

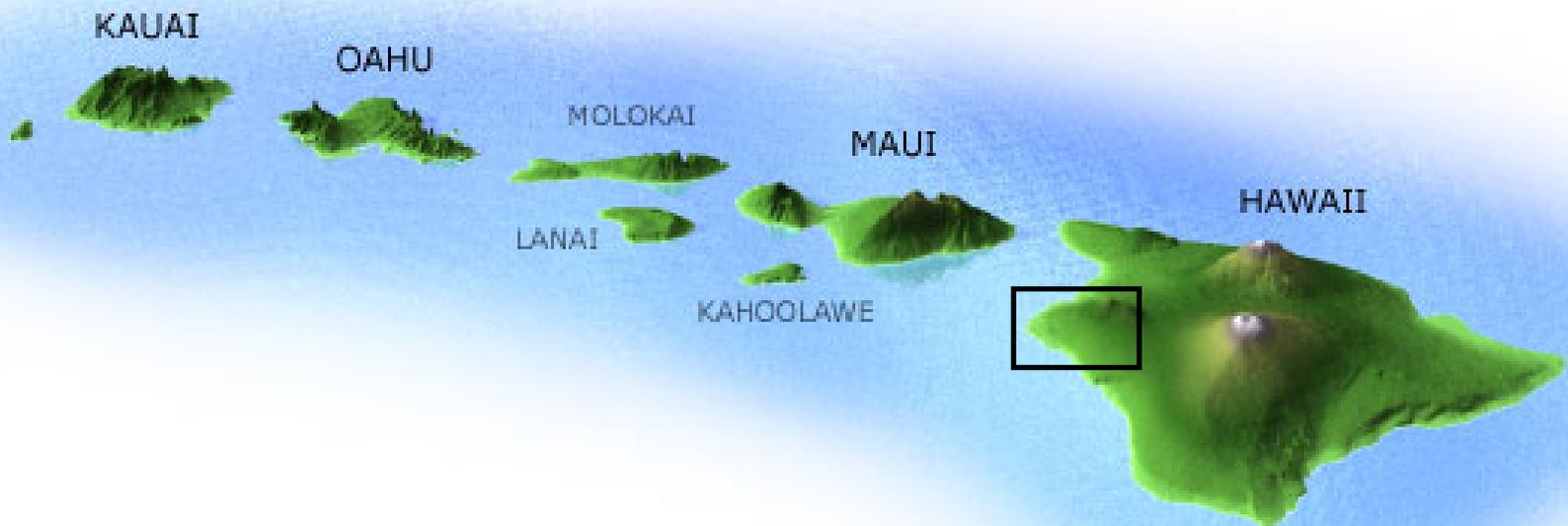
# Can Hawaii's Public Trust Doctrine Protect Ground-Water Dependent Ecosystems?

Paula A. Cutillo

NPS Aquatic Professionals Meeting

February 2008

# The Islands of Hawaii



# Mission

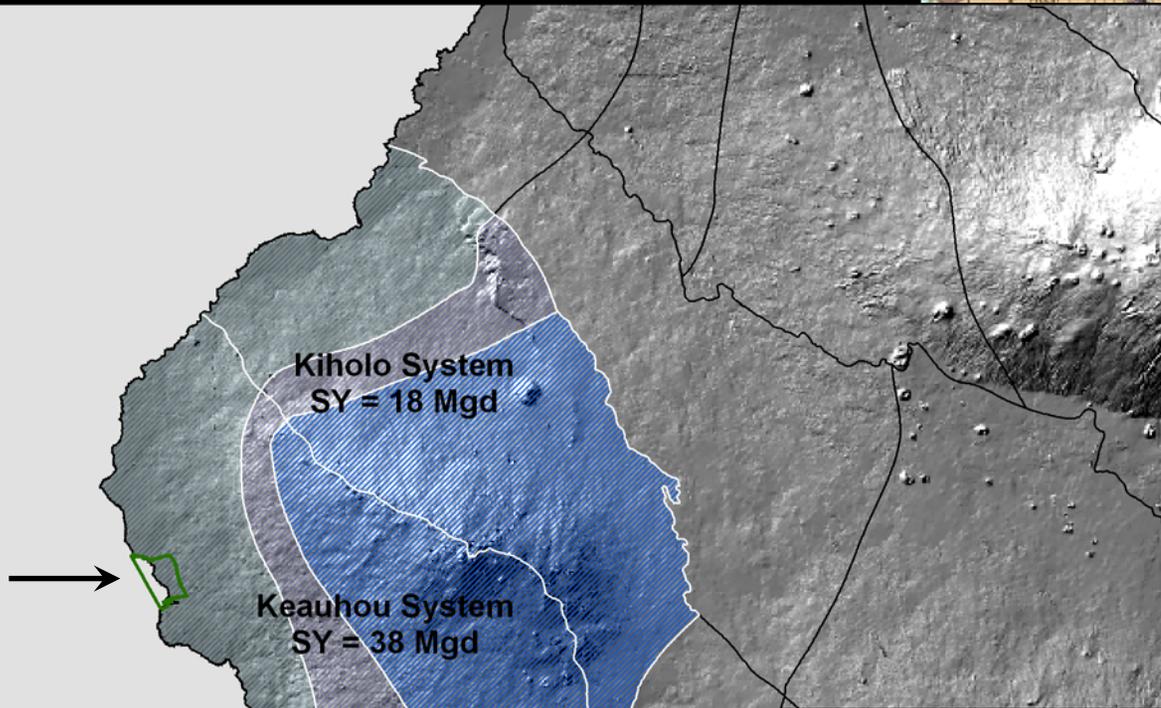
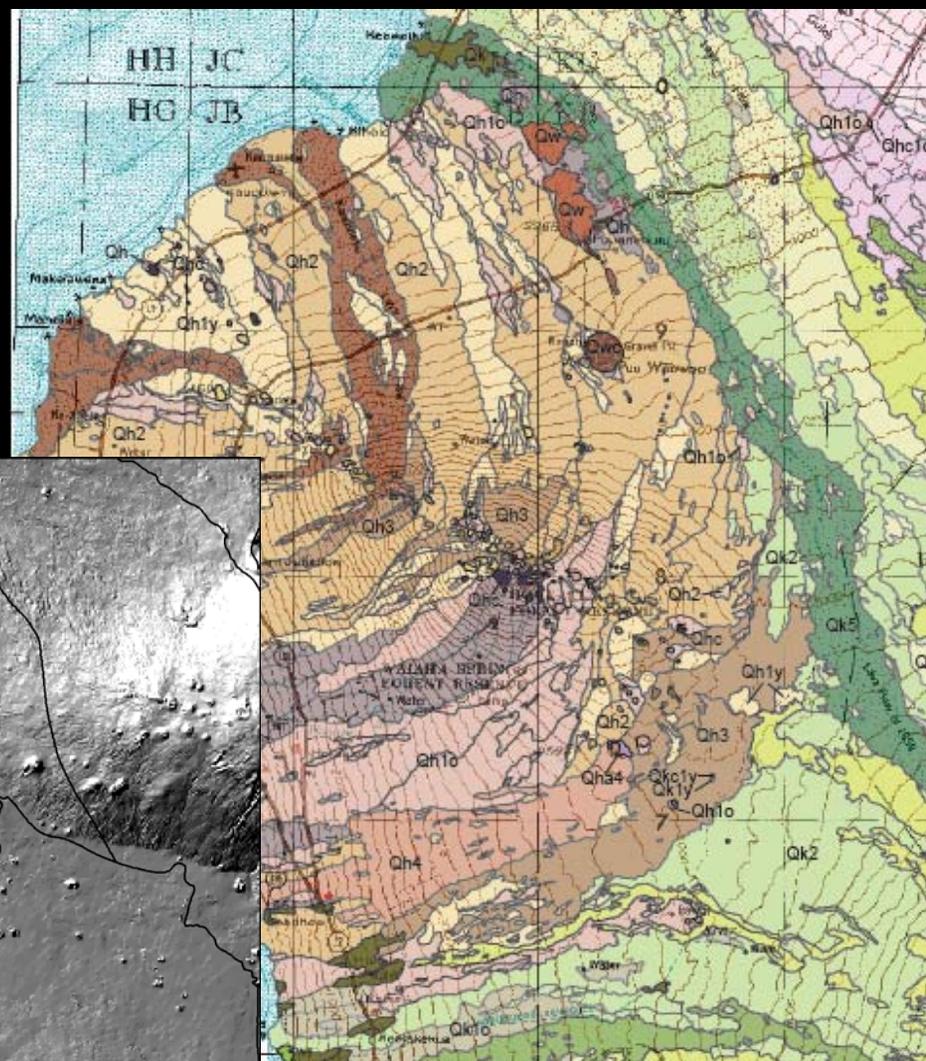
## Kaloko-Honokohau NHP

- To provide a center for the preservation, interpretation, and perpetuation of traditional native Hawaiian activities and culture
- To provide a needed resource for the education, enjoyment, and appreciation of such traditional native Hawaiian activities and culture by local residents and visitors

# Hualalai Aquifer Sector

SY = 56 Mgd

(62,750 ac-ft/yr)



From: USGS OFR 2007-1089

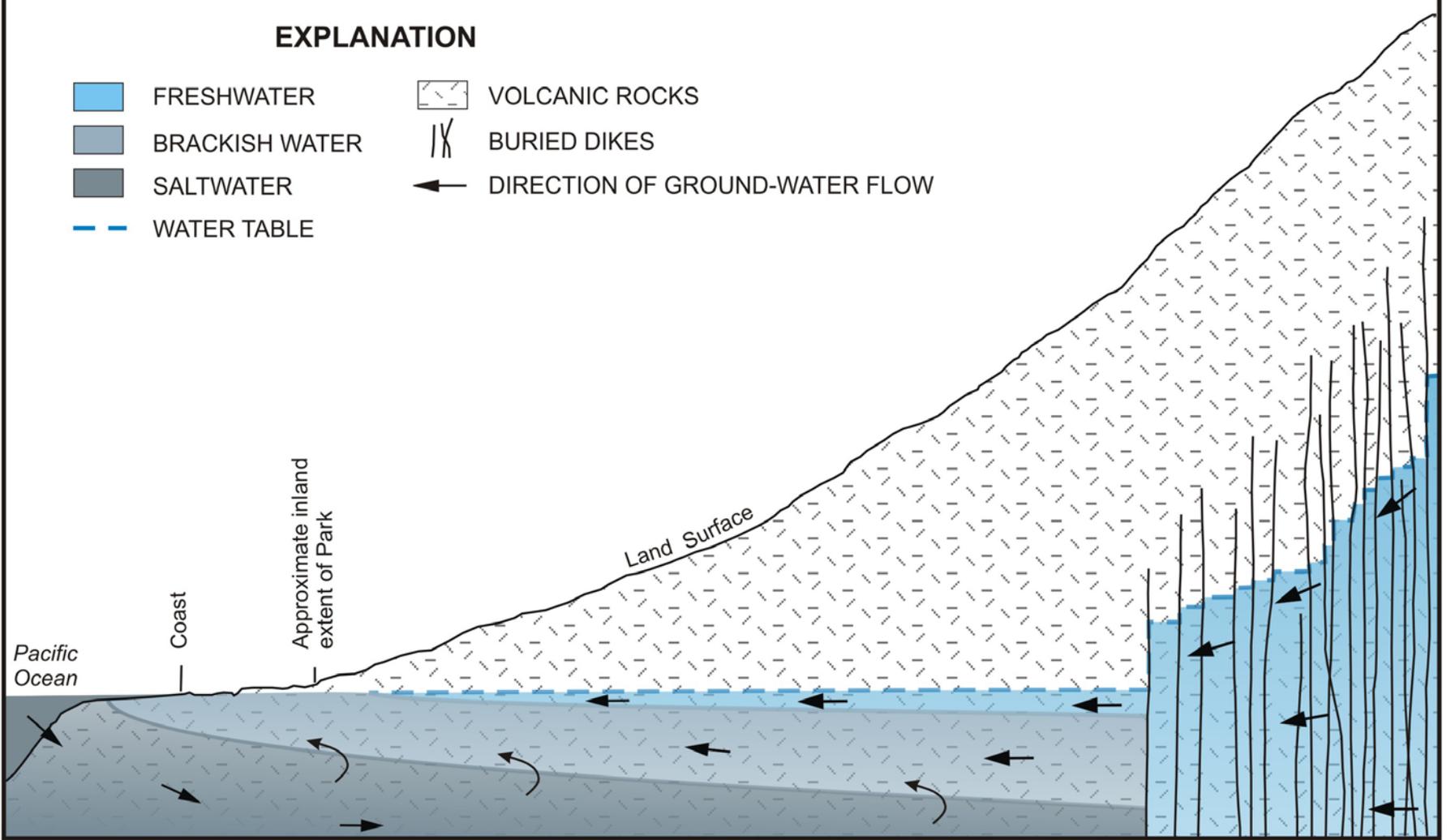
0 2.5 5 Miles

WEST

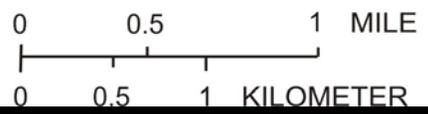
EAST

### EXPLANATION

- FRESHWATER
- BRACKISH WATER
- SALTWATER
- WATER TABLE
- VOLCANIC ROCKS
- BURIED DIKES
- DIRECTION OF GROUND-WATER FLOW



Vertical scale greatly exaggerated





0 0.25 0.5 Miles

### Legend

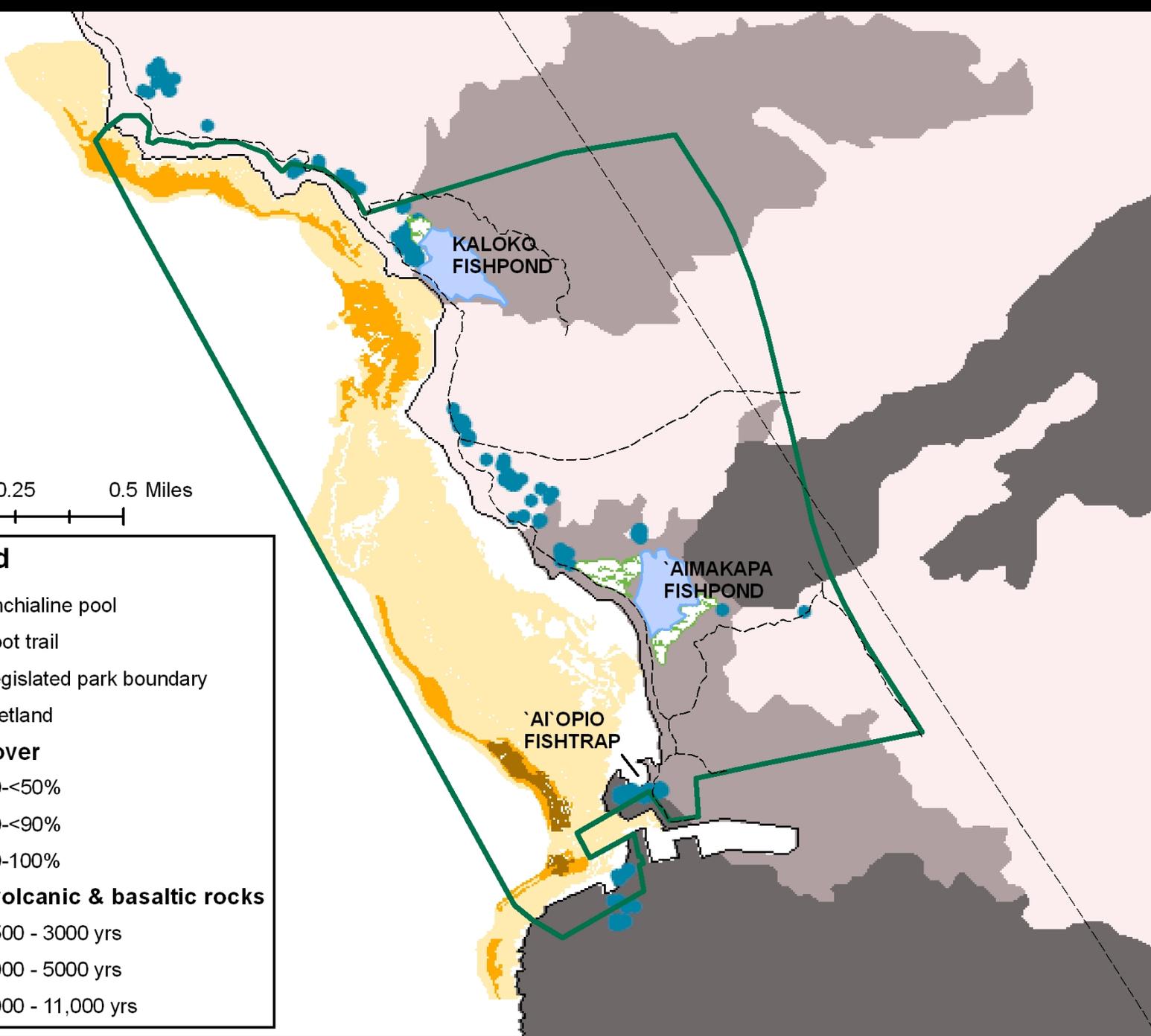
-  Anchialine pool
-  Foot trail
-  Legislated park boundary
-  Wetland

### Coral cover

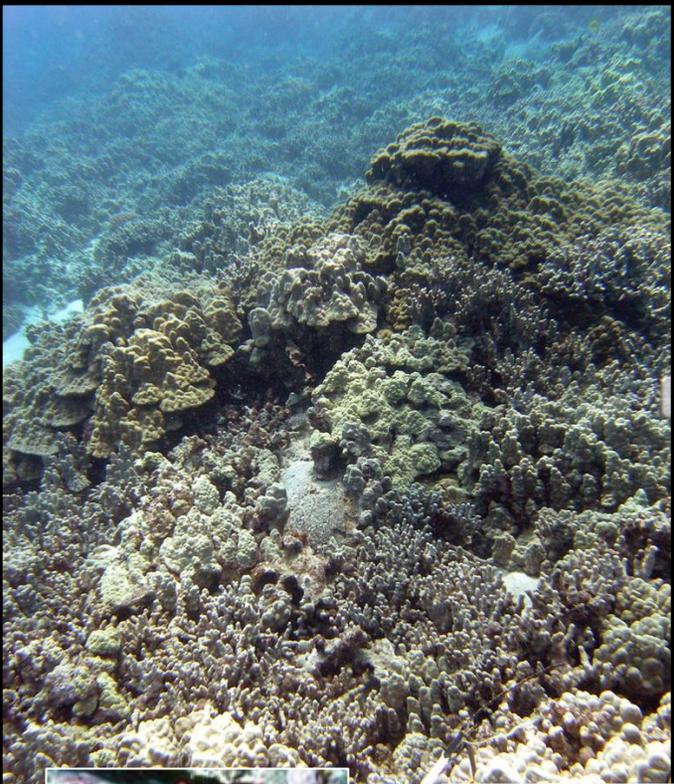
-  10-<50%
-  50-<90%
-  90-100%

### Age of volcanic & basaltic rocks

-  1500 - 3000 yrs
-  3000 - 5000 yrs
-  5000 - 11,000 yrs







red pencil urchin



ornate butterfly fish



mullet



Hawaiian coot



# Anchialine Pools



red pond shrimp



orange-black damselfly



How much water do brackish-water ecosystems need to sustain themselves?



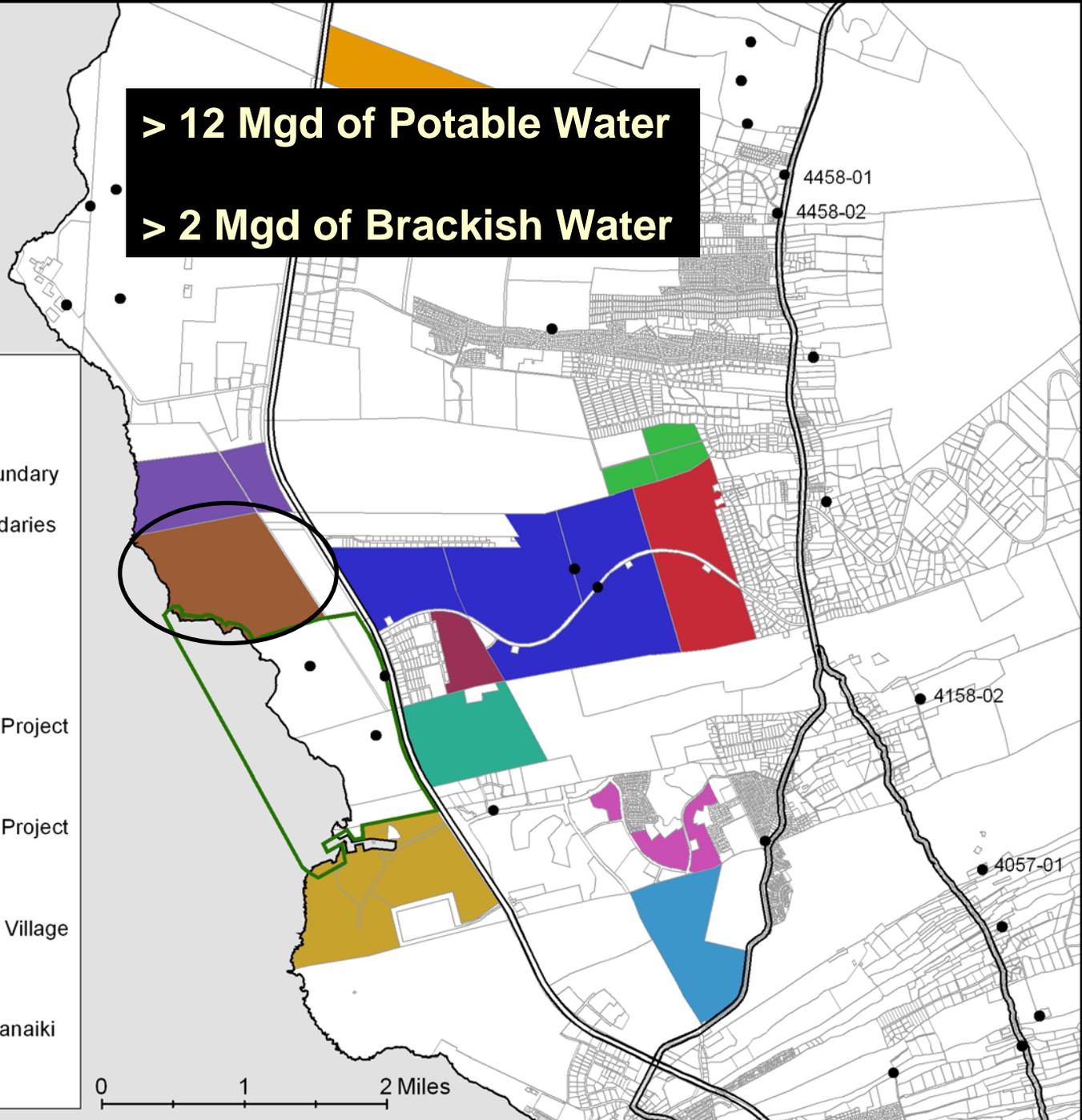


**> 12 Mgd of Potable Water**  
**> 2 Mgd of Brackish Water**

**Legend**

- Permitted wells
- ▭ Legislated park boundary
- ▭ Tax Map Key boundaries
- ▭ Kaloko Heights
- ▭ Kula Nei
- ▭ Kaloko Makai
- ▭ Keahuolu Housing Project
- ▭ Kona Kai Ola
- ▭ La'i'opua Housing Project
- ▭ Lanihau
- ▭ 'O'oma Beachside Village
- ▭ Palamanui
- ▭ The Shores at Kohanaiki
- ▭ TSA Corp.

0 1 2 Miles



# Sustainable Yield & Pumpage

## Hualalai Aquifer Sector

System	SY (MGD)	Max Annual Average Use (MGD)	Maximum Capacity of Existing Wells (% of SY)
Keauhou	38	12	65%
Kiholo	18	4	135%
<b>Total</b>	<b>56</b>	<b>16</b>	<b>88%</b>



# Public Trust Doctrine

- Common resources such as water are to be held in trust by the State for the use and enjoyment of the general public
- Balancing between public and private interests begins with a presumption in favor of public use, access, and enjoyment



# Hawaii State Water Code

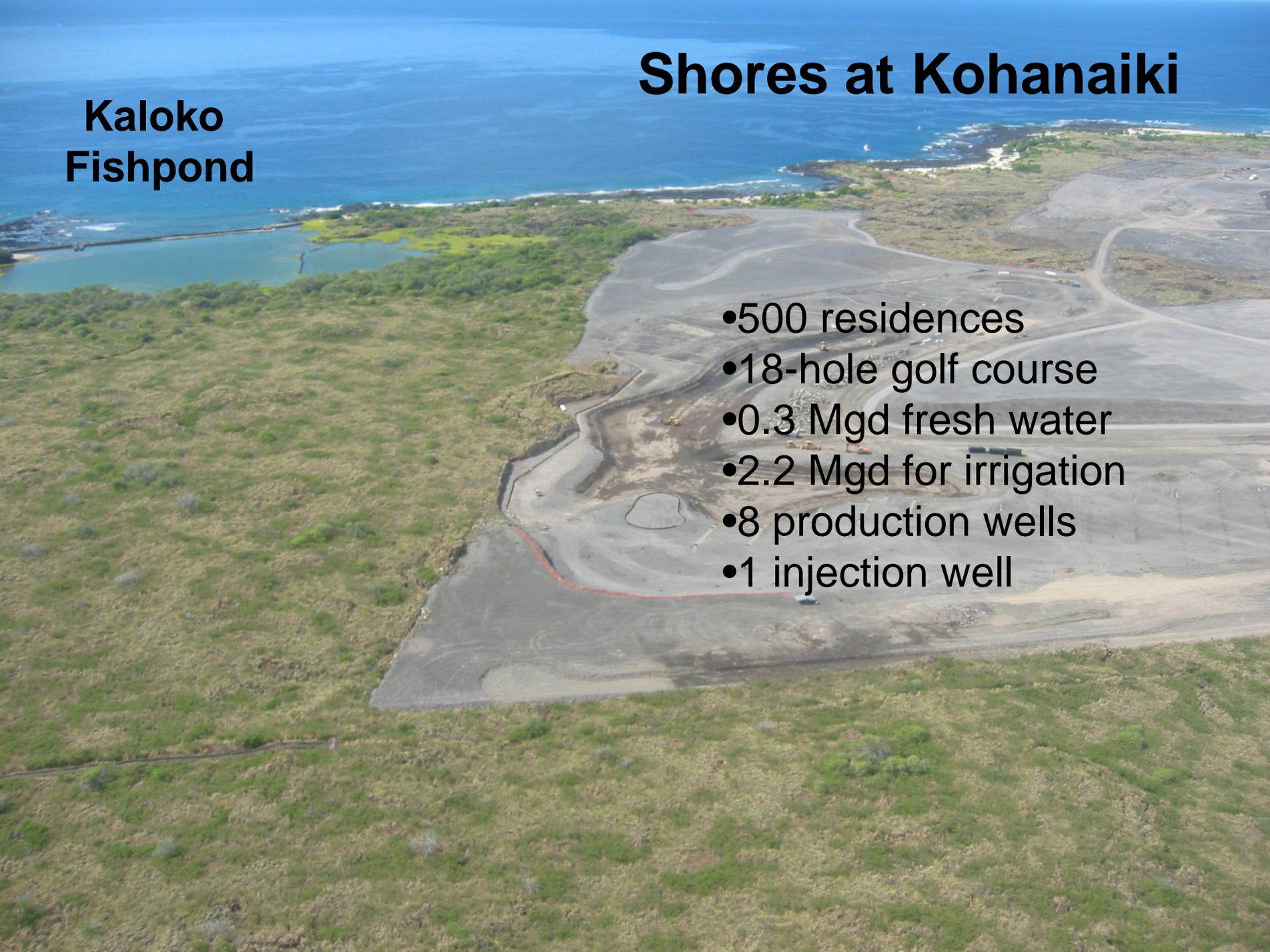
- *Maximum beneficial use for domestic, commercial and industrial purposes*
- *Adequate provision made for*
  - *traditional and customary Hawaiian rights*
  - *fish and wildlife*
  - *ecological balance and scenic beauty*
  - *municipal uses*
  - *public recreation*
  - *navigation*



# Shores at Kohanaiki

Kaloko  
Fishpond

- 500 residences
- 18-hole golf course
- 0.3 Mgd fresh water
- 2.2 Mgd for irrigation
- 8 production wells
- 1 injection well

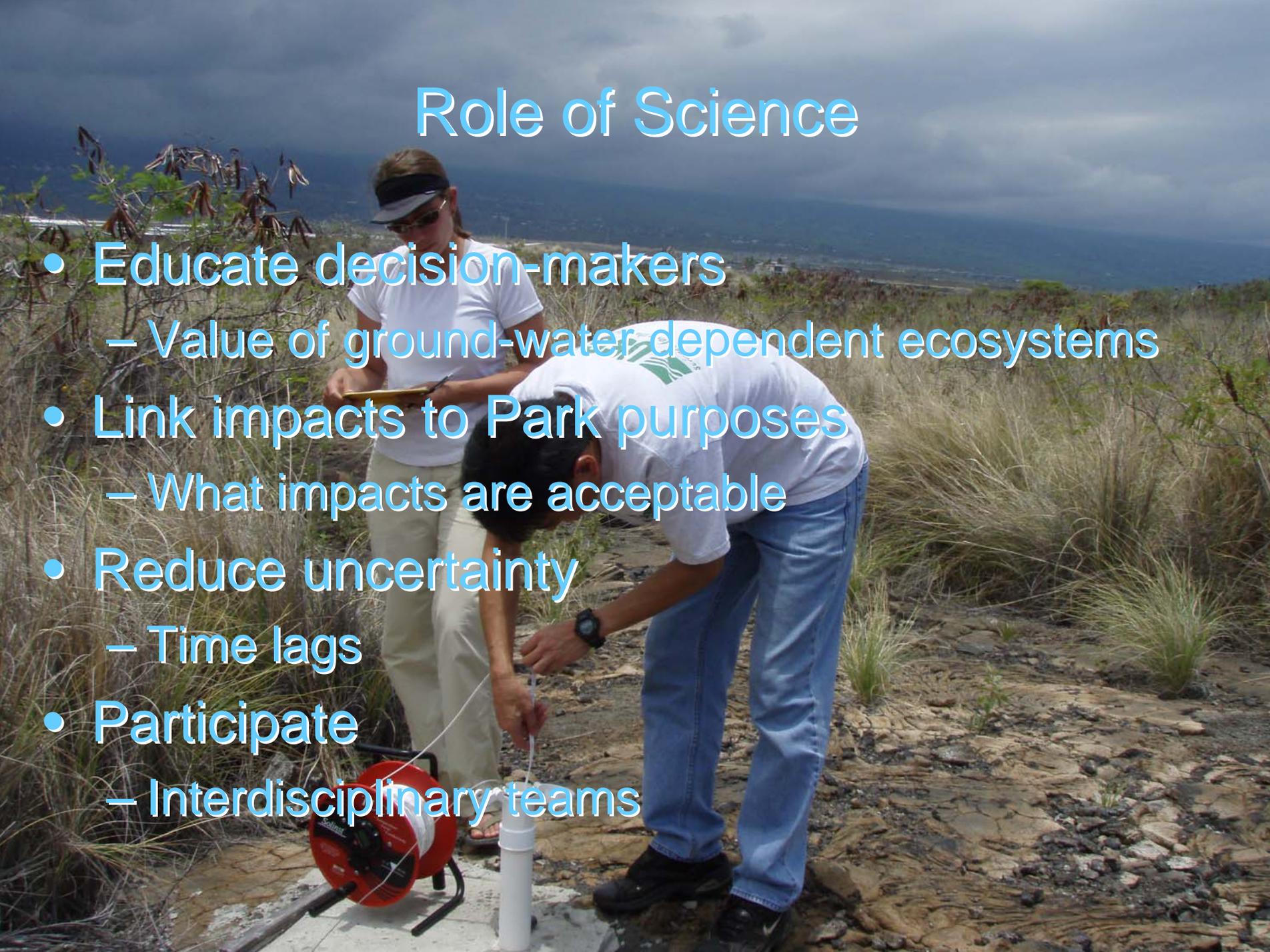




Withdrawal of water from Well #17 was the focus of the Kukui Contested Case Hearing.

# Role of Science

- Educate decision-makers
  - Value of ground-water dependent ecosystems
- Link impacts to Park purposes
  - What impacts are acceptable
- Reduce uncertainty
  - Time lags
- Participate
  - Interdisciplinary teams



# Acknowledgements

- Sallie Beavers, KAHO ecologist
- Eric Lord, WRB water-rights specialist

