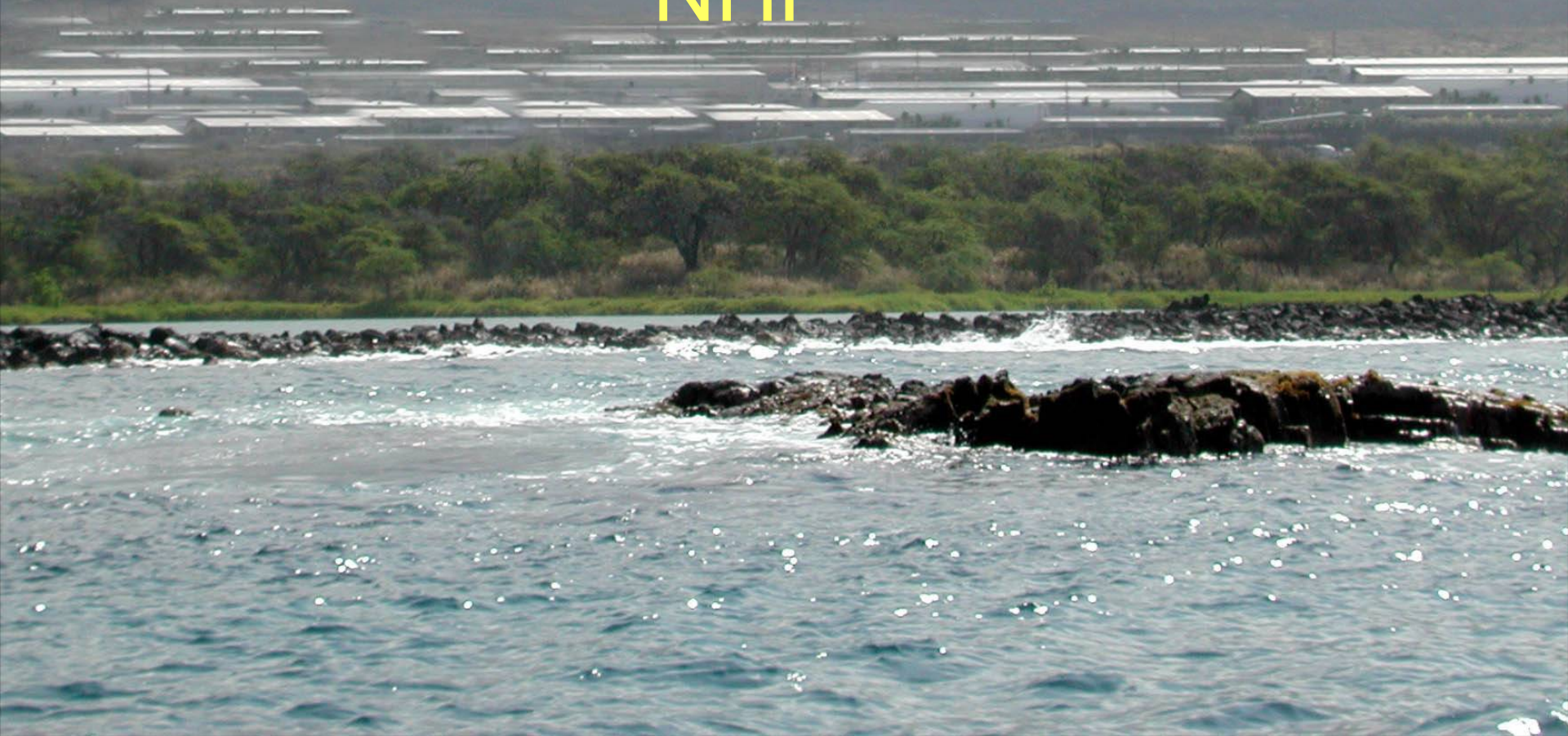




# An Inconvenient Park:

## Urban Development and Resource Protection at Kaloko-Honokohau NHP





“to provide a center for the **preservation, interpretation and perpetuation** of traditional native Hawaiian activities and culture



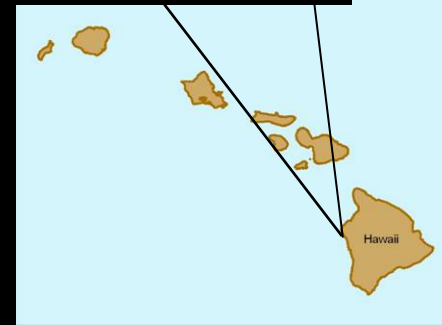


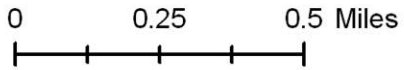
# Kaloko-Honokohau National Historical Park

- Setting
  - 481 authorized total hectares (217 ha marine waters)
  - Four Ahupua`a (land divisions)
- Extensive Cultural Resources
- Natural Resources
  - Coastal terrestrial & marine habitats
  - Two ancient Hawaiian Fishponds, wetlands
  - Anchialine pool habitat
  - Endemic & indigenous biota 16 threatened, endangered and candidate species



Kaloko-Honokohau National Historical Park





### Legend

⊕ Observation well

● Anchialine pool

--- Foot trail

Wetland

### Coral cover

10-<50%

50-<90%

90-100%

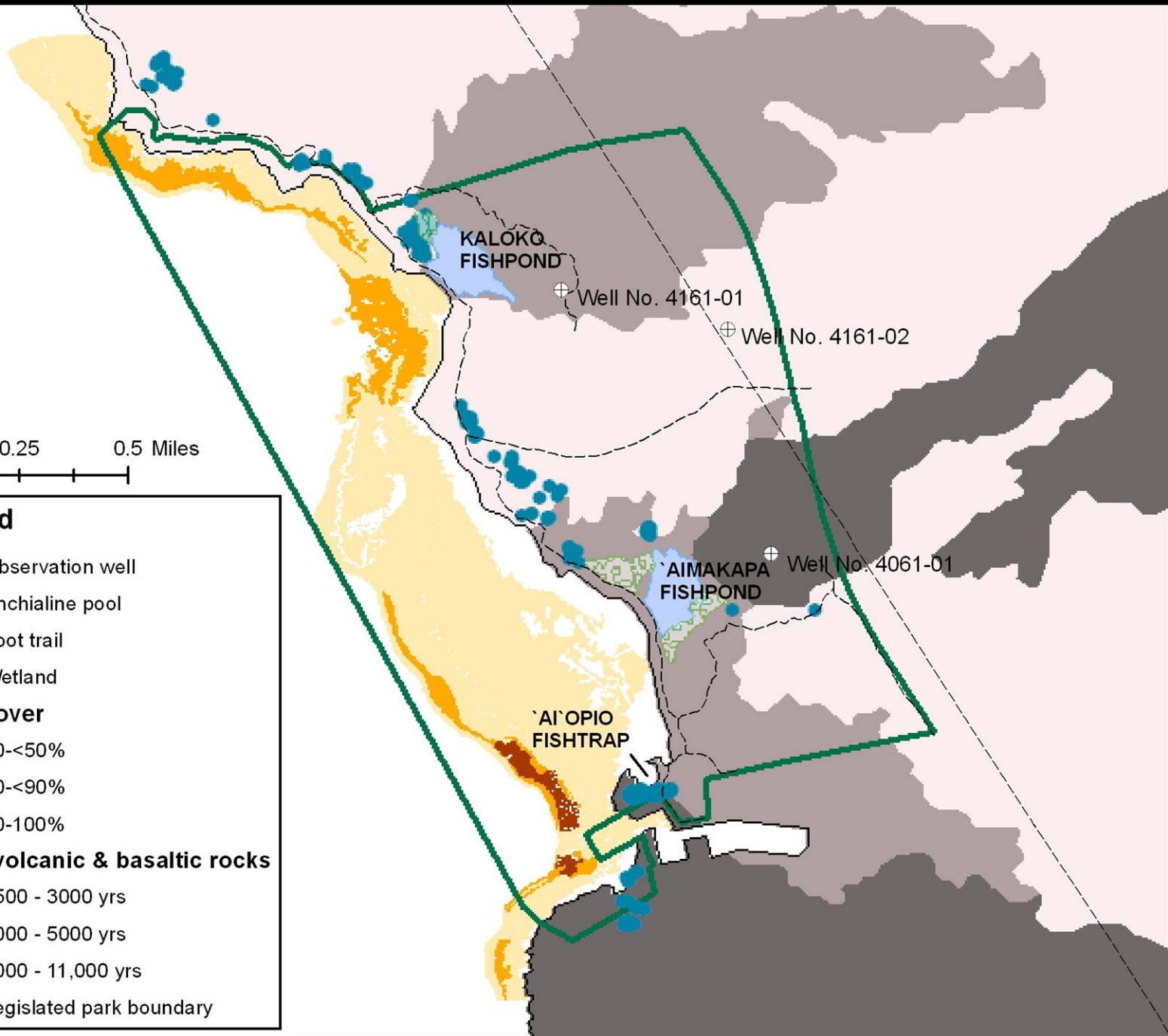
### Age of volcanic & basaltic rocks

1500 - 3000 yrs

3000 - 5000 yrs

5000 - 11,000 yrs

Legislated park boundary





# Groundwater Discharge to Ocean

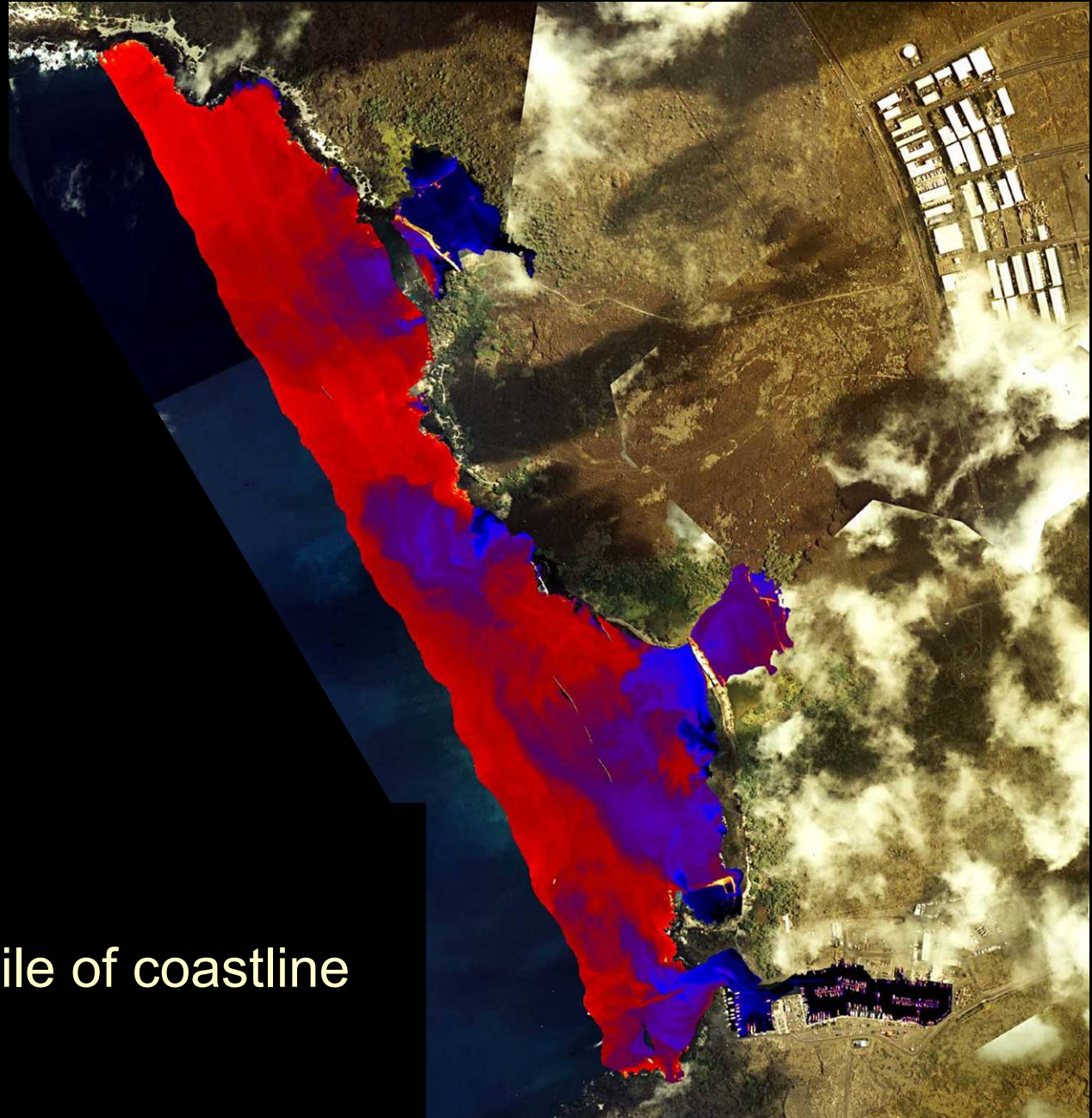
## 2005 Thermal Infrared Image,

A. Johnson, UH Manoa

**Red** = Warm, Salty  
Ocean Water

**Blue** = Cold, Fresher  
Groundwater Input

≈ 3 Mgal/day per mile of coastline



# Anchialine Pools



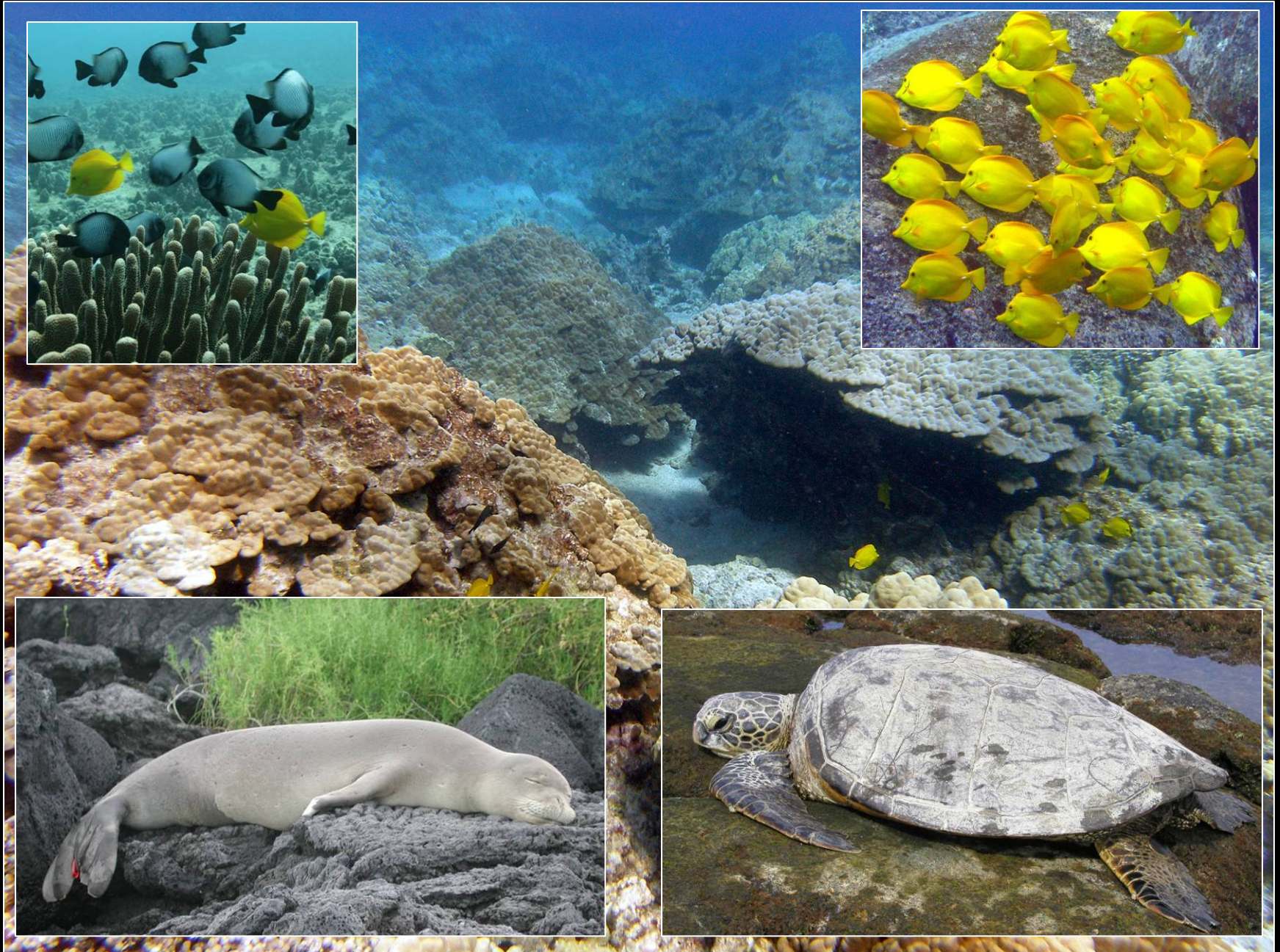
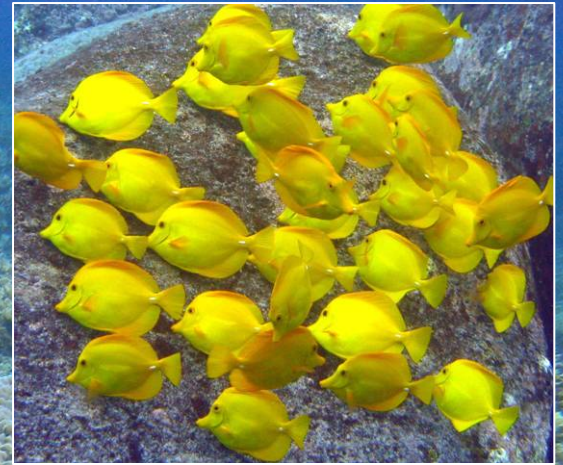
Opae `ula (*Metabetaus lohena*  
and *Halocardinia rubra*)



orange-black damselfly,  
*Megalagrion xanthomelas*









# Land Use Districts State of Hawaii



1978



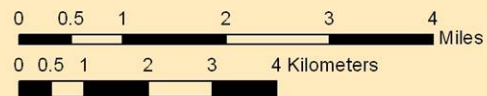
2008



- Current Petition to change to Urban
- Kaloko-Honokohau National Historical Park

## State of Hawaii Land Use Districts

- Agriculture
- Conservation
- Urban





## Land Development: Resource use/change



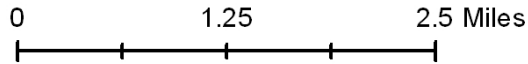
**National Park: natural and  
cultural resource protection**





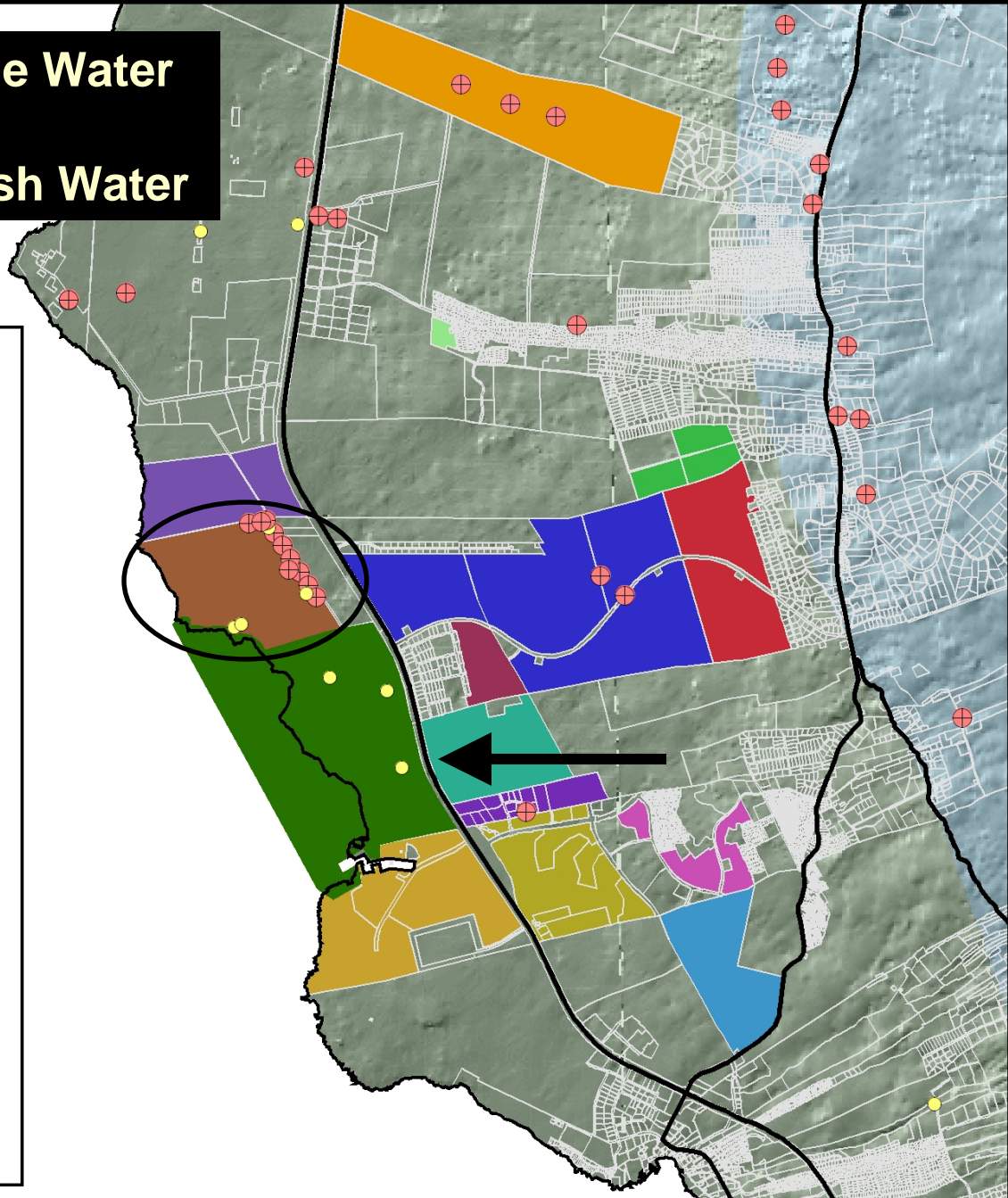
**15.77 Mgd of Potable Water**

**2.20 Mgd of Brackish Water**



**Legend**

- Tax Map Key boundaries
- Kaloko Heights
- Kaloko Makai
- Keahuolu Housing Project
- Kealakehe
- Kona Kai Ola
- Kula Nei
- La`i`opua Housing Project
- Lanihau
- McClean Honokohau Properties
- Seascape Condominium
- The Shores at Kohanaiki
- TSA Corp.
- `O`oma Beachside Village
- Palamanui



# Water Quality: Non-Point Source Pollution







## Land Development: Resource use/change



**National Park: natural and  
cultural resource protection**



# Nonpoint Source Pollution: Participation in administrative proceedings.

## Land Use Commission

- Light Industrial Park. (2001)
  - 13 hearings, >100 exhibits
  - 23 protective conditions  
Stormwater; Wastewater;  
Pollution prevention
- Stipulated agreements
  - Mixed Industrial Park (2002)
  - Light Industrial Park (2002)
  - Residential (2007)
- Intent to intervene
  - Commercial/Residential (2007)
  - Commercial/Residential (2008)

## Hawaii County Council (2002)

- Pilot storm drain program for roadways in Kaloko-Honokohau region
- Storm drain filtration devices
- Potentially include other developments





# Basal Aquifer Water Withdrawal: administrative proceedings, working group.

Kaloko Fishpond

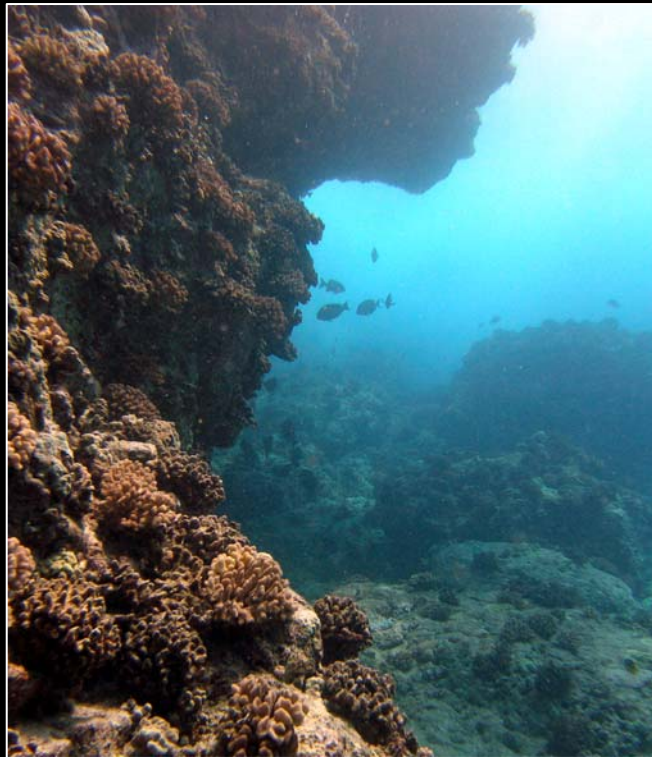
- **Commission on Water Resources Management**
  - Well Construction and Pump Installation Permits
- **County of Hawaii Planning Department**
  - Special Management Area Permit
- **Department of Health**
  - Underground Injection Control Permit
- **Working Group of Stakeholders**
  - Raise awareness of potential impacts; Cooperate on resource protection; Collaborate on data sharing and developing tools to evaluate sustainability

Park  
Boundary

Shores at Kohanaiki  
2.2 Mgd for irrigation  
8 production wells  
1 injection well

# Positive Results

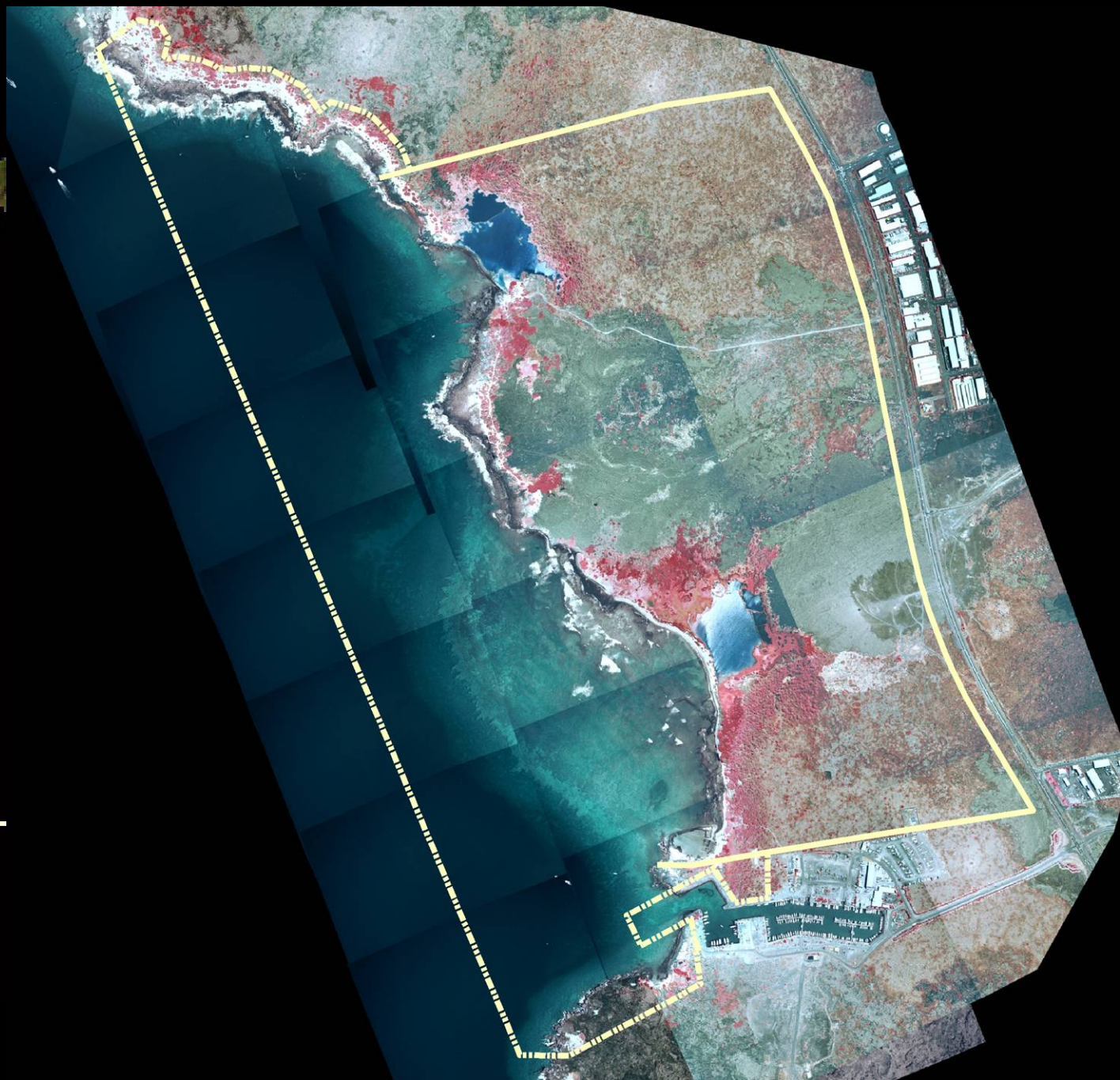
- Raise awareness of resources & ecosystem needs
- Protective conditions and standards - monitoring, testing
- Conditions binding on landowner



# Limitations



- Only immediate area protected
- Large time and resource investment, incl. length of time to decision
- Only new developments, new wells
- **No effective enforcement mechanism**
- **Singular actions, Incremental and sporadic, development by development, well by well; cumulative effects not considered**



0.08%  
Main F