products - Watches and Warnings
10 Minutes - Hurricane Season, Frequency by Month, Historical Trends, Myths
20 Minutes - Hurricane Structure, Hurricane Classification System, Water and Wind Impacts, Characteristics of Wind Circulation and Impact on Structures
(Instructors: NOAA National Weather Service and Certified Provider)

Emergency Preparedness

10 Minutes - Emergency Supplies
10 Minutes - Evacuation Kit
10 Minutes - Evacuation Planning for a Hurricane vs. Evacuation for a Tsunami.
10 Minutes - Scenario Planning.
10 Minutes - Shelter in Place Guidance
(Instructors: Local Emergency Management Agency and Certified Provider)

Hurricane Insurance

20 Minutes - Hurricane vs. Flood Insurance
10 Minutes - Hurricane Insurance - Contract Clauses
10 Minutes - Market Value vs. Replacement Value, Surge Demand, Types of Coverage, Factors Affecting Replacement Value (improvements, inflation, surge demand)
10 Minutes - Risk vs. Premium - Measures to reduce risk- Potential discounts on premiums for home retrofits (hurricane clips, window protection, foundation)
(Instructors: State Farm Insurance Agent and Certified Provider)

Home Strengthening

10 Minutes - Homeowners Handbook to Prepare for Natural Hazards - Introduction
10 Minutes - Hurricane Risk - Damage after Hurricane Iniki - Common Types of Damage,
10 Minutes - Continuous Load Path, Building Codes, Hurricane Clips, Foundation Upgrades
10 Minutes - Wind Damage - Window Protection, Options, Cost
10 Minutes - Preventing damage from trees, strengthening roofs, solar, attics, gutters
(Instructor: Certified Provider)

Note that similar curriculum could be developed for many other professions. Sea Grant has participated in National Institute of Business courses in which the message by Sea Grant was preparedness and the attorneys attending earned 6-8 credit hours. A simple topic that could have relevance and preparation to all attorneys, no matter what their field is business continuity after a storm and how to prepare. For realtors an applicable topic could relate hazard preparedness to building codes and notice to inform requirements.

Following is the approximate number of people in various professions:

Legal/Attorneys - ~5,500

Insurance Agents - 7,425 (data from the DCCA Insurance Division)

Realtors - ~ 10,000 Statewide, 6,000 with the Honolulu Board of Realtors

Teachers – 11,608 as of 2013

Doctors –2,927 as of 2018

In virtually any profession, the message of hazard risk and preparedness can be woven into applicable subject material so that continuing education credits are earned. This can be a powerful tool to reach the **Unreceptive/Skeptical** Group. With each profession, there would be specific work required with the certifying and licensing board for that profession in order to have the education certified for continuing education credits. The time and work to have the course and instructors certified would vary for each profession. At the time of this writing, because of

prior experience, courses for insurance agents and various science professions would be the ones most ready for immediate delivery, while those for teachers and the health profession could be viewed as a medium to long-term goal.

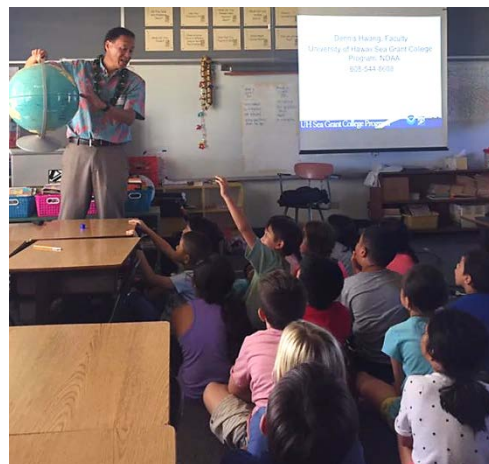
C. School Education

A third powerful tool to reach the **Unreceptive** is school education. In a formal sense, outreach is something done in the community, while education is done in the classroom. While Sea Grant's major experience has been with community outreach, education from the college level to grade school has occurred. It is our experience that school children have a very strong interest and curiosity in science and math. This can be used to educate children on earth science, hazard risk and preparation, as well as their parents.

It is possible to craft science plans to integrate earth science and preparation to meet national standards for science education. To the right are National Science Standards for 2nd Graders. Note the reference with the red arrows to earth events that occur quickly or slowly. Examples given include natural hazards such as volcanos and earthquakes, but hurricanes and tsunamis could just have been easily given. The standards also point to solutions and the influence of society. These plans can be used to teach about hazard risk and preparedness and then conveyed from the students to the home as discussed in the example below. Hopefully if Parents are **Unreceptive**, they will become **Receptive** and if **Receptive** they will become **Proactive**. Even if there is no change in behavior by the parents, the continuous education of hazard risk and preparation to the student each year will help to build a culture more receptive to Resiliency in the future.

2.Earth's Systems: Processes that Shape the Earth		
Students who demonstrate understanding can:		
2-ESS1-1.	Use information from several sources to provide evidence that Earth events can occur quickly or slowly.	
[Clarification Statement: Examples of events and timescales could include volcanic eruptions and earthquakes, which happen quickly and erosion of rocks, which occurs slowly.] [Assessment Boundary: Assessment does not include quantitative measurements of timescales.]		
2-ESS2-1.	Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.*	
[Clarification Statement: Examples of solutions could include different designs of dikes and windbreaks to hold back wind and water, and different designs for using shrubs, grass, and trees to hold back the land.]		
2-ESS2-2.	Develop a model to represent the shapes and kinds of land and bodies of water in an area. [Assessment Boundary: Assessment does not include quantitative scaling in models.]	
2-ESS2-3.	Obtain information to identify where water is found on Earth and that it can be solid or liquid.	
The performance expectations above were developed using the following elements from the NRC document, <i>A Framework for K-12 Science Education</i> .		
Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Developing and Using Models Modeling in K-2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions. <ul style="list-style-type: none"> Develop a model to represent patterns in the natural world. (2-ESS2-2) Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in K-2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. <ul style="list-style-type: none"> Make observations from several sources to construct an evidence-based account for natural phenomena. (2-ESS1-1) Compare multiple solutions to a problem. (2-ESS2-1) Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in K-2 builds on prior experiences and uses observations and texts to communicate new information. <ul style="list-style-type: none"> Obtain information using various texts, text features (e.g., headings, tables of contents, glossaries, electronic menus, icons), and other media that will be useful in answering a 	ESS1.C: The History of Planet Earth <ul style="list-style-type: none"> Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe. (2-ESS1-1) ESS2.A: Earth Materials and Systems <ul style="list-style-type: none"> Wind and water can change the shape of the land. (2-ESS2-1) ESS2.B: Plate Tectonics and Large-Scale System Interactions <ul style="list-style-type: none"> Maps show where things are located. One can map the shapes and kinds of land and water in any area. (2-ESS2-2) ESS2.C: The Roles of Water in Earth's Surface Processes <ul style="list-style-type: none"> Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form. (2-ESS2-3) ETS1.C: Optimizing the Design Solution <ul style="list-style-type: none"> Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (secondary to 2-ESS2-1) 	Patterns <ul style="list-style-type: none"> Patterns in the natural world can be observed. (2-ESS2-2),(2-ESS2-3) Stability and Change <ul style="list-style-type: none"> Things may change slowly or rapidly. (2-ESS1-1),(2-ESS2-1) <hr/> Connections to Engineering, Technology, and Applications of Science Influence of Engineering, Technology, and Science on Society and the Natural World <ul style="list-style-type: none"> Developing and using technology has impacts on the natural world. (2-ESS2-1) <hr/> Connections to Nature of Science Science Addresses Questions About the Natural and Material World <ul style="list-style-type: none"> Scientists study the natural and material

An example of some of these strategies is shown in the photo at right for one of three second grade classes of 25 taught at Waialae Charter School. When asked how many students wanted to be scientists all raised their hand. The school curriculum was to cover continental drift and earth science. The lesson plan that day went from continental drift > plate tectonics > earthquakes and tsunamis > natural hazards > hazard risk for all hazards > preparation for the family. Included in the lesson plan was the message below that the teacher asked the students to bring home to their parents for their signature.



Dear 2nd Grade Students and Parents

Please note that the new guidance for emergency supplies is that that every family should have a 14 day supply of food and water, medications, a flash light, radio, spare batteries as part of your emergency kit.

For water, that is one gallon of water per person per day.

Teachers then collected the signed messages.

Note in developing programs in science education that includes hazard risk and preparation, there should be three considerations (Teacher, Student, and Parent). To facilitate the strategy, short videos could be developed, so that the teachers would not have to spend time in training – which could be a burden or obstacle to implementation. Short videos would allow the key information to be delivered to the students over the course of a year in less than 1 hour. For example:

- 15 minute video on tsunamis during April tsunami month
- 15 minute video on hurricane preparedness in the first week of May before the semester ends & the hurricane season begins
- 15 minute session in fall on the Schools emergency plans (this may already be done).

This could occur every year to reinforce the message. There could be an interactive homework assignment with the student taking home simple material to the parents to discuss and sign, with later report back in class. At the very least, what should be covered by teacher, student and parent are tsunami & hurricane risk, evacuation planning (including how to look up tsunami evacuation zones, flood zones, and storm surge zones), 14 day emergency supplies (how to put the kit together) and the Schools plan if there is a tsunami or hurricane.

Sea Grant has had three meetings with the Department of Education and there are many possibilities to assist so that Next Generation Science Standards for K-12 are taught in a way that hazards and preparation are covered for teachers, students and parents. Some opportunities identified are:

- Toolkits or Lesson Plans for Teachers – to help them cover the Science Standards & key preparation information.
- The Toolkits or Lesson Plans can be for three different levels covering K-12
- After School Programs such as A+ or Summer Fun that cover Hazard Preparation
- Guest Speakers as part of the Tool Kit – This can be one of the new duties for the new Education and Outreach officers - called for in the recommendations for this report.
- Teacher Conferences and/or Workshops
- Continuing Education Credit Courses for Teachers – Required of most teachers and in particular Science Teachers.
- PTA meetings
- Principals – Toolkits, Conferences

D. Financial Incentives

For many individuals in the **Unreceptive/Skeptical** category, the concern for hazard risk is low or non-existent. However these individuals will take action and make decisions if there is a financial incentive. Thus there are two sub-strategies to this section.

1. **Education of Financial Incentives** – Many but not all insurance companies offer discounts for implementing actions that reduce risk. For example it is common to receive the following for hurricane retrofits:
 - a. Roof-to wall connections with hurricane clips (typically 10% off)
 - b. Wall-to-foundation connections (typically 10-12 percent off)
 - c. Window coverings (15-18 percent off for single family homes and 18% off for condominiums).

These discounts are usually cumulative, so doing a, b and c could result in a 40% savings in hurricane insurance. Despite the generous discounts, few homeowners know of these, or even the insurance agents fail to promote them. Education on the existence of these discounts to homeowners and to the insurance agents would facilitate their use. This is an emphasis expressed by many insurance companies that are partners with Sea Grant for the Homeowner's Handbook to Prepare for Natural Hazards Project. There can be a renewed effort to inform insurance companies, clients and agents of any financial incentive in the form of discounts for retrofits.

Even if a company does not offer discounts for retrofits, there could be a renewed effort to have the company offer the discounts.

2. **Reintroduce and Modify the Former Loss Mitigation Grant Program** – As mentioned in the Introduction, there was a State Loss Mitigation Grant Program that was in operation from 2006 to 2008 and provided grants of up to \$2,100 to strengthen the house with retrofits such as those listed above. Approximately 430 homes were retrofitted under the program. In the 2019 legislative session, HB799 HD1 was introduced to resurrect the Grant Program but the measure did not pass out of the Ways and Means Committee.⁷ This program should be renewed and **can be considerably improved to be more effective and financially sound. Key is a partnership with the State and FEMA on this measure.** It should be noted:
 - a. California has a similar home retrofit program called Earthquake Brace & Bolt, to retrofit houses for earthquakes with up to \$3,000 in grants (See: <https://www.earthquakebracebolt.com/>). From 2014 to the present, over 7,000 homes were retrofitted statewide. These programs are highly successful, but the program is entirely funded with the State of California. Many of the retrofit measures and concepts are similar to those developed for Hawai'i (See: <http://seagrantsoest.hawaii.edu/homeowners-handbook-to-prepare-for-natural->

⁷ This bill was introduced by Representatives Scot Matayoshi, Tom Brower, Stacelynn Eli, Cedric Gates, Troy Hashimoto, Lisa Kitagawa, Chris Lee, Gregg Takayama and James Tokioka.

[hazards/](#) the four files on post and pier retrofits for older elevated single wall houses on tofu blocks common on all the islands).

- b. Rather than have a retrofit program funded solely by the State (California or Hawai‘i – HB799), a partnership with FEMA could be much more effective, especially from a financial point of view. FEMA has many grant programs to retrofit houses such as “Sooner Safe” in Oklahoma to create safe rooms in the event of a tornado.



Another program called Fix the Bricks provides grants to conduct seismic retrofits in earthquake areas in Salt Lake City. These programs typically have a 25% match, in other words the State or another entity provides 25% and FEMA 75%.

Immediately, this would be better off for Hawai‘i rather than paying 100% for their own program. Even more enticing is the 25% match can come from numerous sources. Partners of the UH Sea Grant and the Homeowner’s Handbook as well as the City and County of Honolulu Office of Climate Change such as Zephyr and Kupu have offered to partner in such retrofit options (See: <https://www.resilientO‘ahu.org/>). When considering that certain actions by the homeowner can also count as cost share, the Program and work proposed in HB2019 to be paid entirely by State funds can conceivably be conducted, when properly structured, with very little State funds, except for administration.⁸ One concern about establishing such a program for Hawai‘i is erratic grant funding that is typically tied to recent hazard events. However recent restructuring of FEMA’s grant programs will tie grants for mitigation to the level of disasters nationwide, and thus alleviate the concern for an inconsistent funding stream.

- c. Preliminary reviews from FEMA and the Hawai‘i Emergency Management Agency indicate a State retrofit program for hurricanes and earthquakes is indeed attractive. A preproposal was submitted by UH Sea Grant to establish this, and an invitation was made to submit a full proposal.

The strategy to create a financial program to retrofit homes and reach the **Unreceptive/Skeptical** Group, as well as all other groups is viewed as a measure that would take 2 to 3 years to develop. Other State programs would have to be studied so that the many Lessons Learned in the setup and administration of these programs are not repeated in Hawai‘i.

⁸ The most likely candidate for administering this program is the Department of Commerce and Consumer Affairs – Insurance Division, which administered the original Grant Program for Hawai‘i. In testimony to the 2019 Legislature, DCCA offered to administer revitalization of the State Retrofit Program.

E. Hawai‘i Hazards Awareness & Resilience Program (“HHARP”)

The Hawai‘i Hazard Awareness & Resilience Program (“HHARP”) was started by the Hawai‘i Emergency Management Agency (See: <https://dod.Hawai‘i.gov/hiema/resources/hharp/>). The goal of HHARP is to enhance community resilience to multiple hazards through a facilitated education and outreach program that promotes hazard understanding and awareness, and offers tools and information resources to guide mitigation, preparedness, response and recovery. HHARP communities include Waimanalo, Kailua, Joint Base Pearl Harbor-Hickam, Aina Haina, Manoa, Waianae Coast, Ewa Beach, Hau‘ula, Kaneohe Marine Corps, Hawai‘i Kai, Kaneohe, Kahalu‘u, Mililani, and Hanapepe. Other locations are in the process of joining.

While most members of HHARP are **Proactive**, the Program is a great way to reach **Receptive** and **Unreceptive/Skeptical** members because of the very active involvement of HHARP members in their community. HHARP Community members help to organize the major community outreach events such as emergency fairs at shopping malls. The photo at right is at the Windward Mall shopping center and was organized by HHARP members in Kailua,



Kaneohe, and Waimanalo working with the Kailua Neighborhood Board and Windward O‘ahu Neighborhood Board. In this photo, there are many **Proactive**, **Receptive** and probably **Unreceptive/Skeptical** individuals (the full gamut of behavior characteristics). Whatever their behavior, they all can see the community is preparing to be resilient. For the **Proactive** and **Receptive**, the latest information is provided on risk and preparation. The malls are an effective way to reach a large portion of the community.

It is HHARP community members that also go into the Community, either at Board Meetings, or sometimes door to door as friendly neighbors, to share information such as hazard risk, or inventory community resources (such as generators or chain saws). It is this type of consistent and pervasive interaction that will eventually influence the **Unreceptive/Skeptical** and lead to a more resilient community. After an emergency, it is often neighbors that are first responders, not the police and fire. That is why it is so important to know your neighbors. HHARP teams foster a closer community where neighbors know each other. Because HHARP communities have such a large influence on community resilience, their efforts should be expanded. Appropriate actions would be to grow the number of HHARP communities, but this takes an increased number of trainers and organizers. This is addressed in the recommendations in this report.

F. Community Emergency Response Teams (“CERT”)



Similar to HHARP members, it is the members of the Community Emergency Response Teams (“CERT”) that are among the most Proactive and Prepared. CERT members get training in first aid, search and rescue, light rescue, and disaster response. These are special learned skills that can help the police or fire departments during times of need. CERT members are critical to the overall communication/education strategy because these are the community members most likely to be able to assist after a natural hazard.

For a major event, the fire and police may be overwhelmed, but CERT members are the ones that can help the elderly or weak or those in the Assisted Category. They are likely to be the first responders for family members or neighbors. It is the goal of this communication education and outreach strategy that individuals move up the preparedness ladder and the very top are members of CERT. Thus effort should be made to expand CERT’s capability, membership and reach on all islands. Effort can be made to increase resources for volunteer recruitment of CERT members and provide them administrative, outreach and technical help when needed to succeed.

CERT is organized and interfaces differently with each county. Information for the CERT programs for each county can be found at: <http://www.Hawai'icounty.gov/civil-defense-cert> for Hawai'i County; <https://www.mauicounty.gov/1899/Community-Emergency-Response-Team> for Maui; <http://www.honolulu.gov/demvolunteer/cert.html> for O'ahu; and <https://www.Kaua'i.gov/CERT> for Kaua'i.

G. TV and Media

The 2018 Hurricane Behavioral Study found that the most effective way of reaching the population was with the media (TV and Radio). Efforts should be made to continue and expand these avenues for education. Emphasis can be on several avenues, with associated advantages and disadvantages.

- News stories have no cost upfront costs and an interested audience. One disadvantage is that key message elements could be missed or skewed by a reporter.
- Advertisements have direct costs and could have the perception of self-promotion. One advantage is the control of the message and time of delivery by the advertiser.
- TV and radio shows can also be effective measures to reach community members. An example of a show concentrating on preparedness was the Voice of the Sea episode in November of 2019 on hurricane preparedness. This show featured interviews with: (i) the National Weather Service to increase understanding of risk to build a sense of urgency,

(ii) Emergency Managers to cover emergency supplies and evacuation planning and (iii) members of Sea Grant to cover measures to prepare the house.

While TV and Radio shows are effective measures to reach the community, they are most effective for the **Receptive** members of the Community. The **Unreceptive/Skeptical** group would still have tendency to tune out preparation messages from this mode of communication, especially for the longer shows. The **Proactive** Group is likely to already know the information and may need the information in more detail than can be provided by the media. Thus TV and radio communication should be significantly expanded, but not be the only means of reaching the Whole Community. **Such a strategy, should concentrate on shorter pieces and risk based to reach the lowest common denominator, the Unreceptive/Skeptical group.**

H. Hawai'i State Legislature

It is the Hawai'i State Legislature that is critical to this Communication Plan & Outreach Strategy. First, this plan was possible by House Bill 571-2017, introduced by Representative Mark Nakashima and signed into Law as Act 61 – 2017 by Governor David Ige on June 23, 2017. This was a two-year bill (see Chronology).

The Legislature can monitor the progress of all the recommendations and significantly increase the communication outreach budget for traditional and non-traditional modes of education, given the significant risk as indicated by the Pacific Disaster Center study cited in the Executive Summary of this report. Related to the communication plan/outreach strategy:

1. Monitor the effectiveness of mandatory education. If organizations are found to be lax if implemented through organizational policy, then an actual legislative mandate could be created such as when the Legislature mandated all University of Hawai'i employees take Title IX Sexual Discrimination training. This should be an easy decision, given the potential consequences with loss of life for lack of education and the low burden in terms of time to watch a short preparedness video. Funding would be needed to create videos of different length.
2. Provide funding and encourage hazard preparedness training as part of the license professional's Continuing Education Requirements.
3. Monitor school curriculum to ensure principals, teachers, students and parents are informed as simply as possible of tsunami risk, hurricane risk, applicable maps, evacuation planning and emergency supplies.
4. Reintroduce a revised version of HB799 that emphasizes partnerships with FEMA and other organizations to provide the cost share match to retrofit homes. When structured properly, the potentially costly retrofit program could significantly increase retrofit numbers, while being little cost to the State, except for administration costs.
5. Expand and support the HHARP program so that more communities are engaged, thus reaching a higher percentage of **Receptive** and **Unreceptive/Skeptical** individuals.

6. Expand and support the CERT program so more individuals are prepared to help those in need. This would create more **Proactive** community members, which can help the **Assisted** Group.
7. Increase media education and outreach through news stories, advertisements and media shows (TV and radio) to better inform all members of the community on hazard risk and proper preparation.

As discussed previously the Communication Education and Outreach Strategy is not a silver bullet which will insure all members of the community are prepared. It will however, significantly move the needle to a more resilient community. Other key steps the Legislature can do are:

- (i) Monitor building codes so that new houses can withstand hurricane winds. If cost is a concern (the tradeoff is always cost vs. protection), at the very least mandate the builders/developers give new home buyers the option of adding a safe room or window protection at their own costs. Many **Proactive** homeowners would opt for the safer choice and from our interactions with many in this group, there is a multiplier effect because of their willingness to shelter close family, relatives and sometimes neighbors. This is a way to rapidly increase shelter space in the State.
- (ii) Work with HIEMA and the counties on shelter space capacity for the community.

V. NEXT STEPS FOR THE COMMUNICATION STRATEGY – EDUCATION & OUTREACH PLAN

The University of Hawai‘i Sea Grant has had numerous interviews and meetings with the Hawai‘i Emergency Management Agency, the four Emergency Management and Civil Defense Agencies at the county level, and the Department of Education. It has been proposed that six new communication/outreach/education specialist be hired on a permanent basis to work on hazard education and outreach throughout the State. The individuals would work on creating the tools and products for the eight strategies listed in Subsections 4(A to H), as well as other strategies that may later be identified. Different timelines would be required to setup each of the eight sub strategies. Some may be more successful than others. Once established, these individuals would work to implement the measures on a long-term continuous basis, so the culture of Hawai‘i slowly changes over time and is more in tune with the hazard risks in the State.

The new communication/outreach/education officers would be allocated as follows:

1. Four specialist, one in the emergency management or civil defense office for each of the four counties. In our discussion with the heads of each of these agencies, this person could of great benefit. These agencies are generally understaffed and can barely carry out education and outreach under their existing programs, let alone for the eight new strategies to be added, or any additional strategies later identified. In addition, many have requested that the education/outreach mission be increased to include volunteerism

– i.e., increasing the capabilities and reach of HHARP and CERT. Thus, the duties of the new specialist would deal with community outreach, school education and volunteerism.

2. One at the State Hawai‘i Emergency Management Agency. HIEMA currently is involved with education and outreach in many ways, including: (i) administering Federal Grant Programs for outreach and education, which is significant but a very small portion of what is needed;⁹ (ii) creating and administering scientific technical advisory committees (such as “HETAC” – Hawai‘i Earthquake and Tsunami Advisory Committee – which provides technical advice on key preparation measures; and (iii) creating and administering HHARP, but they are understaffed to conduct all the training for this program. Since HIEMA is currently the interface between the Federal Govt., particularly FEMA and the counties, they are a likely candidates to administer this program.
3. One at the University of Hawai‘i Sea Grant to help continue its education and outreach efforts with hazard preparation while helping to create the products needed, after consultation with the other five specialists, for the eight strategies listed in sections 4 (A to H). Sea Grant resources include hazard mitigation specialists, as well as their communication, publication and graphics departments. In addition, Sea Grant has video graphic capabilities and is involved in production of the “Voice of the Sea” TV series which included an episode on hurricane preparedness in November of 2019 (see: http://seagrantsoest.hawaii.edu/hazard-and-hurricane-preparedness/?fbclid=IwAR1uRaInqrLNohUNJO9MQbGRBm4MQHQm_cIQ_ACwOOPnCo-S54S45_dfE).

To increase coordination and communication among the six specialists, quarterly meetings would help to implement items 4 (A to H) over the next 3 years, with some items on a 1-2 year track to implementation (A, B, E, F & G) with others on a 2-3 year track to implementation (C & D). Once setup,¹⁰ education and outreach would proceed on a long-term basis in an effort to continuously move the needle in a steady progression. This is anticipated to go at varying paces depending on several factors such as:

- (i) The history of hazard events hitting or threatening Hawai‘i (there is always a spike in preparedness associated with recent threats). This spike was experienced after Hurricane Lane in 2018, but since 2019 was a relatively quiet year, people will tend to forget over time. Continuous education over time will ensure that communities are becoming more prepared and better able to cope with upcoming threats even after periods of relative hazard inactivity.

⁹ Most of the funding from FEMA coming to the State is tied to past hazard events (e.g., 2018 floods on Kaua‘i and O‘ahu, or volcanic activity on Hawai‘i County). Projects are generally brick and mortar and shovel ready with very little component to education.

¹⁰ Setup time would also have to factor in time to fund the program (e.g. from the Chronology, HB571-2017 was signed into law on June of 2017, but funding was released by the University on January 2018. Time would also be required to hire the appropriate specialists if they are not within the appropriate agencies or department already.

- (ii) Greater progress will be made in strengthening houses after a grant program can be setup. However, this is one of the longer term objectives as there are many Lessons to be learned, as well as mistakes to be avoided, from similar programs around the U.S.

The overall goal is increased education and outreach on hazard risk and preparation, with the community, businesses, organizations, and the school system (principal, teachers, students, and parents), conducted in a systematic manner that attempts to inform everyone.

VI. PREPAREDNESS GOALS

In order to assess success with the proposed program, we rely on the following concepts and data points:

- 1) The five levels of preparedness as discussed in Section III of this report;
- 2) Assumptions made from data in the 2018 Hurricane Behavioral study by FEMA, HIEMA, and the USACOE;
- 3) Data on Home Retrofits; and
- 4) Informal surveys and Lessons Learned when conducting outreach from 2007 to 2019.

To assess progress and goals, we use the five levels of individual preparedness previously identified with an approximate baseline in parenthesis based on assumptions made from the Hurricane Behavioral Study. Note because only 18% responded to the survey, this would indicate the numbers are skewed so that the community appears more proactive. Furthermore the 18% response rate may be some indication of the actual number of **Proactive** people vs., **Receptive** and **Unreceptive/Skeptical**. Nevertheless, some important relationships are indicated which can be of use for this Report in term of setting a baseline and tracking progress.

(1) Aware & Understands Hurricane Risk (54%);¹¹

(2) Have recommended two week supply of food and water (54%);¹²

(3) Have a realistic evacuation plan (45%);¹³

¹¹In the Hurricane Behavioral study, 25% were very worried about a hurricane and 58% somewhat worried. Thus 83% had some concern about a hurricane and using a bell shaped distribution, the midpoint between 25% and 58% is 54%. Thus assumes only about half of the respondents in the “somewhat worried” category understand hurricane risk.

¹²Based on 29% that have a two week supply of food or more, and 51% saying they are not prepared now, but will get everything before the event. Using a bell shaped distribution and assuming only half of the 51% will be able to sufficiently gather their supplies, a rough estimate of 54% is derived.

¹³In the Planning and Preparation part of the survey, 15% said they were “very prepared” and 61% “somewhat prepared.” Assuming a normal distribution, and half of the 61% “somewhat prepared” group actually will plan and prepare an evacuation plan, a rough estimate of this parameter is 45%.

(4) Retrofitted home to make stronger (36%);¹⁴ and

(5) Plans to assist others – friends, relatives, neighbors [e.g., CERT & HHARP] (<36%).¹⁵

Again, these preparedness numbers are likely an overestimate since the 18% responding in the Hurricane Behavioral Study are likely to skew the percentages to make communities appear more **Proactive**. Nevertheless because each successive level is more difficult to attain, the percentage of participation at the higher levels (e.g., retrofitted their homes) gives a very rough indication if progress is being made at the lower levels. Obviously, a person who retrofits their home with hurricane clips is aware and concerned about hurricane risks and is likely to have their emergency supplies and an evacuation plan. However, not all people who know and understand hurricane risks will retrofit their house. These relationships are intuitive, and borne out in the numbers.

To date, approximately 3,103 homes have been retrofitted through past and existing education and outreach programs. **The goal of this strategy is to inform all homeowners of hurricane risk and retrofit an additional minimum 5,000 homes over five years.** Because retrofitting is one of the most difficult items to do in the preparedness ladder (Level 4), a given percentage increase in this parameter would indicate a significantly higher percentages for the lower levels of preparedness (Levels 1-3). Furthermore, many proactive homeowners who have retrofitted have plans to shelter not only their family, but many families (One citizen who retrofitted with hurricane clips, windows protection, door and garage upgrades planned to shelter 20 people in their house – relatives and neighbors – and convinced 6 neighbors on their block to retrofit with hurricane clips and window protection).

Using the Pacific Disaster Center Study estimate of 52,000 homes damaged or destroyed and 27 billion in damages for a Category 2 strike on O‘ahu, saving 5,000 homes (or roughly 10%) could perhaps reduce damages by roughly 10%, or 2.7 billion as a ballpark. This is a good investment for the approximate 1 million per year proposed annualized budget to significantly increase education, outreach and volunteerism in Hawai‘i. **Over time, with continued education and outreach, even more homes could be retrofitted and a culture of preparedness could become significantly more pervasive throughout the State. This will not be the only answer to the significant hazard risk, but it will help move the needle to more resilient communities.**

¹⁴36% of the respondents have taken steps to reinforce their home. The most common improvement was adding hurricane clips. This number seems high and is most likely due to the fact that the survey had an 18% response rate. Interestingly, and this confirms what was expected, the number of houses adding hurricane clips was 5 times more common than protecting windows 34% vs. 7%.

¹⁵None of the 47 questions in the Hurricane Behavioral Study directly relate to community members making plans to help other friends or relatives. Intuitively, and statistically based on the number of HHARP and CERT members, this number would be less than the previous four preparedness parameters.

