



## **WHO ARE WE?**

Walking Palms Global Health (WPGH) works to meet the public health needs of historically vulnerable and low-income communities in the province of Manabí, Ecuador, an area frequently affected by natural disasters. We have ongoing partnerships with local communities, primary and secondary schools, collegiate research institutions, international NGOs, and the Ministry of Health Ecuador. With these partnerships, we've been able to develop research-based recovery initiatives and produce community-driven data in environmental health, disease, and mental health disciplines. Long-term, sustainable development is encouraged by providing employment opportunities and training to local community members, health workers, and global volunteers. Empowering communities to be self-sufficient, we also implement inter-sectoral educational health programs that are personalized in order to meet the unique needs of each community.

## **WHY LEARN WITH US?**

We are an inter-cultural and interdisciplinary team of experts working across the full spectrum of global health. Walking Palms Global Health staff are highly trained in emergency disaster relief and recovery and are bound by our passion for sustainability. We, along with our collaborators, offer perspectives and provide tools which empower leaders to use systems thinking in uncovering creative solutions to global health issues. Global Health dynamics are complex and ever evolving and that's why we use Systems Thinking to help simplify large issues. This approach looks at interactions between environment, biota, and social dynamics to explain health outcomes and disparities. With a combination of workshops led by our unique team members and local guest lecturers we create an environment in which students partake in inquiry-based learning. Global Health & Environment not only gives students the skills needed for research and sustainable development but puts knowledge into action as students partake in our long-term community service projects. We trust that our students will use their learning experiences to impact and empower the future communities that they will serve in.

## **SITE DESCRIPTION:**

This learning opportunity takes place in the unique and charming beach town of Bahía de Caráquez, Manabí, Ecuador. Just south of the equator, the peninsula of Bahía is located five hours Northwest of Guayaquil International Airport. Home to one of the only remaining fragmented tropical dry forests in Ecuador, it includes some of the world's most diverse range of flora and fauna. Bahía transitions between lush green mountains during the wet season and a cool dry season. Although Bahía is still recovering from the 2016 earthquake, the area has vibrant murals, delicious food and rich Latin culture making it the perfect place to learn.



**OUR COURSE:** *Global Health & Environment: “A Systems Approach “*

**Location:** Bahía de Caráquez, Ecuador

**Primary Instructor:** Avriel Diaz

**Email:** [avriel@walkingpalms.org](mailto:avriel@walkingpalms.org)

**Website:** [www.walkingpalms.org](http://www.walkingpalms.org)

**Prerequisites:** Global Health Travel and Training Online Course developed by Boston University  
[www.ebx.org/course/practioners-guide-global-health-bux-globalhealththx](http://www.ebx.org/course/practioners-guide-global-health-bux-globalhealththx)

**Materials & Supplies:** All students must come prepared with a travel journal, writing utensils, hiking boots, field clothes, and bug repellent. See student travel checklist for more details on specific clothing required.

**GOALS:** The objective of the *Global Health in & Environment: “A Systems Approach “* course is to 1) teach students the frame work and applicable tools needed to conduct systems based research and create global health policy, 2) learn holistic sustainable methods aimed at providing natural disaster relief and recovery, 3) engage in unique Latin American culture and apply new ideas to solve world issues.

#### **GUEST LECTURES**

Director & MD—Dr. Freddy Vera, Ministry of Health

Disease Ecologist —Avriel Diaz MA, Columbia University

Marine Biologist—Dr. Cesar Penaherrera, NGO Mirgra Mar

Music Therapist—David Cedeno, WPGH/ IESS

President of Community Health Initiative (HIV) —Ismelda Cedeno, Ministry of Health

Storyteller—Rosa Loor, Community Member

Conservation Biologist—Emily Jager MA, Columbia University

Conservation Biologist —Moncho Loor, Universidad de Aquaponic

Public Health—Juliana Jeremiah MPH, SUNY Upstate



### **Day 1: Intro to Systems Thinking**

Introduction to Systems Thinking  
Introduce Student Project  
Culture in a Global Age  
Exploring the Urban Environment  
Introduction to Community Health Surveying  
Your Health Matters  
Lecturers: Walking Palms Global Health Team

### **Day 2: Health & Natural Disasters**

*Systems Concept 1:* Disasters & Public Health  
Infrastructure  
Stories of New Beginnings: 2016 Earthquake  
Community Health Survey  
Emergency Preparedness  
Lecturer: Director of the Ministry of Health, Dr. Freddy Vera, MD

### **Day 3: Marine Conservation & Health**

*Systems Concept 2:* Marine Conservation & Human Health  
Conservation of Mangroves: Key species habitat & traditional fishing grounds  
Lecturer: Isla de Corazón Preserve

### **Day 4: Urban Agriculture and Nutrition**

*Systems Concept 3:* Diabetes & Hypertension Health Crisis  
Mental Health and Disease Risk – ACE Test  
Ethnobotany & Community Perception Survey  
Medical Garden Construction  
Organic Mosquito Repellent Garden  
Lecturer: Bahía Ecological Club, Juliana Jeremiah, MPH

### **Day 5: Forest Conservation & Health**

*Systems Concept 4:* Climate Change and Public Health Measures  
Tropical Dry Forest Conservation Hike  
Forest Water Resources: Data Collection and Analysis  
Fire, Soils & Indigenous Peoples  
Lecturers: Forest Ecologist, Emily Jager, MA  
Punta Gorda Forest Reservation Conservationist, Ramon Loo

### **Day 6: Ocean Fisheries and Microplastics**

*Systems Concept 5:* Food Ecology & Resources  
Microplastic Field Collection  
Microplastic Lab Processing  
Lecturer: Science Research Director, MigraMar Dr. Cesar Peñaherrera, PhD

### **Day 7: Infectious Disease Ecology**

*Systems Concept 6:* Mosquito Borne Diseases  
Mosquito Field Research Methods  
Stress and Infectious Disease  
Systems Mapping of HIV  
Human Rights Access to Health Care  
Lecturers: Disease Ecologist, Avriel Diaz, MA  
President of HIV Committee of Manabí, Ismelda Cedeño

### **Day 8: Connecting the Systems**

*Systems Concept 7:* Mind Body & Environment  
Wildlife Sanctuary Visit  
Final Project Presentations at Universidad Católica  
Community Potluck

### **Day 9: Implications for Policy**

*Systems Concept 8:* Sustainable Health Care  
Implications for Policy: Education & Research  
Travel Back Home



### **Day 1: Intro to Systems Thinking**

Students Arrive to Bahía in the afternoon  
Introduction to Systems Thinking  
Culture in a Global Age  
Exploring the Urban Environment  
Introduction to Community Health Surveying  
Your Health Matters

The first full day of class in Bahía, students will be introduced to the concept of systems thinking and how it guides the research and learning goals of Walking Palms. Systems thinking is a holistic approach that creates an interdisciplinary method for learning and focuses on how a system's parts are interrelated and how they work overtime in a larger context. This approach will allow students to connect health, the environment, culture and community and analyze them in the broader context of development in Latin America. Next, students will begin to explore the urban environment of Bahía, be introduced to where each of the local communities is located and go over how our team conducts community health surveys to gather data. The class will end the day with a discussion of self-care in the context of public and mental health work, learning about how to promote and prioritize their own health while working in stressful environments.

### **Day 2: Health & Natural Disasters**

*Systems Concept 1:* Disasters & Public Health Infrastructure  
Stories of New Beginnings: 2016 Earthquake  
Community Health Survey  
Emergency Preparedness  
Lecturer: Director of the Ministry of Health, Dr. Freddy Vera, MD

The first systems concept will be focused on disasters and public health infrastructure. Students will learn about how disaster relief was conducted after the 7.8 magnitude earthquake that hit Bahía in 2016. We will hear personal stories from community members about their experiences after the earthquake and how it affects their lives today. Students will use this topic as a basis for conducting a community health survey. While conducting this survey students will uncover key parts of the system i.e. climate, water, roads, electricity, vegetation, erosion and more that are affecting public health. Student's will then use these surveys to create a systems map that focuses on disaster recovery and planning. We will end the day with a workshop on emergency preparedness using a mock health crisis scenario to learn about how disaster relief functions.



### **Day 3: Marine Conservation & Health**

*Systems Concept 2:* Marine Conservation & Human Health

Conservation of Mangroves: Key species habitat & traditional fishing grounds

Lecturer: Isla de Corazón Preserve

This day will focus on marine conservation and health. As a coastal community, Bahía relies on the resources of the local marine area and the conservation of this area is important for public health. One of the most important coastal resources are mangroves as they provide key species habitat for birds and serve as traditional fishing grounds. Students will go to a mangrove forested area and learn about balancing conservation goals and natural resource use by the local fishing industry. The preserve will also discuss the importance of climate change research, harvesting policies, and management are helping to conserve and grow these unique environments.

### **Day 4: Urban Agriculture and Nutrition**

*Systems Concept 3:* Diabetes & Hypertension Health Crisis

Mental Health and Disease Risk – ACE Test

Ethnobotany & Community Perception Survey

Medicinal Garden Construction

Organic Mosquito Repellent Garden

Lecturer: Bahía Ecological Club

The fourth systems concept of the course will focus on the diabetes and hypertension health crisis that is prevalent throughout much of Latin America. The basis of this concept will be nutrition, exercise and the influence of globalization on local diets and health practices. Next, students will learn about the ACE test for trauma and chronic disease that is used by medical professionals to assess the specific needs of individuals that have experienced trauma. Students will connect mental health to physical health by learning about how trauma can increase the spread and severity of chronic disease in vulnerable areas.

In the second half of the day, class will cover ethnobotany, the scientific study of traditional knowledge and customs of people concerning plants and their medical and other uses. We will conduct a survey of community perceptions and knowledge of medicinal plants. Students will help with the construction of a medicinal plant garden in one of the local communities and learn about the use of plants for both medicine and disease prevention such as mosquito repellent.



### **Day 5: Forest Conservation & Health**

*Systems Concept 4:* Climate Change and Public Health Measures

Tropical Dry Forest Conservation Hike

Forest Water Resources: Data Collection and Analysis

Fire, Soils & Indigenous Peoples

Lecturer: Forest Ecologist, Emily Jager, MA

Punta Gorda Forest Reservation Conservationist, Ramon Loor

This day will focus on how climate change affects public health measures. We will go on a hike through the unique and biodiverse tropical dry forest that surrounds Bahía and learn about conservation methods for this ecosystem. During the hike, students will collect data and later in the day will conduct analyses of forest water resources and hypothesize about how climate change will affect these forests. In the afternoon of this day, we will have a lecture on fire, soils and indigenous peoples, relating the use of natural resources by local populations to conservation, culture and community.

### **Day 6: Ocean Fisheries and Microplastics**

*Systems Concept 5:* Food Ecology & Resources

Microplastic Field Collection

Microplastic Lab Processing

Lecturer: Science Research Director, MigraMar, Dr. Cesar Peñaherrera, PhD

The class will go over marine ecology field and lab methods, and then collect sand samples and analyze them in the lab for levels of microplastics. This activity will be led by Dr. Cesar Peñaherrera, the Science Research Director for MigraMar, a marine research and conservation organization for the Pacific Ocean. We will connect the prevalence of microplastics to its implications for ocean fisheries, food and health.

### **Day 7: Infectious Disease**

*Systems Concept 6:* Mosquito Borne Diseases

Mosquito Field Research Methods

Stress and Infectious Disease

Systems Mapping of HIV

Human Rights Access to Health Care

Lecturers: Disease Ecologist, Avriel Díaz, MA

President of HIV Committee of Manabí, Ismelda Cedeño



Class on this day will learn about mosquito borne disease including zika, chikungunya and dengue. We will have a lecture on mosquito field research methods including trapping mosquitos to survey for disease and household health surveys. We will then put these methods to practice collecting eggs, larvae, pupae and adults then learn lab processing skills. We will end with a discussion of human rights access and health care and how global inequality affects public health access. This discussion will be led by Ismelda Cedeño, who is the president of the HIV Committee of Manabí. She will lead a workshop to map barriers to health access including social barriers involved in diseases that carry social stigmas such as HIV.

### **Day 8: Connecting the Systems**

*Systems Concept 7:* Mind Body & Environment

Wildlife Sanctuary Visit

Final Project Presentations at Universidad Católica

Community Potluck

The last full day of class, we will visit the Wildlife Sanctuary and Eco Hotel, Saiananda and have time to explore and meet the Galapagos tortoise and sloth residents. Students will have time to prepare their final project presentations at the Universidad Católica where they will be presenting in the afternoon. We conclude with a community potluck.

### **Day 9: Implications for Policy**

*Systems Concept 8:* Sustainable Health Care

Implications for Policy: Education & Research

Travel Back Home

On the last day of the trip we will connect everything we've learned back to a global context and discussion the implications of local health issues on larger policy measures. What can be improved about public health policy? How does the Ecuadorian system differ from that in the UK? How do perceptions of health and medicine differ in Ecuador compared to the UK? How did this trip influence the way you think about health and the natural environment?