



Center for  
**ISLAND  
SUSTAINABILITY**

**Environment**

**Education**

**Energy**

**Society  
& Culture**

2nd REGIONAL  
CONFERENCE ON  
ISLAND  
SUSTAINABILITY  
APRIL 19-20, 2011  
HYATT REGENCY GUAM



## University of Guam Center for Island Sustainability

### Mission Statement

The Center for Island Sustainability of the University of Guam will create an Island-based model of renewable, sustainable and appropriate technologies focusing on indigenous energy alternatives and replicable research to meet the needs of island communities in the broader areas of **Environment, Economy, Society, and Education**.

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### Nissology – The Study of Island Communities

The uniqueness of island communities vis-a-vis other global communities can be exemplified by (1) their small size, (2) scattered populations, (3) remoteness from major centers of production and consumption, (4) their economic and ecological vulnerability; and (5) unique cultural models.

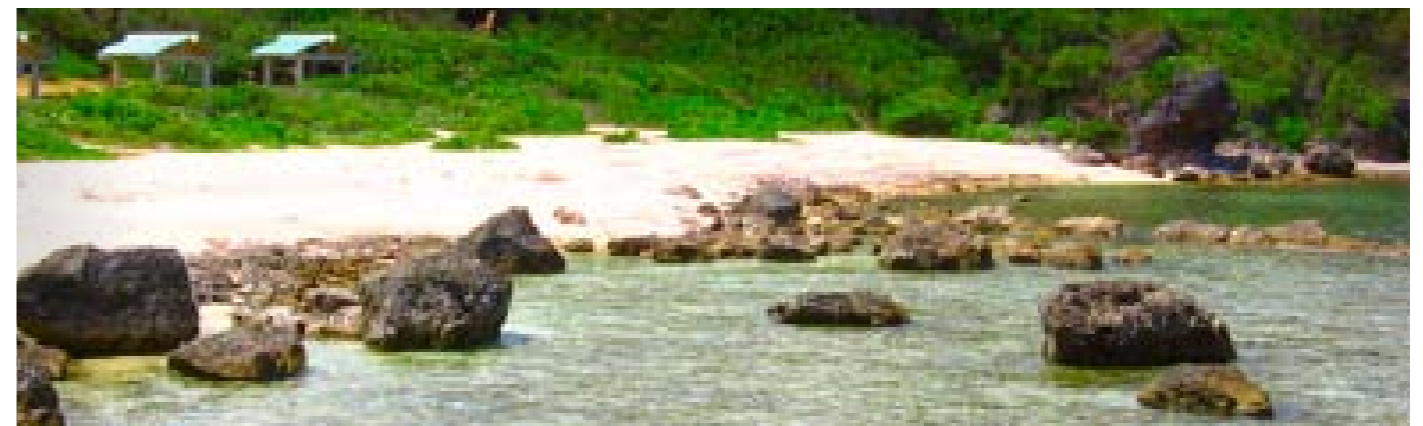
The Center for Island Sustainability (CIS) is designed to collaborate with all regional educational partners, organizations, and governmental agencies. The CIS actively promotes participation from Micronesian Chief Executives, Pacific Post-secondary Education Council (PPEC), US Federal agencies, (USDA,DOE, DOD, DOI, DOT, HUD, EPA, etc.), community organizations, local governments, utilities, and Non-Governmental Organizations (NGOs).

### Engagement of Stakeholders

With the emphasis on indigenous, island-focused sustainability, the CIS will create and provide opportunities for research-based models of renewable and sustainable energy management. In partnership with businesses and agencies, the CIS will design and implement field-based research to better provide for the various needs of island communities, including consultation, training, education, internships, and product models. The University of Guam, as the “honest broker,” is committed to the conservation and management of our limited resources and the implementation of alternative energy sources with an eye not only on the fiscal bottom line, but also the broader impacts on our physical and societal environments.

The University of Guam, through the CIS, is strategically poised to be the preeminent model of sustainability in the Western Pacific and beyond. As an entity, the CIS is created to provide direct, local expertise in indigenous, island sustainability. It relies upon various revenue streams including, grants, fee-for-services, sponsorships, and gifts in kind. In that sustainability is an integrative, trans-disciplinary field, drawing from and adding value to the traditional disciplines and subject areas, the CIS will increase research and publication opportunities for students and faculty on Guam and the region.

The sustainability and research-based directives of the CIS incorporate teaching, training, and expertise, thus providing a competent workforce for an effective business/government-education partnership for the islands of Micronesia and beyond. Indigenous research will facilitate models and standards that meet the unique requirements of our island communities and are replicable by industries, education, and governments within the region.



*This Conference is made possible through funding by the*

OFFICE OF NAVAL RESEARCH

*and the*

U.S. Department of Energy through  
Guam Energy Office



**Agenda**  
MONDAY, APRIL 18, 2011

Pre-Conference Workshop  
9:00 a.m - 3:00 p.m.,  
Monday, April 18, 2011  
University of Guam Campus

Topics:

Non-Carbon based Energy Technologies for Micronesia: An Overview  
Bruce Best, UOG TADEO

Energy Conservation, Efficiency and Audits  
Stephen Ricci, Battelle Memorial Institute

**Special Thanks to Our Partners:**

Guam Power Authority, Guam Department of Education, Guam Community College, Guam Chamber of Commerce, Guam Coastal Management Program, Guam Energy Office, Guam Environmental Protection Agency



**Agenda**  
TUESDAY, APRIL 19, 2011  
Hyatt Regency Guam

8:00 A.M.	Sign-in and Continental Breakfast	Grand Ballroom and Foyer
8:30 A.M.	Opening Remarks	Grand Ballroom
	Robert A. Underwood, President, University of Guam	
	The Honorable Eddie B. Calvo, Governor of Guam	
	The Honorable Judith Won Pat, Speaker, 31st Guam Legislature	
9:00 A.M.	Opening Plenary <i>Island Solutions</i> Alex Steffen, Founder of WorldChanging	
10:30 A.M.	Plenary Panel <i>Policy Implementation</i> Senator Tom Ada, 31st Guam Legislature; Joaquin Flores, GPA; Stephen Ricci, Battelle; Misty Conrad, NREL; Ivan Quinata, GEPA/GEO	
11:45 A.M.	Lunch <i>Energy Policy Basics</i> Misty Conrad, National Renewable Energy Laboratory	Grand Ballroom and Foyer
1:00-2:00pm	BREAK-OUT SESSION A	
Energy	Developing an Energy Data Baseline for Evidence-Based Sustainability Development <i>Stephen Ricci, Battelle Memorial Institute</i>	Ballroom B
Energy	Solar Power for the Western Pacific – Basic Applications <i>Bill Hagen, Hagens Inc.</i>	Santa Rosa/Rita
Environment	Island Wide Environmental Clean Up Program in Guam: Na Gas Gas i Tanota <i>Senator Tina Muna-Barnes, 31st Guam Legislature</i>	Ballroom A
Environment	Mother Nature Sustains Water Quality of Pago Watershed despite Years of Heavy Metal Insult from Ordot Dump <i>Gary R. W. Denton, UOG.</i>	San Vitores/ Vicente/Magellan

**Agenda**  
TUESDAY, APRIL 19, 2011

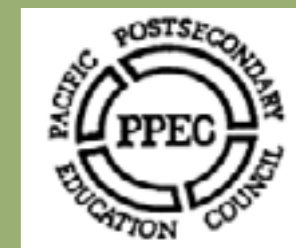
Economics	The i*recycle Program <i>Margaret J. (Peggy) Denney</i>	Ballroom C
2:15-3:15pm	BREAK – OUT SESSION B	
Energy	Guam Power Authority: An Energy Solutions Company <i>Francis J. Iriarte, GPA</i>	Ballroom A
Education	Education For Sustainable Development (ESD) : Teaching and Learning Sustainable Thinking and Practice for Small Island States, Education for Sustainable Development <i>Susana TAUUA</i>	Santa Rosa/Santa Rita
Environment	Growing Guam's Culture, Environment and Economy through Bio-security <i>Roland Quitugua, Conservation Districts: Lisa Fiedler, JGPO</i>	Ballroom C
Environment	<i>Na Para i Guafi</i> Campaign <i>Elaina Todd</i>	San Vitores/San Vicente/Magellan
Economics	Incorporating Triple Bottom-Line Analysis in Decision-Making Through the Business Case Evaluation <i>Steffran Neff, Brown and Caldwell</i>	Ballroom B
3:30-4:30pm	BREAK – OUT SESSION C	
Energy	Guam Energy Task Force Update <i>Misty Conrad, National Renewable Energy Lab</i>	Ballroom A
Energy	Technical Opportunities Assessment for Sustainability of the Guam Community College Campus <i>President Mary A. Y. Okada, GCC</i>	Ballroom C
Environment	Developing the Building Blocks for a Coastal and Marine Spatial Plan in the Western Pacific\ and Micronesia Region: Guam Pilot Area <i>Leslie-Ann McGee, Battelle Memorial Institute</i>	Santa Rosa/Santa Rita

**Agenda**  
TUESDAY, APRIL 19, 2011

Education	Leaders for a Sustainable Future <i>Phil Cruz, Anna Duenas, Sheena Jose, Maribeth Marfega, and Stanley Paracale</i>	Ballroom B
Economic	Green Businesses Program Development on Guam <i>Laura Biggs, Tammy Jo Anderson, Margaret J. (Peggy) Denny, Edwin Reyes</i>	San Vitores/San Vicente/Magellan
4:30pm	Table Exhibits	Grand Ballroom Foyer
6:00pm	Reception Sponsored by: Guam Chamber of Commerce	



Thank you to the following supporters:



**Agenda**  
WEDNESDAY, APRIL 20, 2011

8:00 A.M	Sign-in and Continental Breakfast	Grand Ballroom and Foyer
8:30 A.M	Plenary Presentation <i>Sustainable Prosperity</i> Alex Steffen, Founder of WorldChanging	Grand Ballroom
10:00 A.M	Plenary Panel <i>Economic Sustainability for Guam</i> Dan O'Brien, Battelle; Mary Torre, GHRA; Roseanne Jones, UOG SBPA; David Motroni, Department of Defense; Lorraine S. Okada, Chamber of Commerce	
11:45 A.M.	LUNCH <i>Sustainable Tourism and the Triple Bottom Line</i> Frank Haas, Kapi`olani Community College	Grand Ballroom and Foyer
1:00- 2:00 P.M.	BREAK – OUT SESSION D	
Energy	Joint Region Marianas Energy Conservation Program and Initiatives <i>CAPT Peter Lynch, Commanding Officer</i>	Ballroom A
Energy	Energy Independence for Guam- The Way Forward <i>Carl Swanson, UOG</i>	Magellan
Environment	The Business of Sustainability for Guam - Conceptual Gymnastics or Structural Integrity? <i>Samuel Walker, UOG</i>	Santa Rosa/Santa Rita

**Agenda**  
WEDNESDAY, APRIL 20, 2011

Environment	Planning for Climate Change Adaption <i>Carlton D. Hunt, Battelle Memorial Institute</i>	Ballroom B
Economics	Are we taking advantage of the Energy Tax Credits? <i>Martha Suez-Sales, UOG</i>	San Vitores/San Vicente
Education	Island Youth - Sustaining Our Future - Part 1 <i>University of Guam 4-H Youth Development Program and UOG Green Interns</i>	Ballroom C
2:15- 3:15pm	BREAK – OUT SESSION E	
Energy	Assessing Hydroelectric Power Potential on Micronesian Islands <i>Scott Moncrief, EA Engineering, Science, and Technology, Inc.</i>	Ballroom B
Energy	Sustainability Master Planning - The Process: Case Studies <i>Damian Kelly, HDR Colorado Springs</i>	Ballroom A
Environment	Sustainable Building Practices on Guam; Past, Present, Future <i>Allison R. Rutter, Guam Sustainability Solutions</i>	Santa Rosa/Santa Rita
Environment	Sustainable Soil Management in Micronesia <i>Robert T. Gavenda, USDA-NRCS</i>	San Vitores/San Vicente
Education	Island Youth – Sustaining Our Future - Part II <i>University of Guam 4-H Youth Development Program and UOG Green Interns</i>	Ballroom C
Education	Research-Based Course Projects for Sustainability: Results and Implications <i>Yukiko Inoue, UOG</i>	Magellan/San Vitores/San Vicente
3:30- 4:45pm	Closing Plenary Panel Conference Overview - What is the cost of doing nothing? <i>Alex Steffen, Frank Camacho, Youth participants</i>	Grand Ballroom

BREAK - OUT SESSION A

**The i\*recycle Program**

The i\*recycle program was created by the Guam Business Partners for Recycling, Inc., a non-profit comprised of seven local businesses. Each business provides a specific service for the program to promote the recycling of aluminum cans for the financial benefit of Guam's schools and to raise awareness island-wide regarding the importance of recycling. About 50 schools are participating, 40 with bins provided by the program and numerous others that benefit from the program by recycling on their own. The program represents an ever-expanding effort to solicit greater participation throughout the entire community with the admirable support of the media, by promoting recycling at all major events, and with aggressive and innovative programs at the schools to increase their respective recycling efforts.

**Developing an Energy Data Baseline for Evidence-Based Sustainability Development**

The University of Guam has established the Center for Island Sustainability as part of a larger strategic effort to expand educational programs at the University and promote sustainability both on Guam and regionally. The Governor of Guam recently issued an executive order calling for the establishment of an energy policy, to be administered by the University of Guam. This presentation will provide an overview of the approach being undertaken to provide a foundation of energy data upon which to build practical and effective policies and strategy. Educational transformation, environmental preservation, economic opportunity identification, and development of business models to attract and retain investments for the future of Guam and the region will also be discussed.

**Solar Power for the Western Pacific - Basic Applications**

Solar power for both water and photovoltaics are ideal for the Western Pacific Region, with our constant supply of good quality solar radiation. We started working on this almost 3 years ago and can share how we got to where we are today in terms of product selection: wind vs. solar, thin-film vs. modules as well as engineering to overcome the unique obstacles of island communities. We plan to explore practical solutions and pricing options for implementing Solar technologies on Guam.

**Mother Nature Sustains Water Quality of Pago Watershed despite Years of Heavy Metal Insult from Ordot Dump**

Guam's only civilian landfill, Ordot Dump, has been in continuous use for close to 60 years. The western borders of the dump encroach on wetlands that drain into the Lonfit River. This rather picturesque stream converges with the Sigua River further downstream to form the Pago River, which in turn drains into Pago Bay on the eastern side of the island. Local residents fish all three rivers and the bay for food, and the adjacent lands support a variety of agricultural activities including subsistence farming. Ordot Dump is unlined and does not have a leachate retention system in place. As a result, streams of brown, foul smelling leachate flow intermittently from the dump's perimeter during wet weather conditions and course their way down gradient into the Lonfit River valley below. Past chemical characterization of the leachate indicates that heavy metals are the contaminants of primary concern both from an ecological and human health perspective.

This fact has promoted speculation that fisheries resources from these waters are heavy metal enriched to the point of being unfit for human consumption. In light of this, recent chemical analyses of abiotic and biotic components from the rivers and bay were surprising and indicate that local topographic and climatic conditions continually conspire to produce natural cleansing processes that prevent heavy metal accumulation from occurring within the watershed.

BREAK - OUT SESSION B

**Guam Power Authority:  
An Energy Solutions Company**

With the uncertainty of the military buildup and volatility of the fuel market, GPA's customers are faced with the impact of additional infrastructure and continued increases in fuel costs. In 2010 GPA sought and contracted partners to provide services to assist customers in internally addressing energy efficiencies and implementing energy solutions that proved economical to large energy consumers. The intention was to aid customers that can afford such solutions since GPA does not have a rebate program in place. Proposed solutions may include Energy Efficient Lighting, Pump/Motor Upgrades, Lighting and Air Conditioning Control Systems, and Renewable Energy. GPA hopes to provide assistance to Federal Agencies, Government of Guam, Industrial Customer, Institutional Customers, Heavy Commercial Customers, and Customers with Large Facilities and Sites.

**Growing Guam's Culture, Environment and Economy through Bio-security**

Invasive species have caused tremendous ecological and economic damage to Guam, negatively impacting both the civilian and military communities raising bio-security concerns throughout the Micronesia region. As US military forces are repositioned throughout the Pacific, there will be increased military construction and private sector development on Guam in addition to organic growth. The Micronesian Chief Executive's Regional Invasive Species Council (RISC), comprised of members from Palau, FSM, RMI, CNMI, and Guam, have identified potential increased biosecurity concerns associated with population growth, shipping volume, and trade. While efforts are being conducted at Federal and local levels, do your actions support or threaten island sustainability? And what can you do to protect island sustainability?

**Education for Sustainable Development (ESD)  
Teaching and Learning Sustainable Thinking  
and Practice for Small Island States**

This paper explores the principles of education for sustainable development and its place in teaching and learning sustainable practices among young people. Globalization has brought increased integration of small island states into the modern world of high consumerism fueled by internet banking and shopping, fast and cheap communication through emailing, texting, facebooking and video conferencing have all contributed to bringing the small island states such as Samoa closer to the modern world of information technology and products that claim to make life easier, less stressful and affordable for most ordinary island residents. 'Keeping up with the Joneses carries a lot of climate, environmental, land-use and bio-security threats, that if they are not properly managed, may pose serious threats for Samoa and other small islands in the region. The sustainable management of island state demands and desires for modern living is not too late to achieve. In the case of Samoa, sustainable thinking and practice is best introduced through classroom teaching and learning of young people who will take the message and bear much of the consequences of unsustainable living from the present to 2050. Educating the young generation to prepare them for 2050 is a responsibility of all small-island citizens.

**Incorporating Triple Bottom-Line Analysis in  
Decision-Making Through the Business Case  
Evaluation**

Triple bottom-line considerations (i.e., the balance of economic, environmental, and social considerations) are the cornerstone of sustainability. However, one of the most difficult obstacles organizations are facing is quantifying and justifying the indirect economic factors of social and environmental considerations in their decision-making process.

## Presentation DESCRIPTIONS

This session describes a step-by-step approach that Brown and Caldwell has been using to successfully quantify and incorporate triple bottom line measures into the decision-making process. The process starts with establishing economic, environmental, and social levels of service parameters and their related metrics - which could range from carbon emission reductions and energy efficiency to project aesthetics and traffic interruptions. The level of service is then incorporated into a business case evaluation (BCE).

The BCE is a repeatable, defensible approach that evaluates life-cycle cost in an alternatives analysis. A range of monetized and qualitative values are placed on the triple bottom line levels of service based on stakeholder input on values and external norms such as carbon-trading factors that can be linked to pricing. The triple bottom line measures are then incorporated into the standard life-cycle alternatives analysis of a BCE, which can then be used to make policy, program, and/or project decisions.

### BREAK - OUT SESSION C

#### **Developing the Building Blocks for a Coastal and Marine Spatial Plan in the Western Pacific and Micronesia Region : Guam Pilot Area**

Advancing effective coastal and ocean management requires devising and implementing multi-tooled, place-specific strategies to move an area towards a spectrum of governance support priorities. The Coastal and Marine Spatial Plan (CMSP) offers an operational framework to maintain the value of each area's marine biodiversity, while allowing sustainable use of the economic potential of their oceans. This presentation will create a venue for deliberation of coastal and ocean sustainability issues regarding Guam and Micronesia. This presentation will outline a pilot program proposed by our companies, CIS and Battelle, by focusing on local and regional objectives to leverage, strengthen, and magnify local planning objectives and future development through regional integration of all stakeholder and governance parties in the sub-region of Guam.

#### **Leaders for a Sustainable Future**

In this session, UOG Green Interns will enlighten audience members how they have encouraged and motivated a campus community that practices sustainable development. The various projects that the interns accomplished have transformed awareness into action. The interns serve as leaders in advancing island sustainability by their proactive efforts to commence an era of a green revolution for Guam.

#### **Technical Opportunities Assessment for Sustainability of the Guam Community College Campus**

Guam Community College partnered with Sodexo and UDI to identify opportunities for energy conservation, cost savings, and the overall reduction of GCC's carbon footprint. The resulting Preliminary Technical Opportunities Assessment survey analyzed GCC's energy usage and provided a plan for demand side energy management opportunities on campus. The survey identified ways in which the college could save on future energy and water usage, and the substantial savings GCC could realize by implementing these savings measures. This implementation would allow Guam Community College to become a leader in securing sustainable low carbon energy systems that meet the growing needs of the island community through environmentally friendly methods.

#### **Green Businesses Development Program on Guam**

In an effort to assist the business community in embracing this movement, several GovGuam agencies have formed a task force to develop The Guam Green Star Alliance. The mission of this grassroots program is to develop a collaborative community that is dedicated, in practice, to embracing the triple bottom line (economic, social, and environmental).

## Presentation DESCRIPTIONS

The task force encourages sustainable practices in the private sector that positively impact our island's environment, economy, and social welfare. The group is also seeking input from local entities on 1) current guidelines on what?, 2) anticipated benefits of what?, and 3) identifying interested businesses/business sectors interested in what?

In this talk, the Guam Green Business Program Task Force will outline progress to date, similar program structures used elsewhere (i.e., Hawaii Green Business Program) and expected outcomes.

### BREAK - OUT SESSION D

#### **Joint Region Marianas Energy Conservation Program and Initiatives:**

Brief will provide an overview on DOD energy goals and mandates, Joint Region Marianas energy strategies, energy conservation technologies currently in use or under review/proposed based upon feasibility studies with some focus on Wind Turbine and Seawater Air Conditioning renewable energy alternatives.

#### **Assessing Hydroelectric Power Potential on Micronesian Islands**

Hydroelectric power has the potential to contribute to the sustainability and energy self-sufficiency of Pacific-island nations and complement other renewable energy sources to help meet clean energy goals. Meeting these goals is especially important in the Hawaiian islands, one of the most geographically remote archipelagos in the world, and which currently depends on imported oil for more than 90% of their energy needs. A study was conducted to identify hydroelectric power technologies best suited to

#### **The Business of Sustainability for Guam – Conceptual Gymnastics or Structural Integrity?**

An Island, our measures for development need to address our unique history and our unique situation vis-a-vis a Western economic model. Much of our infrastructure and economy is predicated upon the mindset that we are part of the US/Japan economy without understanding that as an Island, we actually function on a dis-economy of scale. We are nearly 100% dependent upon influences outside of Guam for everything that takes place on Guam, be it tourism, imports, energy, and even our political and social well-being.

If we are to address indigenous solutions for our future, we need to see our true place in the world and appreciate the friable nature of our present situation in the larger world economy. We can be sustainable and highly productive at the same time, but not under the present model.

#### **Island Youth - Sustaining Our Future (Part 1)**

This is a two-part session targeted at helping youth participants of the conference to develop their voices to promote sustainability and make a statement about energy, the triple-bottom line of sustainability (social, economic, environment), and its impact on their home islands and their lives. The first part of the session will have the youth participants participate in small focus groups to develop consensus on the critical energy and sustainability issues that need to be addressed, to identify roadblocks to addressing the issues, and potential solutions to those issues. Each student brings to the table knowledge and experiences from both this conference and in their communities. The second part of the session will focus the students on creating sustainable energy statements that they will share with the rest of the conference participants as part of the closing plenary panel. Required for all youth participants.

**Na'pára i Guafi- Southern Watersheds Campaign**

Wildland fires are a serious threat to the watersheds of southern Guam. The Na'pára i Guafi campaign is a social marketing campaign aimed at reducing wildland fires in southern Guam villages by engaging community members and educating them on the causes and impacts of wildland fires.

**Are we taking advantage of the Energy Tax Credits?**

A brief description of the energy tax credits available to individual and corporate taxpayers as well as manufacturers will be provided. A discussion of proposed legislation to extend, increase, delete or add additional credits will also be discussed.

**Planning for Climate Change Adaptation**

Adapting to changes imparted to natural and built environments by climate change requires proactive planning and a clear set of short, intermediate and long-term goals and actions. For island nations, the intertwining of the natural and built systems amplifies the need for cost effective solutions and integrated planning to ensure sustainability. Moreover, successful adaptation will result in the healthy ecosystems necessary in themselves for sustainability and in the maintenance of ecosystem services that help to protect the built environment. Successful adaptation of the built environment to climate change will help maintain or restore the health of ecosystems and their services. This paper provides a scenario based approach for proactive adaptation planning that incorporates consideration of both the natural and built environments.

**Island Wide Environmental Clean Up Program in Guam: Na Gas Gas i Tanota**

Senator Tina Rose Muña Barnes has been instrumental in the facilitation and implementation of the Island Wide Environmental Clean up Program in Guam. Senator Muña Barnes will be presenting data illustrating the success of the program, the amount of abandon vehicles, white goods, tires and other metallic waste removed from Guam's waste stream, the policy and logistical challenges the program has encountered.

The Abandoned Vehicle Program is a viable sustainable solution that addresses the removal of vehicles, white goods, loose metals, batteries and tires from Guam's waste stream and has the potential to be a successful sustainable program for the region. The program is part of a broader regional policy effort of the Pacific Islands Regional Recycling Initiative Council which is sponsored and supported by the Association of Pacific Islands Legislatures and the Micronesian Center for a Sustainable Future.

**Energy Independence for Guam- The Way Forward**

Although Guam is now completely dependent on imported fuel for almost all of our energy requirements, our beautiful island is rich in many natural sources of energy. By doing a Systems Analysis on the feedback relationships among the causal links connecting the components of our current energy environment, I will identify some of the major critical success factors, and show how Guam may become energy independent by 2050.

**BREAK - OUT SESSION E**

**Sustainable Building Practices on Guam; Past, Present, Future.**

There are many phrases in use today to describe "green" building. We first look at what sustainability means as it applies to buildings, and consider how past and present building practices on Guam have approached sustainability (or not). We then consider what social, economic, and environmental issues drive us towards creating more sustainable structures in our future.. Finally, the question of how we create high performing buildings of today and tomorrow is answered through the concepts of integrated design and whole system thinking as they apply to building design and project team collaboration. Hawaii's unique geography and natural setting, including conventional hydropower, o wave and ocean thermal energy. This presentation will review the methods and results of this study and discuss how study methods could be applied to island communities in Micronesia. Hydropower technologies appropriate to Micronesia will be presented and discussed.

**Sustainability Master Planning - The Process: Case Studies**

This presentation will begin with a discussion of how HDR has accomplished or is accomplishing sustainability, renewable energy, power and infrastructure planning for military communities through several case studies. These studies have direct applicability to Pacific Island sustainable master planning especially in the development of sustainability plans, the use of a Federal Energy Decision System (FEDS) and a Sustainable Return of investment (SROI) process.

**Island Youth - Sustaining Our Future - (PART 2 )  
CONTINUED FROM SESSION D**

**Sustainable Soil Management in Micronesia**

There are a variety of soils in Micronesia, many of which have noticeable limitations in agricultural and engineering uses. For sustainable agricultural production, the maintenance of organic matter in the topsoil is crucial; this is true for the large majority of soils in Micronesia. Loss of topsoil in old volcanic landscapes leads to erosion.

Eventually, the low fertility and toxic levels of soluble aluminum in subsoils prevent the establishment of plant cover and to the formation of badlands. Topsoil degradation leads to a downward spiral of land degradation that is difficult to recover from . Hence, reforestation efforts in western Micronesia will need to address soil limitations to be successful. Other soil-related issues, such as high water tables and dense [compacted?] subsoil, can make some soils unsuitable for a variety of uses. Uncontrolled burning of grasslands has led and will continue to lead to land degradation. In general, soils in Micronesia are a fragile, non-renewable resource that need careful management for prolonged sustainability.

**Research-Based Course Projects for Sustainability: Results and Implications**

This presentation highlights the results from "green" projects produced by students (who were teachers and private and public sector employees) in a 2010 graduate education research course. Their projects focused on the 3Rs initiative: *reduce* whenever possible, *reuse* as often as possible, and *recycle* as much as possible. The green projects selected for inclusion in this presentation focused specifically on : reducing litter on school campuses; going paperless in the Guam Police Department; making Guam Customs eco-friendly; going green without polystyrene; and a trash-free lunch experiment. The striking results demonstrated that daily curricular activities at Universities provide an important way to support environmentally responsible living. Implementing this green course project is an example of how professors can incorporate "sustainability" into their curricula.



**Presenter  
BIOGRAPHIES**

**PLENARY SPEAKER**

**Alex Steffen**



“Alex Steffen, a designing optimist, lays out the blueprint for a successful century.” -The New York Times

Alex Steffen is one of the world’s leading voices on sustainability, social innovation and planetary futurism. He is a writer, public speaker and strategy consultant. Alex was Executive Editor of Worldchanging.com after he co-founded the organization in 2003 until it closed in 2010.

In those seven years, Alex made Worldchanging one of the world’s leading sustainability-related publications, with an archive of almost 12,000 articles and a large global audience (Worldchanging reached over 8 million unique readers and was rated the second largest sustainability site on the web by Nielsen Online in 2008).

Worldchanging’s solutions-based journalism played an important role in revealing formerly obscure innovations and groundbreaking ideas, thereby pushing forward the sustainability movement and changing the way we think about the planet’s most pressing problems.

The critically-acclaimed site won the Utne Independent Press Award, and was a finalist for Webbys (the Oscars of the Net) for Best Blog and Best Magazine, as well as Bloggies for Best Writing and Best Group Weblog.

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**Kristina Balajadia**

Kristina Balajadia is currently working for the University of Guam under the 4-H Youth Development Program. She has a Bachelor’s Degree in Consumer Family Science from the University of Guam and an Associate’s Degree in Liberal Arts from Guam Community College.

In 2003, Senator Muña Barnes also supported legislation that created the Recycling Revolving Fund. Over the last eight years, she as supported and helped to facilitate the implementation of the Abandoned Vehicle Program, which funded by the Recycling Revolving Fund, removes metal waste, tires, and white goods from Guam’s waste stream and ships the waste off-island for recycling.

**Tina Rose Muña Barnes,** currently serves in the 31st Guam Legislature as Senator, Legislative Secretary and Chairperson on the Committee on Municipal Affairs, Tourism, Housing and Recreation. Senator Muña Barnes is serving her fourth term as Senator in the Guam Legislature. During her time in service, she has written laws that prevent human trafficking and labor exploitation, promote affordable housing for working families, and protect Guam’s environment by authoring the first “Bottle



**Laura A. Biggs,** was born in Camden, New Jersey. She graduated from Lenape High School in Mt. Laurel, NJ, graduated cum laude with a B.A. in Biology and Education from Manhattanville College in Purchase, NY. She then went on to achieve her Ph.D. in Pharmacology and Toxicology from the University of Utah in Salt Lake City, Utah. In 2009, Dr. Biggs was hired as Assistant Professor of Extension and Education with University of Guam Sea Grant.

**Presenter  
BIOGRAPHIES**

She currently collaborates with local businesses to develop educational materials and improve environmental practices in addition to developing a multidisciplinary curriculum entitled “Navigating ‘Change Marianas’.



**Frank Camacho,**

Dr. Frank Camacho is an assistant professor in the UOG biology program an alumnus of the University of Guam’s undergraduate biology program. He received his Ph.D. in Biology from the University of Alabama at Birmingham in 2005. He is a member of the Ecological Society of America and the American Association for the Advancement of Science. His research interests include food web dynamics of high island streams and the trophic effects of harmful algal blooms.

**Misty Dawn Conrad**

Ms. Conrad resides in the Integrated Applications Office of Deployment and Market Transformation at the National Renewable Energy Laboratory. She manages project teams in energy planning, resource assessments of energy efficiency and renewable energy (EERE), energy policy, environmental impacts, EERE agricultural applications, island sustainability and rural development. She has managed cutting edge programs such as; the Technical Assistance Program, a venue for state and local officials to seek assistance in energy efficiency and renewable energy technologies, policies and programs and the US Treasury 1603 Program, a program that enables commercial entities to claim payments in lieu of tax credits for renewable technology. Currently she manages projects with Environmental Protection Agency, the Department of Energy and the Office of Insular Affairs in providing technical assistance to communities in the Pacific Islands.



**Phil Cruz**

Phil Cruz is a 20 year old junior at UOG majoring in Marketing with a minor in Communication. Currently he is the Lead Intern of the education/outreach division of the UOG Green Student Internship Program. He is the president of the Green Army, which is a volunteer group at UOG. Also, he is the Treasurer of the FITE Club (Fellows for Inquiry Toward Enlightenment) and a member of the American Marketing Association. Phil integrates sustainability with the clubs and organizations that he is involved in. The only way he promises the next generation a beautiful island is to act sustainable now and to instill sustainable habits with others



**Peggy Denney**



Peggy Denney has lived on Guam for 33 years. From '79 to '95 she was a free-lance court reporter and then returned to school at the University of Guam to obtain a BS in Agriculture. She is currently pursuing a masters in Environmental Science, also at UOG. She was employed by Guam EPA for two and a half years as the program coordinator for education and outreach, and then accepted a contract with the Guam Business Partners for Recycling in August of 2007 as the program administrator to implement the “i recycle” aluminum recycling program for the benefit of Guam’s schools. She hosts the “Where We Live” radio show on K-57 and is president of two environmental non-profit organizations.

## Presenter BIOGRAPHIES



### Gary R.W. Denton

Dr Denton is Professor of Environmental Toxicology and Director of the Water and Environmental Research Institute (WERI) of the Western Pacific at the University of Guam. He has worked on environmental issues for the past 35 years, the last 22 of which have been on Guam. Dr. Denton's primary research interests center on water quality with emphasis on contaminant transport, fate and toxicity. He leads the Pollution Monitoring and Assessment Program at WERI and is currently evaluating the impact of human activities on fisheries resources in the CNMI. Some of his more recently completed works in Guam include determining the impact of Ordot Dump on the Pago Watershed and a critical synthesis of Guam Waterworks Authority's water quality data from the island's drinking water production wells.

### Anna Duenas

Anna Duenas is 18 years old and is currently a freshman at the University of Guam. Majoring in communications, her position as a UOG Green Intern has allowed her to spread the message of going green and leading a sustainable life. Sustainability is the capacity to endure. It is how Duenas strives to live her life. To her, sustainability means being responsible and living within the resources of the planet without destroying the environment now and for future generations.



### Lisa Fiedler

Lisa Fiedler is the Environmental Director of the Joint Guam Program Office Forward, Office of the Assistant Secretary of the Navy (Energy, Installations & Environment). In this capacity she is responsible for environmental management, coordinating planning efforts, execution of NEPA analysis, and environmental elements of master plans. Lisa's federal career includes experience with the USEPA, Air Force, Defense Logistics Agency, and the Army Corps of Engineers. This includes assignments in Okinawa, Germany, Korea, and the mainland US. Lisa earned a BS in applied mathematics from the Pennsylvania State University and an MS in civil and environmental engineering from Cornell University.

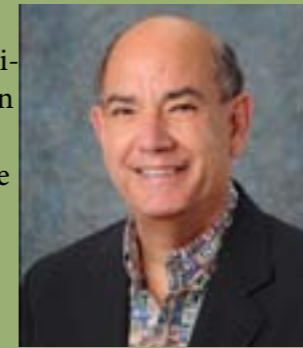


### Bob Gavenda

Bob is a Resource Soil Scientist for USDA-NRCS (US Department of Agriculture, Natural Resources Conservation Service) based on Guam, having transferred there in 2000 after 17 years in Hawaii. His service area covers all of Micronesia. In addition to maintaining accurate soil survey data he assists private landowners and local governments in the use and interpretation of USDA soil surveys. He has worked with soils in a variety of environments but has specialized in tropical soils and has nearly 30 years experience in Hawaii, Micronesia and Latin America. He specializes in soil formation, classification and mapping, and soil behavior and management especially with regards to maintaining or improving soil quality.

### Frank Haas,

Dean of Hospitality, Business and Legal Education programs at Kapi'olani Community College. He has taught undergraduate and graduate level courses in marketing management, creativity, destination management and resort development and management. In addition to his educational duties, he has undertaken training and planning projects focused on sustainability for tourism, government, and non-profit organizations in the U.S., Asia/Pacific and most recently for the Abu Dhabi Tourism Authority. Prior to joining the university, Frank served as Vice President and Director of Marketing for the Hawai'i Tourism Authority, where he managed the state's marketing programs for leisure, business travel, conventions, and sports. His marketing career in Hawai'i includes marketing positions in tourism, fast food, and high tech.



### Carlton D. Hunt

Dr. Hunt is a Research Leader with Battelle in Duxbury, Massachusetts. He received his Ph.D. in Chemical/Geochemical Oceanography from the University of Connecticut in 1979. He joined Battelle in 1986 after nearly a decade of integrated ecological research at the Marine Ecosystem Research Laboratory (MERL) at the University of Rhode Island. During the past 38 years, he has conducted and supervised projects involving the transport, fate, effects, bioaccumulation of contaminants, and water quality impacts of nutrients. His contribution to numerous environmental assessments, Environmental Impact Statements, and monitoring projects provide Dr. Hunt with an extensive knowledge of coastal water and sediment quality issues.

## Presenter BIOGRAPHIES



### Francis J. Iriarte, P.E.

Special Projects Engineer  
Mr. Francis J. Iriarte is a registered Professional Engineer with the Strategic Planning & Operations Research Division (SPORD) of the Guam Power Authority. Mr. Iriarte career with the Authority spans over 18 years in various capacities within the operations group. He is a graduate of the University of Hawaii with the degree in Mechanical Engineering with in varied interests in physical activities and sports in general. Mr. Iriarte resides with his family in the beautiful village of Barrigada.

### Yukiko Inoue,

is a professor at the University of Guam, where she teaches educational psychology and research. Her research interests include: education for sustainability; interdisciplinary studies on student learning and development; improving university teaching and learning with technology; online education for diverse learners; and the social context of learning with a higher education focus. Just as strong her passion for teaching, poetry is an area that she has invested much passion and commitment.



### Sheena Ann Jose

Sheena Ann Jose is a junior attending the University of Guam with a major in accounting and human resource management. She decided to pursue the UOG green internship with aspirations to support UOG's initiative to promote island sustainability.. To her, island sustainability involves preserving the earth's natural resources to help keep future generations from struggling to meet their physical needs. It is her personal mission and goal to inspire others to change their traditional habits into sustainable practices such as recycling, conserving energy, composting, etc.

## Presenter BIOGRAPHIES

She perceives the internship as an opportunity to expand her knowledge in regards to living a “greener” lifestyle while educating and encouraging others to do the same.



### Peter Lynch

Captain Pete Lynch reported aboard U.S. Naval Facilities Engineering Command (NAVFAC) Marianas July 17, 2009 as the Commanding Officer. He was

previously assigned as the Executive Officer at NAVFAC Washington, after “fleeting up” from the Operations Officer position. Before arriving at NAVFAC Washington, he served as the Program Director for the Sustainment, Restoration and Modernization (SRM) Account at Commander Navy Installations from 2004 to 2006.

### Maribeth Marfega

Maribeth Marfega is 12 years old and is currently a Junior majoring in Elementary Education. As an aspiring Elementary school teacher, she hopes to instill into many young minds that sustainability means taking care of our planet for everyone today, and tomorrow. She is also the secretary of a student-driven volunteer club that promotes recycling throughout the community called UOG Green Army



### Leslie-Ann McGee

Ms. McGee is the Director of Ocean and Coastal Solutions at Battelle. Ms. McGee has worked with state and regional entities all over the U.S. on coastal

zone management, marine science and fisheries management. and National Estuarine Research Reserve programs and the Regional Fishery Management Councils.

Her 17 years of professional experience includes marine science and policy, coastal zone management, sensitive marine area identification and management, ecosystem services evaluation, social and economic analyses, GIS analyses and mapping, coastal and marine change indicator and proxy attribute modeling, climate adaptation planning, ecosystem-based marine spatial planning and management, fisheries science and policy, environmental impact statements, biological assessments, endangered species threats and stressors determination and conservation, industry and stakeholder engagements. She has worked with many types of organizations to develop level of service goals that include sustainability and energy efficiency metrics and facilitates project business case evaluations incorporating triple bottom line analysis into decision-making.

### David Motroni

A Navy veteran and graduate of Western New Mexico University. He was assigned as the Assistant Energy Manager for NAS Whidbey Island from 2005-2007 and Acting Air Station Energy Manager 2007-2008. Later as a naval contractor, he provided Resource Efficiency Manager (REM) services to three Pacific Northwest bases, NAS Whidbey island, Naval Base Kitsap, and Naval Station Everett. While working as a REM, he is credited as one of the co-creators of the DOD energy mascot, “BRITE” whose familiar visage graces the Joint Region Marianas energy program and the Guam Energy Office website. Energy Manager in 2010 and is closely supporting the USMC energy program and is the project lead for the Joint Region’s Salt Water Air-conditioning (SWAC) initiative. He is married to the former Stephanie Proto their two daughters, Kimberly and Courtney.



## Presenter BIOGRAPHIES

### Steffran Neff,

Managing Engineer for Brown and Caldwell’s Guam Operation and a National Leader in BC’s Sustainability Group. She is a chemical engineer with more than 20 years of experience in the environmental consulting field and has followed the evolution of the sustainability movement. She started by performing environmental compliance audits and pollution prevention planning, which evolved into environmental and asset management systems auditing and program development.



### Lorraine S. Okada

Executive manager for Carlsmith Ball LLP a law firm in Guam with offices in Hawaii and California. In addition to her professional employment, established her

consulting practice in 2001, and is president and owner of Okada Managing Consulting Services. Started her banking career with Bank of America and retired as vice president with Bank of Hawaii. Received the distinguished award of Guam Business Woman of the Year in 2009 sponsored by First Hawaiian Bank and Marianas Business Magazine. Received the Professional Excellence Award by the Society of Human Resources Management, Hall of Fame Award by the American Institute of Banking; Presidential Award by the Soroptimist of the Marianas, and Outstanding Young Women of America. Active involvement in community and professional organizations: Chairwoman - GCC Foundations Board; Vice Chairwoman - Guam Industry Liaison Group; Guam Chamber of Commerce - Chairwoman - Armed Forces Social Committee and member of the education committee; past vice chair of Guam Workforce Investment Board, past president and CEO, Make A Wish Foundation; and founding president of Society for Human Resource Management (Guam Chapter).

### Mary A.Y. Okada

Dr. Mary Ann Young Okada has served as president and Chief Executive Officer of Guam Community College since June 2007. In that time, she has overseen a 26 percent increase in student enrollment, added new programs, increased partnerships with Guam’s business community, and acquired grant money to construct three new buildings on campus. Prior to serving as President/CEO, Dr. Okada served as Vice President of Financial Affairs, Controller, and General Accounting Supervisor at GCC. Her fiscal expertise has been instrumental in the college’s nine consecutive clean audits. Dr. Okada is a member of the Asian Pacific Association for Fiduciary Studies (APAFS); the Pacific Postsecondary Education Council (PPEC); the American Association of University Women; the Guam Contractors Association Trades Academy Board; the Pacific Resource for Education and Learning Board; and the Guam Workforce Investment Board. She holds a B.A. of Business Administration in Accounting and Management and an M.P.A. in Public Administration from the University of Guam, and received her doctorate in Educational Leadership from the University of Phoenix.



### Stanley Paracale

Stanley Paracale is 22 years old and is majoring in Computer Information Systems with a minor in Military Science. He is currently an intern of the education/outreach division of the

UOG Green Student Internship Program. Stanley has been part of UOG Green since June of last year. He has created various animated advertisements for UOG Green that can be seen on a number of community based web sites. He believes that advancement in technology with regards to sustainability will be significant in appealing to the masses to go green.

**Presenter  
BIOGRAPHIES**



**Roland Quitugua,**  
Roland is the Logistics Chief of the Guam Coconut Rhinoceros Beetle (CRB) Eradication Program and the president of the Guam Association of Conservation Districts. With roots in agriculture he works in the natural resource field promoting the use of native plant species for environmental enhancement, cultural perpetuation and economic sustainability.

**Edwin J.C. Reyes**

Edwin is the Project Manager for the Western Pacific Coral Reef Institute, a cooperative agreement with the National Oceanic and Atmospheric Administration. The mission of WPCRI is to protect and preserve our nation's coral reefs through basic and applied research applicable to management, as well as outreach and education. Mr. Reyes has a B.A. degree in Management from the University of Guam and is a Certified Grants Specialist.



**Stephen Ricci**  
Senior Research Engineer, Battelle Memorial Institute  
Dr. Ricci is a chemical engineer at Battelle Memorial Institute in Columbus, OH and has been working in energy-related research for 17 years. His expertise includes complex modeling of fluid, thermal, and chemical systems in aerospace, gas appliances, medical products, and a wide variety of other appliances. He has in recent years expanded his work to include strategic planning and analysis for improving the energy efficiency of processes and facilities, reduction of energy consumption and costs through technology substitution, and the development and application of alternative and renewable energy technologies. Dr. Ricci has presented research and served on panels at several energy-related energy

conferences and has given guest lectures on energy-related topics at the Ohio State University Colleges of Business and Engineering.

**Allison Rutter**

helps architects, building owners and communities create highly efficient buildings that save both resources and money. Formerly of Rocky Mountain Institute, Allison has worked on projects ranging from community centers in Hawaii to the Empire State Building. She is a former member of RMI's LEED Certification Team, which reviewed and approved LEED projects for the United States Green Building Council. Currently, Allison is Principal of Guam Sustainability Solutions, a firm focused on promoting sustainability efforts in the Marianas. She holds a BS in Mechanical Engineering from the University of Portland and is a LEED Accredited Professional.



**Martha G. Suez-Sales**  
Instructor, Accounting SBPA. I'm originally from Argentina. Graduated with a B.S. in Business administration with emphasis in accounting from San Diego State University in '96. I'm a certified public accountant and have over 15 years of accounting experience working for a credit union in San Diego and in '98 for Deloitte & Touche Guam where I served as a tax manager for the last 6 years. I "retired" from public accounting Dec. 2010 and was hired full time by the University of Guam in January.

**Presenter  
BIOGRAPHIES**

**Dr. Carl Swanson**

Associate Professor, Computer Science  
After receiving my BS in Math from Arizona State University, I joined Bell Telephone Labs as a Member of their Technical Staff. They then sent me back to UC Berkeley to get my Master's degree through their One Year on Campus program resulting in an MSEE then. After two years in the US Army, I returned to Bell Labs and moved with them to Atlanta where I later received my second Master's in Business Information Systems, and ultimately my Ph.D. in Business Administration (specializing in Computer Information Systems). Later I joined with the University of Maryland to teach in their Asian Division in Tokyo Japan. Until the Bubble economy of Japan broke in 1992, I worked with a special Japanese consulting firm in Tokyo building custom OR models. After that I rejoined academia with Huron University's Tokyo Branch which brought me finally to Guam first for a working visa, and later for my position at UOG as a member of the Computer Science unit in the Mathematical Sciences Division, now part of CNAS. This year I was elected to serve as Chairman of this Division.

**Tammy Jo Anderson Taft**

Education and Outreach Coordinator for the Guam Coastal Management Program Bureau of Statistics and Plans. Prior to that position she worked at UnderWater World, Guam EPA and Guam PDN. Throughout her career, she has been interested in Guam's environment and the small actions everyone on our island can take to lessen our impact overall.



**Elaina Todd**

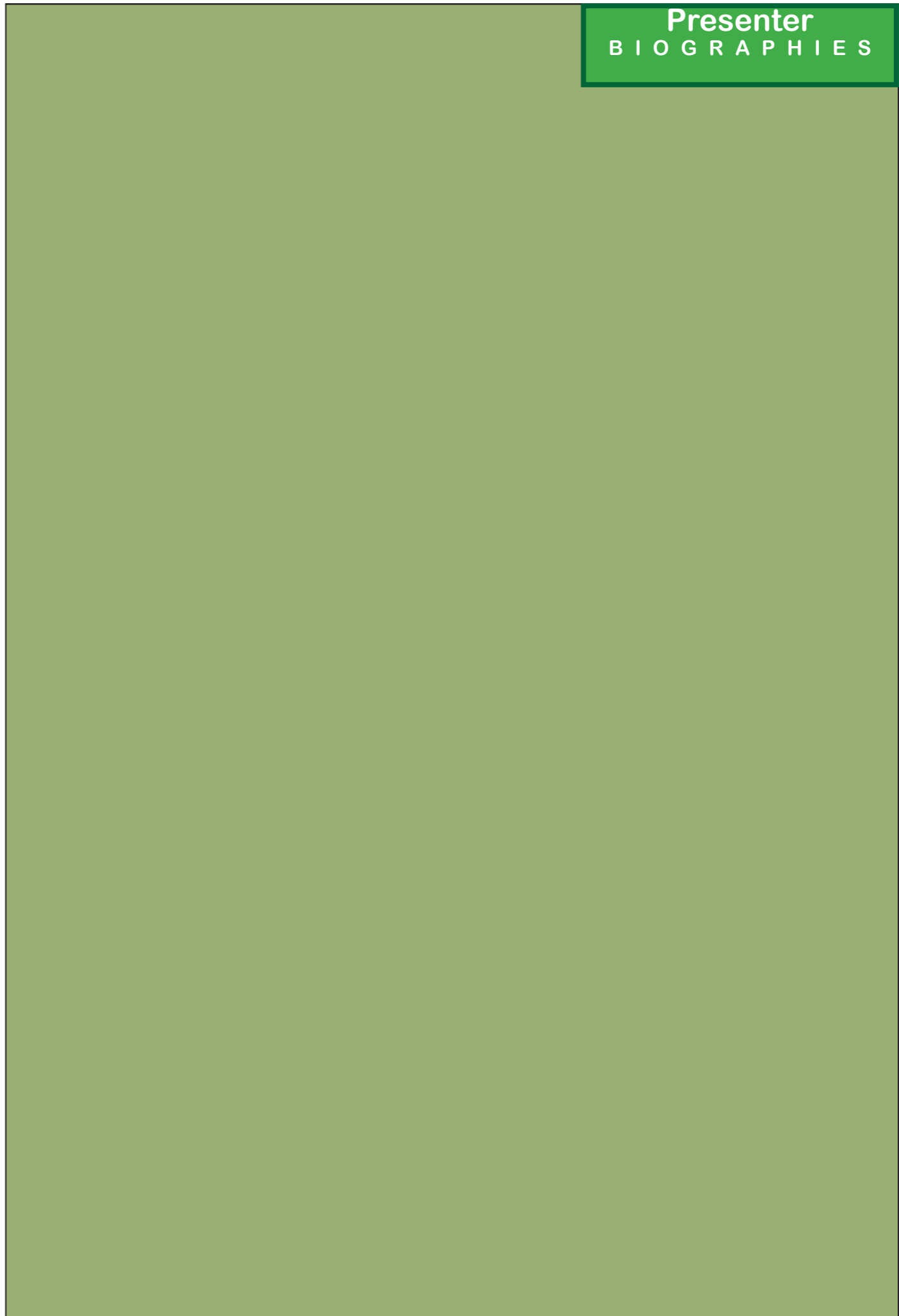
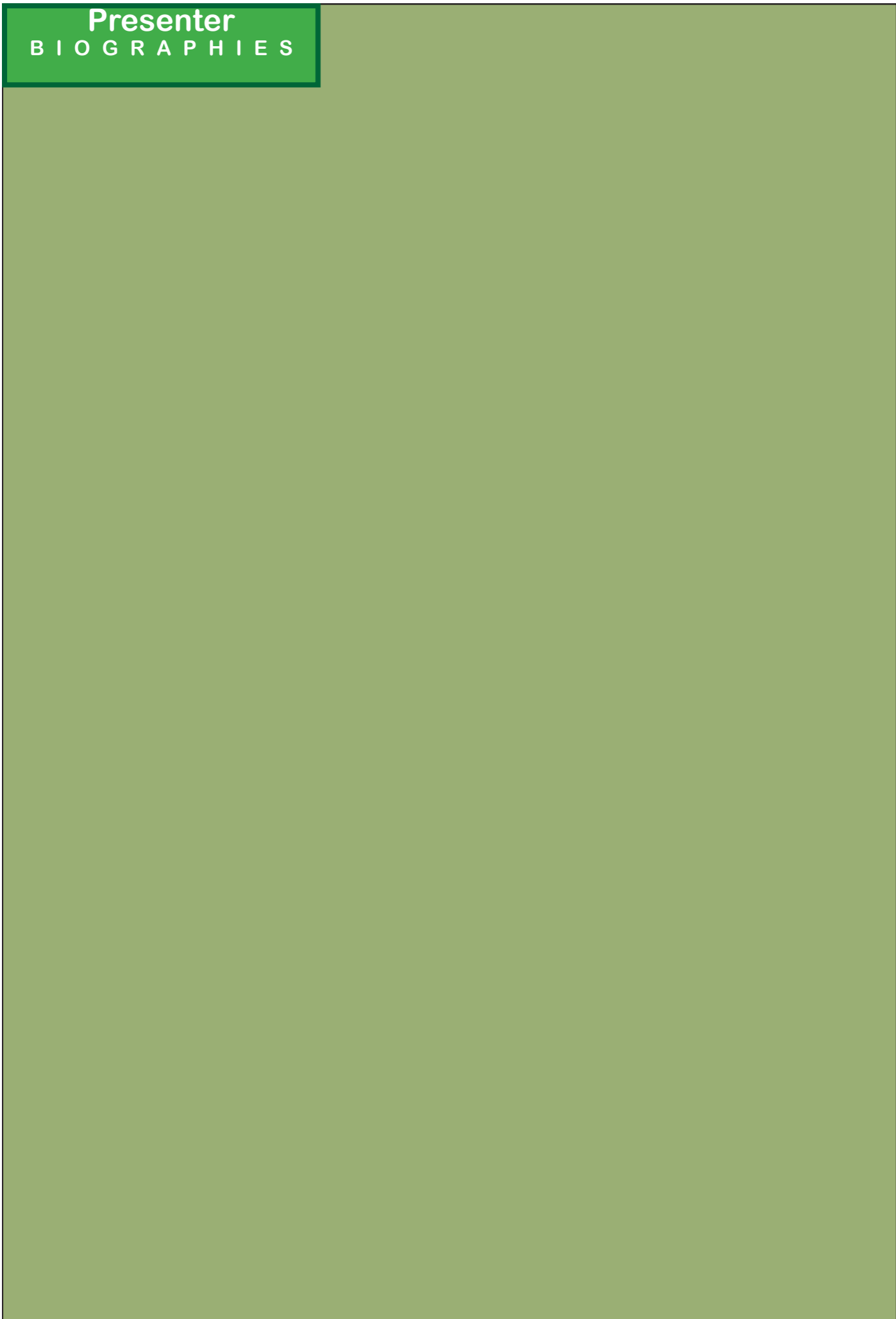
Special Project Coordinator with the Guam Coastal Management Program. Elaina has lived in Guam since 1991. She received her Bachelor's degree in biology from University of Guam, much of her coursework being focused on Guam's ecology and natural resources. She recently completed a Masters's degree in communications at the University of Texas, El Paso through a cooperative program with Rare, an organization focusing on grass-roots conservation campaigns that change the way people relate to their environment.

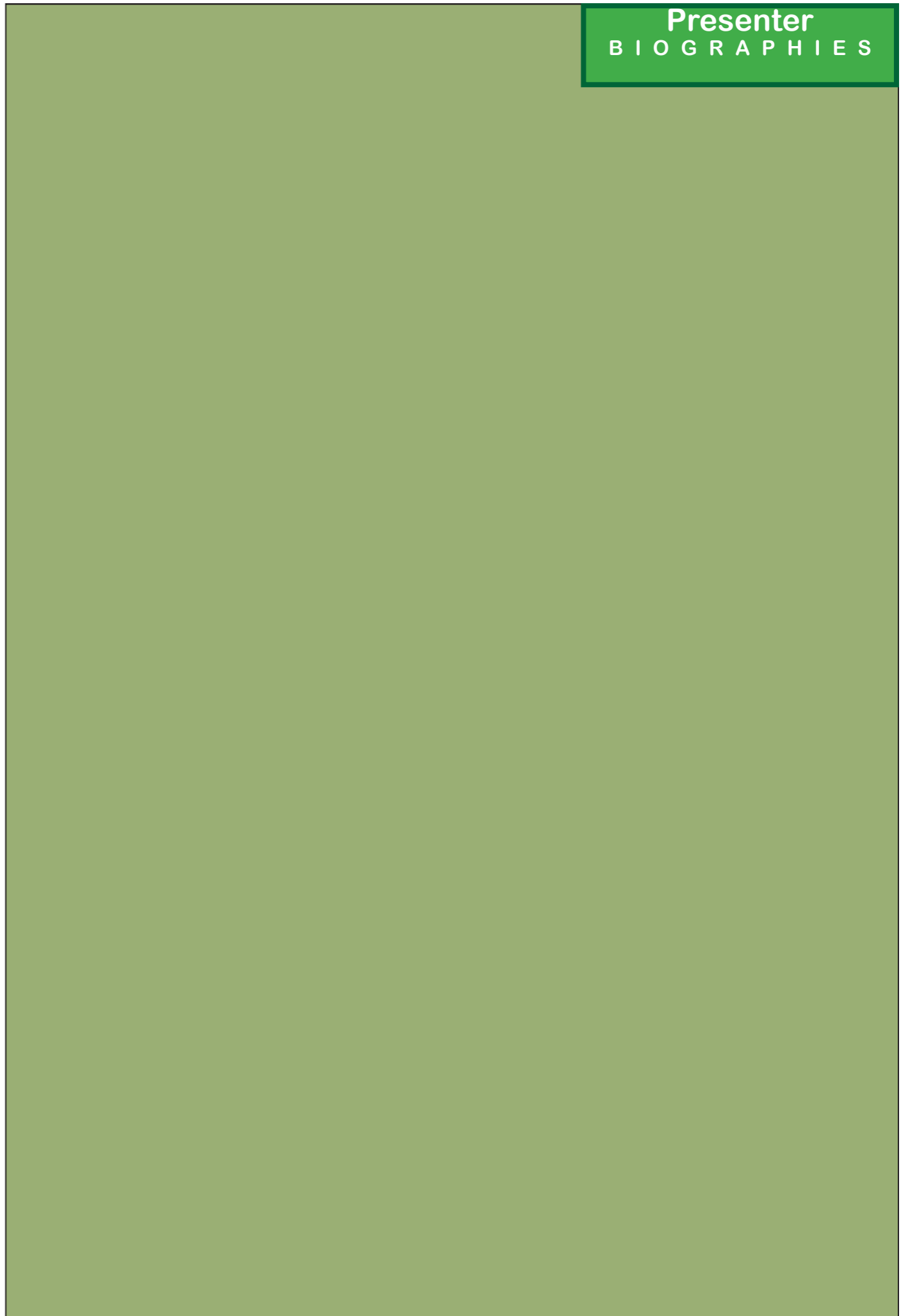
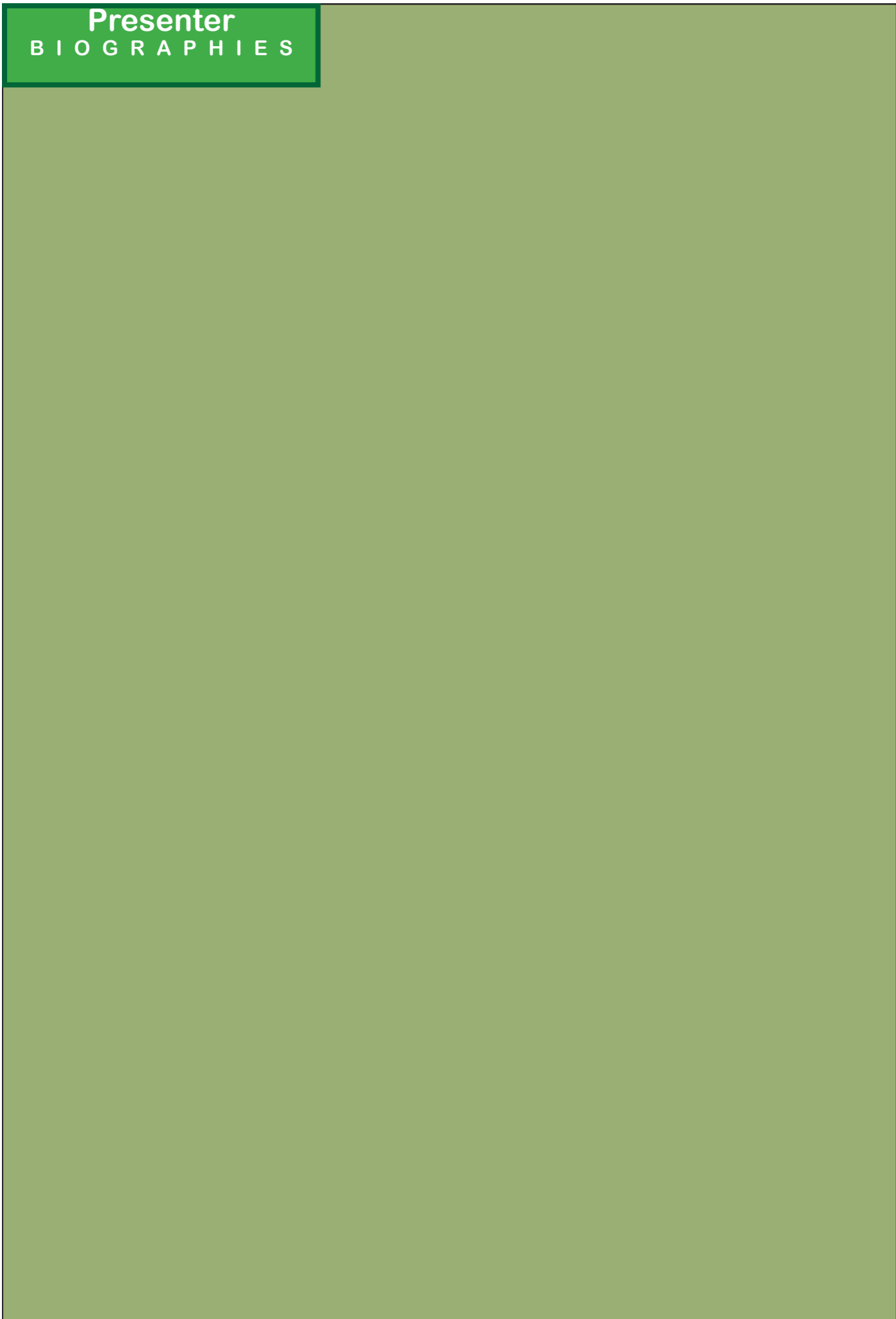


**Sam Walker,**

Born and raised in east Africa, Mr. Walker learned the value of sustainability from an early age. He was also exposed to the need for

inclusive justice as an integral part of building and maintaining the social and cultural fabric of communities. He moved with his family and taught in Yemen for five years before moving to Israel and the West Bank where he taught in education, archaeology and sciences at various colleges. Mr. Walker has always been active in sustainability projects in each place he has lived, working with development organizations on solar, water catchment, irrigation, desalination, and traditional and organic farming. Mr. Walker and his family have lived on Guam for five years where he is the Institutional Researcher for Renewable and Sustainable Energy Management for the Center for Island Sustainability.





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**For more questions, please contact:**  
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