CITY COUNCIL
CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII

No. 12-318

RESOLUTION

RECOGNIZING THE CULTURAL, HISTORIC AND SCIENTIFIC VALUE OF THE KARST FRESH-WATER AQUIFER ECO-SYSTEM OF THE EWA PLAINS, WEST OAHU.

WHEREAS, the Ewa Plains are part of the greater ahupua`a of Honouliuli and consist of approximately 50 square miles located on the southwest corner of the island of Oahu; and

WHEREAS, the Ewa Plains consist of a topography known as "karst," characterized by a porous, permeable coralline reef deposit formed at least 100,000 years ago during at least three high stands of sea level, and known to be more than 1,000 feet thick near the Ewa shoreline, then tapering back as it encounters the ancient lava flows of the Waianae Mountains; and

WHEREAS, the international community uses the European name "karst" to refer to topography that is a geological formation of carbonate limestone rock, and while approximately 20 percent of the United States is underlain by various types of karst aquifers, the flow of underground water in karst terrains has been labeled as mysterious, capricious, and unpredictable; and

WHEREAS, when James Campbell drilled the first artesian well on the Ewa Plains near Honouliuli in 1879, ground water gushed out at an estimated height of over 30 feet due to interior karst aquifer pressure; and

WHEREAS, the Ewa Plains have been irrigated with underground karst aquifer water since 1890, and by 1930, 70 artesian wells had been drilled through the Ewa Plains caprock sediment to irrigate cane lands south of Farrington Highway; and

WHEREAS, scientists have determined that the Ewa Plains karst water system is part of what is known as the Ghyben-Herzberg water lens, where inland basaltic aquifers are relatively fresh and contain less than one percent seawater, but as fresh water moves toward the ocean and mixes with seawater, a brackish transition zone is formed near the Ewa coast, resulting in brackish ground water floating on a saline water lens; and

WHEREAS, a hydrological study commissioned by the Honolulu Department of Environmental Services determined that the Ewa Plains karst water system is very permeable and transmissive, with the underground water pressure wave of the rising tide traveling up to two miles inland from the Ewa shoreline; and

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WHEREAS, Ewa Plains karst subterranean caves also have a sub-surface hydrologic connection of up to two miles inland, with water level fluctuations of up to 16 inches due to the coastal tidal pressure on the Ghyben-Herzberg lens; and

WHEREAS, Ewa Plains karst caves have been found to be as large as shipping containers or community swimming pools, containing stalactites and stalagmites in lengths of up to three feet, made of a beautiful milky-white sparkling mineral called calcite, which is highly prized by mineral collectors; and

WHEREAS, the Ewa Plains karst is a hydrologically connected waterway and fragile natural aquifer filtering system that transfers nutrients and organic carbon to downstream food webs; however, uncontrolled points of pollution can contaminate and overwhelm the natural filters, causing polluted waters to flow into the sea and damage aquatic shoreline populations and related coastal fisheries; and

WHEREAS, through the centuries, the Hawaiians used the Ewa Plains karst water-fed sinkholes for cultural purposes such as micro agricultural sites for bananas, gourds and ti leaves, and in otherwise arid areas, the underground waterways supported large groves of native Hawaiian trees and culturally important native plants; and

WHEREAS, complex Ewa Plains karst aquifers, channels, caves and cavern systems allow underground water streams to emerge and disappear as the water travels towards the sea, creating in some areas wetlands and marshes, and in other areas very dry surfaces with waterways below ground, which spawn small red native freshwater shrimp that are known to be delicious; and

WHEREAS, Ewa Plains karst caves may also create hazardous conditions because they may exist just a few feet below the ground surface, and may open up as potentially large and dangerous sinkholes if disturbed or weakened, but these hazardous conditions may be located and appropriately mitigated by using below ground scanning technologies; and

WHEREAS, because karst is recognized and studied worldwide by universities, institutes and organizations, it presents an opportunity in West Oahu for cultural and eco tourism, scientific research grants, community educational endeavors, and the bringing together of Hawaiian cultural practitioners, teachers and scientists to discuss native Hawaiian flora, fauna, aquatic resources, and to study Hawaiian cultural histories and scientific geological and hydrological facts; and

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WHEREAS, federal bureaus such as the United States Fish & Wildlife Service have funded projects to restore Ewa Plains karst sinkholes and have demonstrated that Hawaiian freshwater shrimp can be restocked and can flourish in these unique karst sinkhole habitats, providing working environments for education and training; now, therefore,

BE IT RESOLVED by the Council of the City and County of Honolulu that it supports recognition of the Ewa Plains karst as an important aquifer water system, and supports cultural history studies and ecological and hydrological research related to the Ewa Plains karst; and

BE IT FURTHER RESOLVED that the City Administration, the State of Hawaii, and the United States government are urged to recognize and further study the cultural, historic and scientific opportunities of the Ewa Plains Karst system; and

BE IT FINALLY RESOLVED that copies of this Resolution be transmitted to the Mayor, the Governor, the President of the United States, the Commander of United States Pacific Command, the Hawaii Community Development Authority, the Department of Hawaiian Home Lands and the Office of Hawaiian Affairs.

INTRODUCED BY:

TOM BERG

DATE OF INTRODUCTION:

NOV 20 2012

Honolulu, Hawaii

Councilmembers