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# Master's Project: DASHBOARD 2.0: A Visual Storytelling Mechanism to Inspire Relationship Building, Participation, & Collaboration for Storytelling

Chelsea Harder  
*The University of Vermont*

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DASHBOARD 2.0  
A Visual Storytelling Mechanism to Inspire Relationship Building, Participation, &  
Collaboration for Sustainability

A Project Presented

by

Chelsea Harder

to

The Faculty of the Graduate College

of

The University of Vermont

In Partial Fulfillment of the Requirements  
for the Degree of Master of Science  
Specializing in Natural Resources and Leadership for Sustainability

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Committee:

Matthew Kolan, Ph.D., Advisor  
Rebecca Stanfield McCown, Ph.D., Professional Affiliate  
Shadiin Garcia, Ph.D., Professional Affiliate

## **ABSTRACT**

The Aloha+ Challenge Dashboard 2.0 project explores an inclusive, decolonizing approach to advance sustainability in Hawai‘i through the value of data and communications to inspire action. Due to its isolated location, rich biodiversity and natural and cultural resources, and strong and committed leadership and communities, Hawai‘i is uniquely positioned to be a leader in sustainability, and to develop placed-based practices for sustainable living that can inspire others to create unique sustainable practices for their communities. This project seeks to advance sustainability outcomes through developing innovative community data capture mechanisms and compelling data visualizations for the State’s online open-data Dashboard which tracks Hawai‘i’s sustainability goals - the Aloha+ Challenge - and serves as a mechanism for transparency, accountability, and action. This next phase of the Dashboard will be called “Dashboard 2.0”. The increased interactivity and engagement of communities and the next generation in sustainability efforts will advance these sustainability goals that have global context and prepare the next generation of leaders to continue to create a more sustainable future for Hawai‘i and beyond. The success of the innovation and development of the new features for Dashboard 2.0 will be measured by feedback from users including Hawai‘i practitioners, government, students, educators, and civil society.

## **ACKNOWLEDGEMENTS**

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## CHAPTER 1: INTRODUCTION

### 1.1. Aspiration

Building a more resilient and sustainable Hawai‘i will be accomplished through relationship building, dialogue, visual storytelling, and inclusion. The optimum area of focus to help achieve a thriving, sustainable future is at the intersection of environmental, social, and economic issues through collaboration and a systems-based approach. Embodying the University of Vermont Master’s of Leadership for Sustainability (MLS) leadership practices (Kolan, Sullivan TwoTrees, et al., [Public MLS Aspiration, ToC, Goals, Practices](#), 2016) will help build relationships to restore Hawai‘i’s natural systems, support thriving communities, honor traditional wisdom and practices, and build a more equitable economic system.

### 1.2. Context

Hawai‘i is a chain of islands located in the middle of the Pacific Ocean which presents unique challenges and opportunities; the effects of natural disasters and implementation of infrastructure and policies can be seen quickly due to the relatively small landmass and distance from externalities. Historically, according to the late Kenneth F. Brown, Native Hawaiian leader and Senator, in his speech to the Hawai‘i State Legislature, “[Hawaiians] developed a refined, complicated system of resource management which allowed [them] to survive in a completely limited resource environment. By the year 1750, the Hawaiians, as we now call them, had a stable society...of a quarter million [people]...living in complete dependence on a limited natural environment, with every possibility of continuing forever this balanced, yet dynamic, man-nature relationship” (1973). However, the arrival of Westerners, starting with Captain Cook in 1778 bringing foreign systems of colonization and industrialization, led to severe degradation of

Hawaiian culture and the natural ecosystems (Trask, From a Native Daughter, 1999, p5-6). Even so, Hawai‘i still maintains a wealth of natural elements and committed communities and leadership that are invested in sustainability.

One illustration of this is the statewide commitment to achieve six sustainability goals by 2030 - the [Aloha+ Challenge](#). Progress on these goals is tracked on the Aloha+ [Dashboard](#), a tangible online mechanism that captures and reflects top environmental, social, and economic priorities through indicators, metrics, and narrative in the context of sustainability in Hawai‘i. This platform provides transparency and accountability to drive informed action and data-driven decision-making. The Dashboard serves as a hub for collaboration for leadership and community locally and globally to create conditions for collaborative sustainability efforts. The United Nations (UN) recognizes the Aloha+ Challenge and the Dashboard as a [localized model](#) to implement the UN Sustainable Development Goals (SDGs) at the national and sub-national level (Wahlén, 2017).

The intent of this project is to encourage the development of place-based practices, or practices that take into account the specific social, economic, and environmental issues of a place - that decolonize the approach to sustainability and contribute to the restoration of balance of the human-nature relationship. These practices can be featured on a centralized portal to enhance communication and encourage participation among Hawai‘i people. This project is informed by the expressed desire of cross-sector leadership of the [Hawai‘i Green Growth](#) (HGG) network, a 100+ member public-private partnership that aligns government, private sector, and civil society on issues of sustainability. Members include Native Hawaiian organizations, state and county



political leadership, business leaders, non-profit organizations, and educational institutions. This network was created on the margins of the Asia-Pacific Economic Cooperation that convened in Hawai‘i in 2011 to have a more coordinated effort to achieving sustainability in Hawai‘i through cross-sector collaboration to share knowledge and resources and to inspire collective action.

HGG is both a network and an organization. This network is led by a small staff, the HGG team, of which I am a member. HGG network and team stewards the Aloha+ Challenge which provide a framework for context, coordination, and action to identify and fill gaps, inspire innovation and action, and reduce duplication of efforts. According to founding members of the Aloha+ Challenge and other sustainability initiatives in Hawai‘i such as the *Hawai‘i 2050 Sustainability Plan*, this initiative “is built on decades of sustainability efforts and progress in Hawai‘i”.

To learn more about HGG and the organization’s local and global initiatives, see this [video](#) played at the 2016 International Union for Conservation of Nature (IUCN) Conference in Hawai‘i. Additional historical context is included in Appendix A.

### **1.3. Goals**

The Aloha+ Dashboard and the HGG network inspired this capstone project. The Dashboard tracks progress on environmental, social, and economic priorities through authoritative data from state, county, private sector, and civil society sources. This project seeks to expand this ‘top-down’, or authoritative, approach to capturing and reflecting data to include community-based, or ‘bottom-up’, data, creating conditions for a more inclusive and decolonized

approach to sustainability. This expansion of the Dashboard - “Dashboard 2.0” - will provide an enhanced tool for the public and decision-makers to use as a common point of reference to generate dialogue and emergent responses to sustainability issues. This will be accomplished through the development of innovative interactive features, compelling data visualizations, and community-driven data capture to engage the public and schools to broaden the target audience and funders as well as increase usership and utility of the Dashboard.

#### **1.4. Literature, Resources, and Previous Work**

My role as the Sustainability Dashboard Coordinator at HGG is to serve as a thought leader, an innovator of social and technological mechanisms for change, a data manager and analyst, and a convener of diverse groups of people in Hawai‘i to gather and distill key themes and actions through relationship building and strategic design. I manage the Aloha+ Challenge via the Dashboard through goal milestones, indicators, and metrics to measure and track progress in sustainability outcomes. In the last six months, my role has expanded to include enhancing the Dashboard to broaden target audience to engage the next generation in real-world application of sustainability, enhance user experience and the Dashboard’s content through visually compelling graphics, multi-layer maps, and creating interactive features and community data capture mechanisms to garner additional participation in Hawai‘i’s sustainability movement. I am leveraging this expansion of my role as an opportunity to apply my capstone project to this new space of my work and evolve my leadership practice through applying the teachings of the Masters of Leadership for Sustainability (MLS) program.

The relationships built and maintained through the HGG network inspired the creation of Dashboard 2.0 including the visual storytelling mechanism and the community data-driven web application. The majority of the ideas, content, validation, and evaluation of Dashboard 2.0 were garnered through mutually beneficial relationships. My background as an engineer, educator, energy expert, community developer, my experience with island cultures, and love and respect for relationships rooted in love helped position me for this opportunity. My technical expertise, ability to work with people of various ages, and organizational and relationship building skills were all critical to the development of this project.

## **CHAPTER 2: STRATEGIES & METHODS**

### **2.1. Theory of Change**

The Theory of Change (TOC) for this project is that when I center the leadership practices of personal sovereignty, critical thinking, conscious communication, and relationship building through the Dashboard 2.0 project, the results will be meaningful relationships that yield increased participation in sustainability endeavors. By providing a conduit for communities and individuals to participate in sustainability, people will be inspired to take action, resulting in accelerated progress of Hawai‘i’s sustainability goals - the Aloha+ Challenge. The state’s online open-data portal which tracks the sustainability goals - the Aloha+ Dashboard, will reflect community action via the participatory mechanisms this project created. By leveraging this existing public-facing platform and illustrating actions, people and organizations in Hawai‘i will be encouraged to take further action for sustainability. The next phase of the Dashboard developed through this project, “Dashboard 2.0”, serves as an enhanced platform with compelling visuals, increased interactive and user-friendly features, and community-driven data

capabilities. These enhancements to make the Dashboard and its contents more accessible and digestible will result in the increased participation of organizations and communities in this movement. This strategy will help decolonize the approach to sustainability, building critical mass to shift to a thriving economy and society, enhance the human-nature connection, and honor natural order.

This methodology is informed by the University of Vermont Leadership for Sustainability Master's Program (MLS) (Kolan, Sullivan TwoTrees, et al., [Public MLS Aspiration, ToC, Goals, Practices](#), 2016) with a specific focus on growing my leadership practice through personal sovereignty, critical inquiry, conscious communication, and relationship building. Personal sovereignty, actualizing my unique potential, has helped me to identify skills and attributes I can offer to my personal and professional leadership practice and move through fear of judgement in applying them. Critical inquiry and conscious communication have helped me find my voice as a leader and increase the rigor of my conversations by asking difficult questions and getting to the heart of what people are trying to communicate. These leadership practices have enhanced my ability to deepen relationships and, ultimately, advance this work in sustainability.

My TOC was inspired by my experience of the power of relationships in Hawai'i and how love and trust can inspire collective action. Multiple individuals and organizations in Hawai'i have asked me how they can contribute to the Aloha+ Challenge via the Dashboard when they learn about these initiatives. This project builds mechanisms to feature actions

through the Aloha+ Challenge framework and could channel further community and individual action if users feel it is compelling enough to share with neighbors, colleagues, and loved ones.

## **2.2. Leverage Points**

This project aspires to address a diverse set of leverage points. Leverage points are defined by Donella Meadows as - places within a complex system where a small shift in one thing can produce big changes in everything (Meadows, [\*Leverage Points: Places to Intervene in a System\*](#), 1996-2018). HGG specializes in complex, multi-stakeholder issues through leveraging the 100+ member network and cross-sector collaboration by providing framing and cohesion under a shared set of values, building consensus, identifying opportunities and barriers to drive action toward collective goals. The product of this work is reflected on the Aloha+ Dashboard. The Aloha+ Dashboard 2.0 is a mechanism to further illustrate this process and outcome, utilizing leverage points such as: providing metrics and parameters to increase accessibility of information and transparency of government; showing positive and negative feedback loops by tracking progress on Hawai‘i’s sustainability goals through trends and visual storytelling to illustrate the effect of actions and inaction; updating data and information on a continual basis and building mechanisms for participation to evolve the Dashboard and its content to maintain relevance for users and offer the opportunity to change the flow of information from government’s authoritative data to the public to community-driven data; and lastly, to utilize Dashboard 2.0 as a hub to catalyze conversations around sustainability to support emergent ideas (Meadows, [\*Leverage Points: Places to Intervene in a System\*](#), 1996-2018). See Appendix B for full description to how the Dashboard 2.0 project addresses leverage points.

### **2.3. Strategies and Methods**

The initial strategy of the next phase of the Dashboard was to engage local students and academic institutions in real-world sustainability projects through a “Dashboard Lab”. A virtual and physical space for students, along with faculty advisors and guidance from practitioners, would develop innovative strategies to achieve the Aloha+ Challenge goals for Hawai‘i using the Aloha+ Dashboard as a framework for holistic solutions balancing social, economic, and environmental priorities. See Appendix B for details on the initial strategy.

### **2.4. Change of Strategies and Methods**

Through conversations with HGG network partners and potential users of the next phase of the Dashboard, HGG staff realized that a more effective initial methodology to inspire people in Hawai‘i to participate in sustainability actions through the Dashboard would be to create a more compelling, user-friendly platform with interactive features and data visualization. This shift in scope resulted in a modified strategy to engage students, academic institutions, and communities in the achievement of the Aloha+ Challenge goals.

HGG staff created Dashboard 2.0 through research, technical software, and integration of partner and community input from outreach efforts. The intent of HGG’s outreach efforts was to understand the most compelling mechanisms to implement for the next phase of the Dashboard to make it more digestible and accessible. Per my TOC, this will result in increased participation of organizations and communities to help decolonize the approach to sustainability, building critical mass to shift to a thriving economy and society, enhance the human-nature connection, and honor natural order.

HGG selected a diverse set of users of varying professions, age, ethnicity, and gender to test the prototype features of Dashboard 2.0 to offer feedback on data visualization and community engagement mechanisms. Success of the enhancements to the Dashboard were tracked through user feedback.

My internal progress tracked how I am authentically modeling core leadership practices that will help me be a more effective and authentic leader. This project was an opportunity to expand my learning edges in the following core MLS leadership practices: personal sovereignty, critical inquiry, conscious communication, and relationship building, (Kolan, Sullivan TwoTrees, et al., [Public MLS Aspiration, ToC, Goals, Practices](#), 2016) while holding space and sensory capacity for emergent themes. See Results section for explanation of how these leadership practices manifested. My growth of these leadership practices was tracked through feedback and response to my actions from HGG staff, network partners, and new and existing relationships. Centering results around relationships helps to decolonize the approach to implementation of sustainability initiatives, provides accountability, and creates space for multiple ways of being and knowing through input from diverse perspectives.

## **CHAPTER 3: RESULTS**

### **3.1. Outputs**

The Dashboard 2.0 project resulted in the following: increased Dashboard usership by over 50% (Google analytics, 2018); multiple speaking opportunities and articles on the statewide sustainability goals - the Aloha+ Challenge; student involvement in developing mechanisms to

advance progress on sustainability goals and participation in implementation of real-world sustainability projects; feedback from users on the functionality and utility of Dashboard 2.0 features; and stories of cross-sector partners utilizing the Aloha+ Dashboard to make decisions. The following tangible deliverables and relationships have informed the subsequent intended and unintended outcomes.

### **3.2. Tangible Deliverables**

With the support of my HGG team, partners, and MLS coaching from professors and peers, I launched the first phase of the Aloha+ Dashboard 2.0 with interactive features and more robust metrics and contextual narrative to further highlight the work of organizations in Hawai‘i that contribute to sustainability. The two tangible mechanisms created are the visual storytelling mechanism, or ‘Story Map’, and the web-platform prototype to capture school and community data for local food production, food waste diversion, and compost production. These are featured in Appendix C, E, and F. Crowdsourcing data and showing how individual and community efforts can contribute to sustainability in Hawai‘i shifts the narrative from ‘top-down’ authoritative data to show sustainability efforts and inform decision-making to ‘bottom-up’. These mechanisms help create conditions to decolonize the approach to sustainability initiatives through participatory mechanisms for communities and organizations.

### **3.3. Relationships**

The Aloha+ Challenge Dashboard 2.0 project has further strengthened partnerships with civil society organizations, educational institutions, educators, students, technical experts, practitioners, communities, and government entities. The platform provides a centralized hub for



people to learn the needs and desires from these diverse groups through interactive features and enhanced usability to help advance social, economic, and environmental priorities in Hawai‘i and inspire community-driven efforts for sustainability outcomes. Dashboard 2.0 can serve as a connection tool to share diverse knowledge and increase participation in sustainability efforts through providing a centralized system to share data, information, stories, and resources. By creating mechanisms to tell stories and amplify voices of various groups, the Dashboard 2.0 project contributes to decolonizing the approach to statewide sustainability efforts through an inclusivity that encourages sharing of diverse perspectives.

Relationships are an essential component of the Dashboard 2.0 project to ensure that diverse feedback helps shape implementation. Conversations with network partners, technical experts, government entities, and potential new users of Dashboard 2.0 offered important insight and resources to the Dashboard 2.0 development and opportunities to build my leadership practice. These relationships were integral in the creation of the Story Map, web application, public speaking opportunities, increased political support and partnerships and alignment with global entities like the United Nations (Wahlén, 2017), and expansion of my leadership practice. Details are featured in Appendix C, E, F, and G.

Ultimately, these relationships contributed to creating more user-friendly platform to enhance storytelling across Hawai‘i through Dashboard 2.0 mechanisms, as well as my deeper personal and professional engagement with organizations and individuals. These features can be used as a conduit for sharing of knowledge, information, and resources with the intention to

decolonize the way information and data flows and inspire place-based practices that help restore the human-nature relationship and natural order.

### **3.4. Intended Outcomes**

The original intended outcome was a functional Dashboard Lab with two teachers and students to create innovations for the Dashboard. However, HGG network and Dashboard users offered guidance to shift the project scope to develop “Dashboard 2.0” for a greater impact. This entails providing an enhanced user-interface and increasing the utility of the Dashboard. These outcomes were realized through the tangible deliverables and relationship built (see section 3.2 Tangible Deliverables and Appendix C). While the Dashboard Lab is still being actualized, I chose to focus this project on the tangible mechanisms to capture and reflect community-driven data.

My personal intended outcomes were to expand my learning edges in systems thinking, critical inquiry, and conscious communication. These are detailed in Appendix C.

### **3.5. Unintended Outcomes**

My original expectations for the project were to focus on critical inquiry, conscious communication, and systems thinking continue to build partnerships and pathways for collaboration for the Dashboard Lab, to engage students in real-world sustainability projects to better prepare them for the workforce and to advance Hawai‘i’s sustainability goals. This was informed by the desire expressed by teachers and students through interviews during the development of the Aloha+ Challenge Green Workforce and Education goal.

However, given the shift from education to technical innovations and strategic partnerships for Dashboard 2.0, I needed to develop new skills in response to what the project called for to achieve the desired outcomes. This was an uncomfortable process. I found that I resisted this change in direction and was not interested in contributing in this manner. However, my supervisor reinforced that I am to be the resident technical and data expert to round out the team and to achieve the desired outcome of the project, so I stepped into this role fully. I felt my resistance break in two phases resulting in ownership of my expertise and shifting to an innovation mindset. Emergent themes throughout this project include my self-confidence, ownership of expertise (Lentfer, *Claiming Our Stories* course module, 2017), and creativity and innovation. The details of these shifts and emergent themes are in Appendix C.

This new phase of the project was a leverage point to expand my MLS core leadership practice of personal sovereignty (Kolan, Sullivan TwoTrees, et al., [Public MLS Aspiration, ToC, Goals, Practices](#), 2016). I not only felt an expansion of skills, but I saw a personal shift in my behavior. The reaction to my work gave me renewed confidence in my expertise in engineering, data fluency and management, and technological innovation and design. This confidence helped me clarify my voice as a leader, grow my abilities as a boss and offer guidance to those whom I supervise, and practice state-shifting, defined as stepping into an optimal mental and emotional state for various situations (MLS California retreat, Summer 2017). These skills offered public speaking engagements (e.g. [Hawai'i VERGE](#) annual energy conference panel moderator, Sustainable Tourism Summit Foundational Panel speaker, ThinkTech web-based energy talk

show, Hawai‘i GIS annual event presenter, Annual Agriculture Conference speaker), and recognition as an expert and thought leader from local and global audiences.

Centering the core leadership practices of critical inquiry, conscious communication, systems thinking, and personal sovereignty increases my capacity to be an effective and authentic leader through examining ways of being, ways of knowing, and uniquely positions me to serve in the roles in which I am called to serve. These practices all point to relationship building and how I am engaging with others to do this work. Showing up fully and actualizing my potential expands the outcomes of my work by creating conditions to help decolonize the approach to advance sustainability in Hawai‘i and contribute to the restoration of balance of the human-nature relationship.

## **CHAPTER 4: EVALUATION AND ASSESSMENT**

### **4.1. Assessment of Quality of Work**

To assess the quality of my work, I consulted various sources – my Capstone throughline coach, my supervisor and colleagues, and those with whom I have a close personal relationship. I engaged each of these people to gather diverse feedback and guidance on the process and outcomes throughout this project. Details of how this feedback shifted my mindset, build new skills, and groundtruth the value of the Dashboard 2.0 innovations, see Appendix D.

### **4.2. Alignment of Results with Aspirations, Goals and Principles**

The intention of the project was to create opportunities for involvement of Hawai‘i’s leadership, practitioners, residents, and the next generation in sustainability efforts through

enhancing the user-interface and utility of the Dashboard. Per my TOC, providing mechanisms for individuals and organizations to share their actions and stories helps to decolonize an approach to sustainability. Participants are able to see how their efforts contribute to sustainability in Hawai‘i and are inspired to be a part of this movement and take further action. In short, this centralized hub with interactive capabilities will expand the target audience increase people’s engagement in social, environmental, economic issues through Dashboard 2.0.

This project was an opportunity to expand my systems thinking, critical inquiry, and conscious communication skills through relationship building and increased technical capacity. In order to expand the target audience and enhance features, I needed to know what various people desired, how they wanted to interact, and to develop the technology to create these enhancements. This was accomplished through building relationships with current users, technical experts, and people that do not yet use the Dashboard. It was also important for me to learn the functionality of the Dashboard more deeply and to enhance my knowledge of potential software capabilities to make informed decisions. These aspirations, goals, and principles were present throughout this project and have helped guide the process. The results of the Dashboard 2.0 project stayed true to these intentions and helped create surface area for emergent themes in expanding my learning edges of the MLS core leadership practice of personal sovereignty (Kolan, Sullivan TwoTrees, et al., [Public MLS Aspiration, ToC, Goals, Practices](#), 2016). This practice helped me take ownership of expertise in my technical abilities, to find my voice as a leader and comfort in public speaking by building my self-confidence, and encouraging me to be more creative in my approach to addressing sustainability due to the need for innovative mechanisms to capture and reflect community stories.

### **4.3. Feedback and how it was incorporated**

Overall, the feedback on the Dashboard 2.0 developments from various parties was encouraging. Key feedback was to not hesitate to launch an innovation - even if it is not perfect, that strategic communications are key to increasing awareness, understanding of value, and usership of Dashboard 2.0, and that specific tools need to be differentiated for various audiences. I learned the value of clear and concise communication of the goals and intent of the project to make the content more accessible and relevant to different audiences (Rojas, personal conversation, Feb. 2018). I incorporated this feedback by pushing myself to launch two key innovations - the mobile application and Story Map - at a point in which they were functioning, but not perfect; I accepted and sought strategic public speaking opportunities (Appendix G) to launch the new tools and to show the intersection of our work to multiple audiences; I simplified and streamlined my talking points around the Dashboard 2.0 project and features for the new innovations to communicate to a variety of users through multiple channels, speaking to their interests rather than making broad statements. Communication around this project helped grow my personal sovereignty practice (Kolan, Sullivan TwoTrees, et al., [Public MLS Aspiration, ToC, Goals, Practices](#), 2016) resulted in positive publicity for Dashboard 2.0 and HGG.

## **CHAPTER 5: RECOMMENDATIONS/NEXT STEPS/KEY LEARNINGS**

### **5.1. Next Steps**

I plan to continue to build upon the progress of Dashboard 2.0 to help decolonize approaches to sustainability by expanding my methodology. Next steps for this project are informed by the MLS “ToC” (Kolan and Sullivan, [Public MLS Aspiration, ToC, Goals,](#)

[Practices](#), 2016), assuming that work occurs in an ecosystem of interdependence, differentiation, and self-organization. Guided by the value of interdependence, my team and I will continue to develop meaningful relationships with diverse audiences (i.e. students, educators, communities, practitioners, experts, and leadership) in Hawai‘i to pilot test the recent Dashboard 2.0 innovations. Guided by the value of differentiation, my team and I will consult with the various groups and individuals mentioned to gather feedback as to how they would like to use this technology to help accomplish their goals and further their participation in sustainability, and will adapt the platform accordingly to further develop the tools to enhance user-interface and utility of the Dashboard. Guided by the value of self-organization, my team and I will continue to generate and gather new ideas for Dashboard features and tools in the spirit of on-going learning and creatively explore new territory and possibilities and implement these strategies. This includes differentiation of various tools for specific audiences which is currently underway and strategic communications that will offer a conduit for community stories to be told should they wish to share. These practices are intended to encourage increased usership of the Dashboard and participation in sustainability practices to advance the Aloha+ Challenge goals. Near-term deliverables will be to develop Story Maps for the five remaining goals and to develop a reward system for the community data capture mechanism to show user progress and incentivize input at the individual and community level.

## **5.2. Recommendations**

Recommendations are to continue to work with partners to understand how they want to use Dashboard 2.0 to tell their stories of sustainability efforts, and develop accordingly. A specific focus will be on engaging youth and students in application of sustainability through

Dashboard 2.0 and the Aloha+ Challenge framework. Usership statistics will be a primary means of measuring participation, but I recommend finding more qualitative, holistic methods like capturing stories of success to measure and leverage impact of the Dashboard and the Aloha+ Challenge.

### **5.3. Key Learnings**

Key learnings that emerged from this project are the importance of defining a clear target audience, the value of strategic marketing, to trust in myself and own my expertise, and the necessity of rest. It was apparent that defining a clear target audience was critical to the appropriate design of new tools and features for Dashboard 2.0. By defining target audiences, the tools can be differentiated to cater to users wants and needs which will increase participation and usership. Marketing was never an interest of mine and I did not see the value so clearly until the launch of Dashboard 2.0. Strategic marketing clearly tells the story of the tool and illustrating the value it can bring to a specific audience. This communication can make the difference between success and failure of a product.

Personal learnings were tracked in accordance with the MLS core leadership practices (Kolan, TwoTrees, et al., [Public MLS Aspiration, ToC, Goals, Practices](#), 2016) through feedback from relationships. The core leadership practice that has been significantly informed my leadership practice is personal sovereignty. This practice has helped me represent myself and my work with confidence. Owning my expertise inspires confidence from others and can help illustrate shared values and catalyze action. A key learning illuminated from this project was my ability to step into the role of an innovator. This skill was needed to advance my portfolio, even



though I was not within my interest or expertise. To employ these skills, it is important not to “make the perfect the enemy of the good” and to avoid “analysis paralysis” in the effort to make progress. Lastly, I have learned the value of rest. For all of 2017, I was working long hours and weekends, and was stressed about deadlines. This had a cumulative effect of fatigue and affected my ability to think clearly and find joy in my work. My supervisor recommended a more thoughtful and strategic approach, so for the first half of 2018, I dedicated time to relax and take a “brain break” to rejuvenate myself while maintaining reasonable hours. This holistic approach to personal and professional self-care greatly improved my emotional and physical state. This is a practice I will continue to employ.

#### **5.4. Emergent Questions**

Questions I am left with are:

- What are steps I can take to improve my leadership practice?
- How can I create space for innovation and emergence in my work?
- How do I continue to grow my practice to build self-confidence?
- What are practices to employ to improve my skills in state-shifting to be in my personal power?
- Am I serving the right role for my interests, values, and skill sets?
- How do I continue to cultivate strength-to-strength relationships with those whom I am intimidated by?
- How can I leverage the power of shared values?

- What are the most potent, strategic steps I can take to grow my leadership practice and live out my purposes?

I will explore these questions by continuing to seek feedback from my colleagues and those with whom I have personal relationships as well as continue to assess how my actions and aspirations align with my values. Leaning into these questions will help develop and expand my leadership practice.

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## APPENDICES

### Appendix A: Introduction - Expansions of Context

#### A.1. Hawai‘i’s History of Sustainability 1970 – present

Hawai‘i’s sustainability movement started in the 1970’s, following the Hawaiian Renaissance, to create an equitable, green economy that honors natural ecosystems. Groups of leaders in Hawai‘i created numerous plans throughout this time, iterating and building upon each other: Hawai‘i 2000 was a book outlining the vision and plan for action for a more sustainable future; Mālama Hawai‘i, a former organization with a mission to care for the ‘āina (land, water, air) was based on traditional values and ancestral wisdom in which the ‘mālama ethic’ still lives on today; and in the 2000’s, over 10,000 individuals in Hawai‘i from the private sector and civil society produced the Hawai‘i 2050 Plan for Sustainability with included five overarching principles and nine strategic actions. However, these efforts were not gaining the traction that those involved hoped. In 2011, cross-sector leaders came together in advance of the annual Asia-Pacific Economic Cooperation (APEC) with the goal to reduce duplication of efforts and identify and close gaps through cross-sector collaboration. Leadership realized that the missing piece of the puzzle to advance the previous plans was political leadership commitment and accountability. Thus, the Aloha+ Challenge and its component Dashboard was birthed, resulting in six integrated sustainability goals to be achieved by 2030 that are tracked through an online open-data mechanism. This set of goals builds on the traditional wisdom and the previous plans, with joint political commitment from the Governor, all four County Mayors, and the Office of Hawaiian Affairs. These goals are a blueprint for action that have garnered not only local attention but global recognition as a localized model to for the United Nations 2030 Sustainable Development Goals (SDGs).

#### A.2. Hawai‘i’s commitments to sustainability included in the Aloha+ Challenge:

[Hawai‘i Clean Energy Initiative](#) in 2008 (70% clean energy by 2030) and a legislative amendment in 2015 (100% clean energy by 2045); a commitment by all four County Mayors to [100% clean transportation by 2045](#); the Governor’s [Sustainable Hawai‘i Initiative](#) established in the 2016 IUCN conference to achieve 100% increase in local agricultural production by 2020, stronger invasive species policy, infrastructure and capacity by 2027, 30% of priority watersheds protected by 2030, 30% of nearshore marine areas effectively managed by 2030, and complete transfer to clean, renewable energy by 2045; Hawai‘i’s greenhouse gas (GHG) legislative [Act 234](#) set in 2007 to ensure the state returns to 1990 GHG emission levels (13.66 million metric tons per year) by 2020; and [state commitment to the Paris Agreement](#) in June 2017 (UNFCCC, 07 June 2017).



## Appendix B: Strategies & Methods

### B.1. Dashboard 2.0's Leverage Points for Change (expanded version)

12. Constants, Parameters, Numbers: *Track numbers and parameters (like benchmarks, memberships, performance measures)* – The Dashboard measures and tracks progress on agreed sustainability goals in Hawai'i. Dashboard 2.0 increases the amount of relevant data tracked and its utility and accessibility to multiple audiences.

11. Buffer Sizes and other stabilizing stocks: *Change proportion of resources held in reserve, in relation to output* – The Dashboard serves as a platform for collaboration leading to collective visioning and sharing of actions so as to reduce duplication of efforts and identify and address gaps. With the increased utilization and visibility of Dashboard 2.0, there will be more collaboration around resource sharing and ideating around how to fill gaps.

10. Material Flows Structure: *How material stocks move throughout the system* – Dashboard 2.0 shows transportation flows, fluctuations in populations, job market, community participation in sustainability, and other related metrics and contextual narrative.

9. Delays: *Speed up/slow down response to change* – The Dashboard is a hub for sustainability in Hawaii and enhances the ability for community members, students, leadership, policy-makers, and other users to make decisions more quickly due to the transparency of data compiled in one platform in a simplified form. Dashboard 2.0 has expanded its target audience and supporters by engaging community and students, increasing actions and enhancing collaboration and advocacy around policy, business models, and institutional processes.

8. Negative Feedback Loops: *Strengthen negative (self-correcting) feedback loops* – With Dashboard 2.0's enhanced data visualization and modeling capabilities, people can verify their assumptions and decisions based on data projections. Dashboard 2.0 will allow users to see a more comprehensive picture and thus illuminating systems that are not optimal and may inspire ideas and strategies for change.

7. Positive Feedback Loops: *Strengthen positive (reinforcing) feedback loops* – Dashboard 2.0 will clearly show areas where efforts are successful using metrics and indicators along with contextual narrative. These metrics and narrative are updated annually, at the very least.

6. Information Flows Structure: *Change how information flows: who has access to what info, when, and how* – The Dashboard is accessible to all people statewide, nationally, and internationally through the open-data platform. This availability of sustainability metrics,

information, and resources is unprecedented. Dashboard 2.0 gives users increased access to sustainability information by making the data digestible to the public.

5. *Rules: such as incentives, punishments, and constraints* – The Dashboard is a mechanism for policy action and inform decision-making. Dashboard 2.0 provides users with incentives to participate in sustainability efforts and community action can now be displayed with geolocation, highlighting how communities and schools are contributing to Hawaii’s sustainability goals.

4. *Evolution: Increase resilience: the power to add, change, evolve, innovate, self-organize at every level* – Dashboard 2.0 creates conditions for connection, collaboration, and collective impact among students, faculty, practitioners, community members, leadership, and policy-makers by providing an interactive hub for sustainability metrics, information, and resources.

3. *Goals: The goals of the system* – Dashboard 2.0 tells a visual story of the statewide sustainability goals through an open-data platform, defining key leverage points, actions, gaps, and opportunities to achieve these goals.

2. *Context Paradigms: Change the mindset or shift the paradigm from which the system arose; increase visibility of change agents (goals, structure, rules, delays, parameters)* – Dashboard 2.0 clearly illustrates goals, policies, actions, and gaps developed through a multi-year process including hundreds of stakeholders and experts to provide an accurate snapshot of sustainability in Hawaii. This one-stop shop of sustainability creates the shared context for where we are and where we’re going in terms of Hawaii’s sustainability goals. Dashboard 2.0 also includes a mechanism to capture and reflect school and community data, showing the value of community action and how it contributes to achieving Hawaii’s sustainability goals, as well as connecting students to real-world sustainability projects, positioning them as future leaders and stewards of sustainability for the next generation.

1. *Transcend Paradigms: Support emergence. Practice Not Knowing to allow for transcending paradigms* – The Dashboard and Hawai‘i Green Growth supports an iterative process that welcomes voices from across Hawai‘i to support a collective vision for a more sustainable future. The Dashboard and Dashboard 2.0 are living platforms that capture current issues, policies, and initiatives as they emerge.

## B.2. Initial Capstone Strategy

Faculty at the middle school, high school, and college level would work with HGG and practitioners to identify real-world projects for students to apply their studies and gain practical experience. Each student would be assigned to a faculty advisor to serve as a mentor throughout the duration of the project as well as a practitioner with whom to work on their assigned project. Students would receive course credit for their work, instructors would receive credit-hours, practitioners would receive free assistance on their project, and HGG would receive feedback and innovative ideas on their Aloha+ Dashboard. This suite of benefits to each party would foster

a mutually beneficial relationship among academic institutions, practitioners, and the HGG network.

A physical space, the “Dashboard Lab”, was proposed in which students, practitioners, and faculty advisors could convene to ideate and collaborate around cross-sectoral methods to address projects. This physical and virtual hub of innovation and collaboration would help to build the next generation of leaders in sustainability by involving them in practical application of learned skills. This method assumes that students and faculty are interested in sustainability issues, that practitioners are willing to work with academic institutions on their projects, and that projects will offer meaningful learning experiences for students. The strategy was informed by the MLS values of relationship building (Kolan, Sullivan TwoTrees, et al., [Public MLS Aspiration, ToC, Goals, Practices](#), 2016). This methodology would build relationships across academic institutions, students, educators, and practitioners to encourage knowledge share and innovation to advance sustainability goals.

## Appendix C: Results

### C.1. Story Map Narrative

The *‘Āina-Based Education Systems Map* created by a group of local philanthropies, community-based organizations one as a collaborative effort to tell stories of how communities and organizations are using place-based education (*‘Āina-Based Education Systems Map*, Hau‘oli Mau Loa Foundation, 12 Sept. 2017) inspired the creation of Dashboard 2.0’s visual storytelling mechanism, or ‘Story Map’. In my experience, storytelling is an important part of Hawai‘i culture. Through conversations with partners and colleagues and with technical guidance and encouragement from our funders, HGG created a visual storytelling mechanism or ‘[Story Map](#)’ to enhance interactivity and data visualization. As a prototype, HGG created a Story Map for the Aloha+ Challenge Natural Resource Management goal, expanding it to include interactive features such as layered maps, quizzes, and community resources.

### C.2. Local Food Goal Expansion Narrative

Local food production and consumption is a major issue in Hawai‘i as “Hawai‘i imports roughly 90 percent of its food” (Penniman, *Maui No Ka Oi*, 2016). This is reinforced by the Department of Agriculture in a 2012 speech at the Hawai‘i State Legislature, “Hawai‘i imports approximately ninety-two percent of its food (Kent, *Food Security in Hawai‘i* p. 28, 2014). Since 2012, the Department of Agriculture no longer captures statistics on local food production in Hawai‘i and there is a great need to show the most comprehensive picture possible of the local food system in Hawai‘i. From 2016 to 2017, the Aloha+ Challenge Local Food goal consisted primarily of estimates of local food produced which was limiting. By popular demand of local food system experts, practitioners, and cross-sector HGG partners, the HGG team restructured and expanded [Local Food](#) goal through research and connecting with subject matter experts to offer them the opportunity to share their thoughts and in turn have their work featured on the Dashboard. This helped provide a more comprehensive snapshot of the local food system in Hawai‘i, illustrating data trends, current conditions, and opportunities for increased efforts and collaboration.

### C.3. Web Application for Waste Narrative

#### Impetus for Web Application Creation

HGG partners recognized the need for community data around food production and food waste. The recently released 2017 Waste Composition Study indicates that “organics [food waste] (36%) make up the largest portion of Honolulu’s overall waste stream” for the City and County of Honolulu (Cascadia, pg. 1, June 2018). In response, the HGG team was inspired to create a web application to capture food metrics to promote Hawai‘i’s goal of Doubling Local

Food Production (Governor Ige, [Sustainable Hawai'i Initiative](#), 2016). Hawai'i State Senator flagged efforts that schools on the Windward [east] side of O'ahu were doing with a community-based organization to capture food waste and turn it into compost (Nemoto, Inside Out Hawai'i, [Zero Waste](#), March 2017). HGG met with these groups to understand their work and explore collaboration. Due to their interest to have their data displayed more prominently on a public site, HGG partnered with the Hawai'i State technology department and a local developer company to develop a prototype [web application](#) to capture community and school data around local food production and food waste diversion, inspired by the work of the community-based organization and local schools to capture food waste and create compost to sell for school projects. Through the currently pilot phase, this prototype web application is currently being used to track the efforts of these groups showing local food production, food waste diversion, and pounds of compost produced through geolocation data on Google Maps.

#### C.4. Relationships

##### Expansion of Leadership Practices through Relationship Building

Through the conversations with network partners to identify next steps and the Dashboard 2.0 development process, I practiced critical inquiry and conscious communication. I strived to ask clarifying questions to better understand the perspective of funders and what sort of enhancements they wanted to see. My practice was to not fall into my habit of being agreeable and glaze over the details to appease them, but to continue to strive for understanding through questions and offering my perspective openly. Through these conversations, I practiced conscious communication through deep listening not only to their words, but to their non-verbal communication, and summarizing what I inferred from them in my own words what I felt they were trying to convey. I practiced this with my HGG team and partners, such as schools and community partners we sought to work with on this project. This led to deepening relationships and a more holistic vision of how the project could grow through this authentic and observant communication. I strived to increase my capacity in systems thinking in this work. This is inspired by my supervisor's encouragement to increase my capacity as a thought leader and to draw connections from multiple local and global initiatives to identify synergies, opportunities, and gaps in my work leading the Dashboard 2.0 implementation. By giving myself freedom to think creatively and explore indirect connections and moving past my idea of perfection, I identified multiple avenues in which Dashboard 2.0 could expand and discovered multiple future projects and partners to expand the scope of this work. For example, a mobile application was created in India to measure the safety and security of neighborhoods. This sparked an idea to do something similar in Hawai'i to address the gap in gender equality and perceived safety. This will be incorporated into the next phase of Dashboard 2.0 prototypes and pilots.

##### Relationships Helping Dashboard 2.0 Implementations

HGG garnered increased interest and public speaking opportunities from the Dashboard 2.0 implementation and relationships. HGG developed a relationship with an international company that provides geographic information system (GIS) software for visual storytelling through 'Story Maps' to explore storytelling around sustainability issues and increase usability of the Dashboard. Through this partnership, HGG acquired the software license to enhance data visualizations, visual storytelling, and interactive features to better illustrate current conditions of sustainability in Hawai'i, traditional place-based knowledge, and opportunities for cross-sector

collaboration, sharing, and inspiration. The local company's staff provided training to increase knowledge and fluency of the software to fully actualize the benefits of the software for maximum impact. This software license and its capabilities was a major part of Dashboard 2.0 through the creation of a Story Map for the Aloha+ Challenge Natural Resource Management goal. This enhanced interface aspired to increase visibility and knowledge sharing around sustainability issues, such as ecosystem restoration within Hawai'i communities. It can serve as a platform for conversations and education at multiple levels. The positive reception of this feature led to a public speaking opportunity at Hawai'i's annual GIS conference in June 2018. This speaking opportunity increased interest from multiple parties on the margins of the conference in using the Aloha+ Challenge as a framework to help organizations meet their sustainability goals.

Political support for grassroots efforts are important to help advance initiatives. Political will and commitment is inspiring and helps connect on-the-ground efforts to a broader context. The Aloha+ Dashboard and Dashboard 2.0 has garnered continued support from Governor and his staff through highlighting the Aloha+ Challenge at public events and creating his [Sustainable Hawai'i Initiative](#) (Governor, 2016) aligning goals to the Aloha+ Challenge and the Dashboard. County Mayors have used the Dashboard and the 2.0 components to show how their efforts are interconnected with statewide initiatives and support the Aloha+ Challenge and Dashboard by garnering additional awareness and support. For example, see Mayor Carvalho [video](#) (2017).

HGG's partnership with Senators created connections with a local waste program that helps schools divert their food waste from school lunches and turn it into compost and vermicast soil to generate income for the school. A prototype mechanism was developed to start knowledge and resource sharing through collaboration with State of Hawai'i technology department, HGG, and a local web developer company to create a prototype [web application](#) to capture community and school data around the Aloha+ Local Food goal. This partnership leveraged the opportunity to feature head of the state's technology department on a panel at annual energy conference (see event photos in Appendix F), further illustrating the value of data, innovation, and dashboards to advance sustainability outcomes. Hosting a panel that highlighted the State's work built increased alignment and collaboration between the State technology department and HGG as well as other State departments who attended the session to learn about the value of data, innovation, and dashboards from someone they trust within the State government. Instilling more trust with government entities helps break down silos and illustrate the interconnectedness of cross-sector work and common values and goals.

The efforts to advance the Aloha+ Challenge goals and create interactive community-driven features on the Dashboard drew international attention and helped Hawai'i gain recognition as being a leader in sustainable development by providing place-based models for localized implementation of the United Nations (UN) global Sustainable Development Goals (SDGs). The Aloha+ Challenge and Dashboard was formally recognized by the UN as a localized model to implement the UN's global SDGs through the SDG Knowledge Hub – International Institution for Sustainable Development's (IISD) platform in this [article](#) (Wahlen, *SDG Knowledge Hub*, 2017). Additionally, HGG Executive Director was featured in a UN SDG Knowledge Hub webinar and [article](#) highlighting the Dashboard as one of the four key North American data initiatives (Leone, *SDG Knowledge Hub*, 2017). This recognition helps build

cross-cultural relationships with other nations and sub-nations to continue the dialogue around sharing best practices and lessons learned.

## C.5. Intended Outcomes

### Implementation of Leadership Practices

I practiced honing my systems thinking skills by finding synergies by looking from a broader perspective and tying these connections back to the overall intention of the project to ground-truth if my actions are achieving the desired goals. Additionally, I have worked to draw connections between current conditions and efforts. For example, China announced that they will no longer accept imported plastic waste per the National Sword policy effective January 2018 (Watson, [NPR](#), 28 June 2018). This directly affects Hawai'i as the state produced over 8,400 pounds of plastics for recycling in 2016 (Hawai'i State Department of Health, 2016). In response, HGG is now exploring a partnership with a local grassroots organization focused on waste reduction to leverage exposure at a community event in the near future to build community awareness and engagement around zero waste and circular economy. This local organization expressed that they will benefit from using the Aloha+ Challenge to provide a broader context and sustainability framework at their event. HGG is now pursuing a joint potential funding opportunity from a local philanthropy has an interest in waste management. Critical inquiry and conscious communication were aspirations to help me have more productive conversations to ultimately build stronger relationships and drive outcomes desired by the HGG network and partners. I pushed myself to ask questions that I am uncomfortable asking for fear of a negative response. For instance, I began asking my supervisor for more direct feedback on my performance at more frequent increments in the attempt to learn from what I can do better and what she believes I am doing well. Additionally, I have been asking more clarifying questions to people outside my organization to better understand the meaning of what they are saying and their objectives. I would ordinarily not speak up with high-level leadership as I felt I was beneath them. But now I realize that we have common goals and shared values which connects us, which encourages me to feel like I have a place within these conversations. Through asking questions that make me uncomfortable, I began finding more clarity and confidence in my voice each time I pushed myself. I noticed a change in people's response to me in that they were more inclined to connect with me and want to pursue initiatives together. I now find myself speaking more freely and being more comfortable sharing my opinion in staff and external meetings. By further developing these three skills, I found that I am honing my voice as a leader, was able to make marked progress on my project which I had felt I was stuck on for a while, and was given opportunities for public speaking to frame sustainability in Hawai'i and to hold open dialogue around methodologies, outcomes, and lessons learned in the process of trying to make progress on Hawai'i's sustainability goals.

## C.6. Unintended Outcomes

### Shifting from Expectations to Current Conditions

The first phase was to move from my expectations of focusing on interpersonal skills to step back into an engineering mindset to acquire the focus and rigor necessary to ensure our sustainability metrics and indicators were accurate, properly analyzed, managed, and presented to key stakeholders with specific references. This is where I started owning my expertise by

acknowledging that I have the skills necessary to perform in this role. The second phase of my work was to shift from an engineering mindset oriented around technical rigor to an innovation mindset, similar to a start-up mentality to produce mechanisms for user engagement. In my approach to developing mechanisms to provide enhanced data visualizations and interactivity, I found that I was thinking many steps beyond what was needed. The learning curve was steep and the specifics of what was being asked were unclear, so I felt unsure of how to proceed and wanted to make sure I had included as much as possible in my first iteration and did the appropriate research to make the best choices possible in terms of software and functionality. This led to “analysis paralysis”, or the desire for perfection that impedes implementation. I wanted to have everything mapped out before I took the first step because in my uncertainty, I felt I needed a safety net because this was new territory for me. However, in speaking to my throughline coach (Stanfield-McCown, 2018), it was clear that I was stepping into a start-up mentality, and that the rigor I was applying was impeding my progress. I had to unlearn my engineering/scientific way of thinking and move into an innovation/creativity mindset to produce a Minimal Viable Product (MVP), release it to users as a pilot to test it, and gather feedback and begin iterating on it to improve the product. When I released my product, my supervisor, network partners, and users were pleased with it and encouraged me to continue the work.

### Emergent Themes

Emergent themes that manifested throughout this process include self-confidence, ownership of expertise (Lentfer, *Claiming Our Stories* course module, 2017), finding my voice as a leader, awareness of how my presence affects people and situations, and innovation. Themes relate directly to the MLS core leadership practice of personal sovereignty (Kolan, Sullivan TwoTrees, et al., [Public MLS Aspiration, ToC, Goals, Practices](#), 2016). Through guidance and encouragement from my supervisor, I have begun to build my confidence to speak without fear of judgement, knowing that I have the technical skills needed to perform my work and/or I can build these skills, to not to be afraid of a challenge, and giving myself freedom to ideate, no matter how unrelated it seems. She helps me explore my “blind spots” (Mistinguette, *Johari Window*, 2017), defined as areas which are known to others but unknown to me. My supervisor also helps me explore my potential by challenging me to expand the ways I am thinking, interacting, and operating. This has helped build my personal sovereignty and shifting my internal narrative to a mindset of scarcity and fear to abundance and inspiration. For example, I noticed my younger teammates offering ideas during staff meetings and admired their fearlessness to share, even though their ideas may not be directly related or viable. I noticed I had plenty of ideas at the caliber they were thinking, but I acknowledged the fear in judgement I had around sharing it if they were not good ideas. Consciously, I began attempting to shift my mindset from trying to be perfect and appropriate, to being creative and collaborative which has been freeing and generative. It has improved our team dynamic and collaboration across projects and has ultimately helped me draw connections and expand the scope of implementation for the Dashboard 2.0 project.



## **Appendix D: Evaluation and Assessment**

### Assessment of Quality of Work through Relationships

My supervisor has been my greatest guide throughout this project. She has encouraged me to own my technical expertise – to know the Dashboard data inside and out and be able to present on it during key stakeholder meetings and to develop innovative mechanisms for data visualization and interactivity. This helped shape my abilities and skills and inspire me to grow into a mindset of which I previously had no interest. The MLS program has inspired me to serve where I am called and to listen to what parts of myself need to show up. This was the perfect opportunity to practice this capacity. This new space allowed me to serve in the capacity that was needed to expand the target audience and increase participation on the Aloha+ Dashboard, which tracks Hawai‘i’s sustainability goals - the Aloha+ Challenge - developed by HGG’s 100+ member network and agreed upon by the Governor, all County Mayors, Office of Hawaiian Affairs, and unanimously supported by the Hawai‘i State Legislature (State of Hawai‘i ([SCR 69](#), 2014)). This process to develop new features for Dashboard 2.0 had a steep learning curve and took longer than expected to research software and features, consult experts, and implement these innovations. I had to let go or “unlearn” my scientific/engineering mindset and shift to a start-up/innovation mindset. When pressured, I presented a variety of options to my supervisor around our objective to increase the interactivity of the site and the data visualization. She was pleased with the results which is a strong marker of success, and a relief for me.

My capstone throughline coach was instrumental in helping me shift from an engineering mindset to an innovation mindset. Through discussing the change in direction, she illuminated the drastic shift in strategy and helped me identify and name why this process was so challenging. I realize now that I learned an entirely new skill set in the process - how to shift from an engineering mindset to an innovation mindset.

I consulted technical experts and developers on various aspects of Dashboard 2.0 (e.g. the visual storytelling mechanism and the community data capture web application). These technical experts provided their assessment and constructive feedback to tweak the products, but did not have major suggested changes. Overall, they were pleased with the products and the enhancements to the Dashboard to develop Dashboard 2.0 which gave me confidence to release to the public. Two of our partners suggested that I launch these enhancements publicly at upcoming events. That felt like a seal of approval and led to several public speaking opportunities to launch these new Dashboard mechanisms and engage additional users.

Lastly, I showed and discussed the process and product to community members, students, and close friends and family to gauge whether or not these new features were valuable or useful. I received a mixed, but generally positive reaction. This request for feedback from such a broad

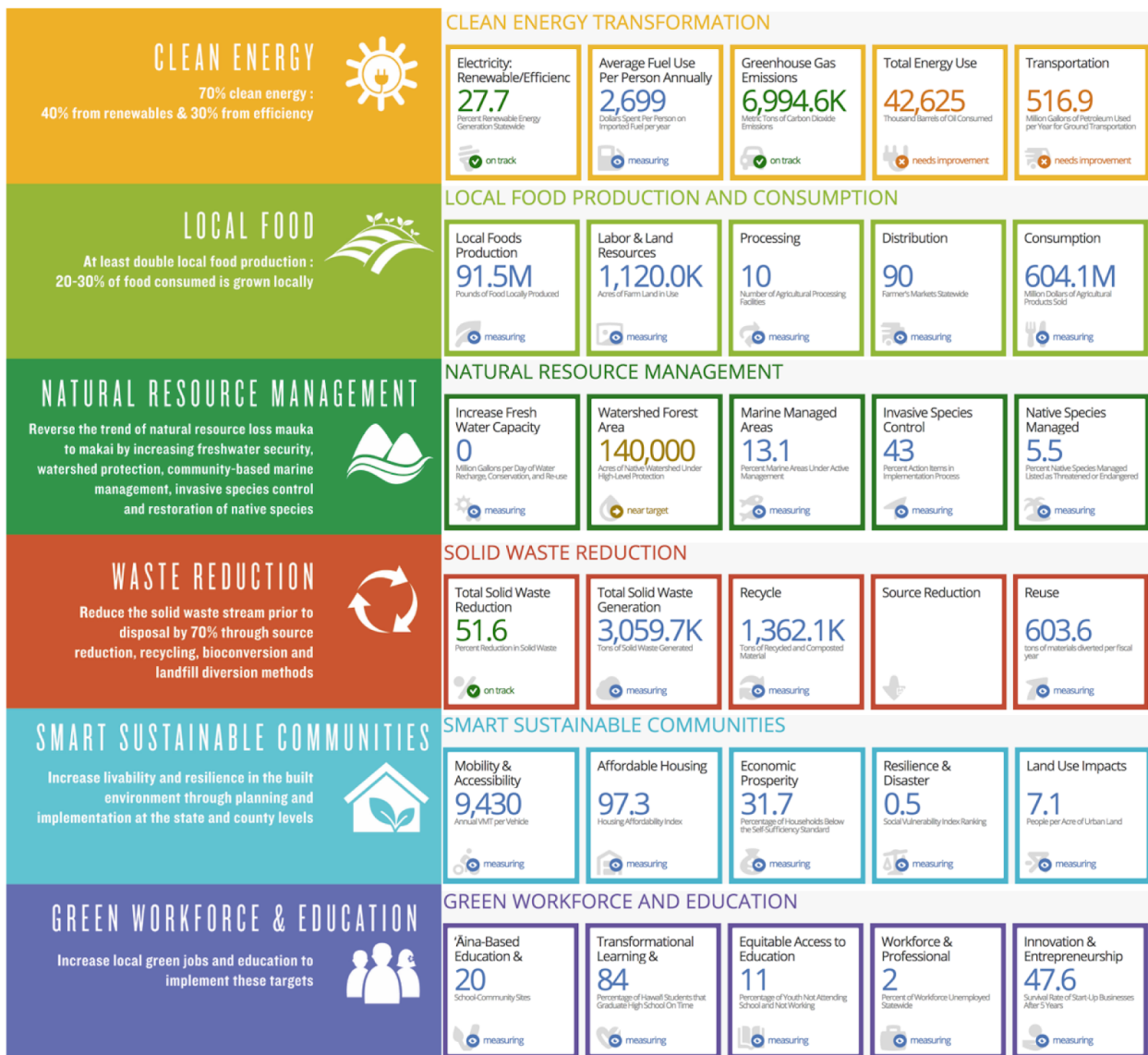
set of users helped me realize that I needed to define a clear target audience for this expansion. This differentiation of various tools for specific audiences is currently underway.

### **Appendix E: Tangible Deliverables**

- 1) Launch of Dashboard 2.0 including enhancements to Dashboard through data visualizations, interactive maps, look and feel of site, expansion of Local Food goal: <https://dashboard.hawaii.gov/aloha-challenge>
- 2) Story Map created with Esri software for Aloha+ Natural Resource Management Goal: <https://aloha-challenge.maps.arcgis.com/apps/MapJournal/index.html?appid=d03f9d98c2b74b619ed77f0c43ca9e72>
- 3) Web-based application for community data entry created in collaboration with DataHouse: <https://hgg.datahouse.com/>
- 4) The Aloha+ Challenge and Dashboard connection to United Nations Sustainable Development Goals: <https://sustainabledevelopment.un.org/sdgs> through articles (February 2017)

## Appendix F: Figures of Dashboard Innovations

F.1. Enhanced [Dashboard](#) including expanded Local Food goal and interactive maps within



F.2. Web-based mechanism for community data capture (screenshot)



## Community Data for Aloha+ Local Food Goal

Map Satellite

Princeville  
Kapaa  
Koloa

Kapolei  
Honolulu

HAWAIIAN ISLANDS

HAWAII

Lahaina  
Kihai

Waimea  
Waikoloa Village  
Kailua-Kona  
Island of Hawai'i  
Volcano

SHARE YOUR CONTRIBUTION TO THE ALOHA+ LOCAL FOOD GOAL

Are you harvesting or composting?  produce or  compost

Quantity and Types of Produce

Qty  pounds of  Select Produce Type  Choose File No file chosen

Add more

Location

City where food was grown

Description

Interesting information about what you grew or how you grew it.

Submit

F.3. Dashboard 2.0 visual storytelling mechanism, 'Story Map' for Aloha+ Challenge [Natural Resource Management goal](#) (screenshots)

# Aloha+ Natural Resource Management Goal

This statewide goal is represented by five targets: *Fresh Water Capacity, Watershed Area, Marine Species Managed, Invasive Species Control, and Native Species Managed*. These targets indicate top priorities in Hawai'i identified by local stakeholders and experts, represented by qualitative and quantitative data.

The *Aloha+ Challenge* is a model for localized implementation of the United Nations Sustainable Development Goals (SDGs).



# Aloha+ Natural Resource Management Goal

baseline, coupled with projections for population increase, it is estimated that 100 mgd of additional fresh water capacity\* is needed in order to meet Hawai'i's future water demands without extracting more valuable groundwater resources or resorting to high cost alternatives such as desalination. To achieve this ambitious goal, key stakeholders across the public, private, and philanthropic sectors must work together on conservation, reuse, and recharge initiatives.

\* Fresh water capacity refers to the amount of water available for consumption, and can be defined as the total decrease in water demand combined with the increase in water supply.



## Aloha+ Natural Resource Management Goal

### Water Recharge

Water recharge delivers rainfall and surface water back into aquifers. Over time, developed areas and pavement has changed the way water naturally recharges by preventing water from being absorbed back into the earth. From 2005 - 2011 there was approximately a 7.5% increase in development and paved areas statewide.

See land cover data on NOAA's C-CAP Land Cover Atlas at right

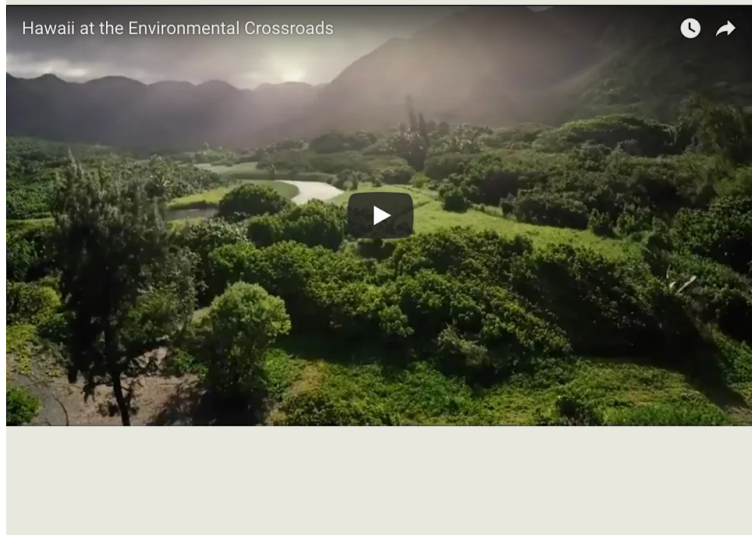
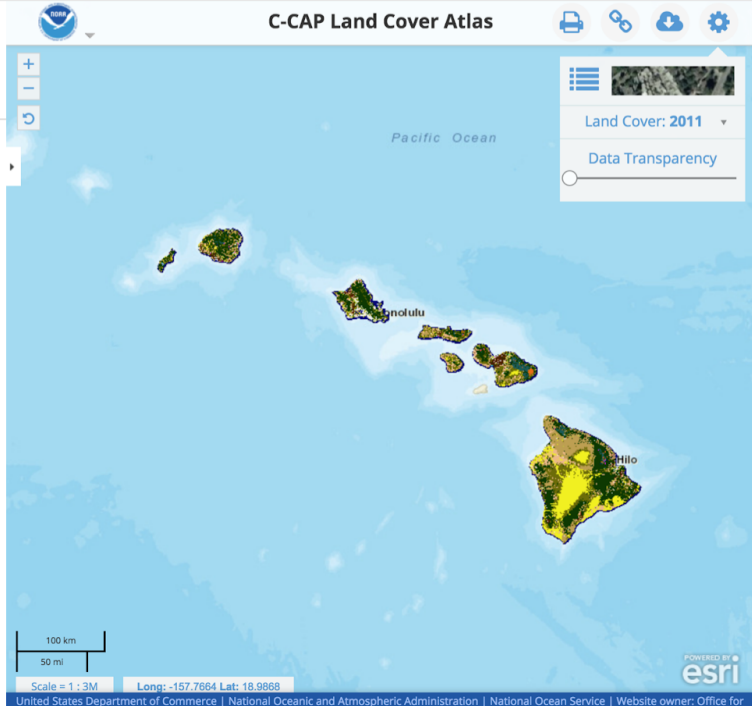
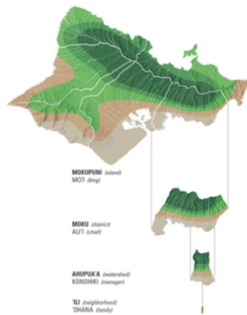
In addition, changes in upland forest have reduced the amount of direct water recharge. Recharge can be improved through increasing upland forested protection ([Visit Watershed](#)) and increasing green infrastructure. Metrics to measure green infrastructure are still being defined and will be tracked as new green infrastructure projects are completed.

### Water Resource Maps

## Aloha+ Natural Resource Management Goal

### Traditional Land Divisions

Native Hawaiian ancestral knowledge is grounded in the relationship between people and 'āina. 'Āina (meaning that which nourishes us) encompasses land, ocean, ecosystems, and all living things. Aloha 'āina is a way of life that practices reverence and stewardship for the land and all life forms.



Aloha+ Challenge Story Map [Edit x](#)

## Aloha+ Natural Resource Management Goal

No issues detected x

### Water Conservation

Water conservation is the most efficient and cost effective way to manage the demand on Hawai'i's limited fresh groundwater resources. Conservation can be achieved through improving the efficiency of residential and agricultural water use. Since a quarter of all water pumped statewide is used for agriculture (see bar chart below), Hawai'i should focus on improving efficiency in agriculture water use by 15% by 2030.

Island	Municipal	Agriculture	Irrigation	Military
Oahu	75	10	10	5
Maui	30	15	10	5
Hawaii	45	15	10	5
Kauai	50	10	10	5
Molokai	40	10	10	5
Lanai	60	10	10	5
Maui	70	10	10	5
Lanai	75	10	10	5
Maui	75	10	10	5

Island	Maui
Agriculture	17%
Industrial	43%
Irrigation	6%
Military	0%
Municipal	33%

OVERVIEW MAP

Esri, HERE, Garmin, FAO, USGS, EPA

Aloha+ Challenge Story Map [Edit x](#)

## Aloha+ Natural Resource Management Goal

Hawai'i residents currently use 164 gallons of water per day per person (approximately 33 buckets full), which needs to be reduced to 130 gallons per day per person to achieve Hawai'i's 2030 goal.

### Calculate your water footprint!

Take this quiz to compare your water usage to those across the United States and get tips to reduce your use.

### Water Recharge

Water recharge delivers rainfall and surface water back into aquifers. Over time, developed areas and pavement has changed the way water naturally recharges by preventing water from being absorbed back into the earth. From 2005 - 2011 there was approximately a 7.5% increase in development and paved areas statewide.

## WATER FOOTPRINT<sup>®</sup> CALCULATOR

### What's your water footprint?

This calculator helps you estimate your total water use. You know water comes from the tap, but do you know how much water goes into your sandwich? Your gadgets? The electricity that powers them? Soon you will!

[GET STARTED >](#)

¿Cuál es su Huella Hídrica?

[Dive deeper](#)

Tips, articles and educational material

[SAVE WATER](#)

[WATER USE](#)



## Appendix G – Publicity

G.1. The Aloha+ Challenge was recently highlighted by the United Nations (UN) Sustainable Development Goals (SDGs) Knowledge Hub as a localized model for SDG implementation:

<http://sdg.iisd.org/news/hawaii-plans-state-level-sdg-implementation/>



**Figure 2:** The Aloha+ Challenge was highlighted by the UN SDG Knowledge Hub as one of the four key North American data initiatives: <http://sdg.iisd.org/news/north-american-community-organizations-exchange-lessons-in-localizing-the-sdgs/>



G.2. VERGE annual energy conference breakout event – half-day Sustainable Tourism session – Foundational Panel (photos below)



Figure set 5: VERGE annual energy conference event panel (photos and program below):

VERGE
HAWAII
Home
Speakers
Program ▾
Sustainable Tourism Summit
Travel
About

Thursday, Jun 14, 2018

## Data, Dashboards, & Innovation to Drive Action on Sustainability Goals


Breakout

Hawaii Green Growth will host an expert panel to discuss the value of centralized open data dashboards and innovative data capture mechanisms to drive sustainability outcomes. The panel will explore multiple perspectives on data collection and management, and how it provides accountability and drives action and decision-making for the government, private sector, and the public through analysis and visual representation on open-data dashboards to achieve Hawai'i's ambitious energy and sustainability goals.


Tracks

Models for Market Transformation


Speakers




Todd Nacapuy




Donavan Kealoha



Chelsea Harder



Aki Marceau



Ben Sullivan



G.3. 2017 Hawai‘i Annual Code Challenge presentation (below at left)

G.4. ThinkTech Hawai‘i State of Clean Energy show June 2018: [Hawai‘i Advancing Progress on Sustainability](#) (below at right)

