

Pacific Islands Environmental Conference
Saipan, CNMI

**Coral Reefs, Marine Protected Areas
and Watershed Protection**

Mayor Jeremy Harris
City & County of Honolulu
June 23, 2004

State of the World's Coral Reefs



Among the most biologically diverse ecosystems

State of the World's Coral Reefs



- Coral reefs are home to 25% of all marine species
- It is estimated that 75% of the world's reefs will be destroyed or significantly damaged in the next 20 years

State of the World's Coral Reefs



Coral reefs have experienced widespread degradation due to global warming, pollution, and destructive fishing practices

State of the World's Coral Reefs



More than half the world's reefs are threatened by human activity, with up to 80% at risk in the most populated areas

State of the World's Coral Reefs



Urbanization, industrialization, tourism, and growing coastal populations have degraded coastal areas, reduced water quality, and increased pressure on marine resources

Fisheries Management

Coral Reef Overfishing



Fisheries Management

Destructive Fishing Techniques



- Poison fishing
- Dynamite fishing
- Destructive fishing gear



Fisheries Management

Better Management Needed



Fish and game laws based on scientific understanding of species and coral reef ecology

Fisheries Management

Better Management Needed



Reef management strategies

Land Use and Coral Reefs

Urbanization Impacts



Inappropriate land use in coastal zones

- Industrial development
- Development in wetlands and critical habitats

Land Use and Coral Reefs

Urbanization Impacts



- Habitat destruction
- Mangrove destruction
- Estuary destruction



Half of the world's wetlands and mangroves disappeared in the 20th century

Land Use and Coral Reefs

Urbanization Impacts



- Solid waste mishandling
- Recycling programs
- Landfills – leachate draining into reefs

Land Use and Coral Reefs

Urbanization Impacts



- Leachate membrane programs

Watershed Protection

Managing Watersheds



Watershed Protection

Controlling Non-point Source Pollution



Sediment plume on
Mississippi River

Strict grading regulations

Watershed Protection

Controlling Non-point Source Pollution



Agricultural Controls

- Soil runoff
- Pesticides, herbicides, fertilizer
- Irrigation and tilling practices

Watershed Protection

Controlling Non-point Source Pollution



Storm drain maintenance with vactor trucks

Watershed Protection

Controlling Non-point Source Pollution



Storm Drain Protection

Watershed Protection

Controlling Non-point Source Pollution



Storm Drain Protection

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Controlling Non-point Source Pollution



Storm Drain Protection

Watershed Protection

Controlling Non-point Source Pollution



NPDES – Permitting and Regulations

Watershed Protection

Controlling Non-point Source Pollution



NPDES – Permitting and Regulations

Watershed Protection

Controlling Non-point Source Pollution



NPDES – Permitting and Regulations

Construction Mitigation



Runoff must be treated before discharge by detention
or flow-through filtration



The Ahupua'a

- A political and ecological unit of land
- Designed to support the people who live within its boundaries
- Provides for all basic material and cultural needs

Watershed Protection

Controlling Non-point Source Pollution



Under the ahupua'a system, the ancient Hawaiians observed strict rules for the protection of natural ecosystems from the mountains to the sea

Hawaiians lived in harmony with the land

Watershed Protection

Controlling Non-point Source Pollution

Ala Wai Watershed Management Program



Improving water quality and fostering awareness of ahupua`a concepts through community-based stewardship of the Ala Wai watershed

Watershed Protection

Controlling Non-point Source Pollution



Ala Wai Canal

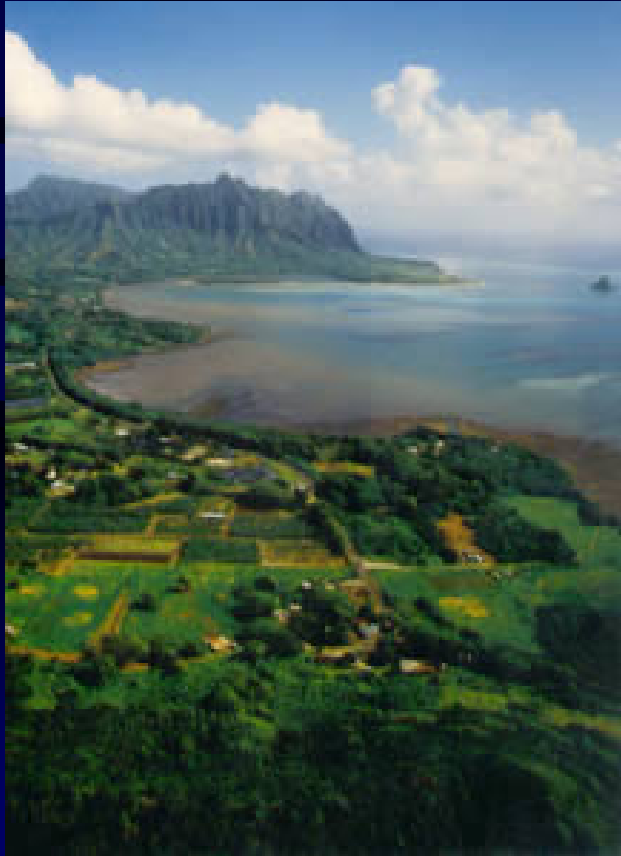


Receives runoff from many surrounding streets – including the Waikiki area

Watershed Protection

Controlling Non-point Source Pollution

Kailua Watershed Management Program



- Studies non-point source pollution in the Kailua, Kane‘ohe and Waimanalo areas
- Implements measures to mitigate pollution
- Oversees volunteer water quality monitoring efforts

Watershed Protection

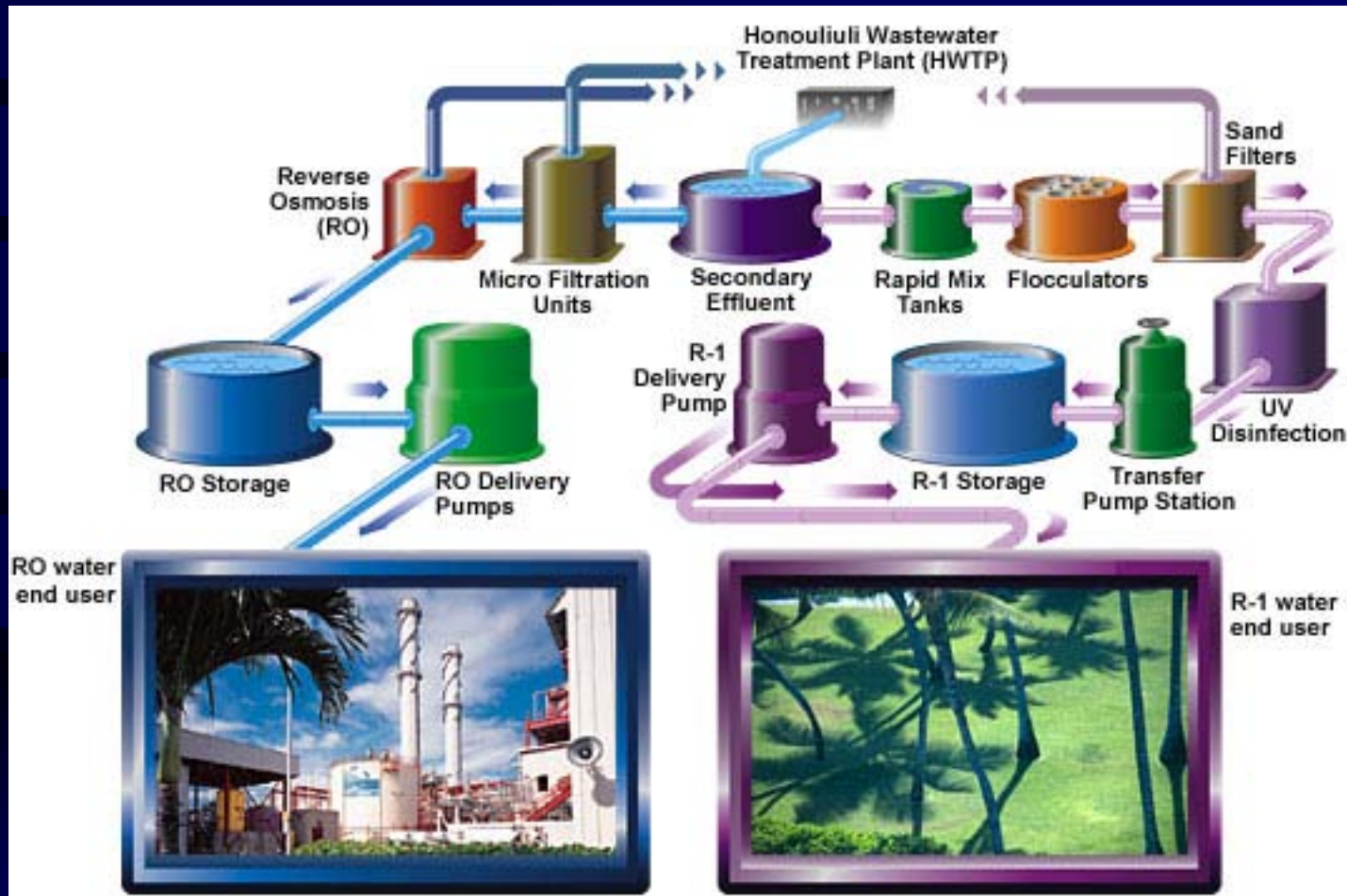
Controlling Non-point Source Pollution



“Streamwalks” program familiarizes residents with the importance of watersheds



Wastewater Recycling



Recycling wastewater instead of disposal in lagoons and reef areas

Wastewater Recycling



U.S. Filter Plant – State of the art water filtration technology

Wastewater Recycling



Irrigation of golf courses

Wastewater Recycling



Agricultural irrigation

Wastewater Recycling

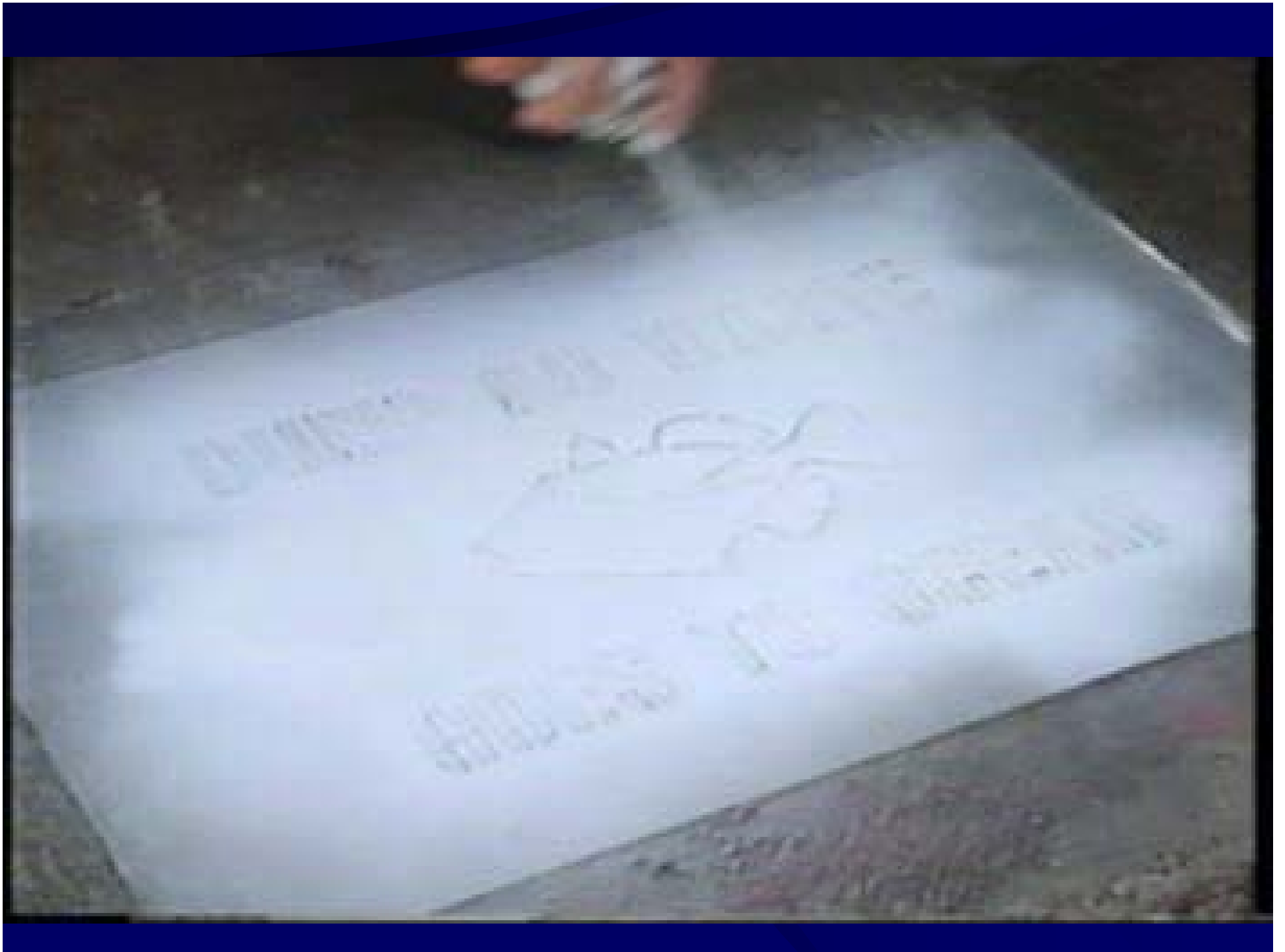


Membrane technology

Public Education and Community Involvement



Storm drain stenciling program



Public Education and Community Involvement



Household hazardous waste education and drop-off programs

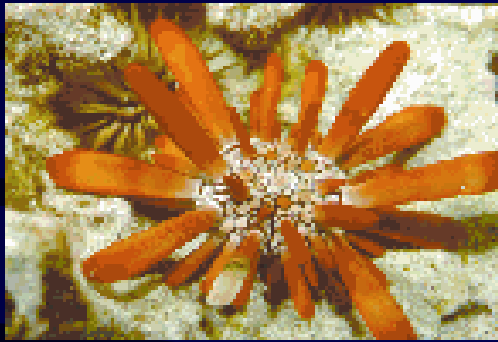
Public Education and Community Involvement



Adopt-a-Stream Program



Public Education and Community Involvement



Adopt-a-Reef Program

Public Education and Community Involvement



Earth Protection Agents Program



Public Education and Community Involvement



Hawaii Coral Reef Initiative

Hanauma Bay Nature Preserve



Hanauma Bay ca. 1930





By the 1980s a rapid increase in the number of visitors had overtaxed the ecosystem's ability to recover

Too Many People, Too Many Cars

The spoiling of Hanauma Bay



Don't look for familiar faces among the multitudes at Hanauma — Several residents have lately retreated from the refuge and its teeming shores.

Throngs cram, trash, trample 'maxed out' park



Hanauma Bay as it was



Economic Diversification – Edu-tourism



Marine Education Center
AIA Design Excellence Award 2003

Hanauma Bay Nature Preserve

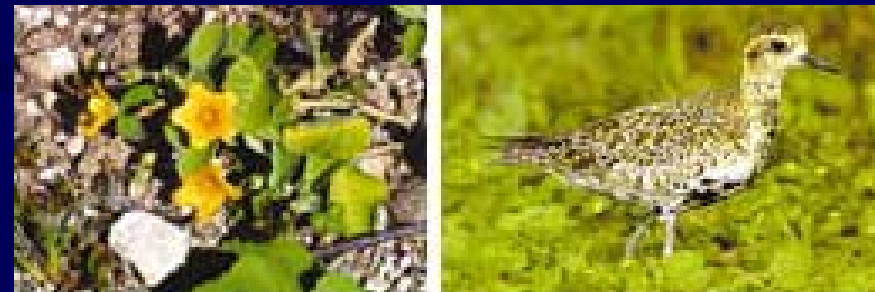


Economic Diversification – Edu-Tourism



Marine Education Center

Hanauma Bay Education Program



Promote understanding of marine and coastal ecosystems

Hanauma Bay Education Program



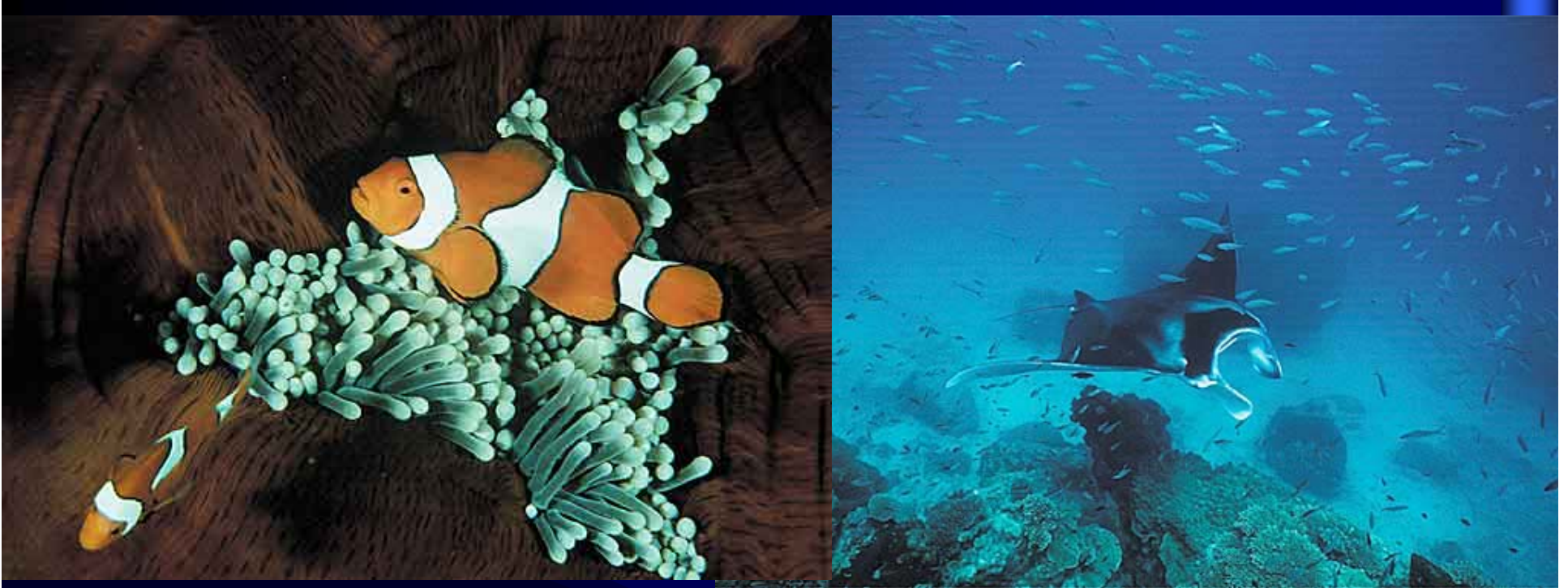


Global Warming



Ocean warming is extremely hazardous to coral organisms

Global Warming



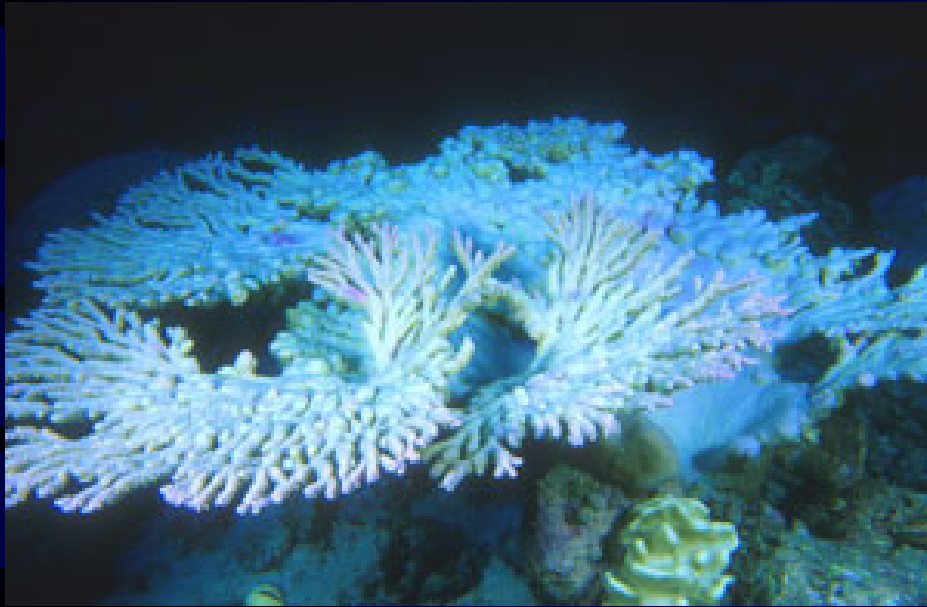
The pace of global climate change is exceeding the capacity of coral reef organisms and communities to adapt₅₈

Global Warming



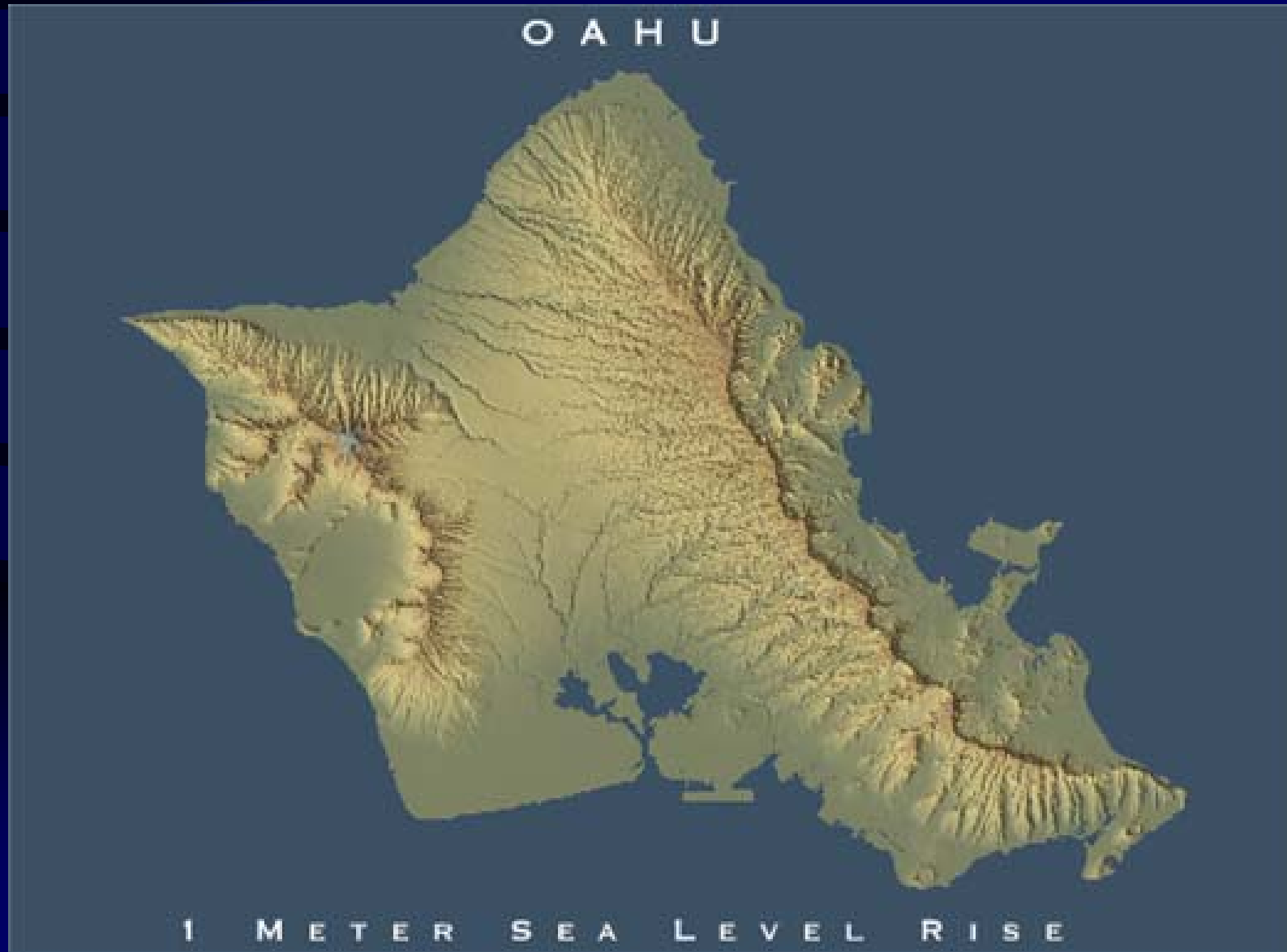
Global climate change is taking an incalculable ecological and economic toll on the world's coral reefs

Global Warming



Scientists predict that coral reefs and the benefits they provide will be lost unless climate change is addressed

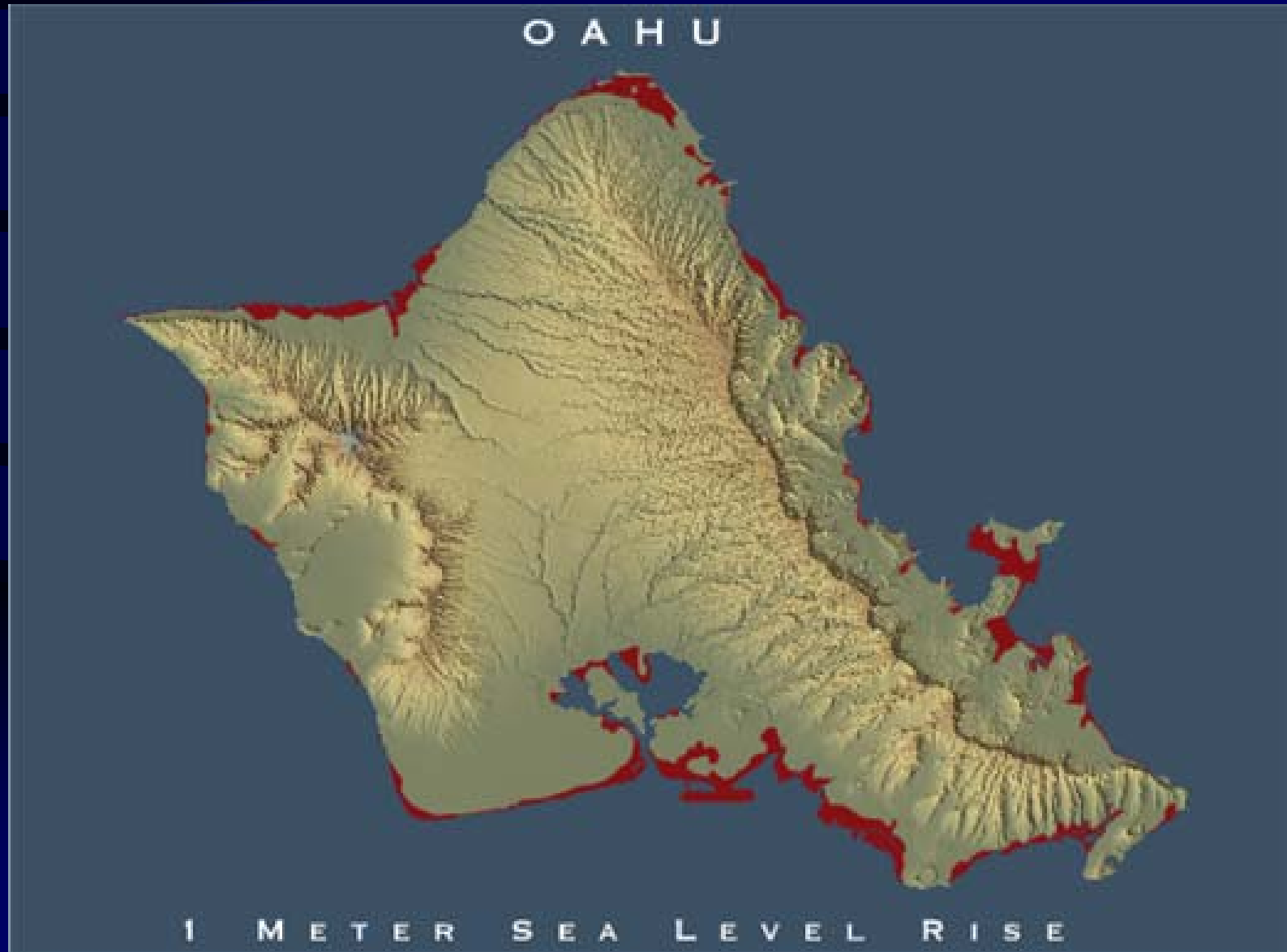
Potential Sea Level Rise on Oahu



Potential Sea Level Rise on Oahu



Potential Sea Level Rise on Oahu



Potential Sea Level Rise on Oahu



Potential Sea Level Rise on Oahu



A I R P O R T T O W A I K I K I
1 M E T E R S E A L E V E L R I S E

Potential Sea Level Rise on Oahu



Potential Sea Level Rise on Oahu



A I R P O R T & D O W N T O W N
1 M E T E R S E A L E V E L R I S E⁶⁷

Potential Sea Level Rise on Oahu



A I R P O R T & D O W N T O W N
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Potential Sea Level Rise on Oahu



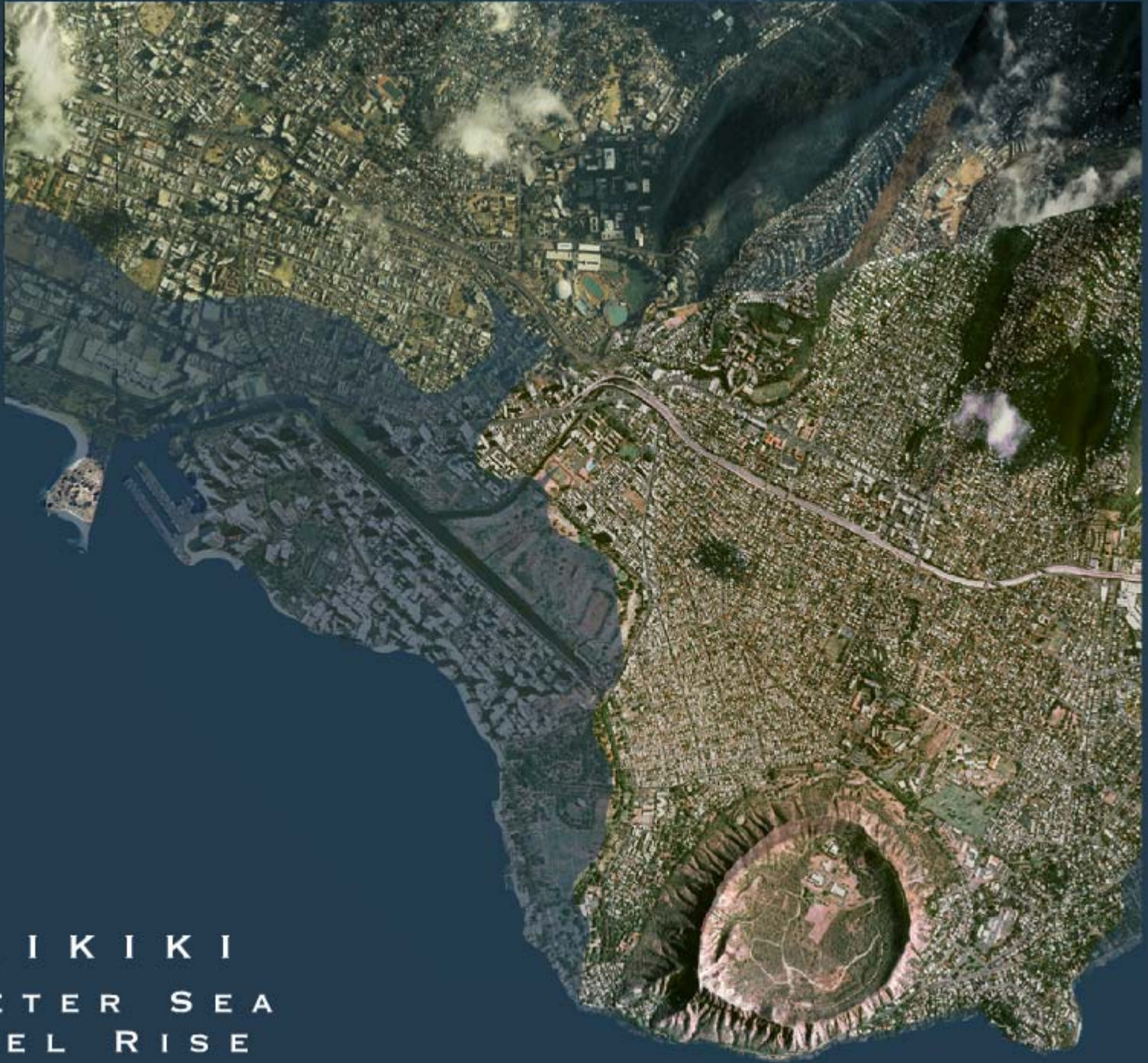
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Potential Sea Level Rise on Oahu





W A I K I K I
1 M E T E R S E A
L E V E L R I S E



W A I K I K I
1 M E T E R S E A
L E V E L R I S E

Global Warming

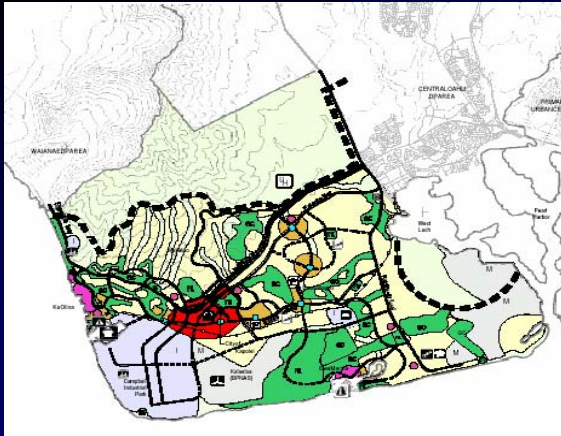


Global carbon dioxide concentrations in the atmosphere are expected to rise from 350 ppm to over 400 ppm by 2030

The Honolulu Experience

Land Use

- Preserve watersheds
- Protect wildlife habitats
- Maintain open space and scenic view plains



Land Use



Curbing Urban Sprawl

Sustainable Community Plans

KO'OLAU LOA SUSTAINABLE COMMUNITIES PLAN



DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU

ESTABLISHED 1968



NORTH SHORE SUSTAINABLE COMMUNITIES PLAN

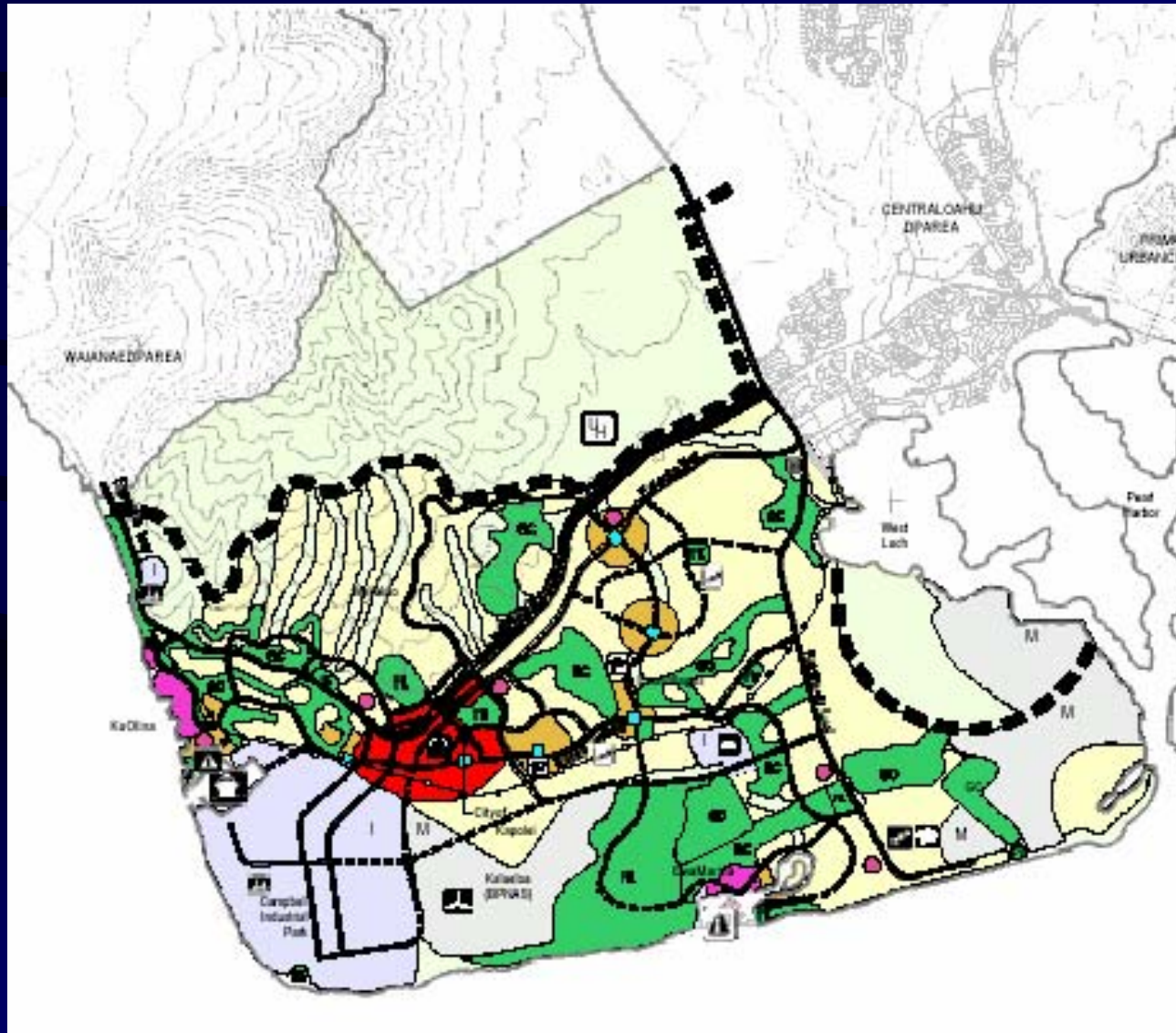


DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU

JULY 2000



Urban Growth Boundaries



Loss of Habitat and Biodiversity



Hawaii is the “extinction capital” of the world

Protecting Wildlife Habitats



Waimea Valley – Partnership with Audubon Society

The Honolulu Experience

Natural Resource



- Reject the paradigm of consumption and waste
- Develop systems for recycling and reuse



- Protect natural habitats

Natural Resource Policies Gone Wrong



Protecting Our Natural Resources

Solid Waste

Sustainable Practices



- Recycling
- Source Separation
 - Plastics
 - Metals

Curbside Recycling



Pilot Program to be Expanded Island-Wide

Islandwide Recycling



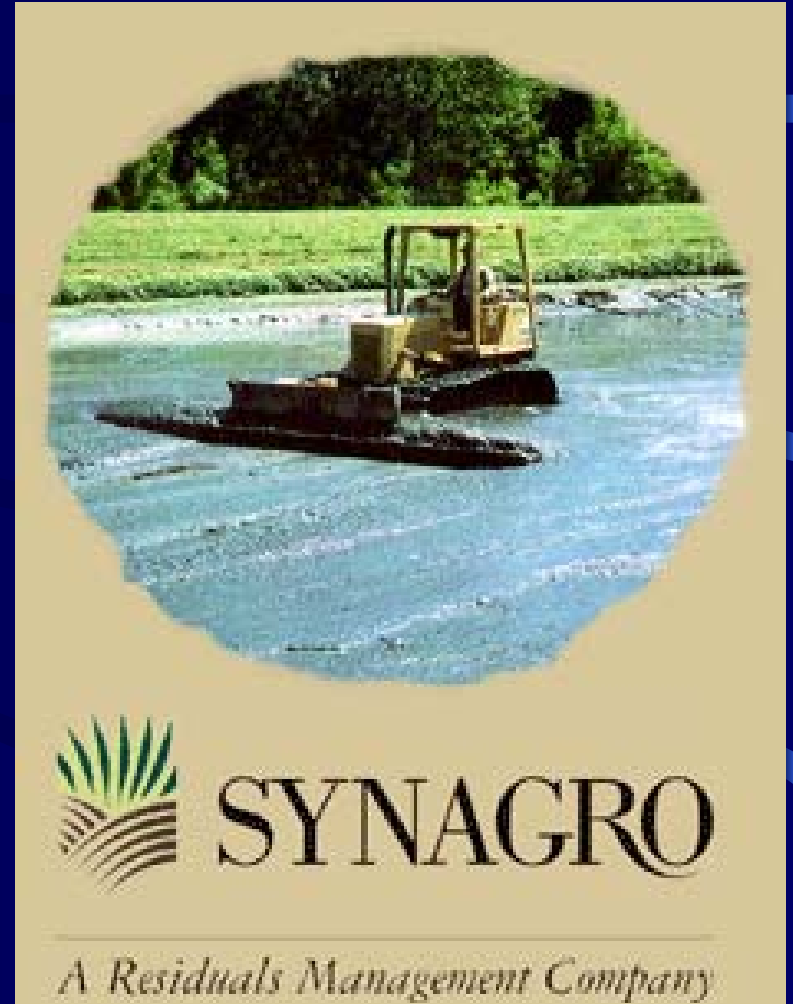
Additional blue and green automated containers to be issued to each household – with no pickup fees

Protecting Our Natural Resources

Wastewater Treatment and Reclamation



Conserving Our Natural Resources



The Search for New Technologies

The Honolulu Experience

Energy

- Energy Efficiency
 - Enact energy codes
 - Retrofit existing facilities
- Distributed Energy systems
 - Reduce dependence on fossil fuel power plants
 - Have buildings produce their own electricity
- Renewable Energy
 - Shift primary and transportation to renewable sources

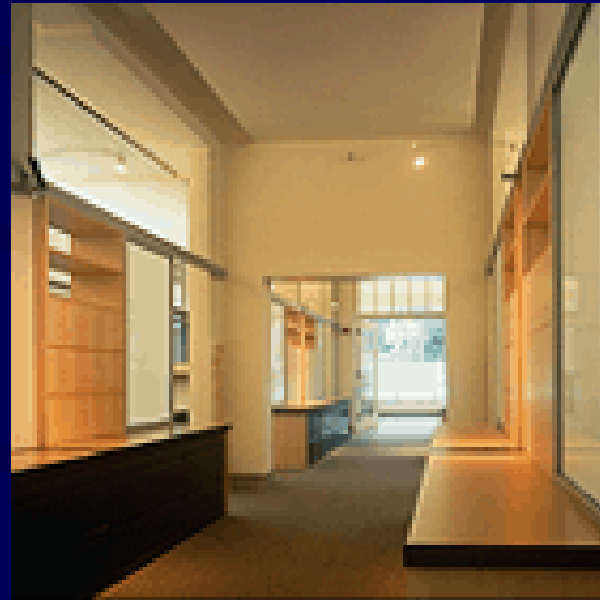


City Energy Code



Over \$300 million projected savings

Green Building Standards



City partnership with UH School of Architecture and Rebuild America to establish standards for all new city construction



**Goal: Cut energy demand
at city facilities in half by 2010**

Co-generation



Electrical demand at City Hall cut by 80 percent

Energy Efficiency Upgrades



City Hall



Kaneohe District Park



Kaneohe Police Station

LED Traffic Signals



Replacement of traffic lights with light-emitting diodes saves \$250,000 annually

U.S. Department of Energy Partnership



Street light runs on solar and wind power

Green Fleets Initiative



Renewable Energy – 1,000 Bio-diesel City Vehicles

Honolulu Bio-Power Initiative

Partnership with:

- Gas Technology Institute
- University of Hawaii
- Rebuild America
- The Gas Company



Refuse-Derived Fuel Power Plant



- Converts over 2,000 tons of waste per day
- Enough electricity for 40,000 homes
- Annual electrical revenue of over \$26 million
- Reduced imported oil by 10.7 million barrels

Honolulu Solar Initiative



Hydrogen Power Park



Partnership with:

- Hawaii Natural Energy Institute
- California Energy Commission
- U.S. Department of Energy

Hydrogen Fueling Kiosk



The Honolulu Experience

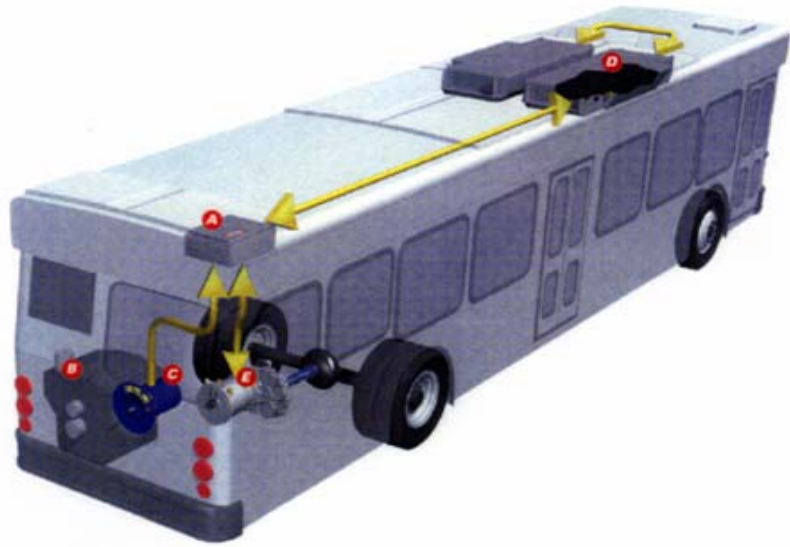
Transportation

- Non-polluting mass transit, not fossil-fueled automobiles
- Offer incentives for the use of alternative and renewable energy use: hybrid-electric, hydrogen fuel cell, bio-diesel...

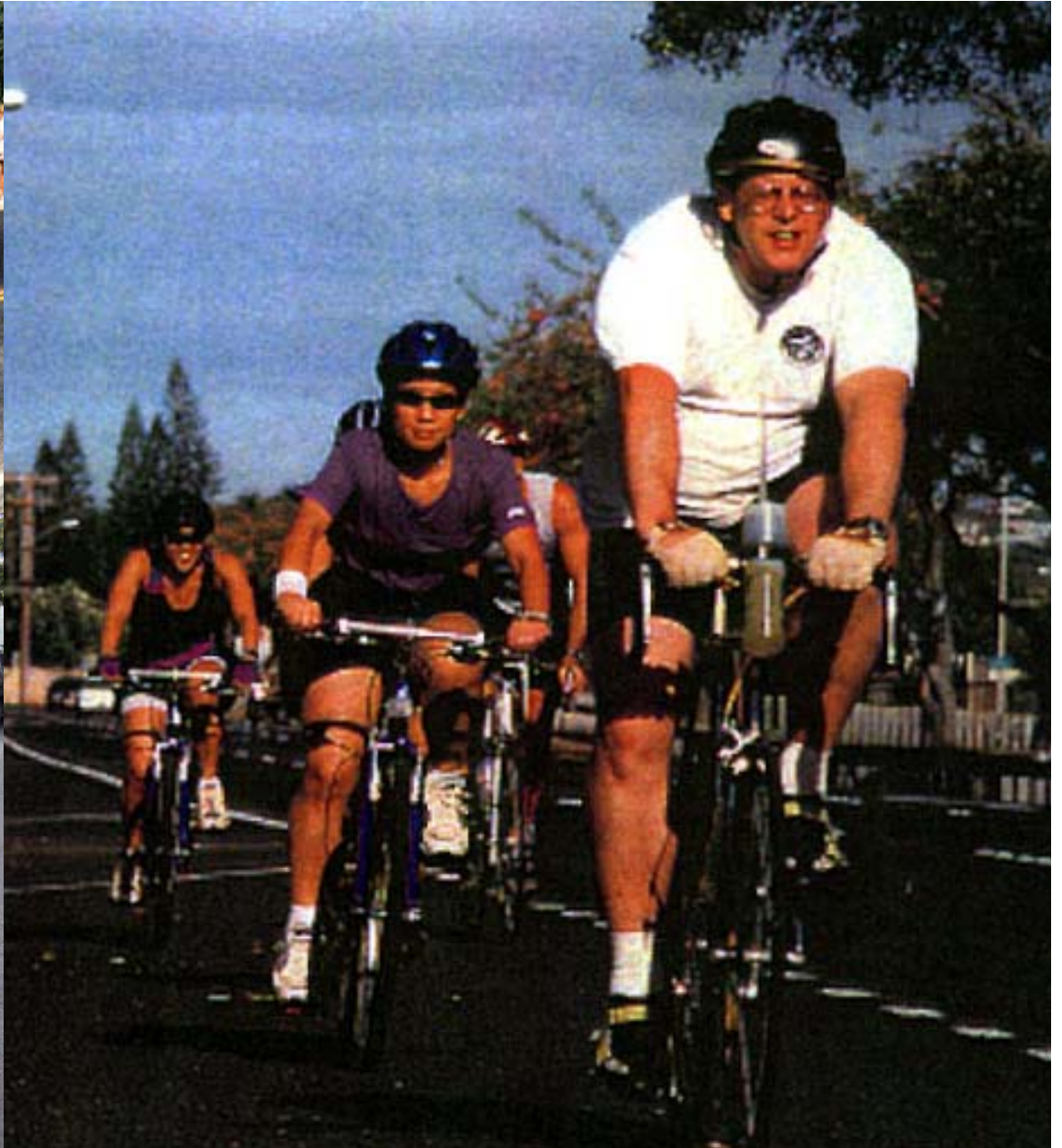


Best Transit System





Hybrid Bus



Cycling



Fuel Cell Technology

Global Warming



Islands must speak as one

Mahalo

