OVERVIEW OF THE HAWAIʻI COMMISSION ON WATER RESOURCE MANAGEMENT

Kohala Community Outreach Meeting

January 16, 2025

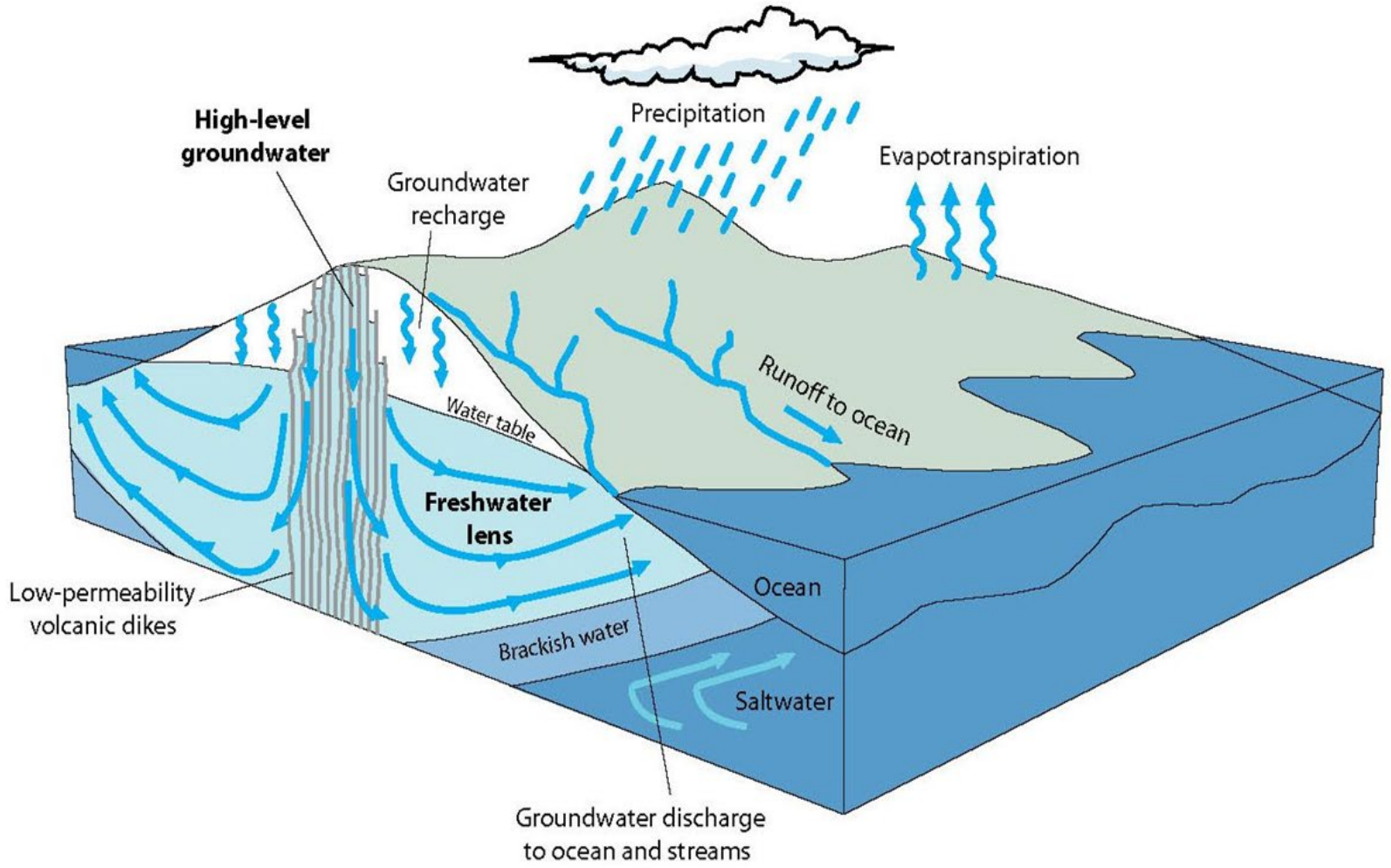
PRESENTATION OVERVIEW

- Water resources in Hawai‘i
- Who is the Commission on Water Resource Management (“CWRM”)?
- How does CWRM protect, manage, and regulate water in Hawai‘i?
- Water resources in Kohala

WATER RESOURCES IN HAWAIʻI

ISLANDS IN THE PACIFIC

GENERALIZED HYDROLOGY ON ISLANDS

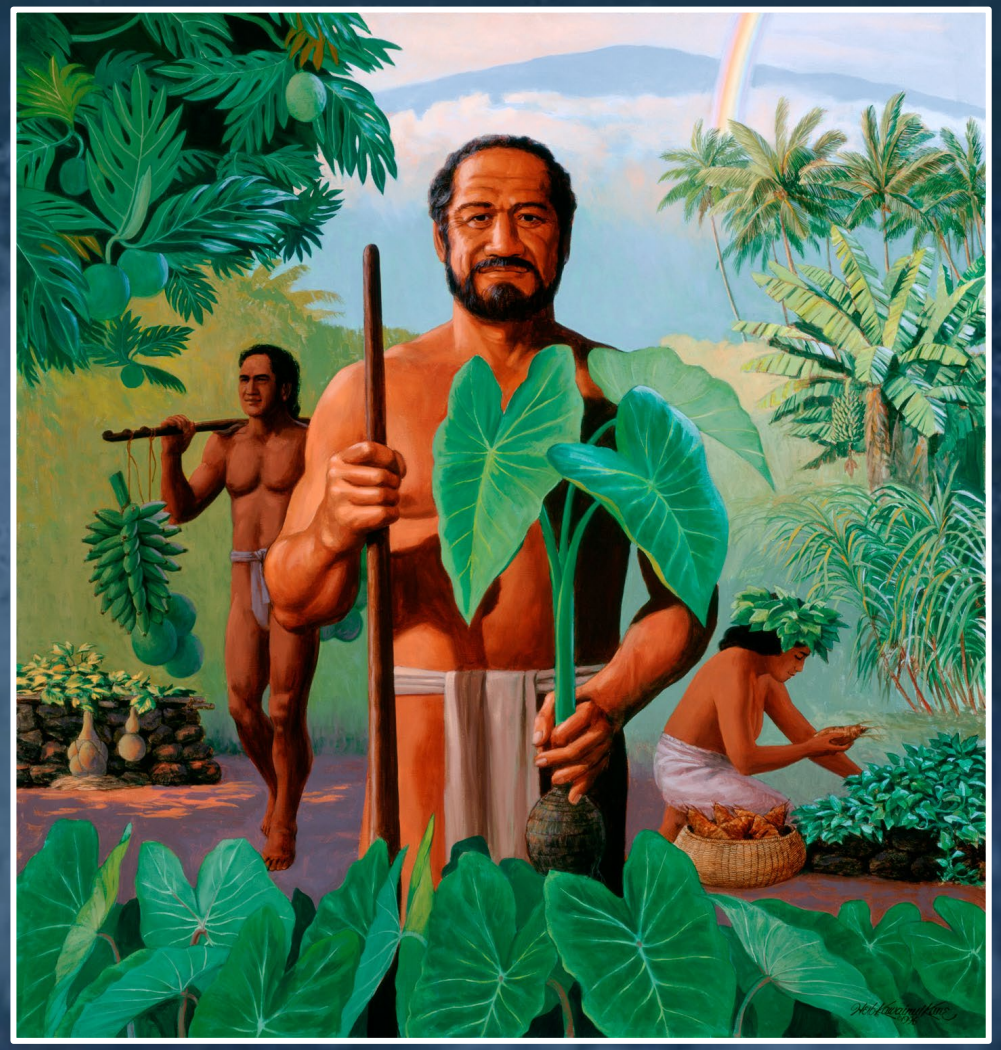


Izuka et al. 2018. Volcanic Aquifers of Hawaii—Hydrogeology, Water Budgets, and Conceptual Models. USGS SIR 2015-5164

Commission on Water Resource Management
State of Hawaii

HAWAIIAN WATER AND LAND MANAGEMENT

- Kāne brought forth fresh water
- Water is a public trust resource, it cannot be owned
- Water flows “mauka to makai”
- Healthy water resources = healthy thriving communities



WESTERN PERSPECTIVES ON WATER AND LAND MANAGEMENT

- Plantation agriculture = commodification of water
- Water no longer treated as a public trust resource
- Water diverted out of watersheds for the benefit of a select few

WHO IS THE COMMISSION ON WATER RESOURCE MANAGEMENT (CWRM)?

WHO IS CWRM?

- 1978 constitutional amendment mandates a water resource agency
- Created in 1987 & administratively attached to DLNR
- Staff and 7-member Commission
- Administers the State Water Code (HRS Chapter 174C)
- Regulates all waters of the State (surface and ground) and all water users (county municipal and private)
- CWRM manages water quantity vs. quality (DOH)

HAWAI'I CONSTITUTION

*"The State has an obligation to **protect, control and regulate the use of Hawaii's water resources** for the benefit of its people.*

Public Trust Doctrine

WHO IS CWRM? (cont.)

- 7 members of the Commission
  - Chairperson of BLNR (Chair of Water Commission)
  - Director, State DOH (ex-officio voting member)
  - 5 members are appointed by the Governor and approved by the State Senate
    - 1 member must have "substantial experience or expertise **in traditional Hawaiian water resource management techniques** and in traditional Hawaiian riparian usage such as those preserved by 174C-101"
    - Each member must have "substantial experience in the area of water resource management"

Dawn N.S. Chang

Kathleen Ho (DOH designee)

Lawrence H. Miike

Aurora Kagawa-Viviani

Wayne Katayama

Paul Meyer

V.R. Hinano Rodriguez

MISSION

- To protect and manage the water resources of the State and provide for the maximum beneficial use of water by present and future generations

VISION

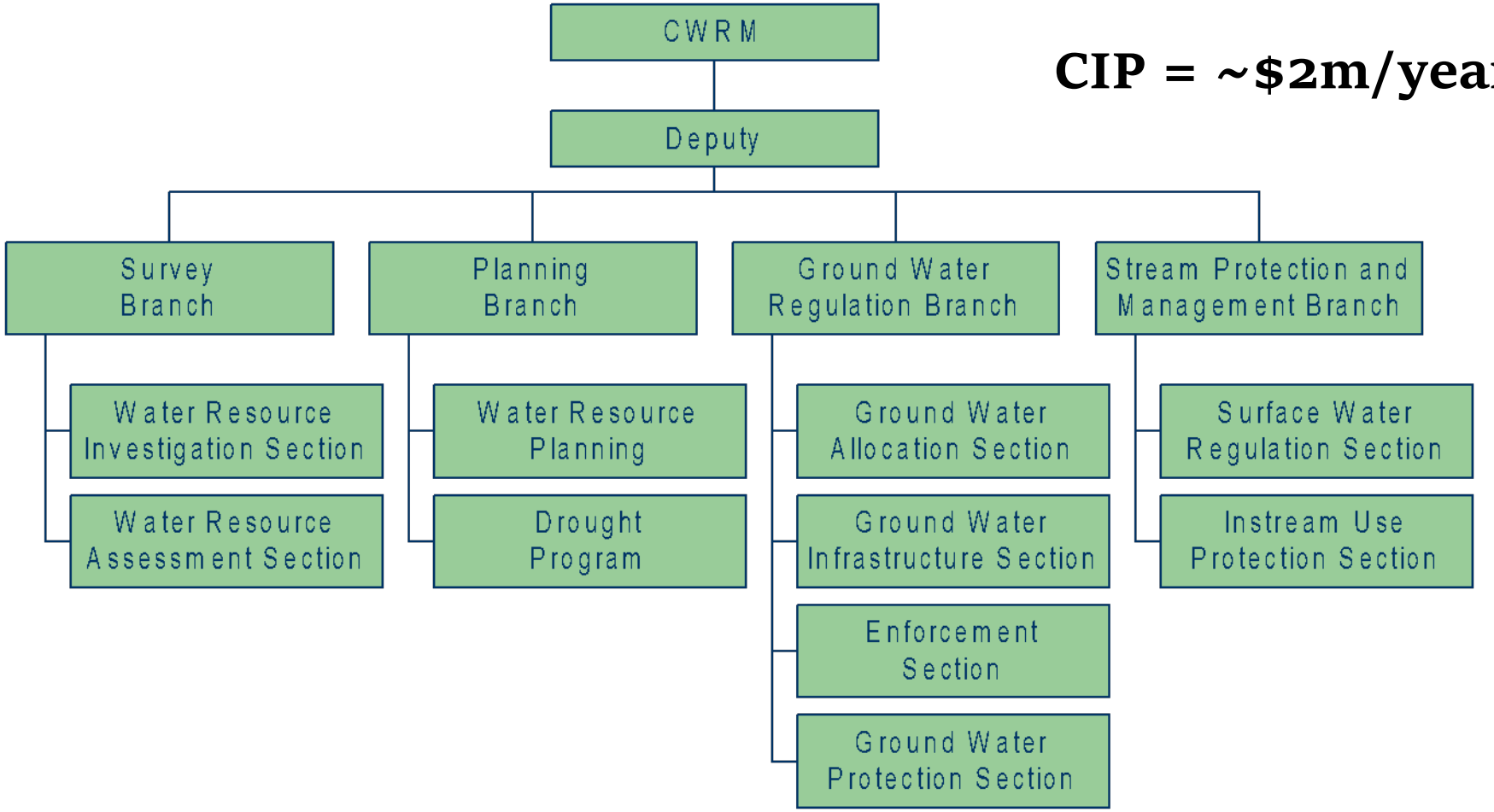
- Flowing streams, sustainable aquifers, and functioning watersheds for the use, enjoyment, and benefit of all

ORGANIZATIONAL CHART

Commission staff = 33 positions

Budget = ~$4m/year operating

CIP = ~$2m/year



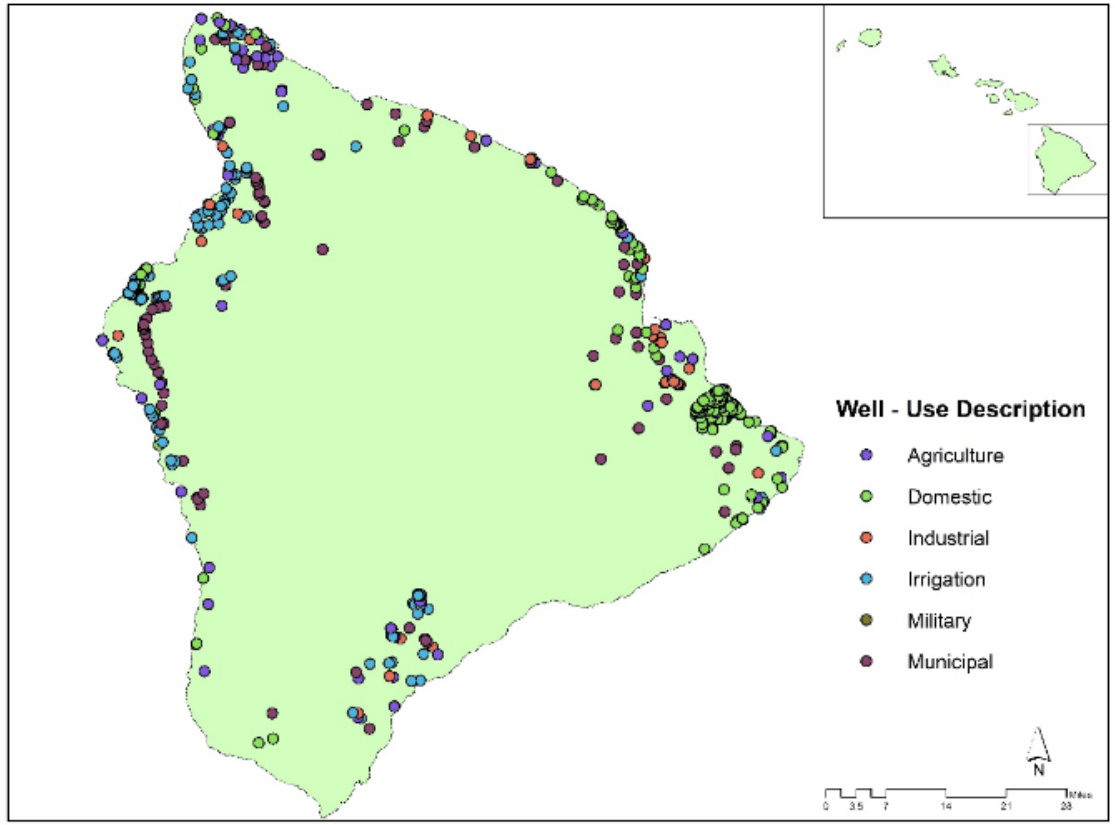
CWRM PROGRAM OVERVIEW

- Planning
  - Develops comprehensive, long-range plans for the protection, conservation, and management of the State's water resources.
- Ground Water Regulation
  - Issues well construction and pump installation permits, ground water use permits in management areas, monitors aquifer health, and establishes sustainable yields.
- Stream Water Protection and Management
  - Issues stream channel alteration permits, stream diversion works permits, surface water use permits in management areas, establishes instream flow standards, and conducts surface water resource assessments
- Survey
  - Collects and analyzes hydrologic data and assesses water resource availability and use.

PLANNING

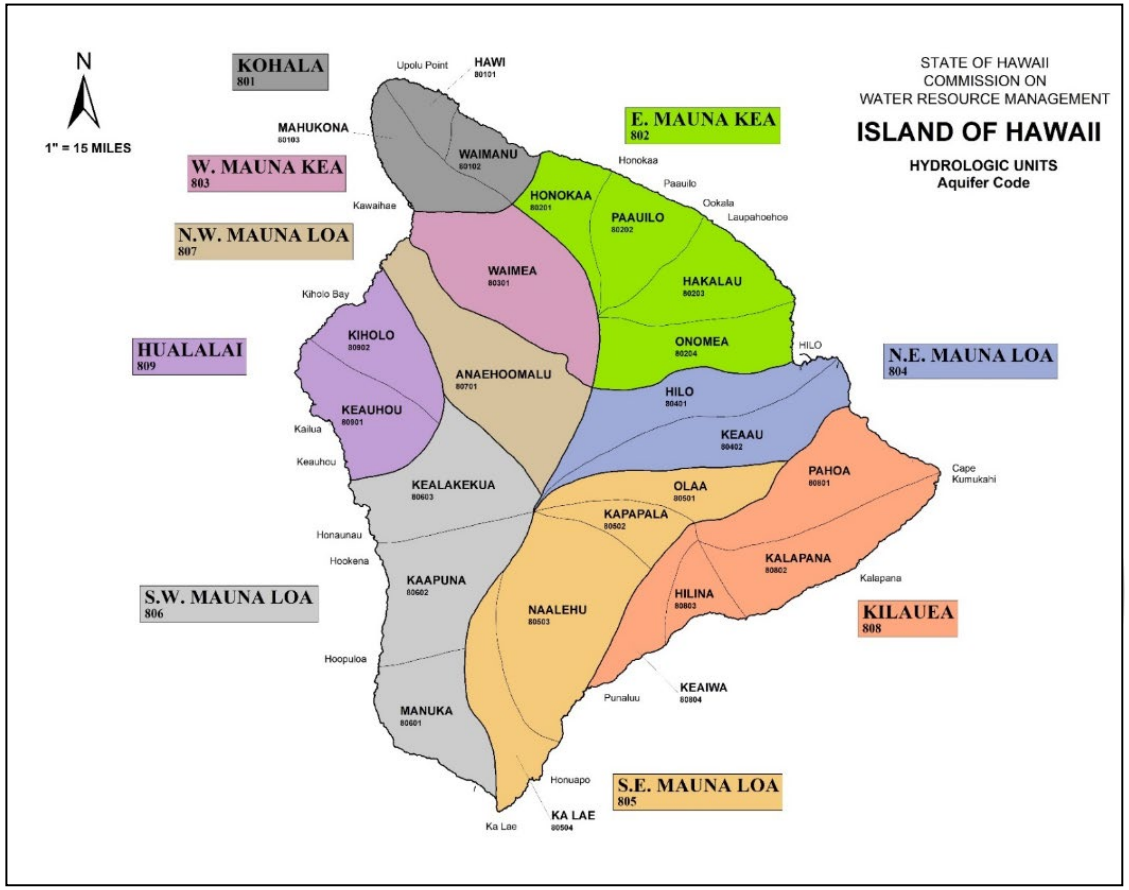
- Implement the State Water Code through long-range planning and agency coordination
- Develop and update the Hawai‘i Water Plan (HWP)
- Water conservation, shortage and drought planning, water audits

GROUND WATER REGULATION



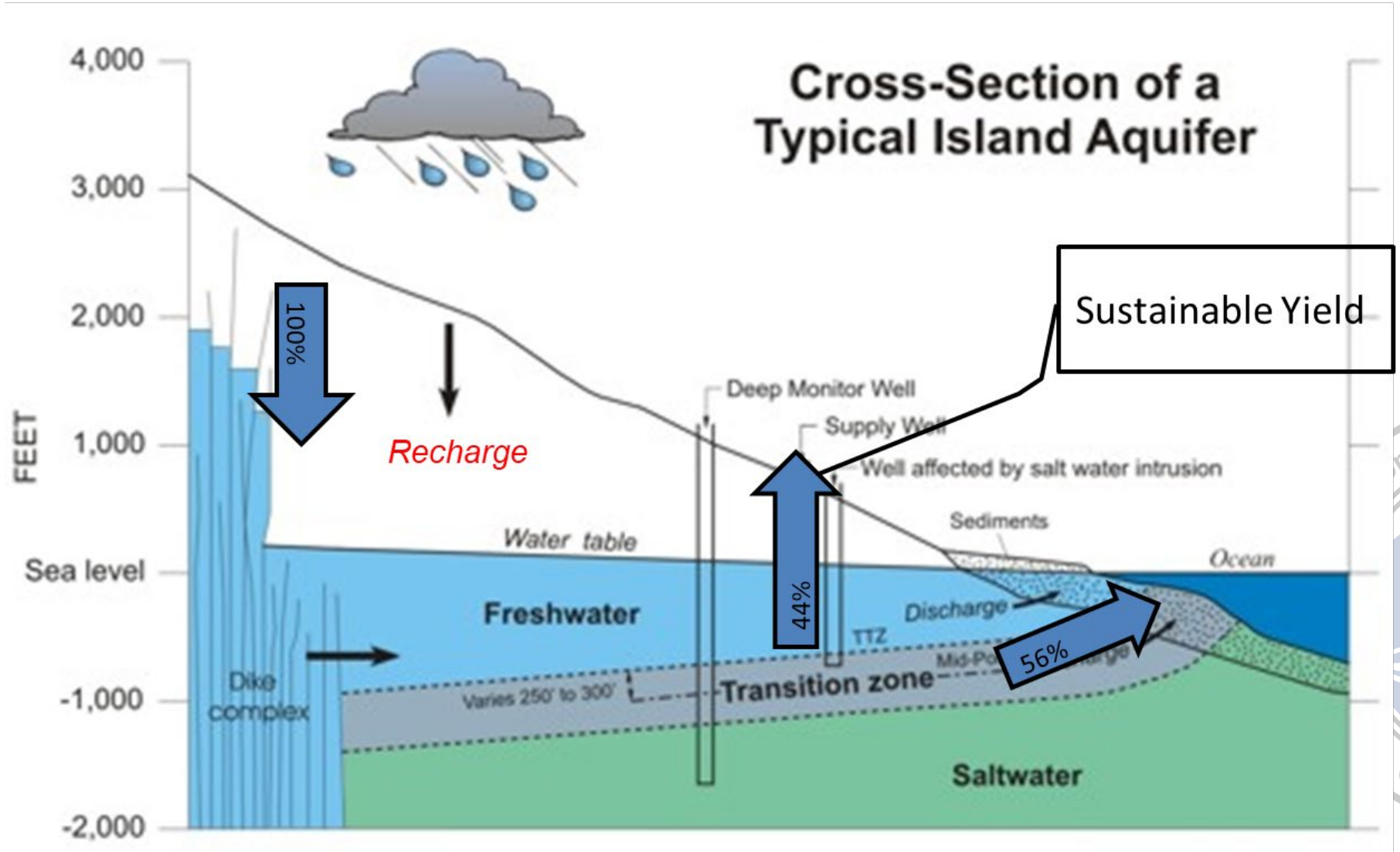
- Sustainable limits
(aka: “Sustainable Yields”) are set for each aquifer system

- 5,500 wells in the State
- 110 aquifer system areas statewide

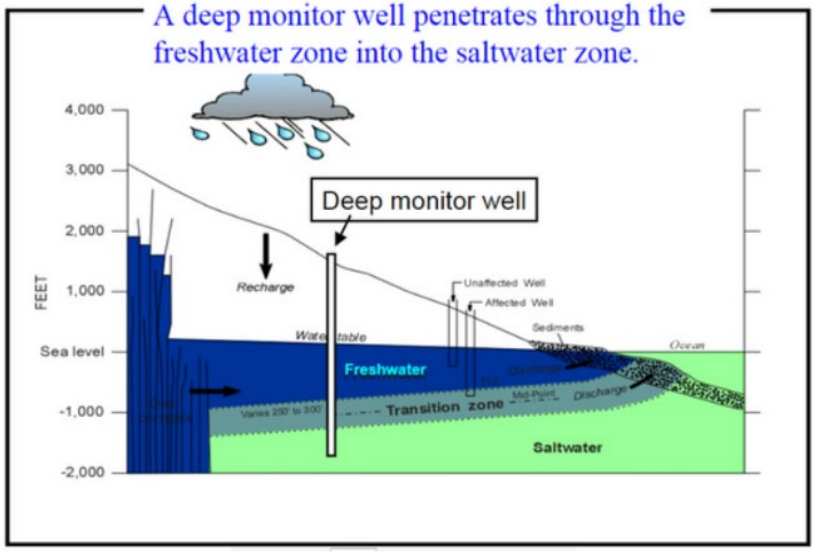


How is Groundwater protected?

Resource Assessments – Groundwater Sustainable Yields

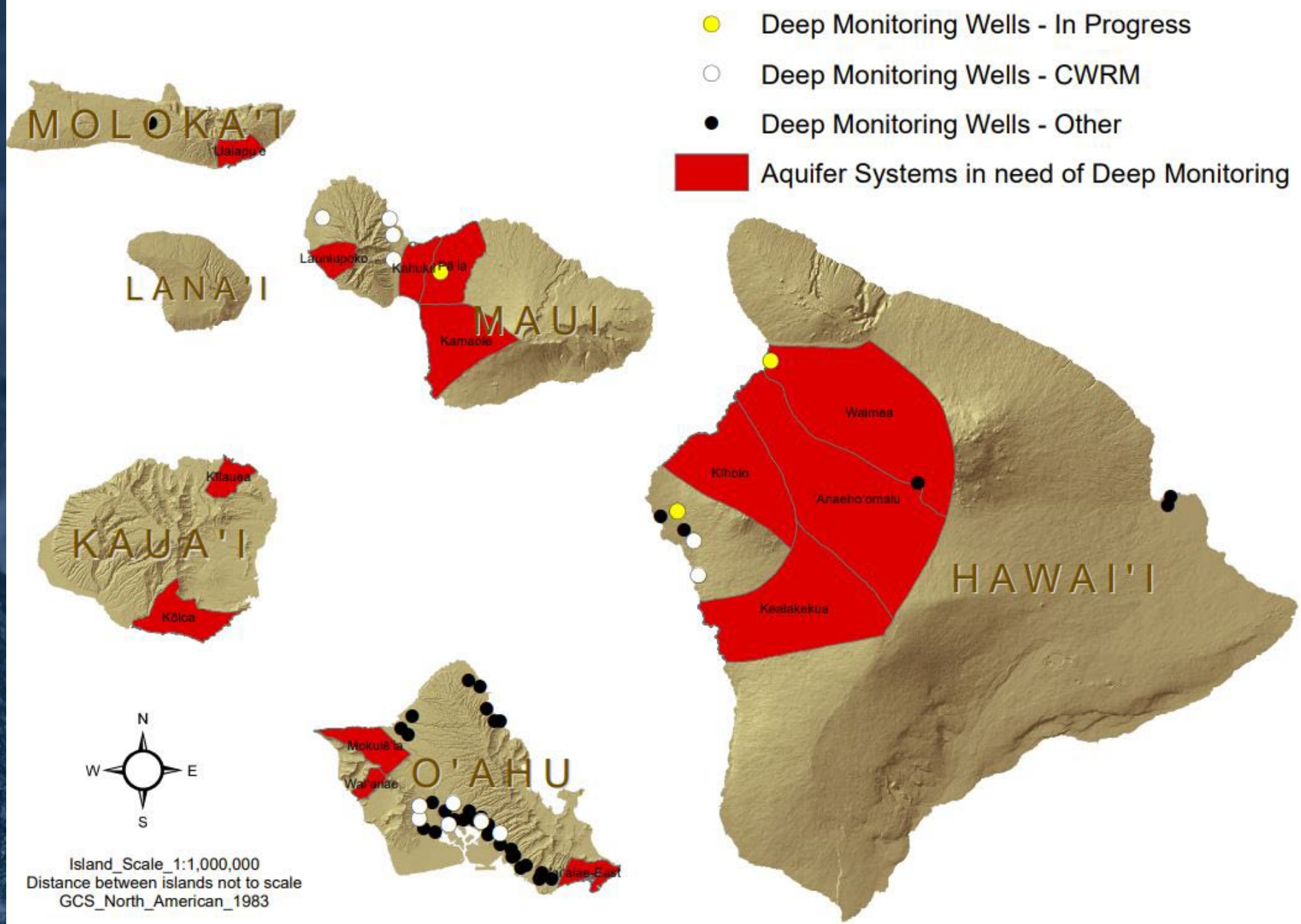


SURVEY BRANCH



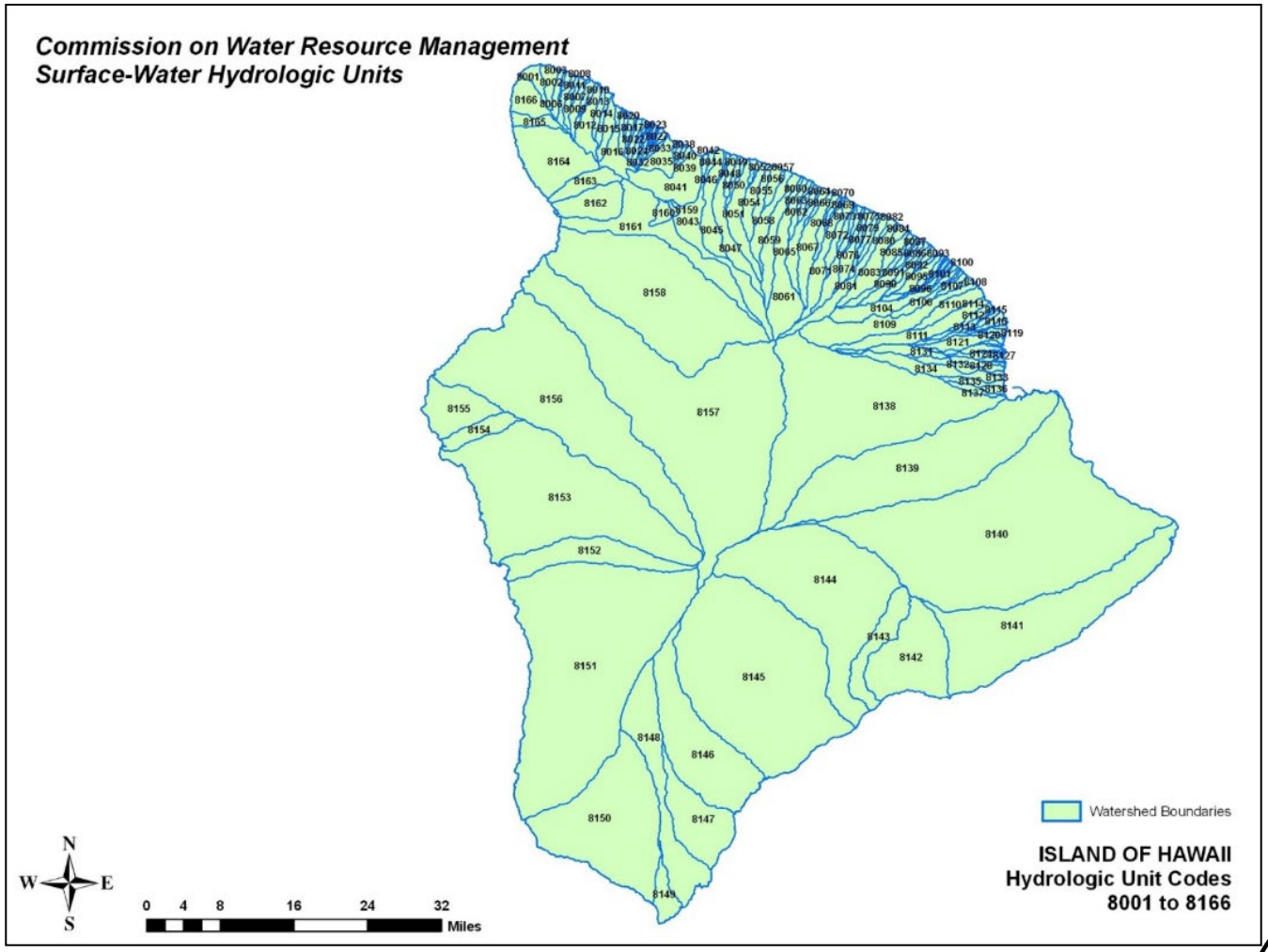
- Water Use Reporting
- Ground water hydrologic monitoring
- Deep Monitor Well ("DMW") Program
  - CWRM currently monitors 12 DMWs: 6 on O'ahu, 4 on Maui, and 2 on Hawai'i Island
  - Ideally, there would be 3 DMWs in each Aquifer System Area (over 300 DMWs)
- Capital Improvement Project ("CIP") for new DMWs statewide = ~ $2M/year

Aquifer Systems in need of Deep Monitoring Wells



STREAM PROTECTION AND MANAGEMENT

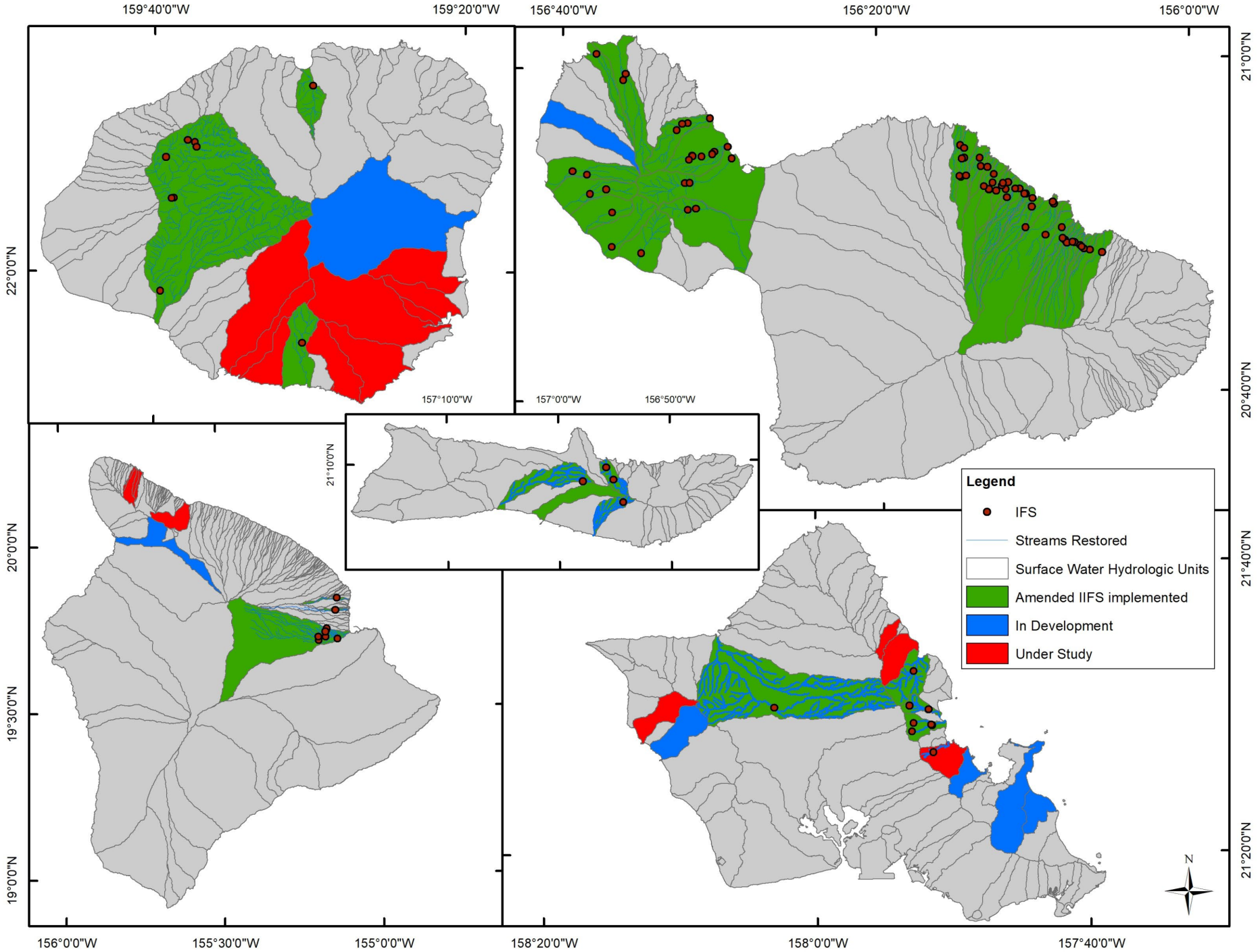
- 376 perennial streams
- ~1,300 stream diversions
- Policies to protect aquatic life, recreational values, and traditional and customary practices (ex: Interim Instream Flow Standards – IIFS)



STREAM PROTECTION AND MANAGEMENT (CONT.)

- Surface water hydrologic monitoring
  - ~85 monitoring sites – streams and ditches
- Also collect data at other locations, conduct seepage runs
- Analyze current and historic USGS and other datasets
- Conducts biological assessments
- Coordinates the United States Geological Survey ("USGS") Cooperative Agreement
  - 44 stream gages, 6 observation wells, 17 rain gages

Amended Instream flow standards Implementation and development



Commission on Water Resource Management
State of Hawaii

HOW DOES CWRM PROTECT, MANAGE, AND REGULATE WATER IN HAWAIʻI?

HAWAIʻI WATER LAW PUBLIC TRUST DOCTRINE

Hawaii Constitution

State Water Code

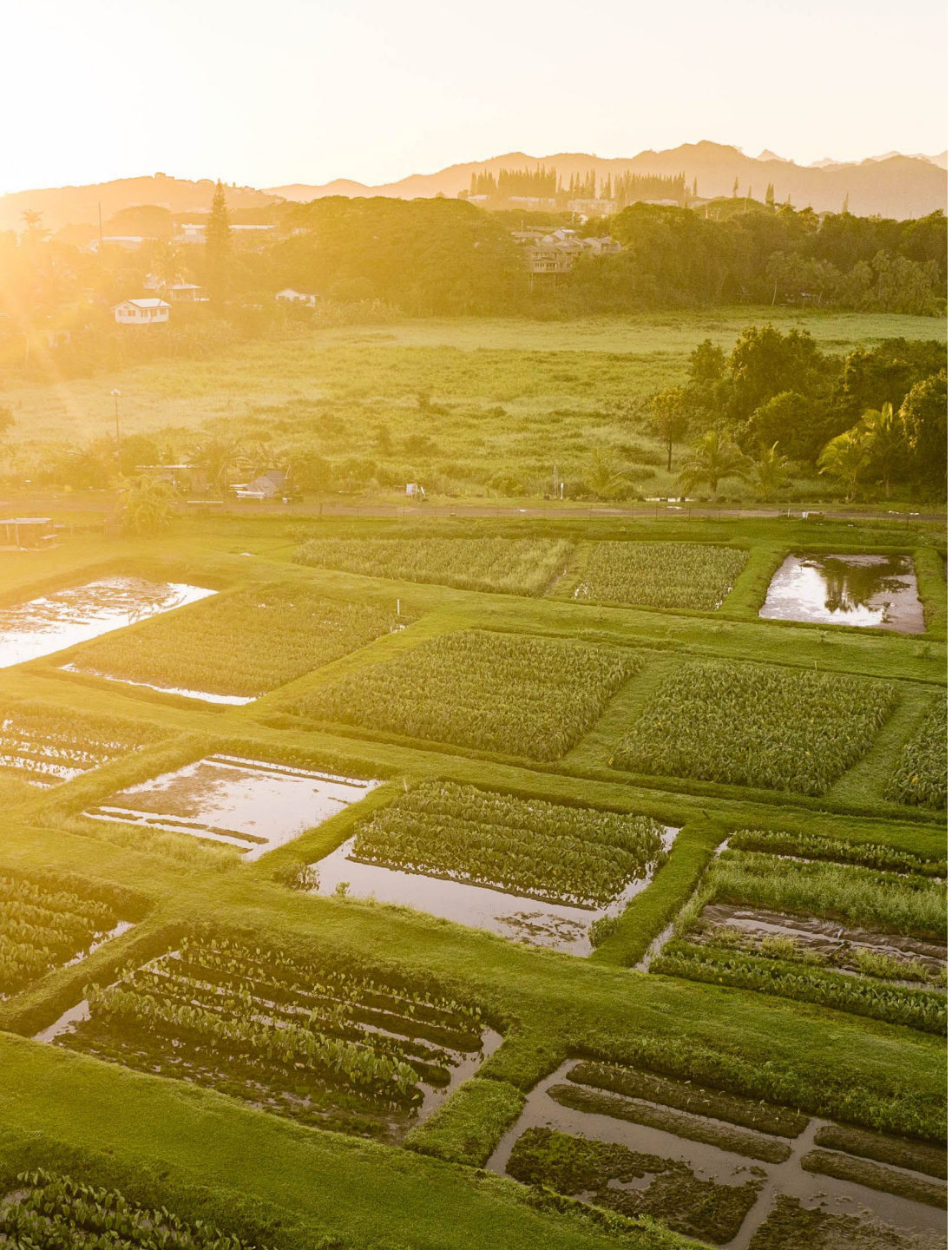
HRS Chapter 174C

Admin Rules

HAR Chapters 13-167 to 13-171

Supreme Court Decisions

- Water is a public trust resource, it cannot be owned
- Imposes a "**dual mandate** of
  - (1) protection
  - (2) maximum reasonable & beneficial use"

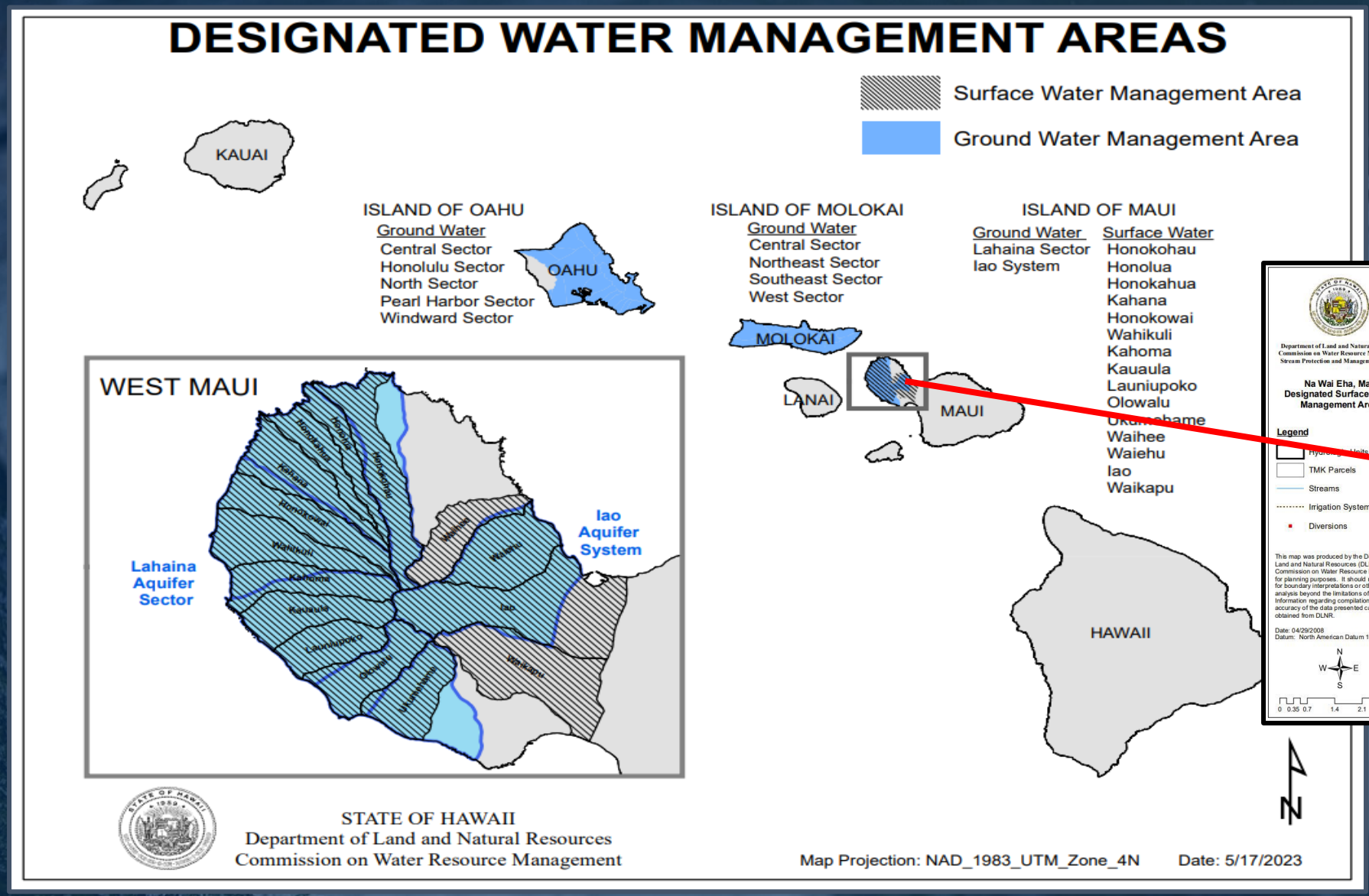


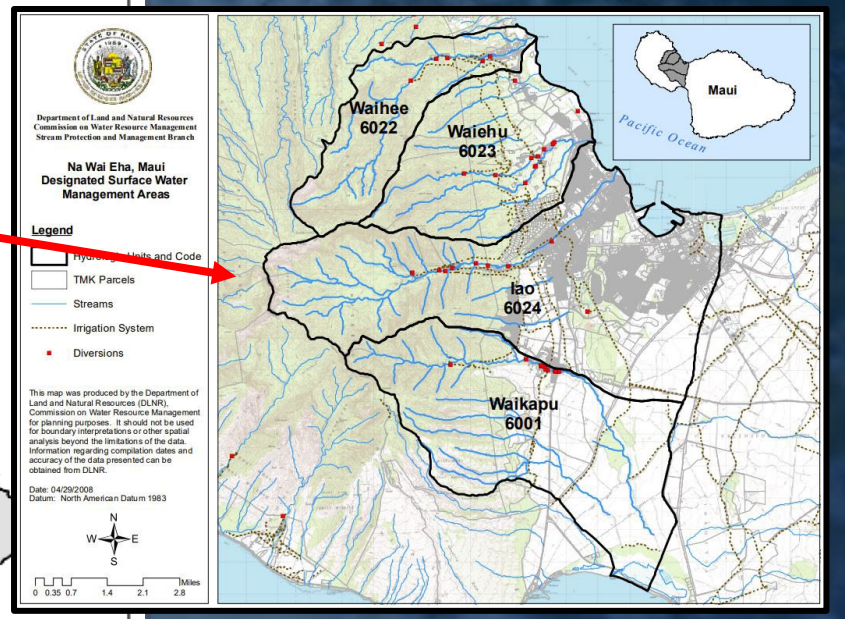
PUBLIC TRUST PURPOSES

1. Environmental protection ("maintenance of water in its natural state")
2. Exercise of traditional and customary Native Hawaiian rights
3. Domestic water use
4. DHHL reservations
5. Appurtenant rights

There are no "*absolute priorities*" between uses under the public trust.

WATER MANAGEMENT AREAS



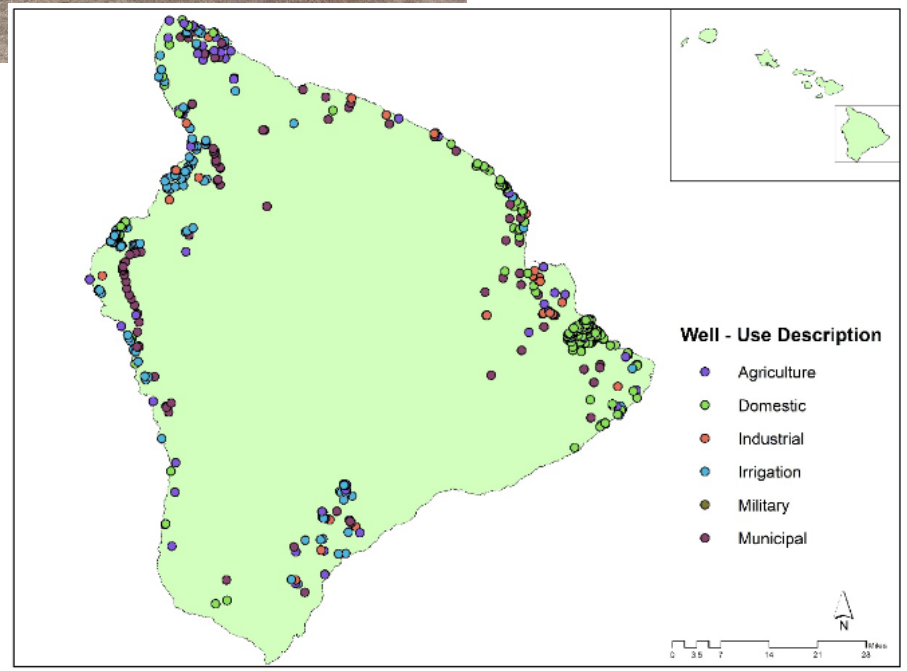


PERMITTING - STATEWIDE

- Well Construction and Pump Installation Permit ("WCPIP")
  - Ex: drilling a new well for ag. purposes

- Stream Diversion Works Permit ("SDWP")
  - Ex: installing a diversion to convey water for ag. uses

- Stream Channel Alteration Permit ("SCAP")
  - Ex: constructing a retaining wall in a stream



- Applicable to all water users (county municipal and private)

WATER USE PERMITS

- Designated areas only
- WUPs can be for ground or surface water
- Identifies quantity of water (ex: X mgd for agriculture)
- Alternatives analysis
- Applicable to all water users (county municipal and private)

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

APPLICATION FOR GROUND WATER USE PERMIT

For Official Use Only:

FORM GWUPA

☐ New Use
☐ Modification of WUP No. ______
☐ Existing Use

For detailed instructions on filling out this application form completely, refer to the attached instructions. Incomplete applications will not be accepted for processing.

APPLICANT INFORMATION

1. APPLICANT INFORMATION			2. SOURCE LANDOWNER INFORMATION		
Name/Company		Contact Person	Name/Company		Contact Person
Mailing Address			Mailing Address		
Phone	Fax	E-mail	Phone	Fax	E-mail

SOURCE INFORMATION

3. ISLAND

4. AQUIFER SYSTEM AREA

4A. SUSTAINABLE YIELD FOR ITEM 4 MGD

5. SOURCE INFORMATION
Attach additional sheets, if necessary.

Well Number (if known)	Well Name	Existing or Proposed?	TMK	Flowmeter installed?
			___ - ___ - ___ : ___ (zone, sector, plat, parcel)	☐ Yes, date installed ___ / ___ / ___ ☐ No
			___ - ___ - ___ : ___ (zone, sector, plat, parcel)	☐ Yes, date installed ___ / ___ / ___ ☐ No
			___ - ___ - ___ : ___ (zone, sector, plat, parcel)	☐ Yes, date installed ___ / ___ / ___ ☐ No
			___ - ___ - ___ : ___ (zone, sector, plat, parcel)	☐ Yes, date installed ___ / ___ / ___ ☐ No
			___ - ___ - ___ : ___ (zone, sector, plat, parcel)	☐ Yes, date installed ___ / ___ / ___ ☐ No
			___ - ___ - ___ : ___ (zone, sector, plat, parcel)	☐ Yes, date installed ___ / ___ / ___ ☐ No

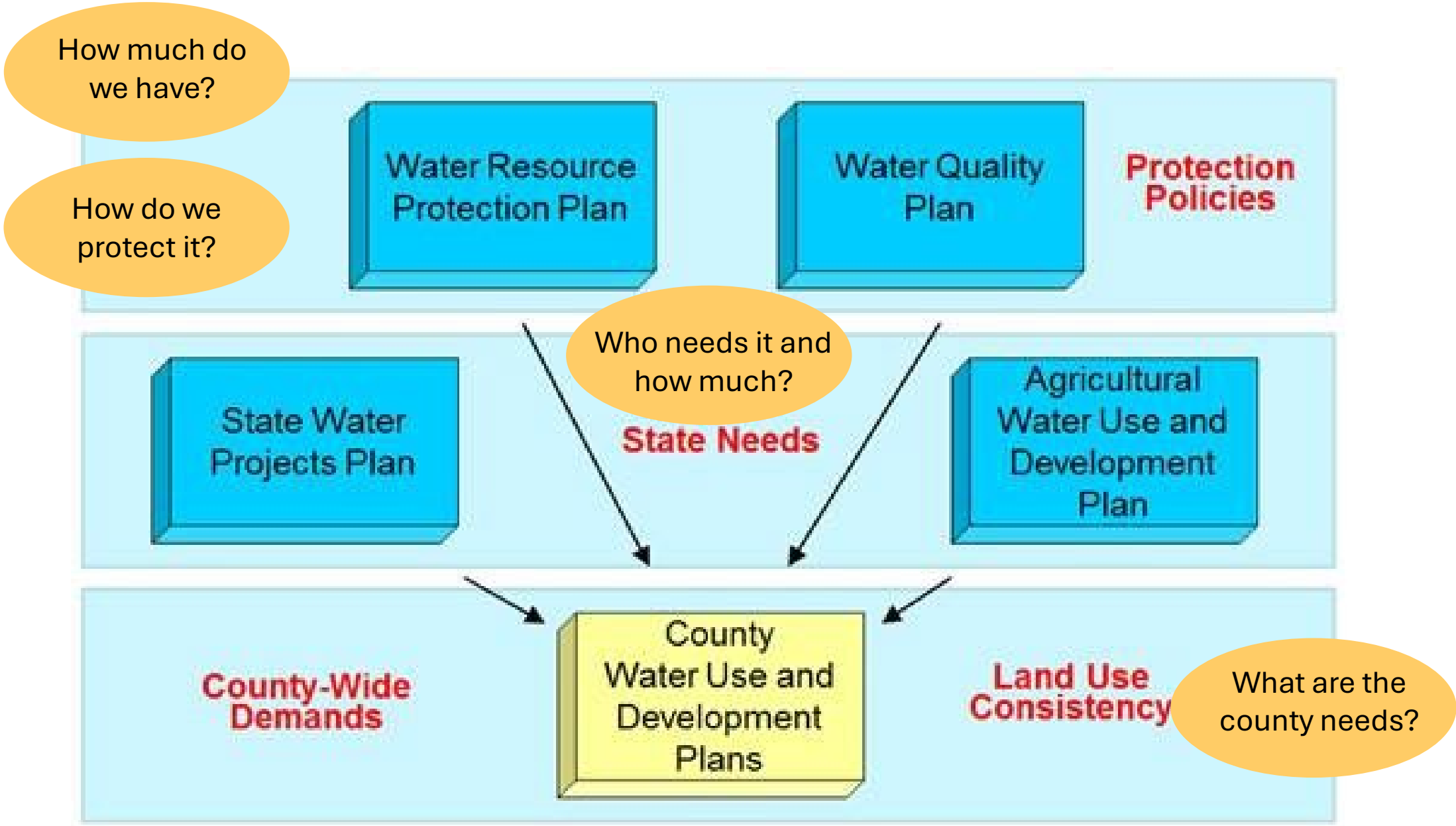
USE INFORMATION

6. **TOTAL QUANTITY OF WATER REQUESTED:** In the space below, enter total from Box M in Item 11 (Table 1) of this application.
gallons per day, averaged over 1 year

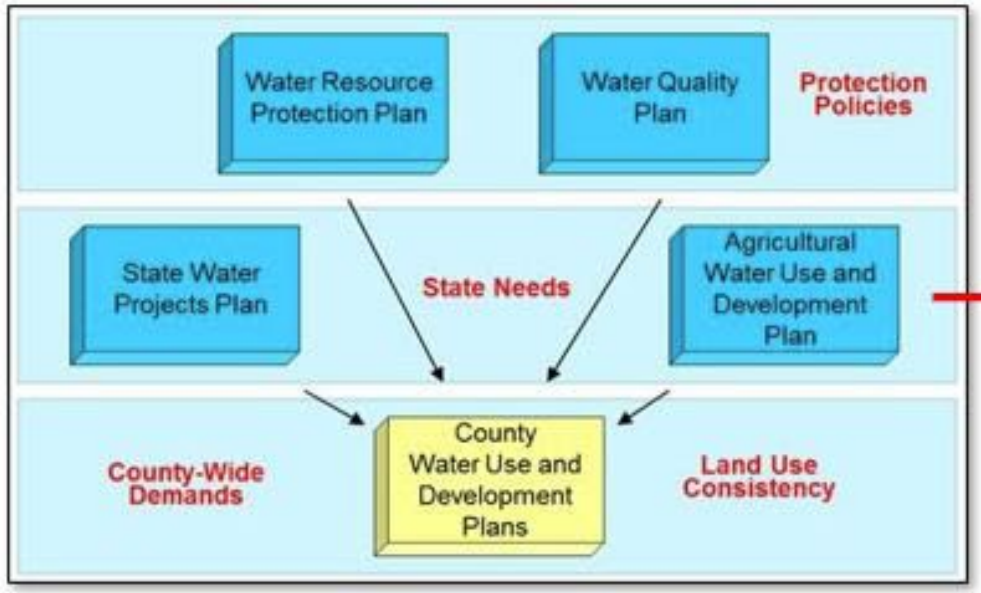
7. **USE:** ☐ Agriculture ☐ Domestic ☐ Industrial
Check all that apply. ☐ Irrigation ☐ Military ☐ Municipal

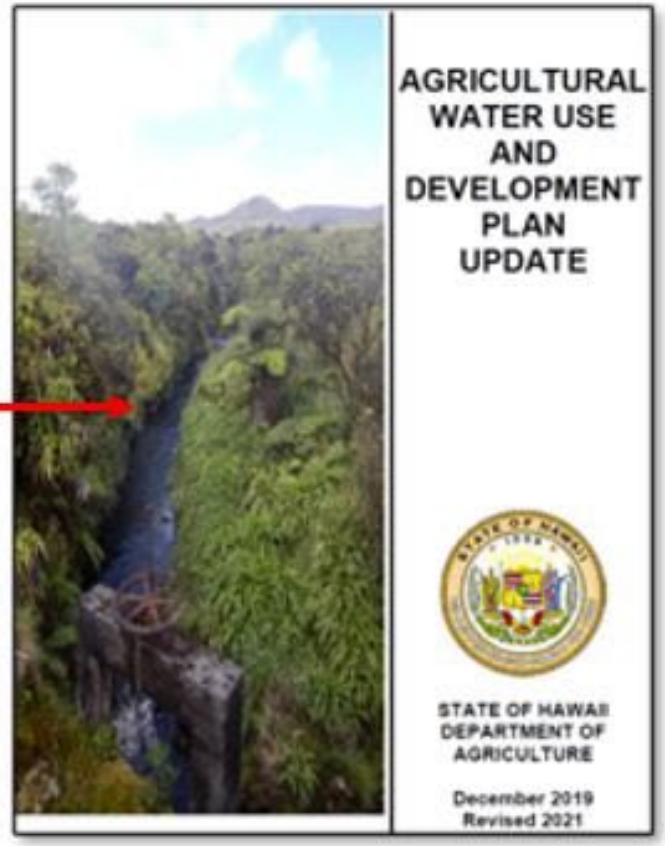
8. **LOCATION OF WATER USE:** Show the location of the use on a map, attached as a .pdf to this application. See Item 11 (Table 1, column B) of this application.

The Hawai‘i Water Plan



AGRICULTURAL WATER USE AND DEVELOPMENT PLAN

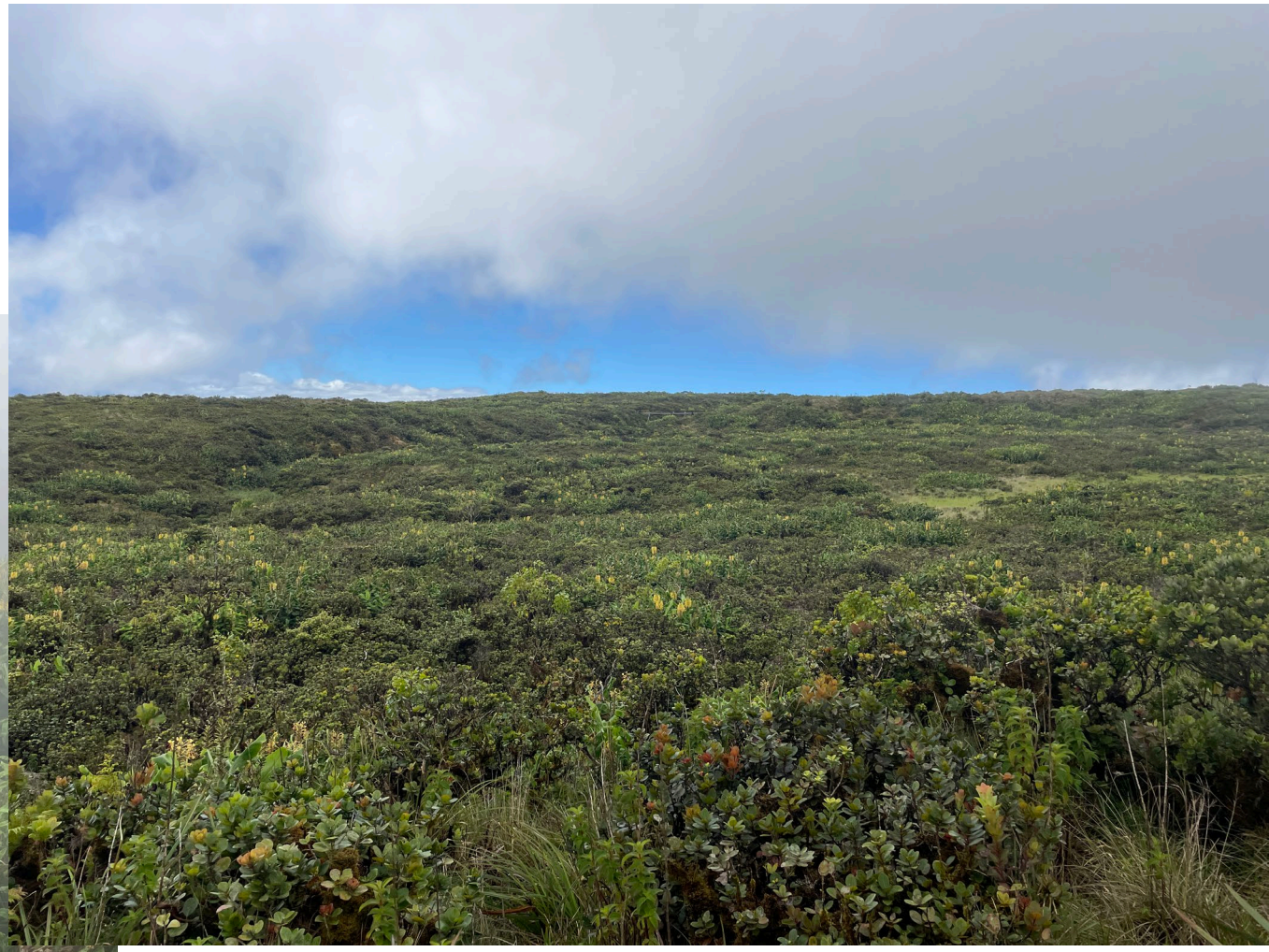





HAWP
FORESTRY AND WILDLIFE
HAWAII
HAWAII
HISC
INVASIVE SPECIES COUNCIL
AgriBusiness
DEVELOPMENT CORPORATION
Commission on Water Resource Management
State of Hawaii
Department of Agriculture
STATE OF HAWAI'I
Department of
Water
County of Kaua'i
Board of
Water Supply
COUNTY OF MAUI
STATE OF HAWAII
HAWAII STATE
DEPARTMENT OF HEALTH
DAR
Hawaii Division of Aquatic Resources
UNIVERSITY OF HAWAI'I
USGS
science for a changing world

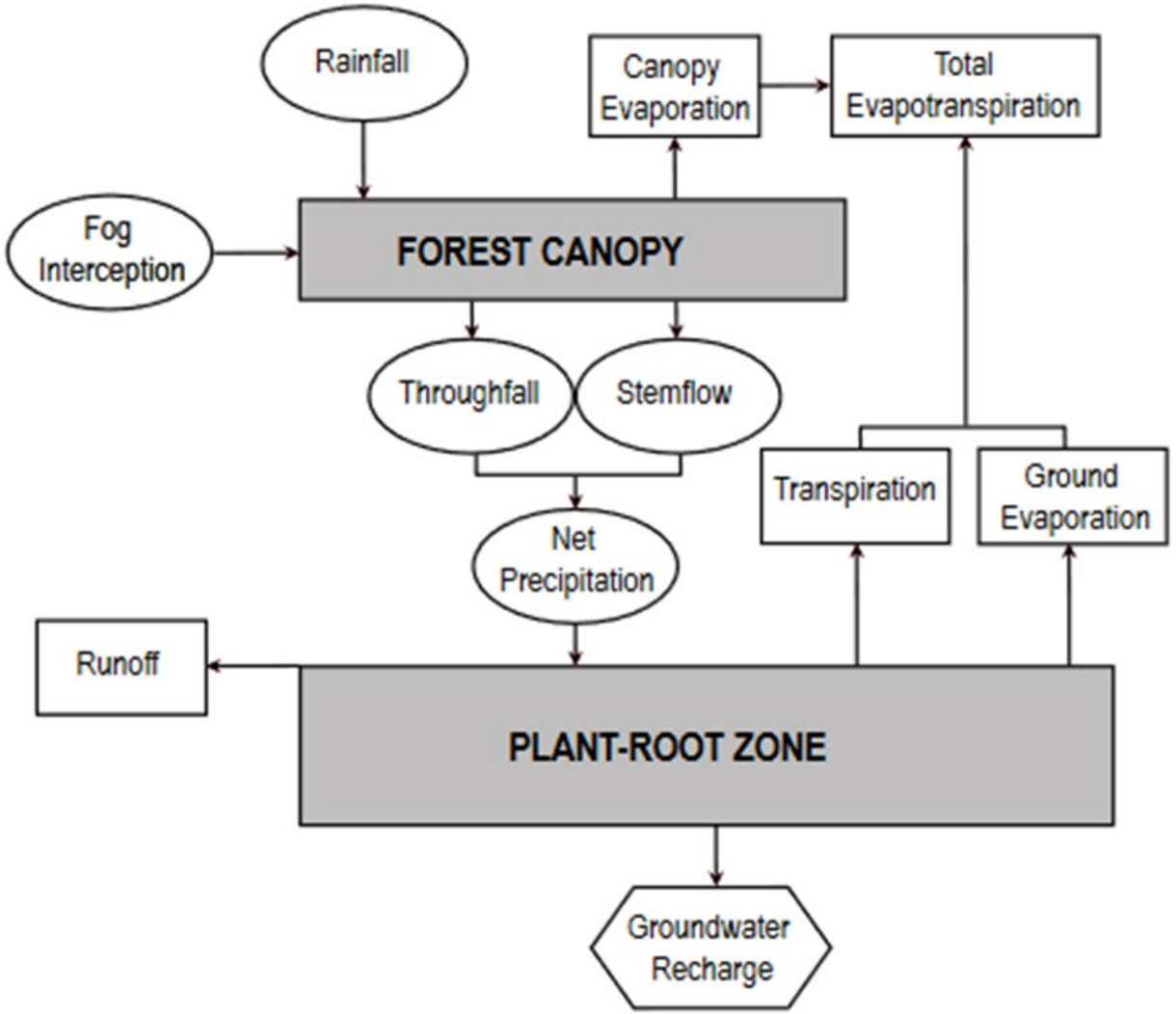
WATER RESOURCES IN KOHALA

Protecting the Watershed to Protect the Water

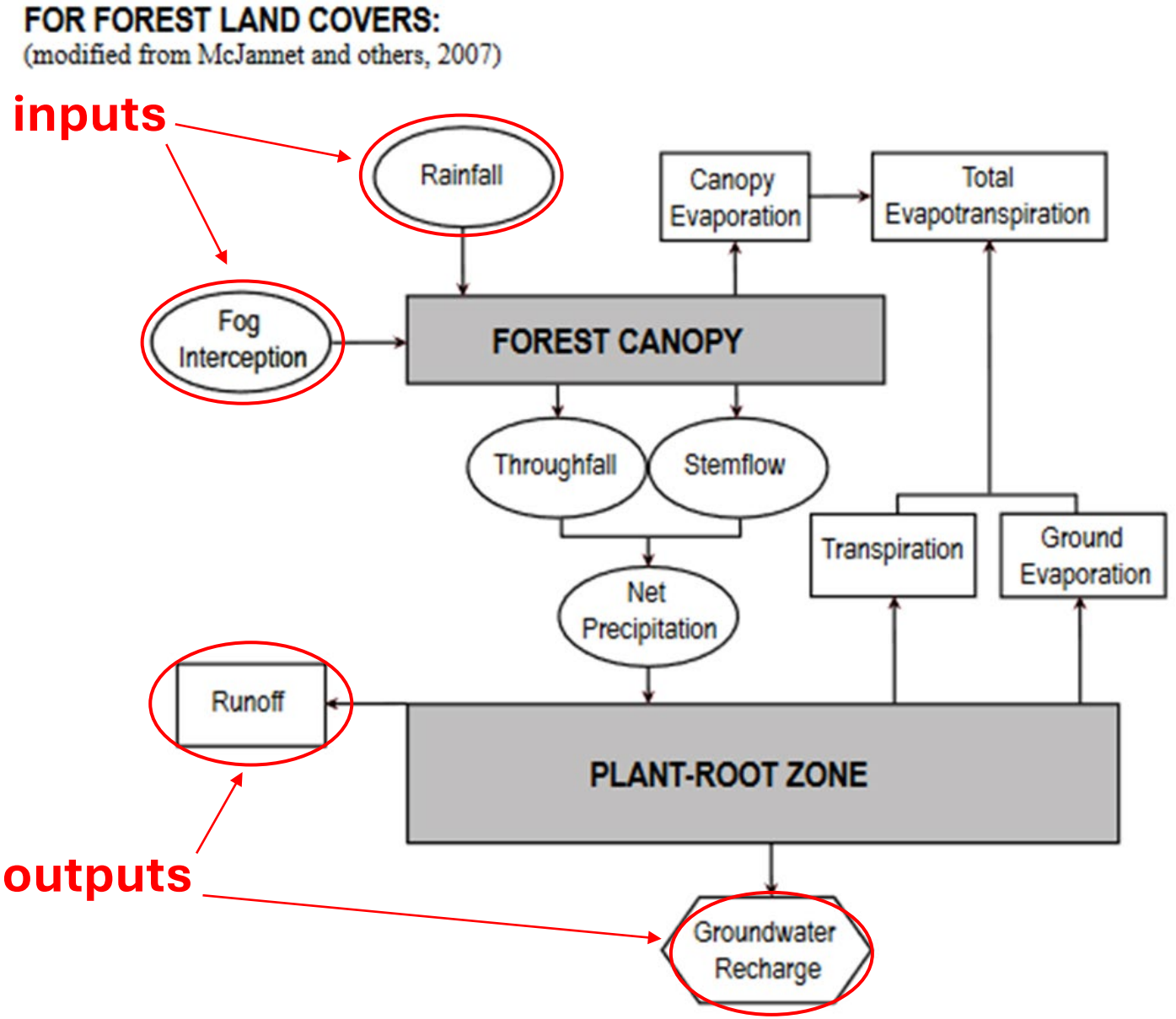


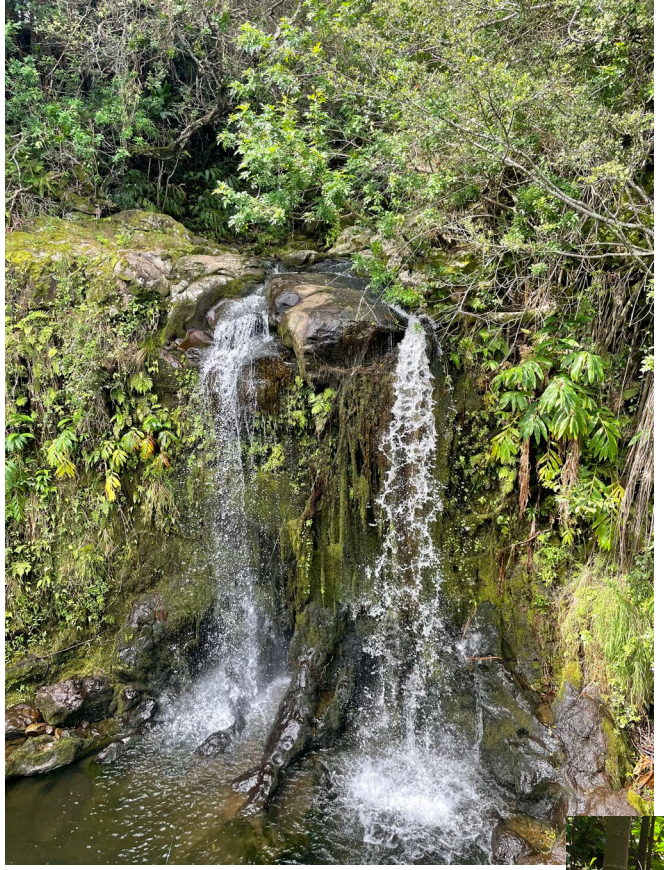
Generalized Model of Surface and Groundwater

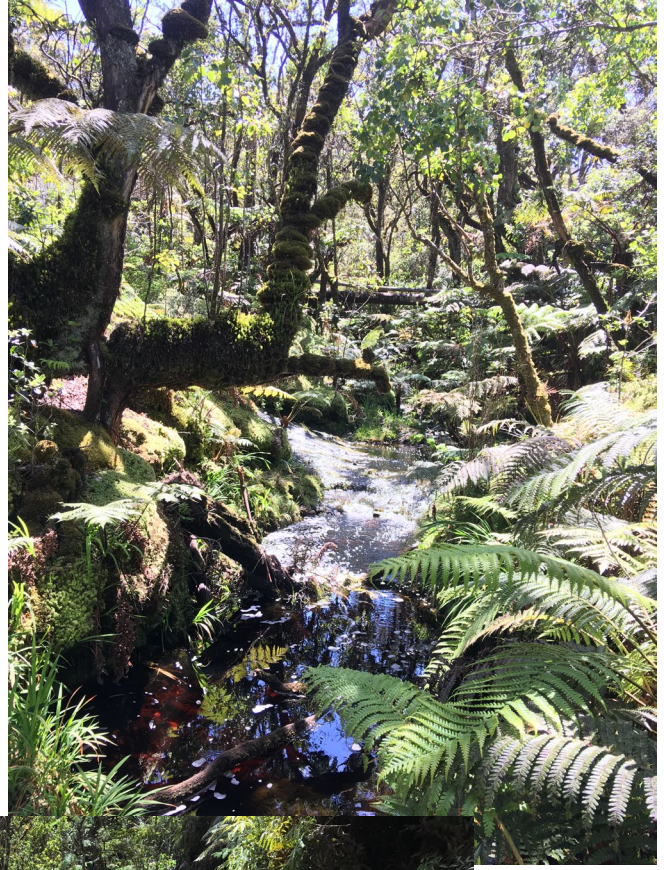
FOR FOREST LAND COVERS:
(modified from McJannet and others, 2007)



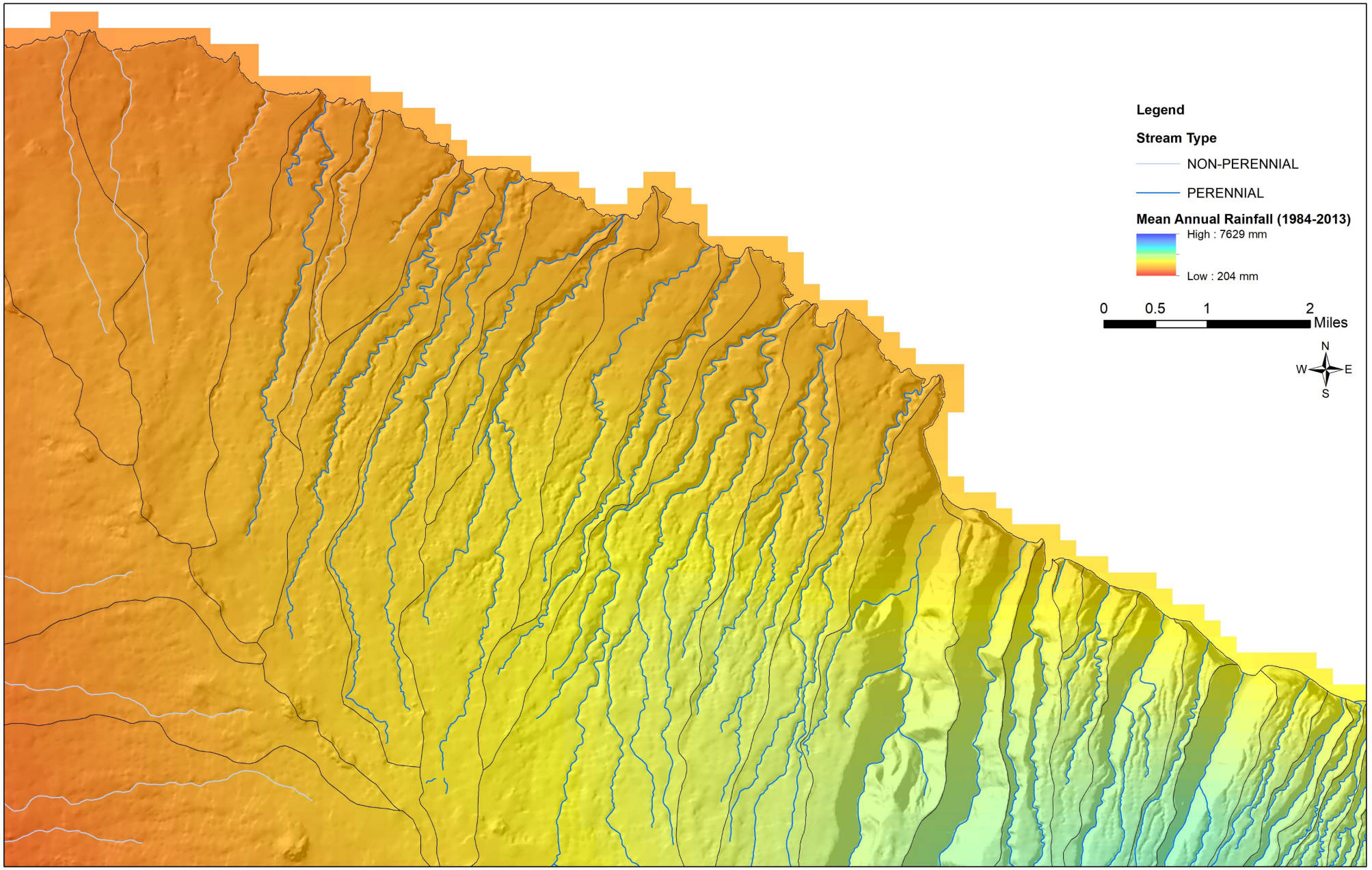
Generalized Model of Surface and Groundwater





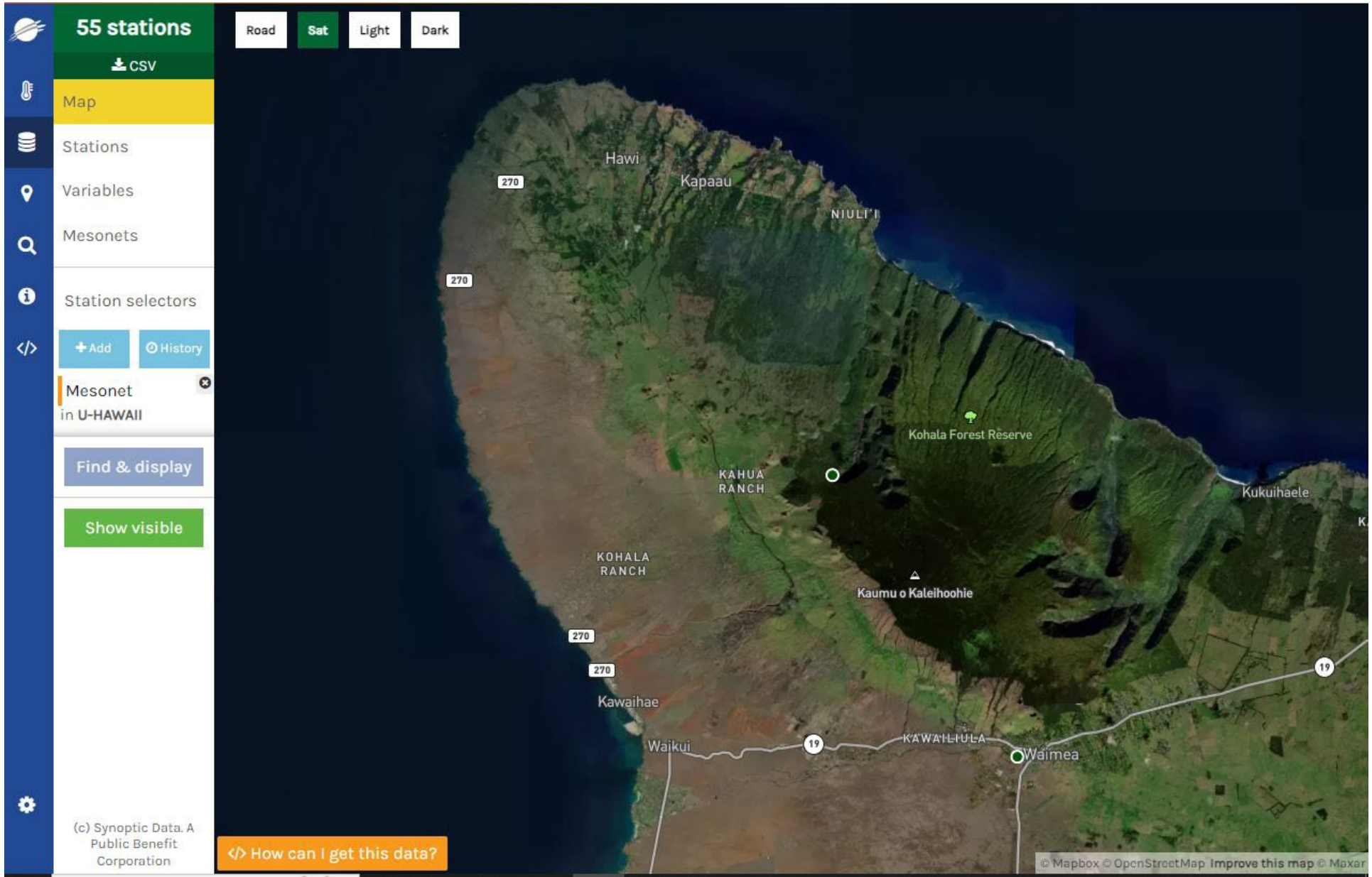


Rainfall and Streamflow in North Kohala



Monitoring Climate in North Kohala

University of Hawai‘i Mesonet Climate Station



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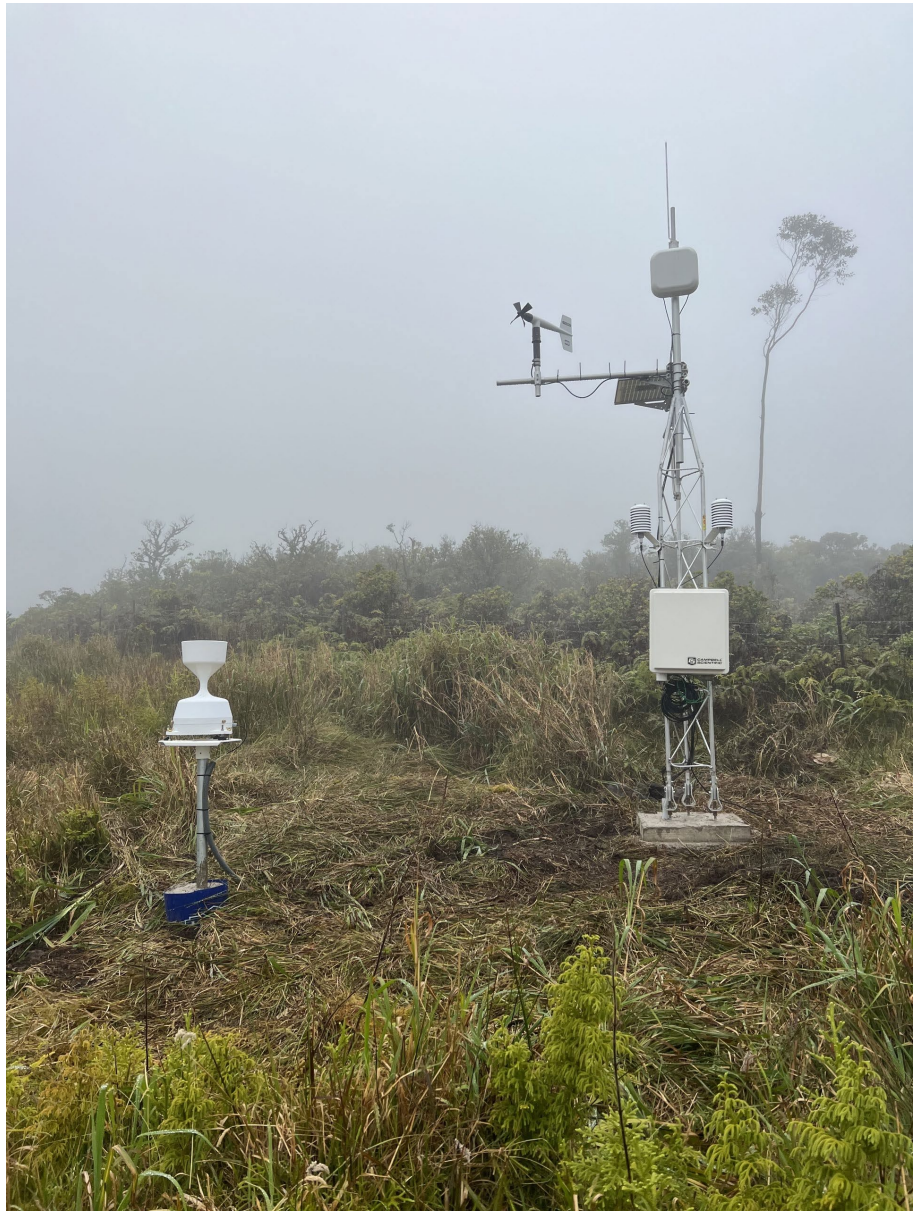
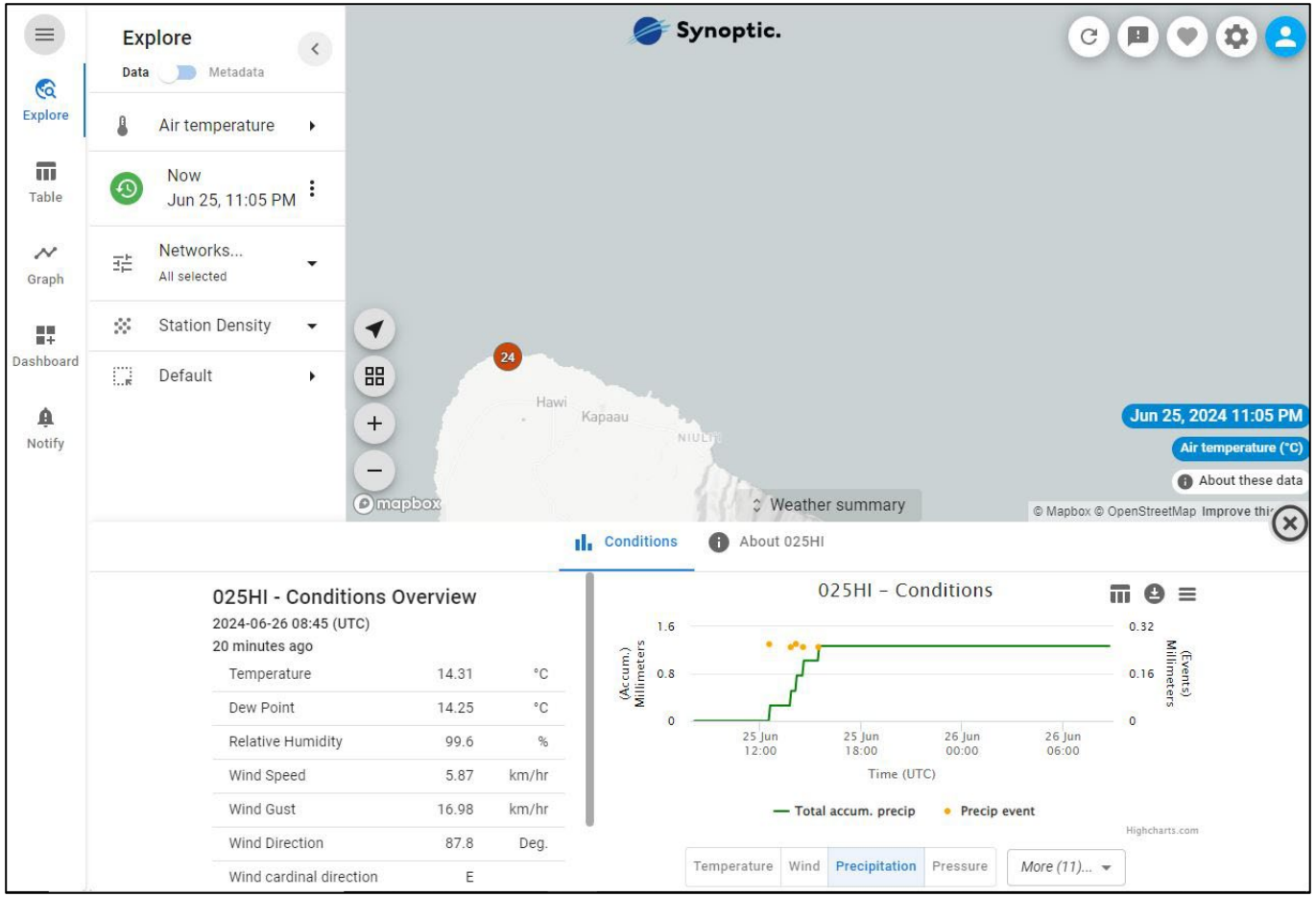
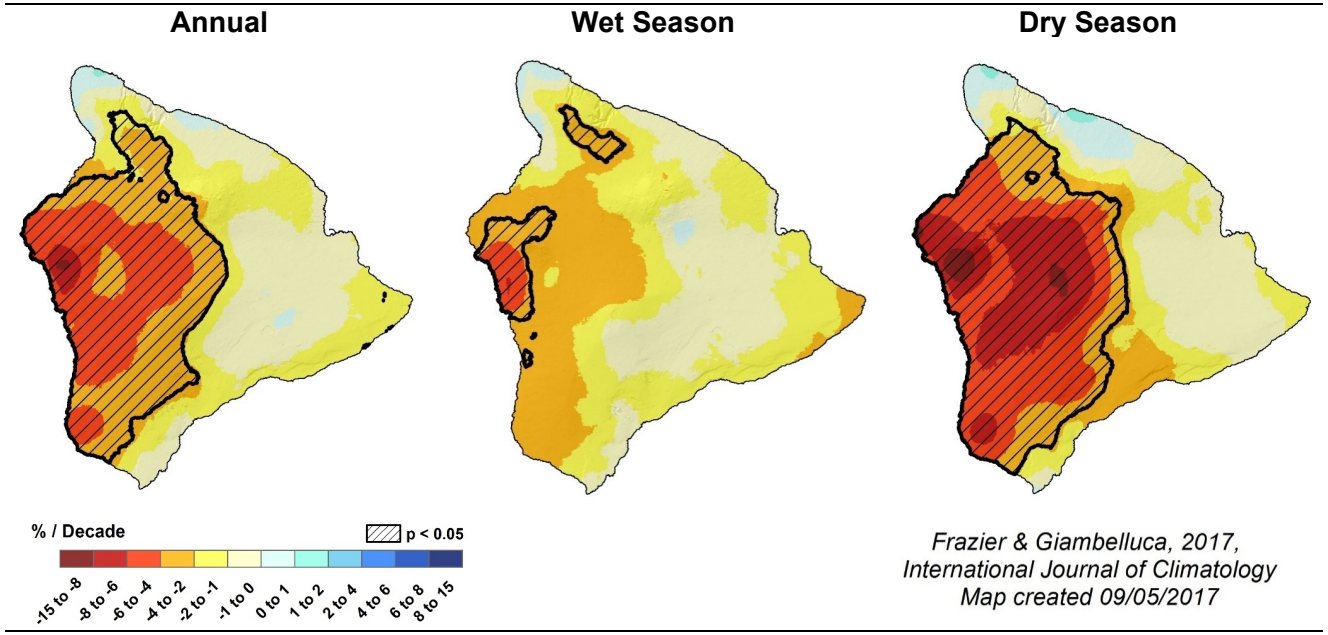




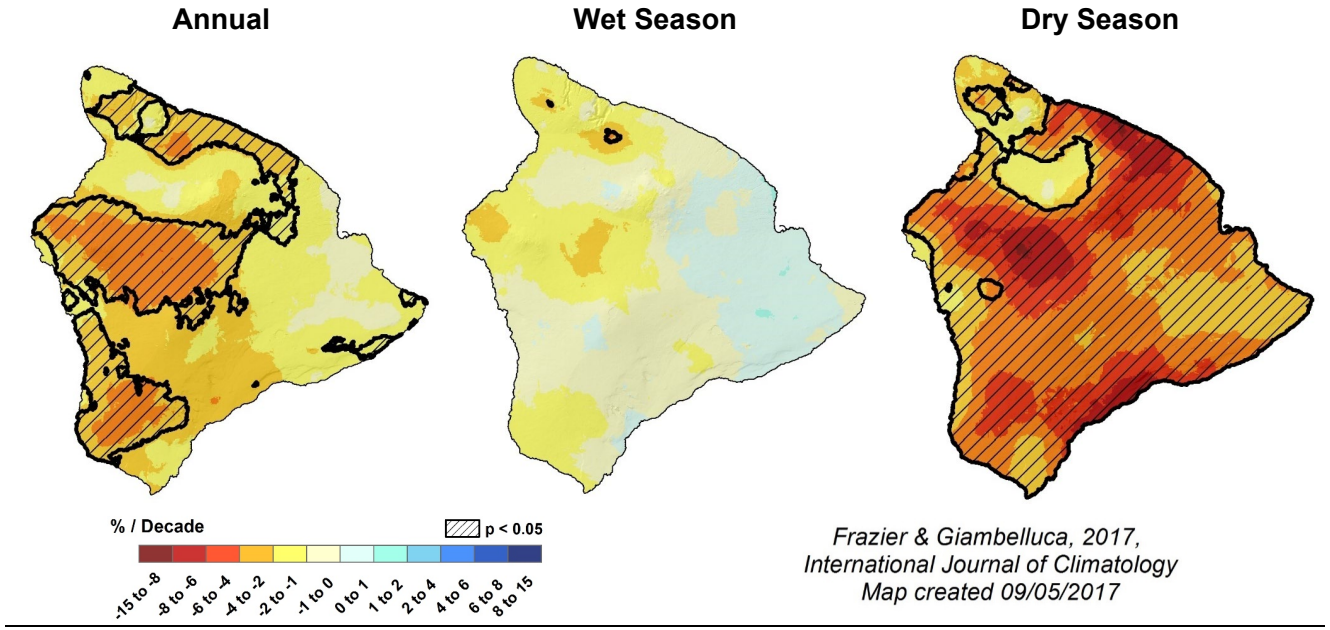
https://www.wrrc.hawaii.edu/hawaii-mesonet/

Trends in Annual and Seasonal Rainfall

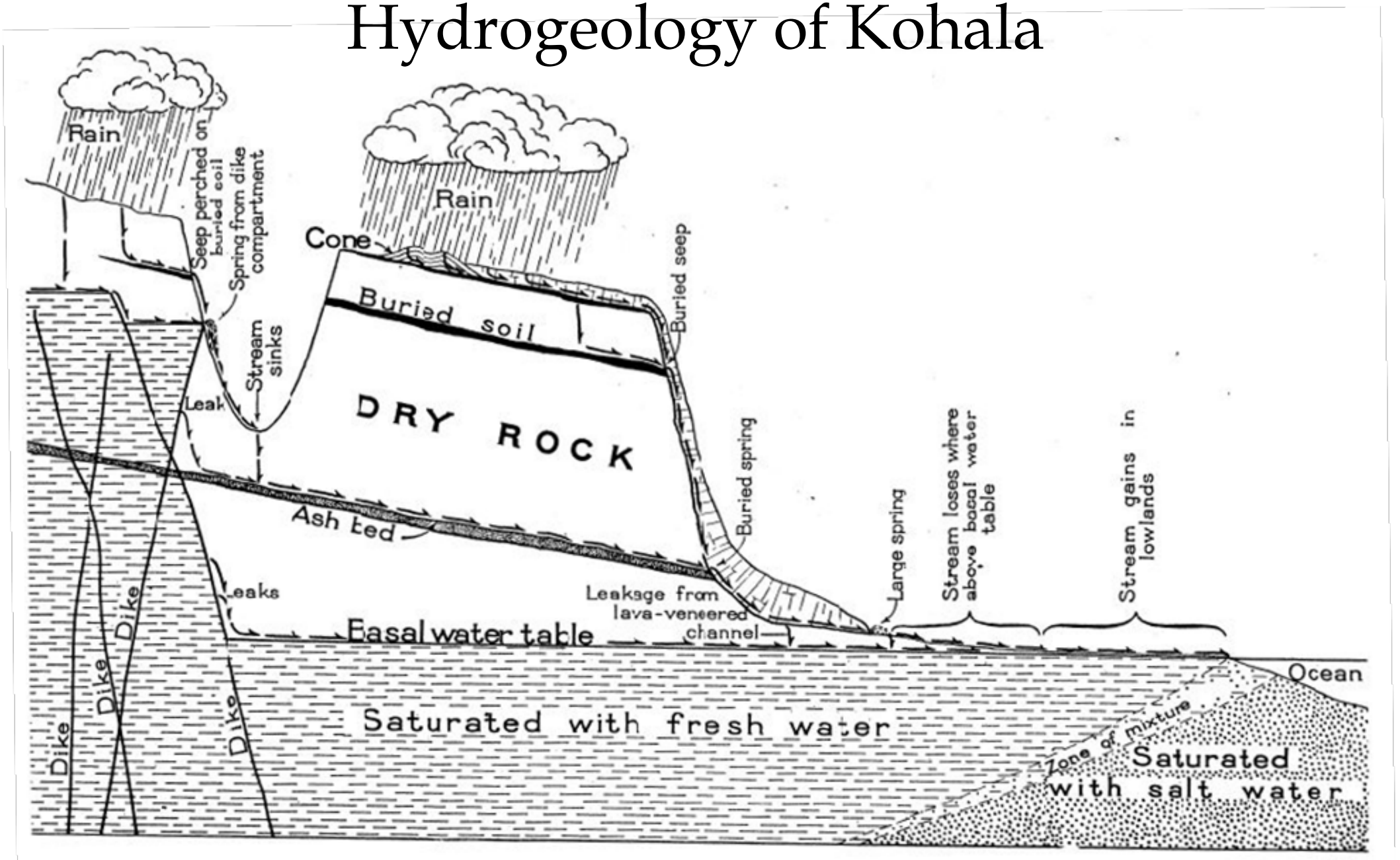
1920-2012



1983-2012



Hydrogeology of Kohala



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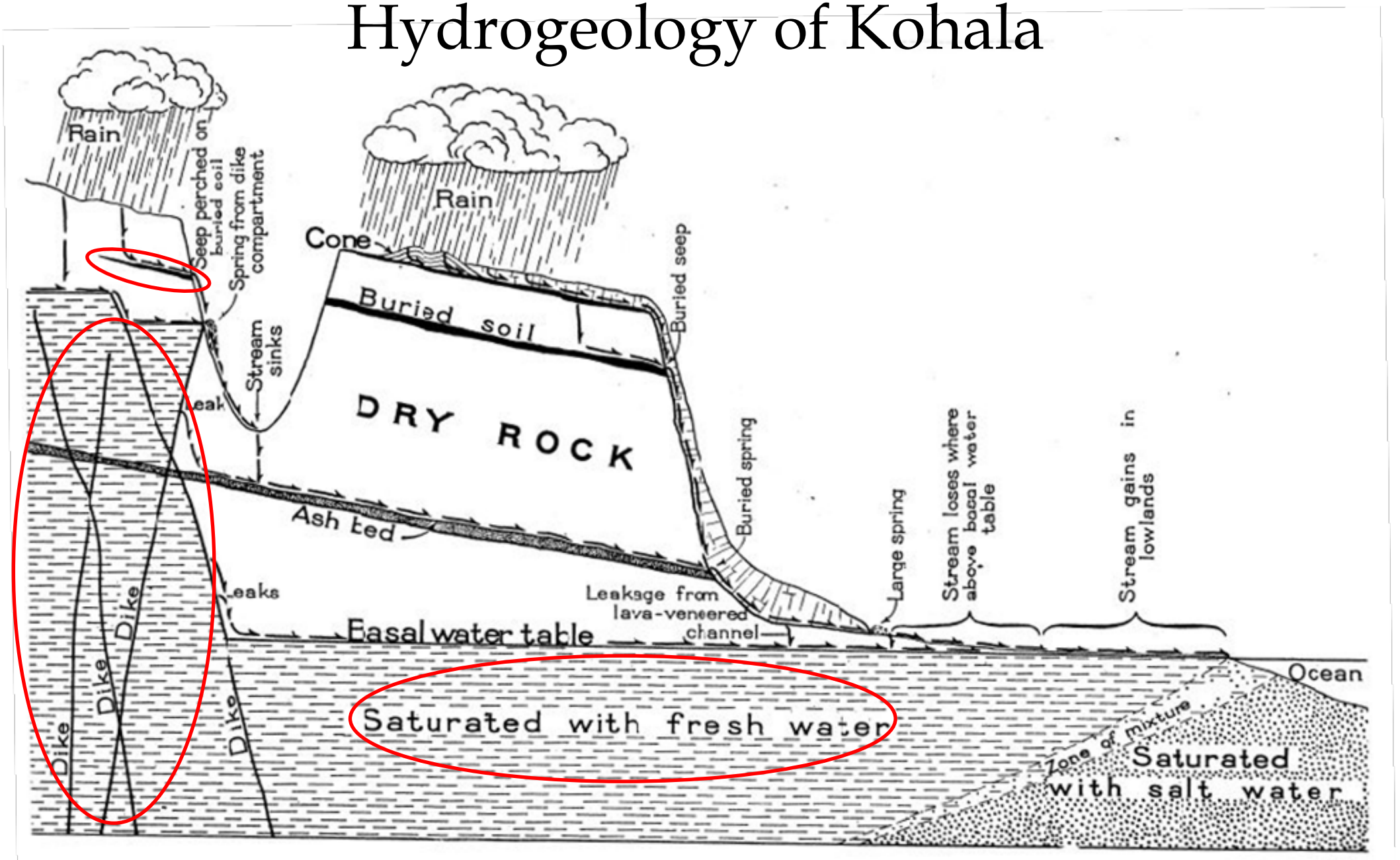

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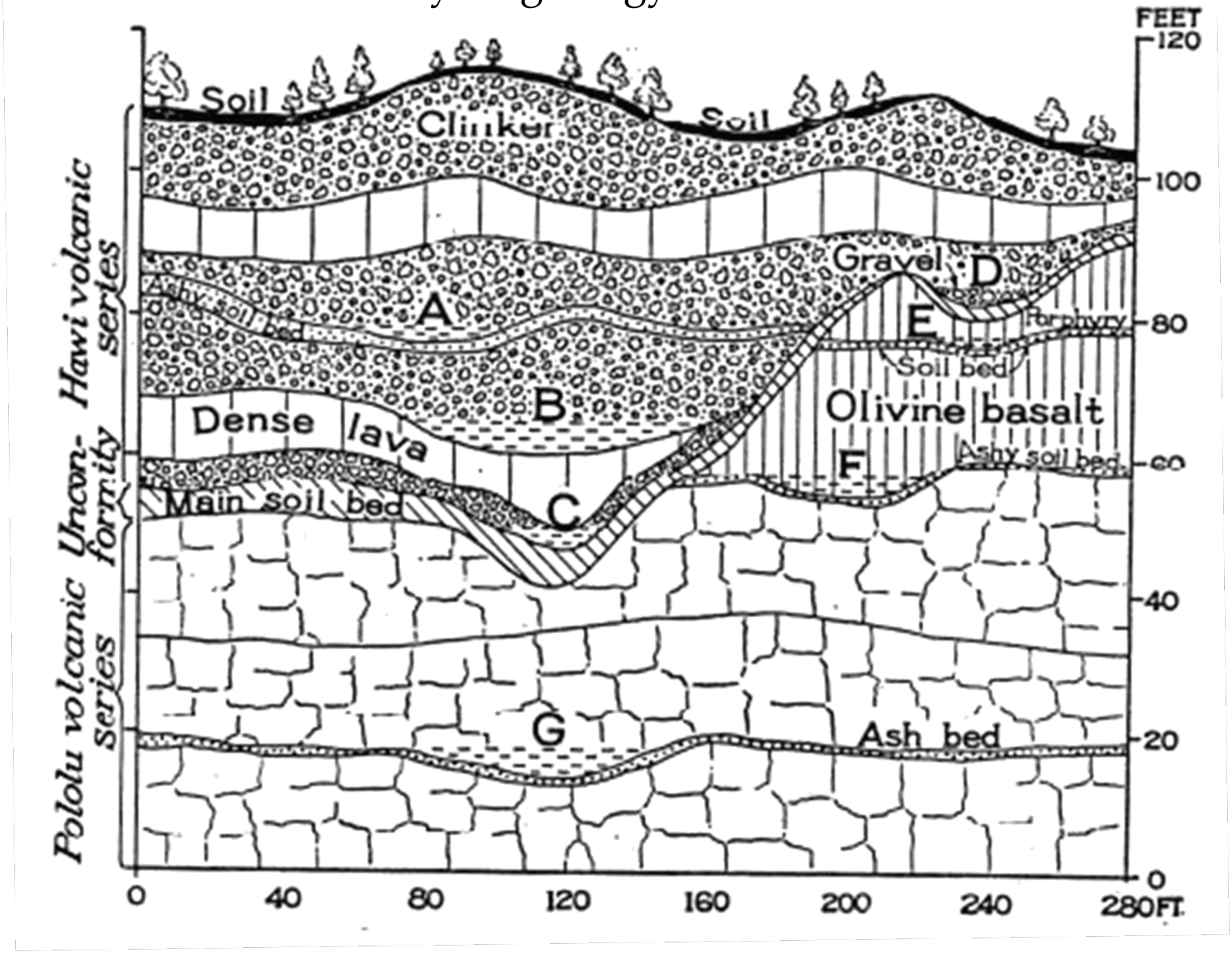

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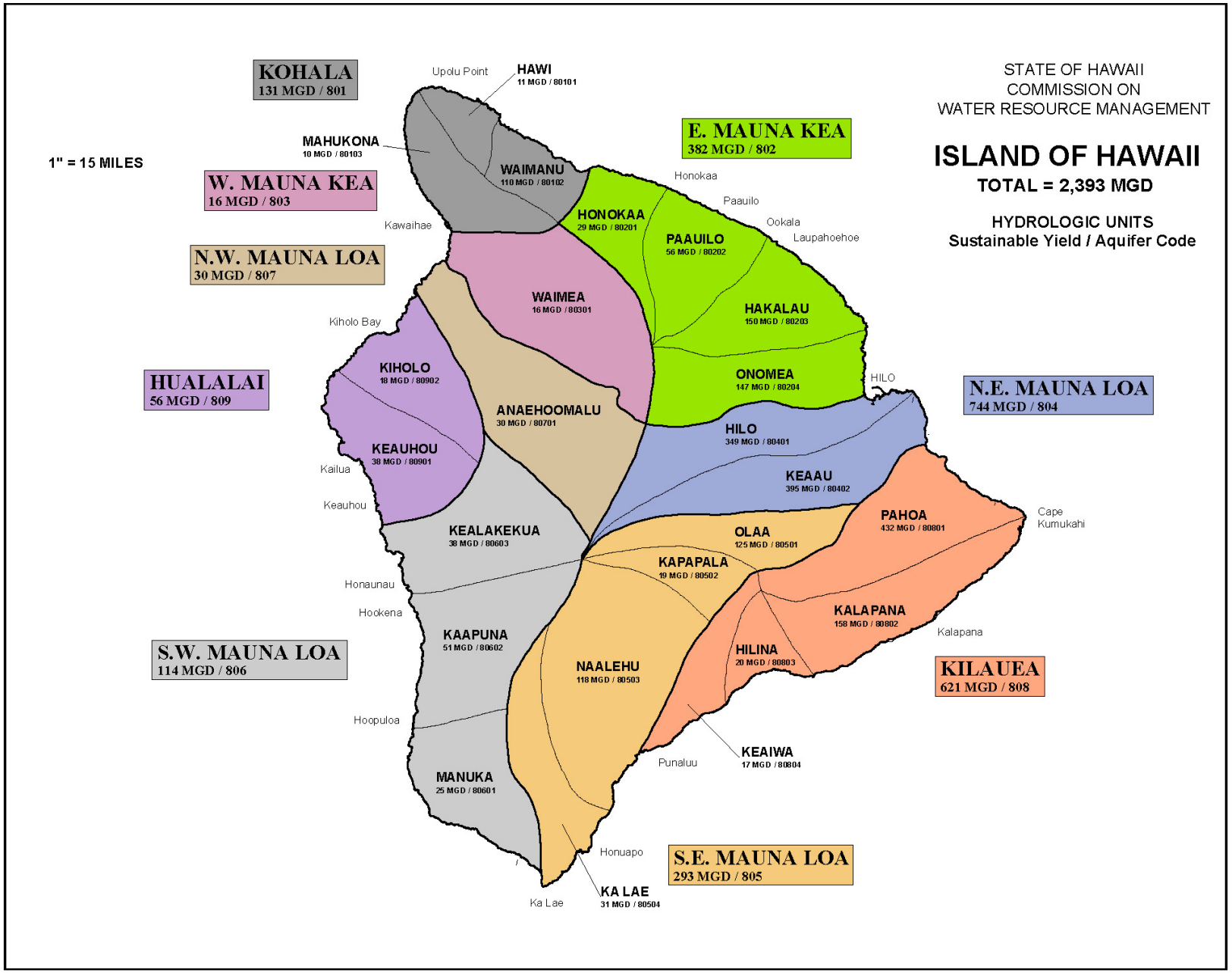
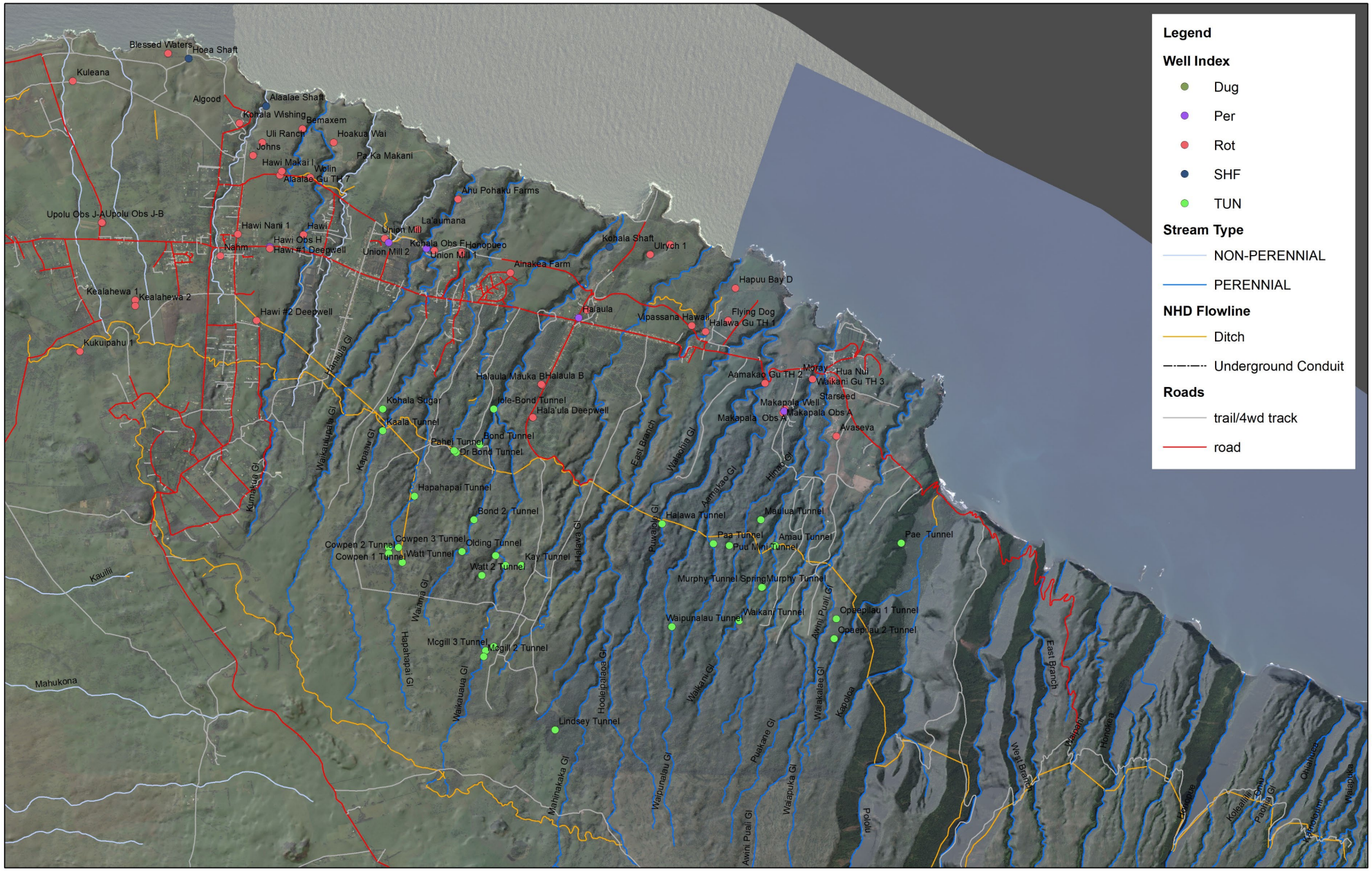
Sustainable Yield



06/20/2018

Map Projection: Universal Transverse Mercator

Existing North Kohala Wells

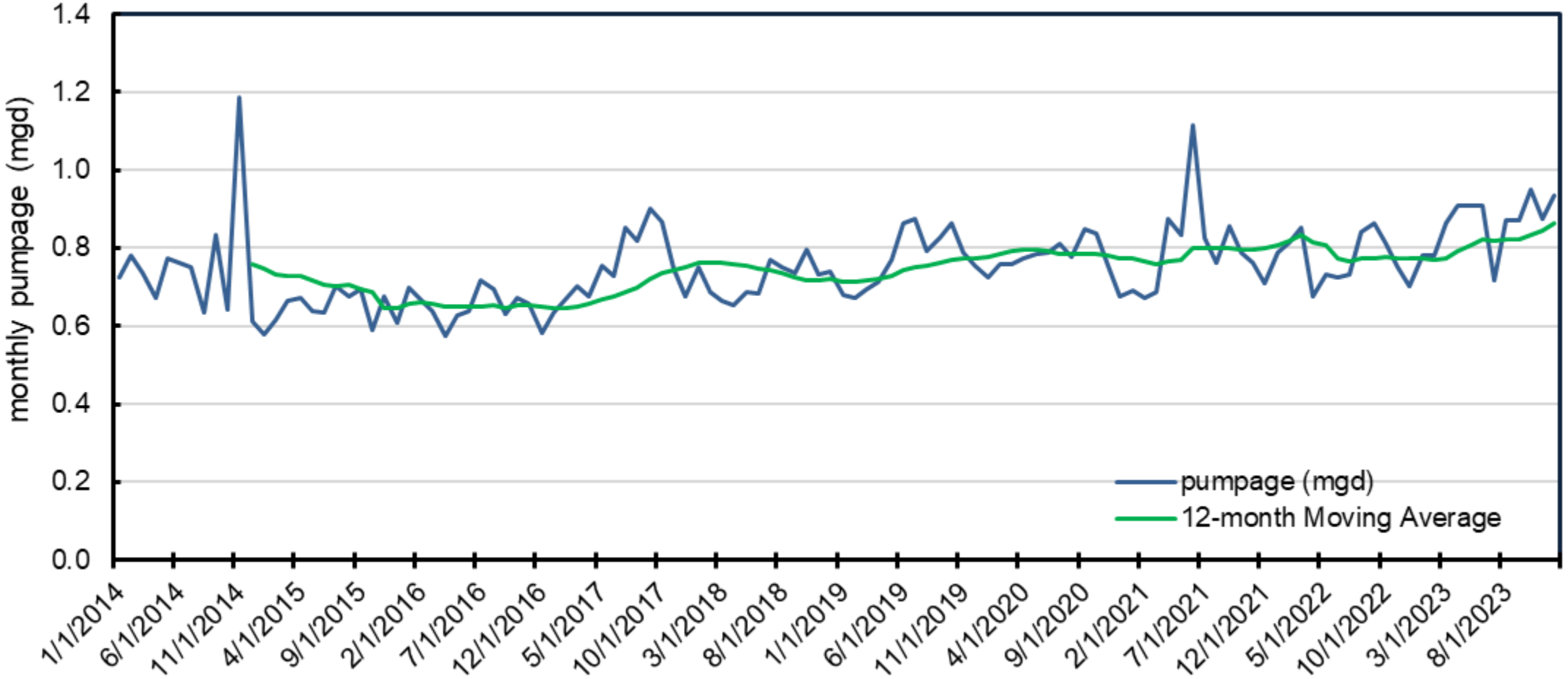


Existing North Kohala Wells

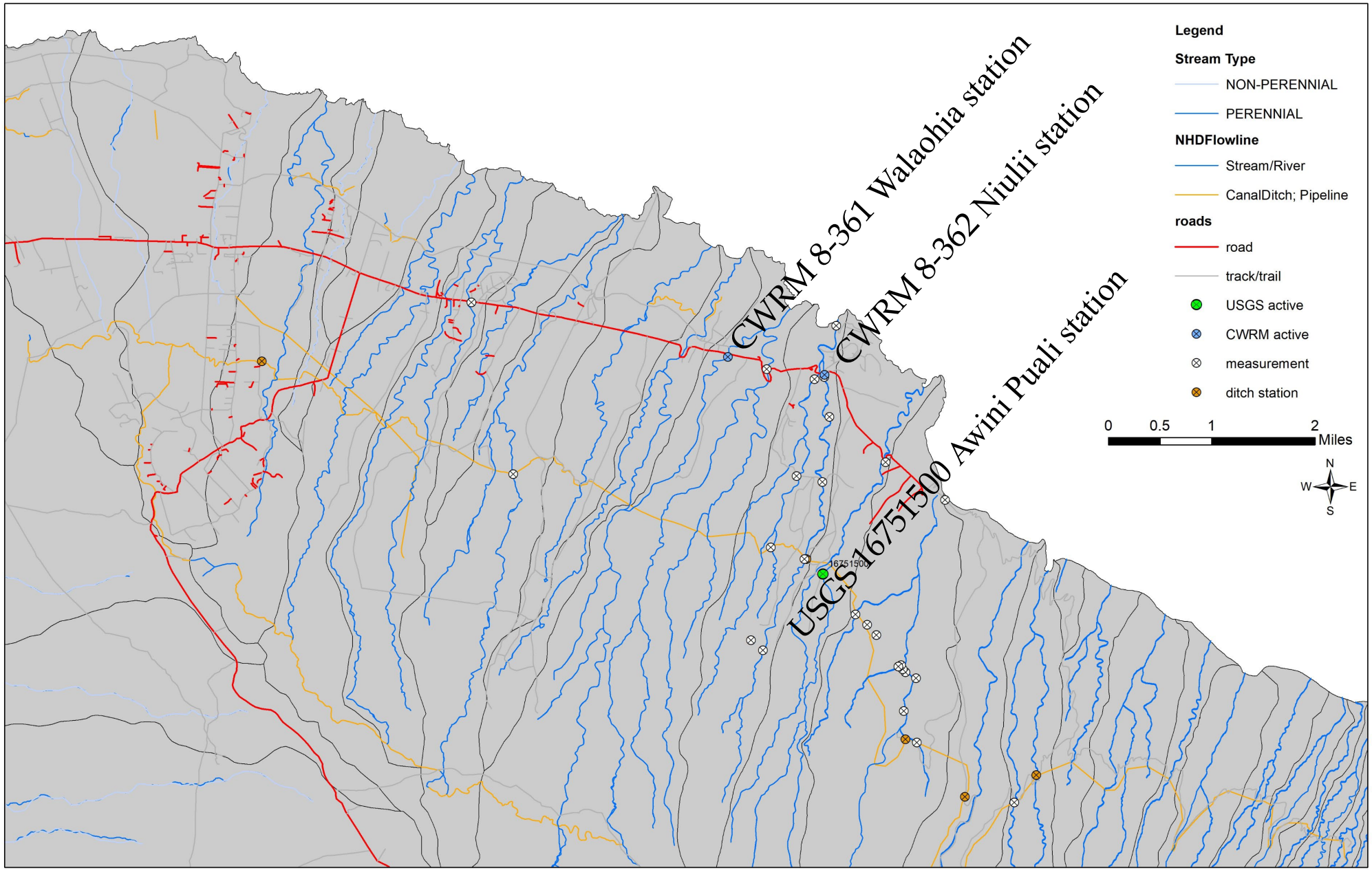
Waipunalau Tunnel (8-7146-001)

Murphy Tunnel (well 8-7145-002)

North Kohala Groundwater Use: Reported Pumpage



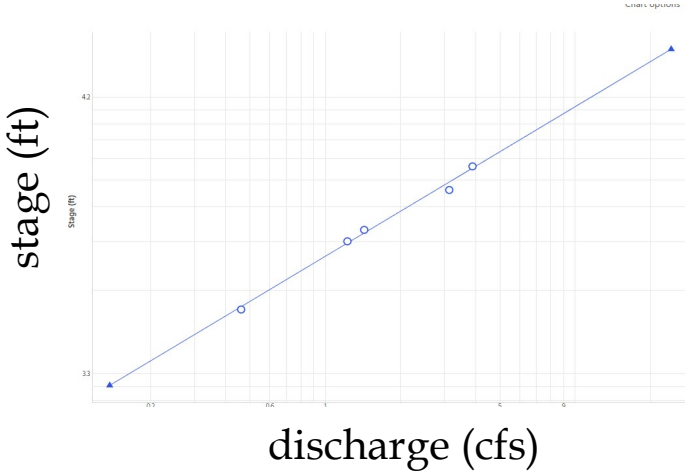
North Kohala Surface Water Monitoring

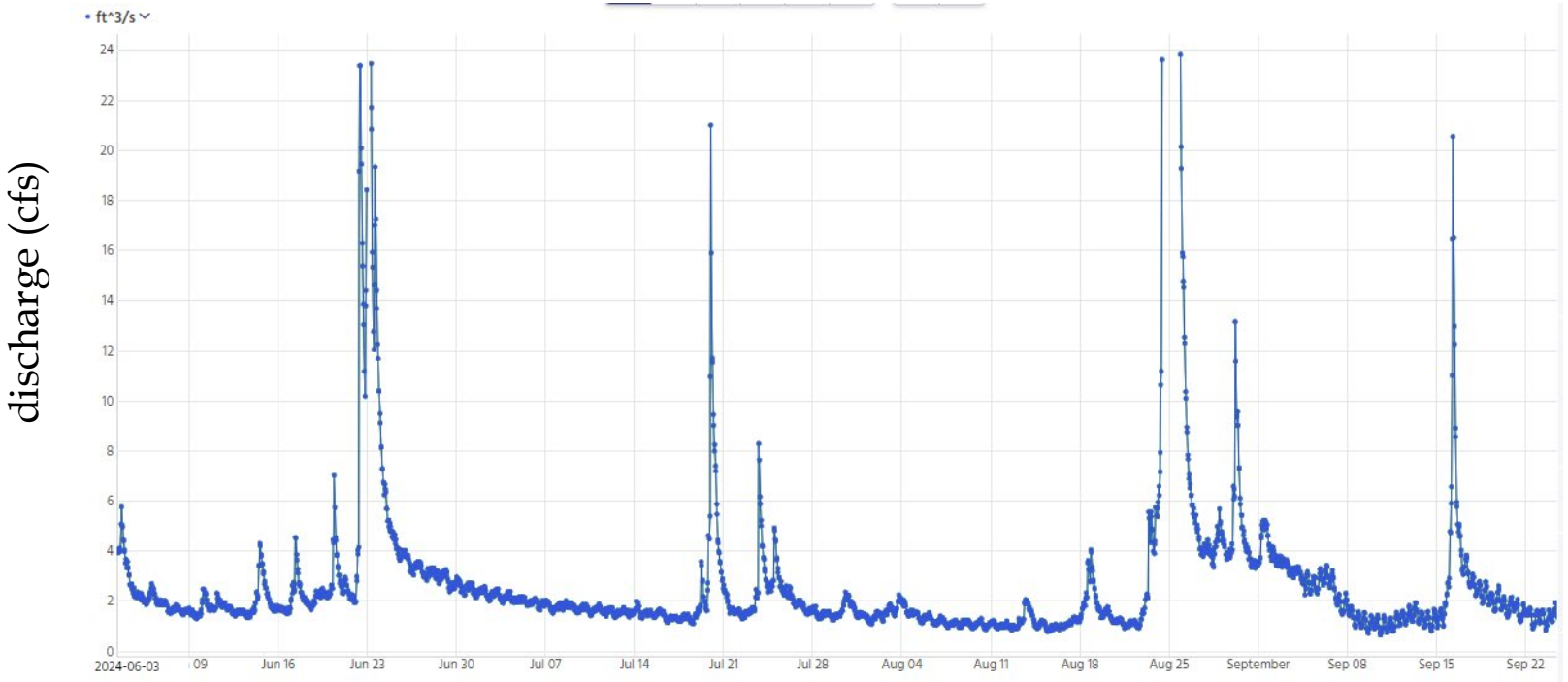


North Kohala Streams: CWRM Stream Gages

CWRM 8-362
Niulii at highway

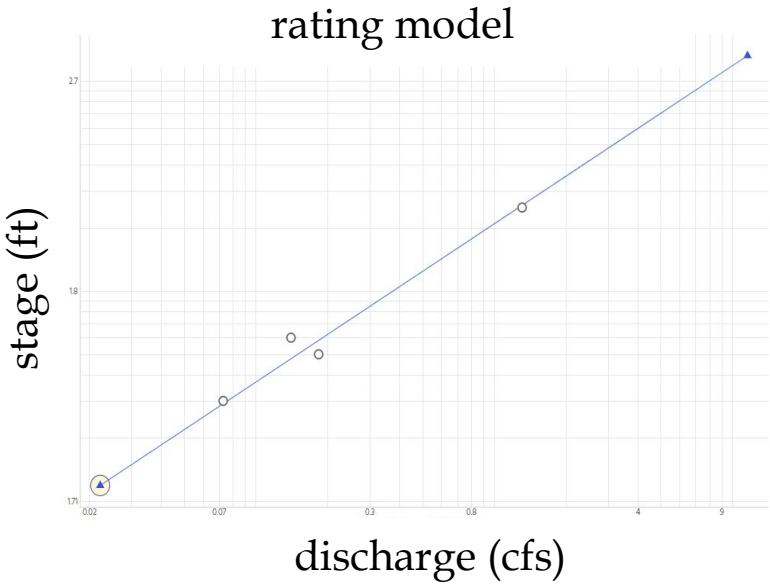
rating model



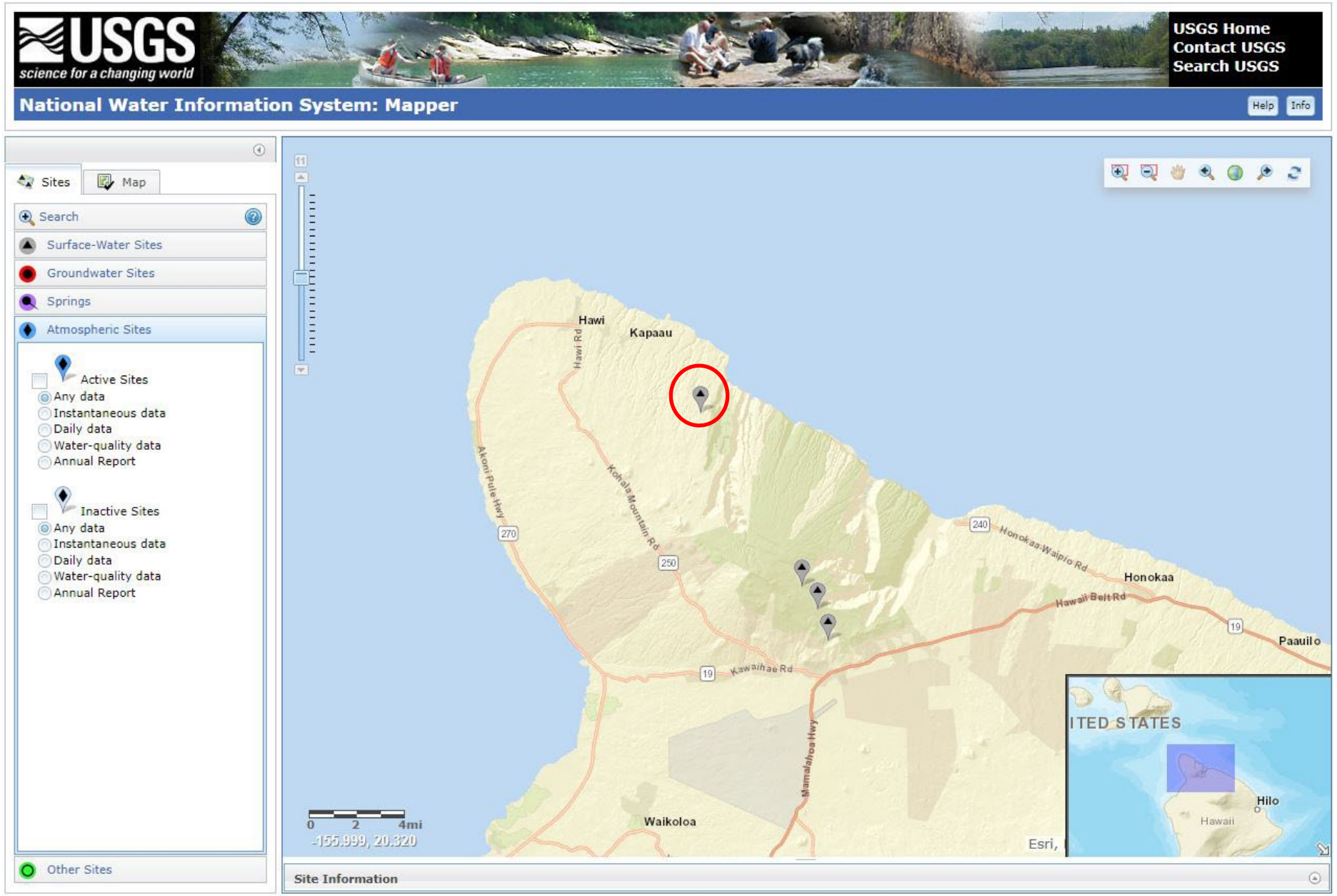


North Kohala Streams: CWRM Stream Gages

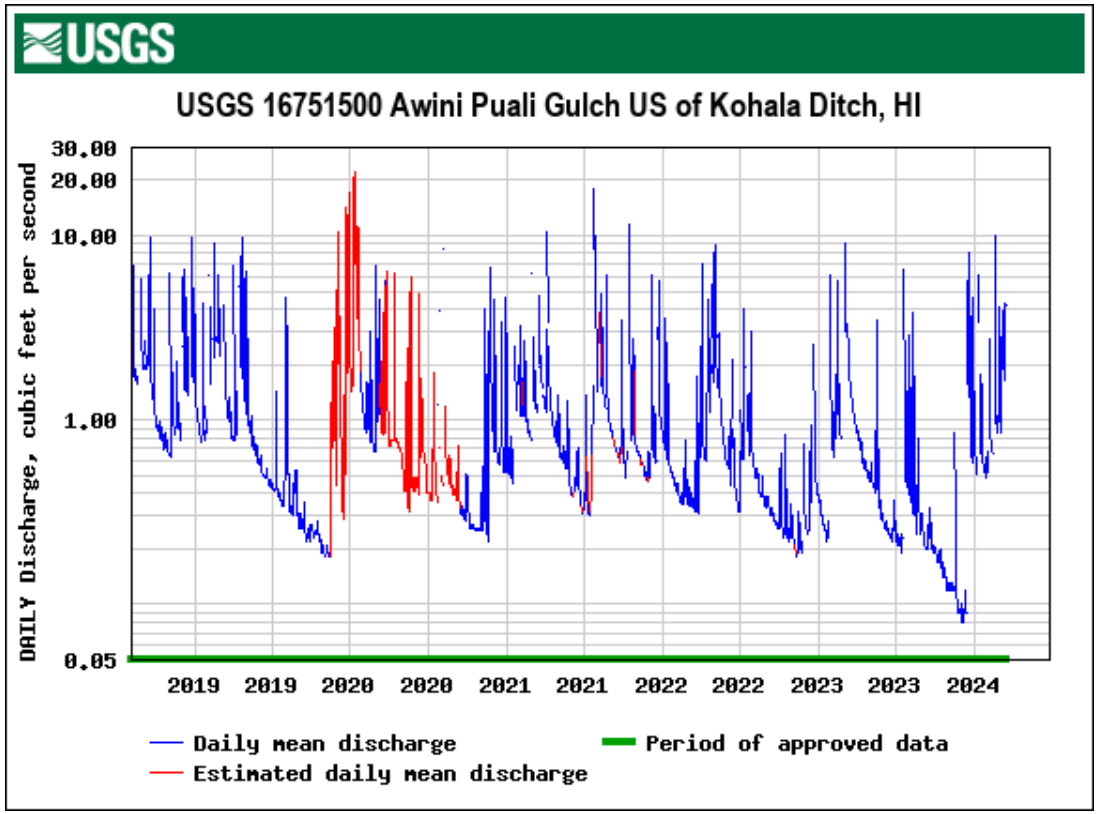
CWRM 8-361
Walaohia at highway
(Aamakoa West Tributary)

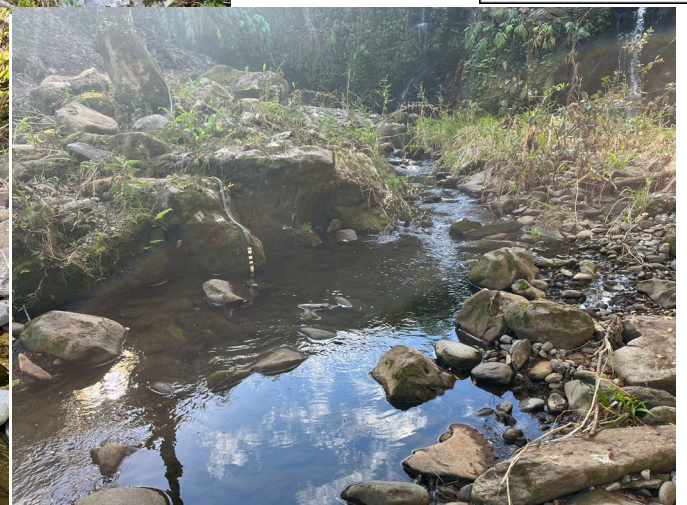


USGS 16751500 Awini Puali

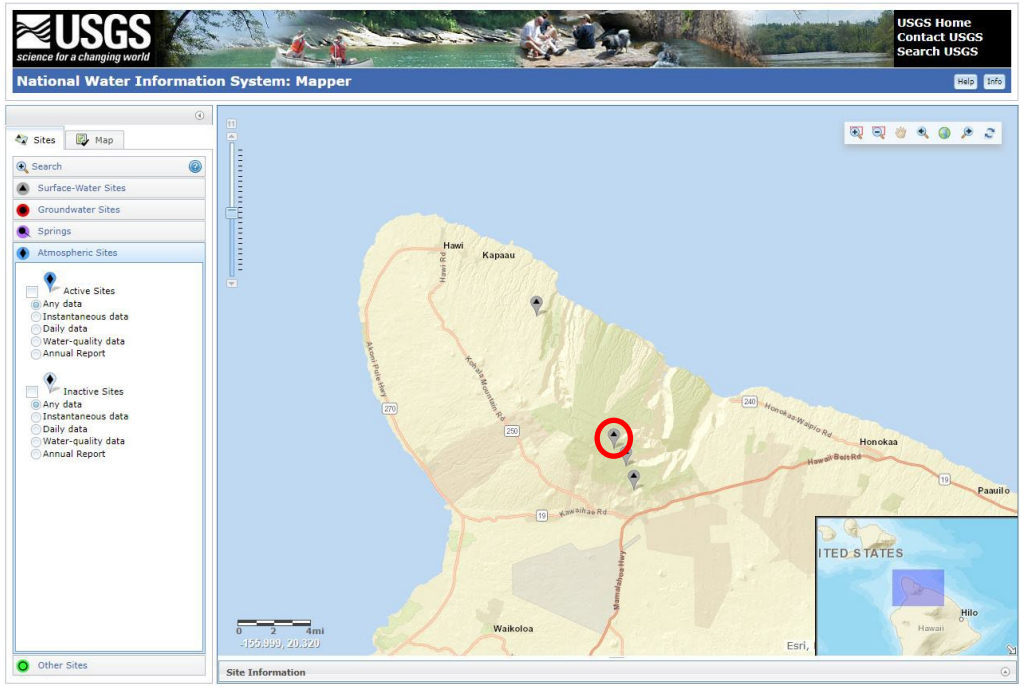


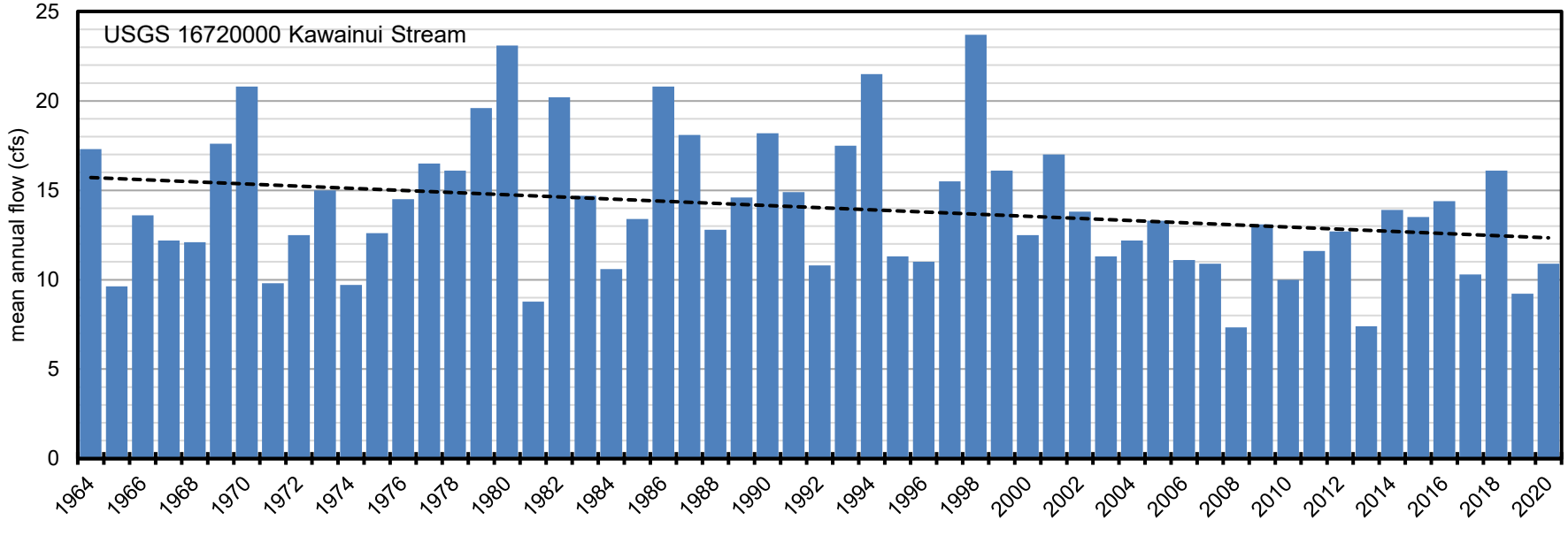
USGS 16751500 Awini Puali



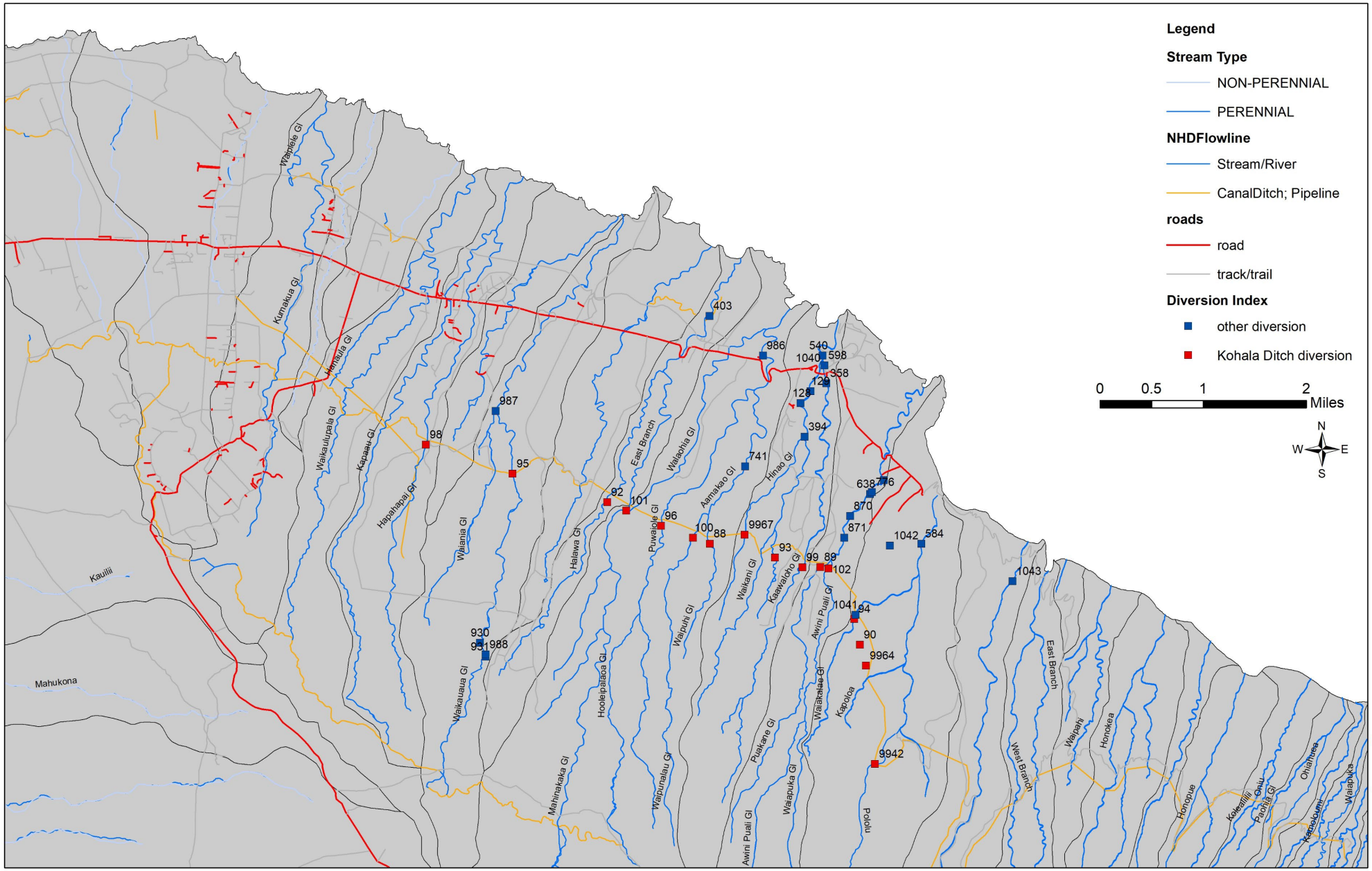


USGS 16720000 Kawainui Stream





Stream Diversions in North Kohala



Inactive Kohala Ditch Diversions

Intake #3 Awini Puali

Intake #4 Waikama

Intake #5 Niulii

Intake #6 Waikane

Kohala Ditch 2023 site visit

Amending Instream Flow Standards

Hydrology

- Median Flow
- Base Flow
- Pre-Diversion Flow Estimate
- Groundwater Interaction
- Surface-Water Use
- Ground-Water Use
- Other

Fish/Wildlife Habitat

- Stream Channelizations
- Native Vertebrates
- Invertebrates
- Invasive Species
- Recruitment
- Abundance
- Diversity
- Distribution
- Other

Recreation

- Swimming
- Nature Study
- Fishing
- Boating
- Parks
- Other

Ecosystem Maintenance

- Estuaries
- Wetlands
- Riparian areas
- Nearshore Waters
- Natural Area Reserves
- National Parks
- Other Protected Areas
- Other

Aesthetics

- Scenic Views
- Waterfalls
- Tourism
- Other

Navigation

- Boating
- Other

Hydropower

- Present Use
- Potential Use
- Other

Water Quality

- Water Quality Standards
- 303(d) Impaired Waters
- Total Maximum Daily Loads
- Land Use
- Other

Conveyance of Water

- Multiple Diversions on a Single Stream
- Other

Hawaiian Rights

- Traditional and Customary Rights
- Taro Cultivation
- Appurtenant Rights
- Cultural Values
- Other

Noninstream Uses

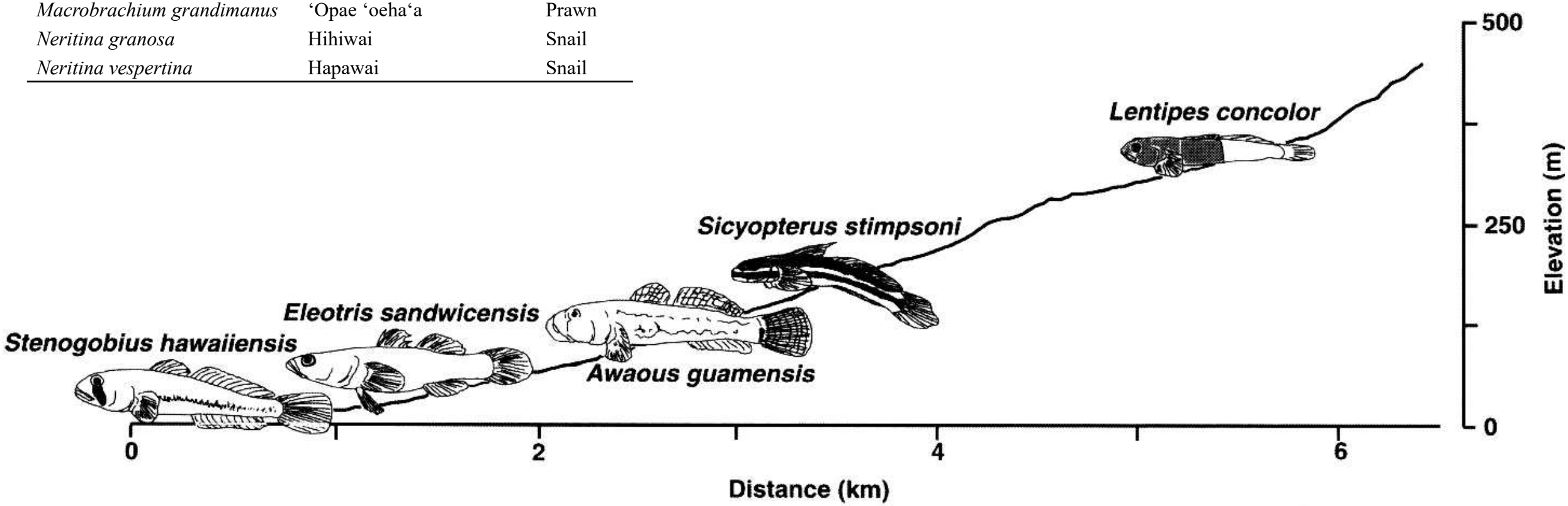
- Diversions
- Domestic/Municipal Use
- Hawaiian Home Lands
- Agriculture
- Industrial
- Present vs. Potential Use
- Economic Impacts
- Other

Amending Instream Flow Standards

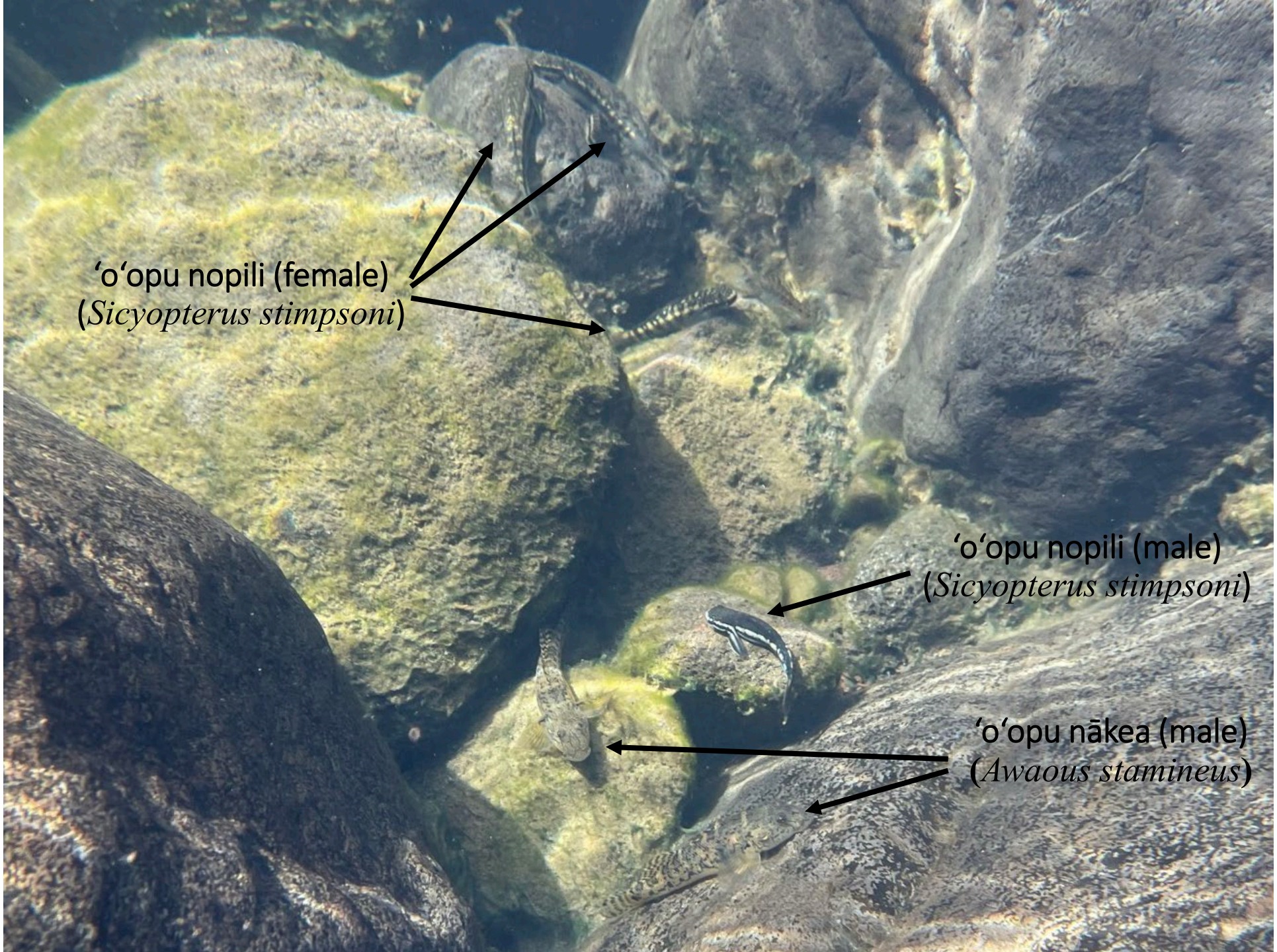
1. Use best available data to evaluate instream values on a stream-by-stream basis; largely rely on historic documents and datasets
2. Collaborate with community to document place-based knowledge
3. Develop new datasets when necessary through fieldwork

Quantifying Habitat Use by Amphidromous Species (ʻoʻopu, hīhīwai, ʻōpae)

Scientific Name	Hawaiian Name	Type
Awaous stamineus	ʻOʻopu nakea	Goby
Lentipes concolor	ʻOʻopu hiʻukole (alamoʻo)	Goby
Sicyopterus stimpsoni	ʻOʻopu nopili	Goby
Stenogobius hawaiiensis	ʻOʻopu naniha	Goby
Eleotris sandwicensis	ʻOʻopu akupa (okuhe)	Eleotrid
Atyoida bisulcata	ʻOpae kalaʻole	Shrimp
Macrobrachium grandimanus	ʻOpae ʻoehaʻa	Prawn
Neritina granosa	Hihiwai	Snail
Neritina vespertina	Hapawai	Snail




ʻoʻopu akupa
(*Eleotris sandwicensis*)
ʻoʻopu naniha
(*Stenogobius hawaiiensis*)

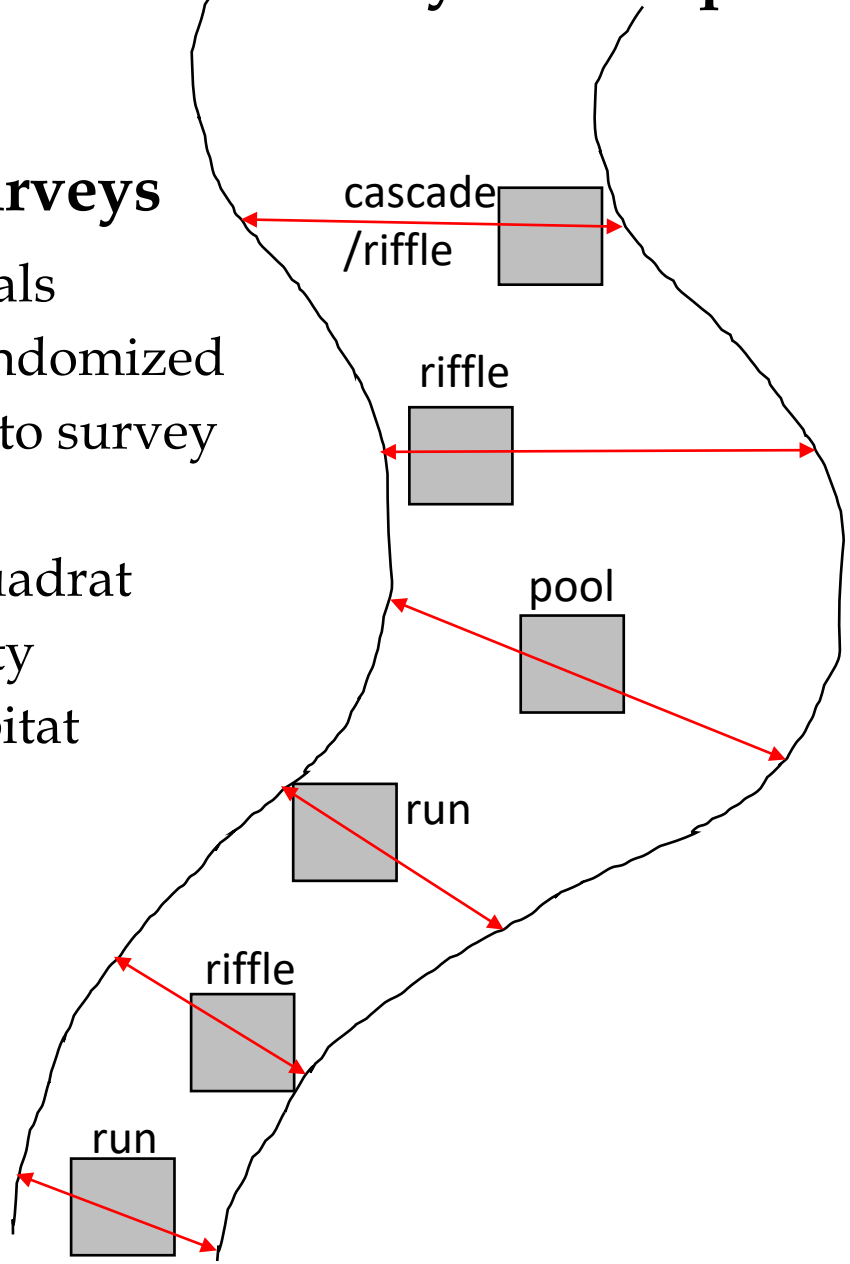

ʻoʻopu nopili (female)
(*Sicyopterus stimpsoni*)
ʻoʻopu nopili (male)
(*Sicyopterus stimpsoni*)
ʻoʻopu nākea (male)
(*Awaous stamineus*)


ʻoʻopu alamoʻo (male)
(*Lentipes concolor*)

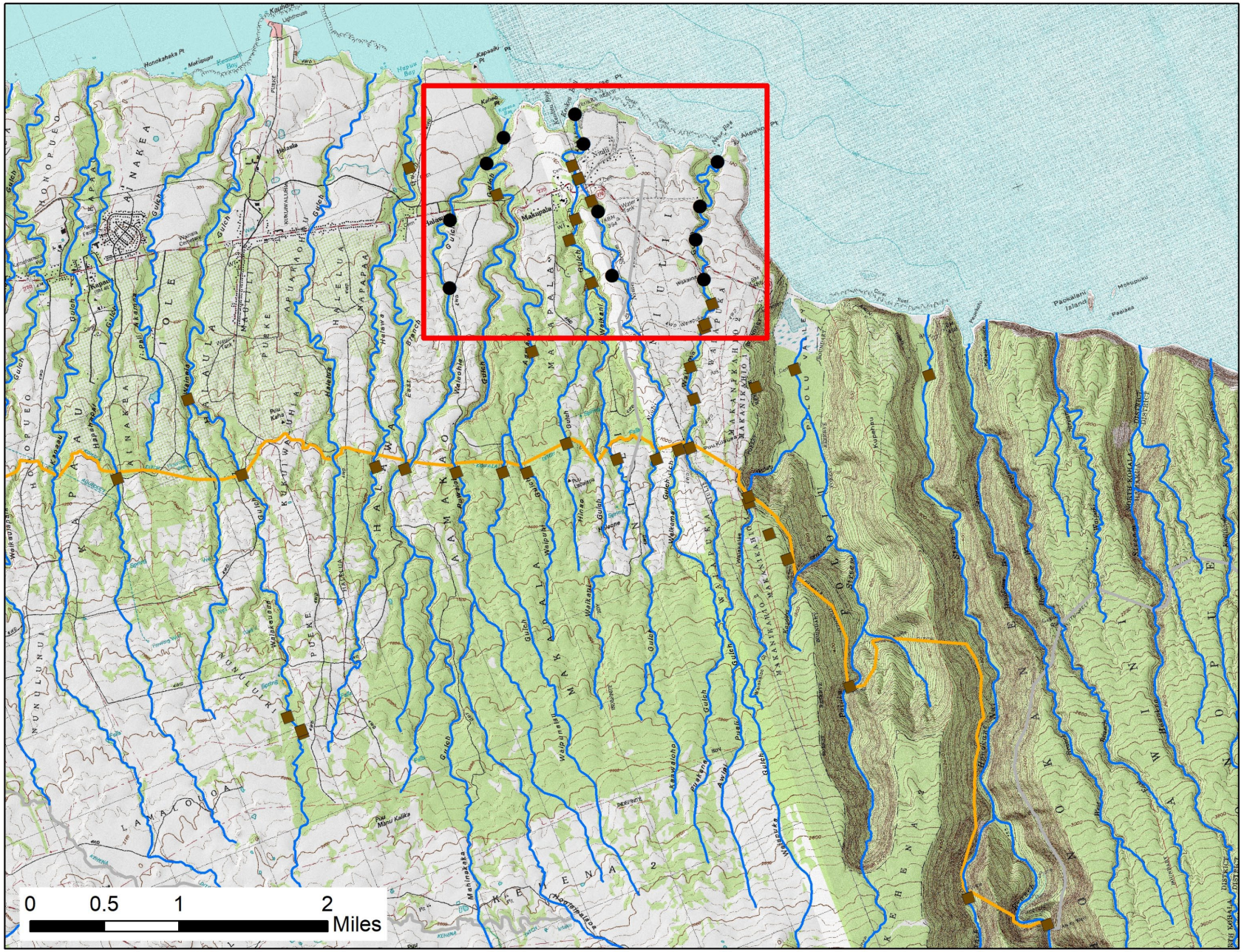
Biota Survey Technique

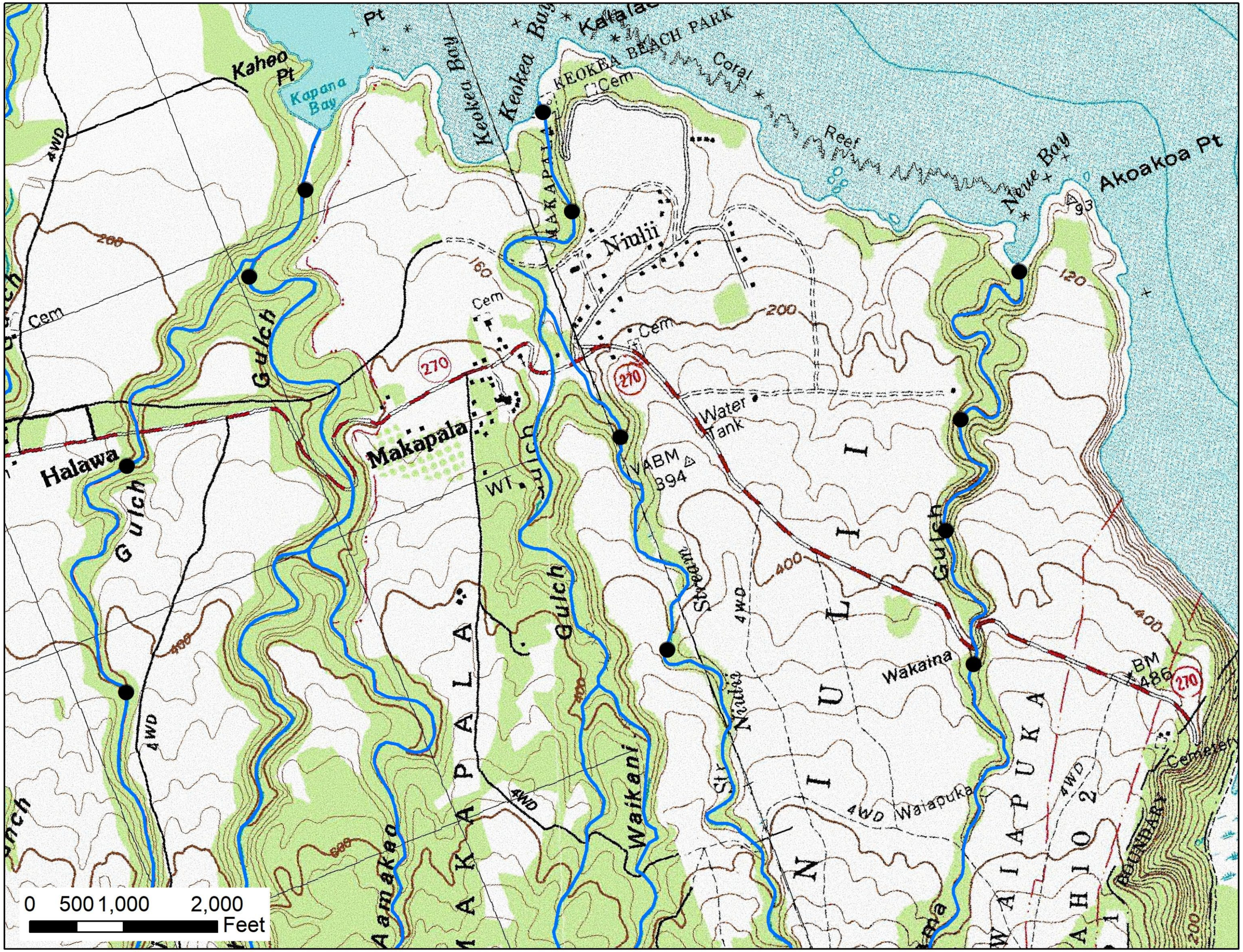
Point-Quadrat Reach Surveys

- 20x surveys at 10 m intervals
- Location along transect randomized
- Quadrat established prior to survey
- 2-minute visual survey
- All species identified in quadrat
- Dimensions, depth, velocity
- Substrate proportions, habitat



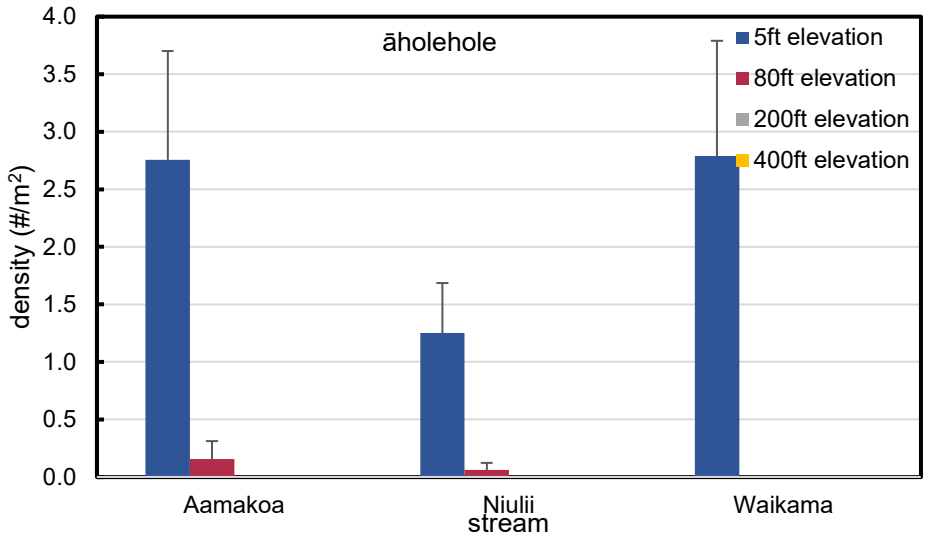
Quantifying Habitat Use by Freshwater Species

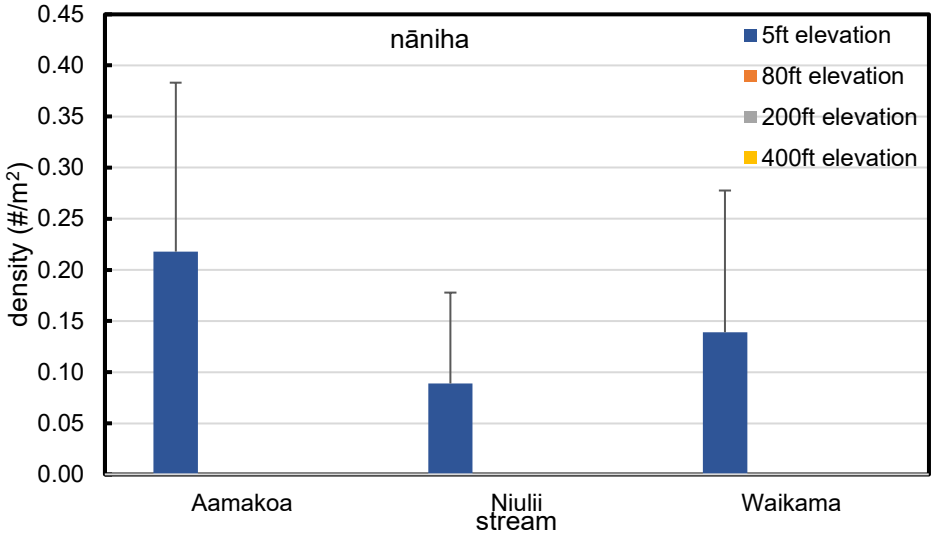


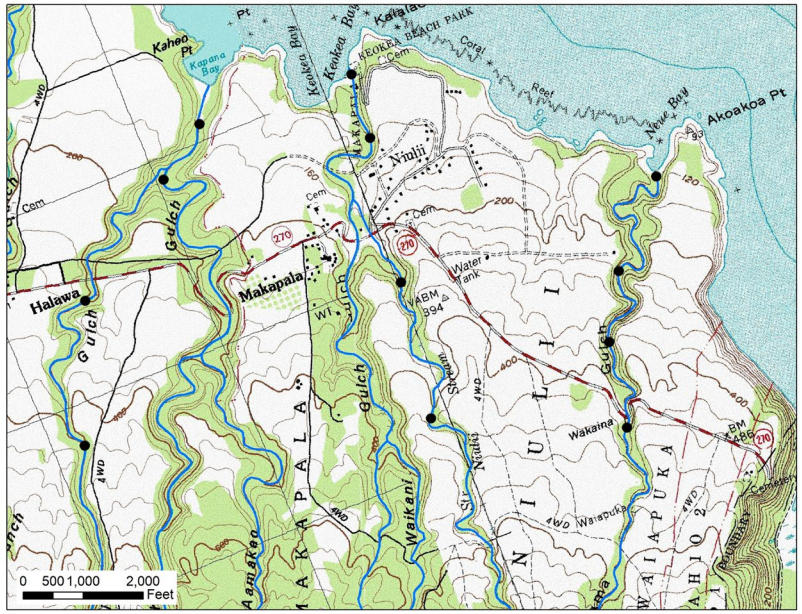


Kaheo Pt
Kapana Bay
Keokea Bay
Keokea Bay
Kalala
KEOKEA BEACH PARK
Cem
Coral
Reef
Niue Bay
Akoakoa Pt
93
MAKAPALA
Niulii
120
200
160
Cem
Cem
Cem
270
Gulch
Halawa
Gulch
Makapala
Water Tank
VABM 394
WT
Gulch
Stream
Gulch
400
4WD
Wakaina
BM 486
Cemetery
Waikani
Niulii
Str
4WD Waiapuka
BOUNDARY
Aamakao
MAKAPALA
NIULII
WAIAPUKA
4WD
200
400
600
0 500 1,000 2,000
Feet

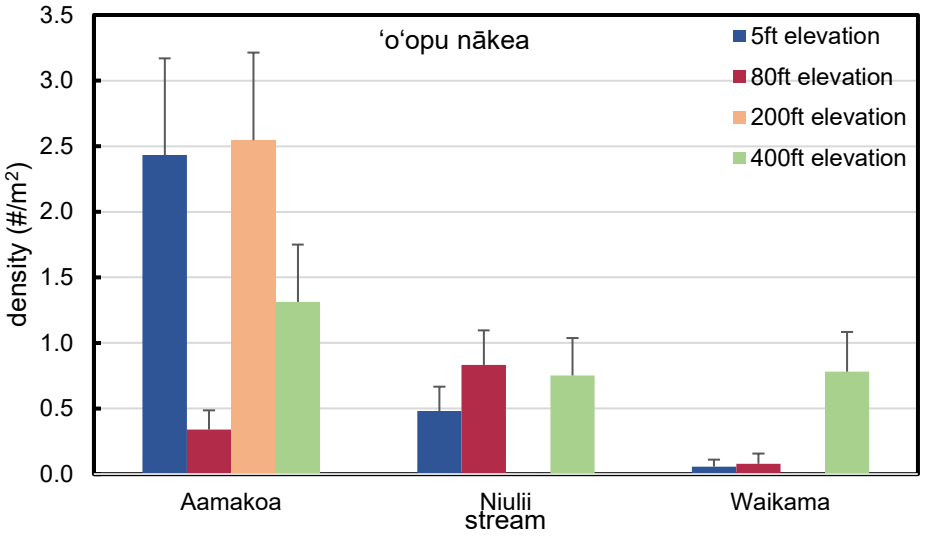
Quantifying Habitat Use by Amphidromous Species
Poor climbers: aholehole, ‘o‘opu naniha

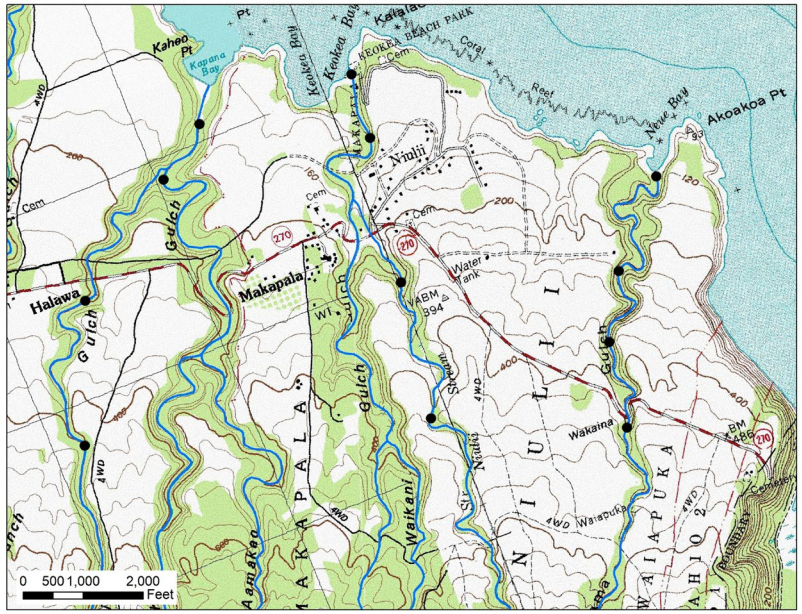


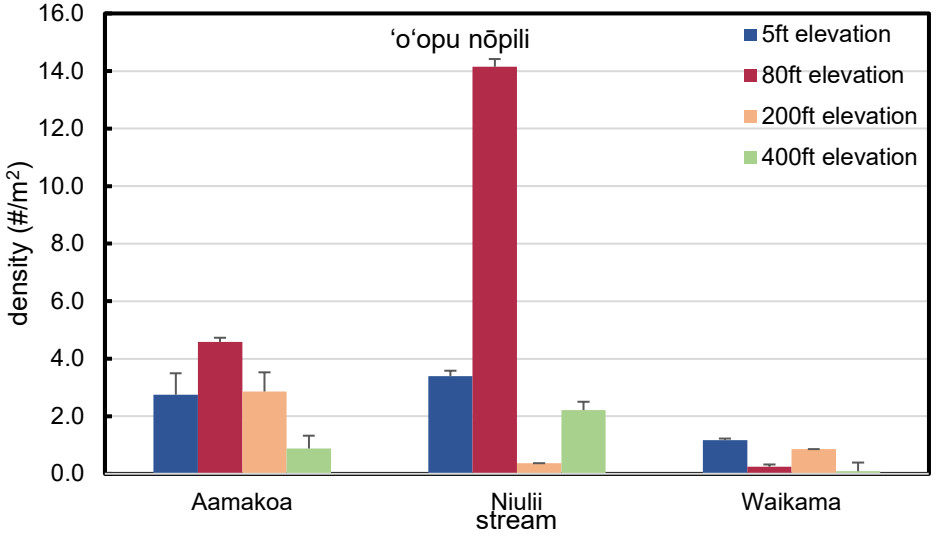


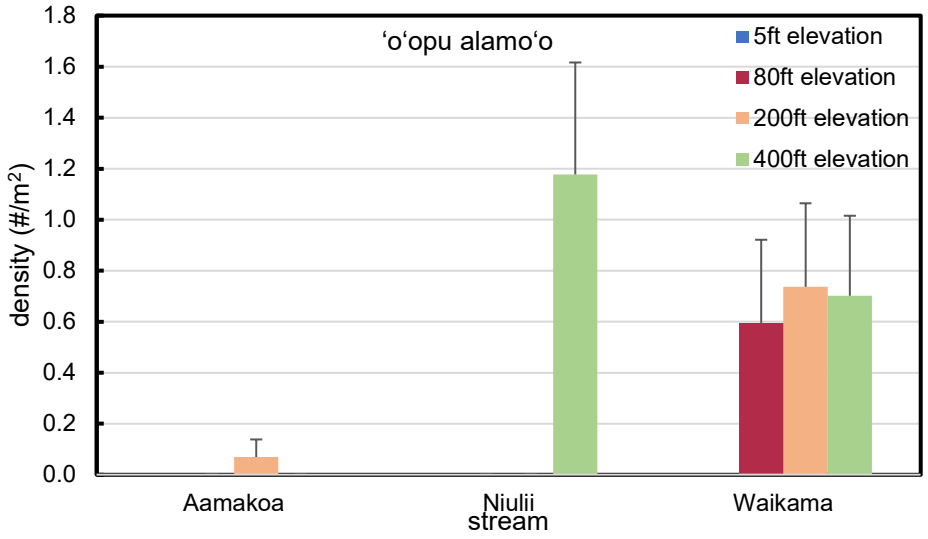


Quantifying Habitat Use by Amphidromous Species
Good Climbers: ʻoʻopu nākea, alāmoʻo and nōpili

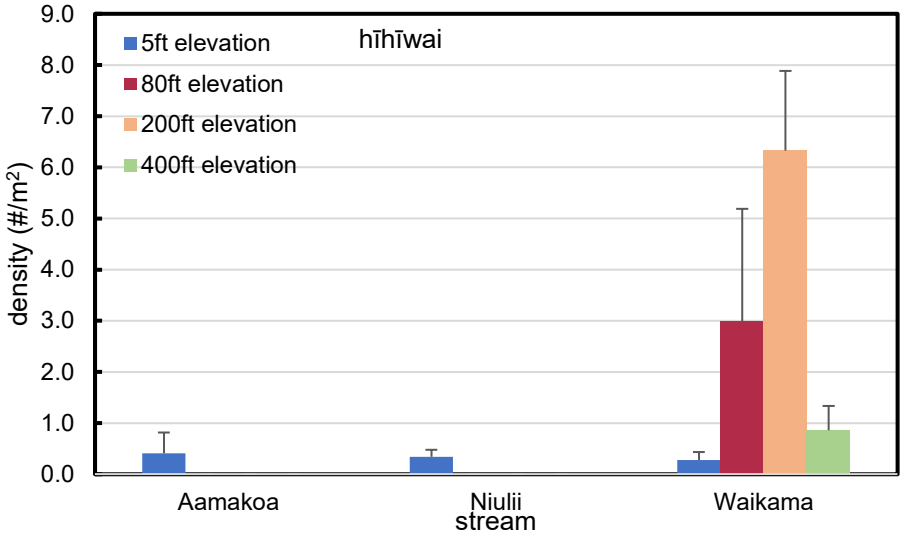


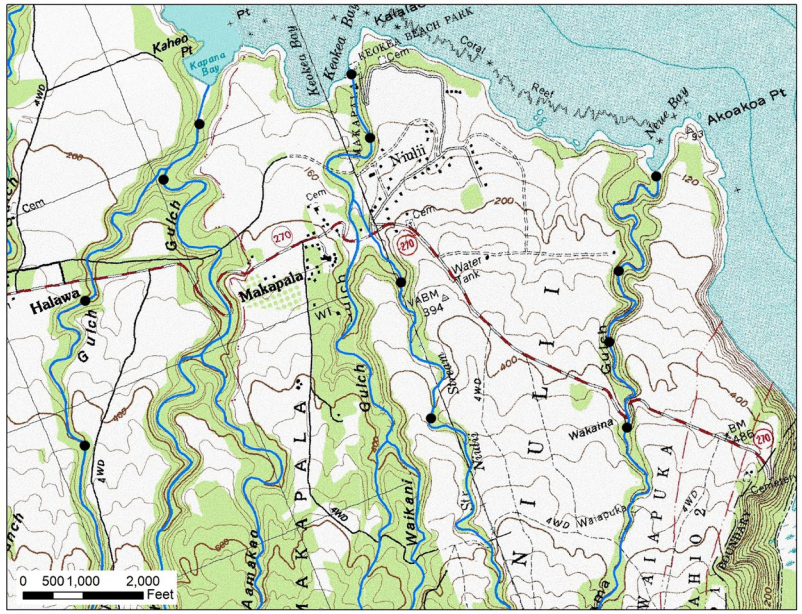


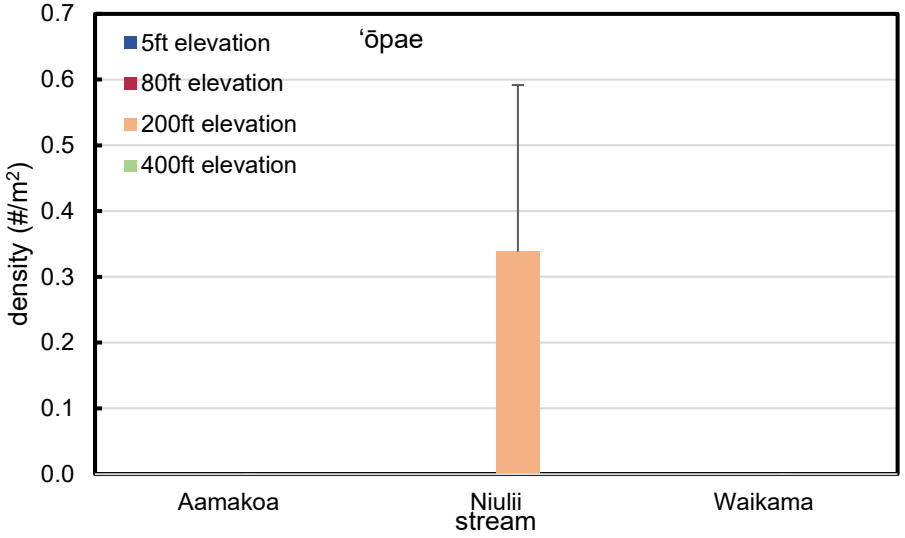




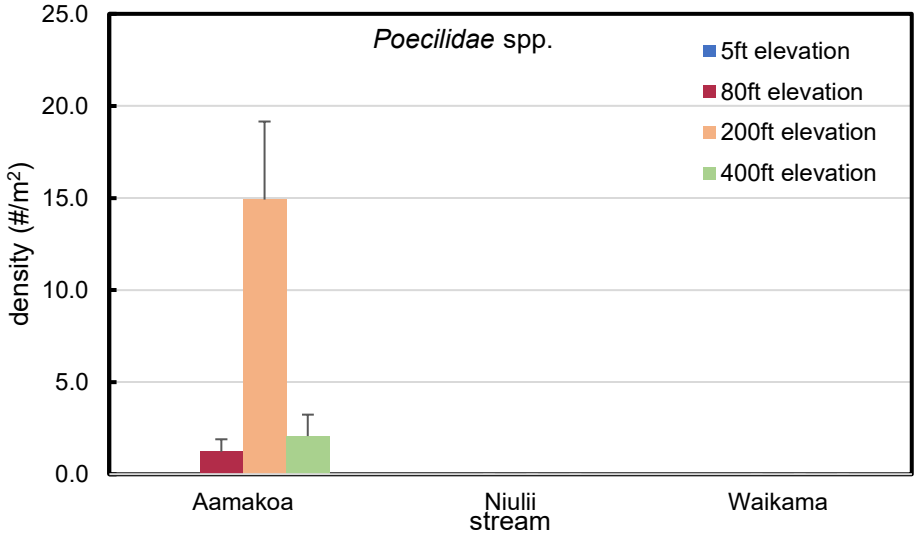
Quantifying Habitat Use by Amphidromous Species
Endemic Invertebrates: ʻōpae and hīhīwai

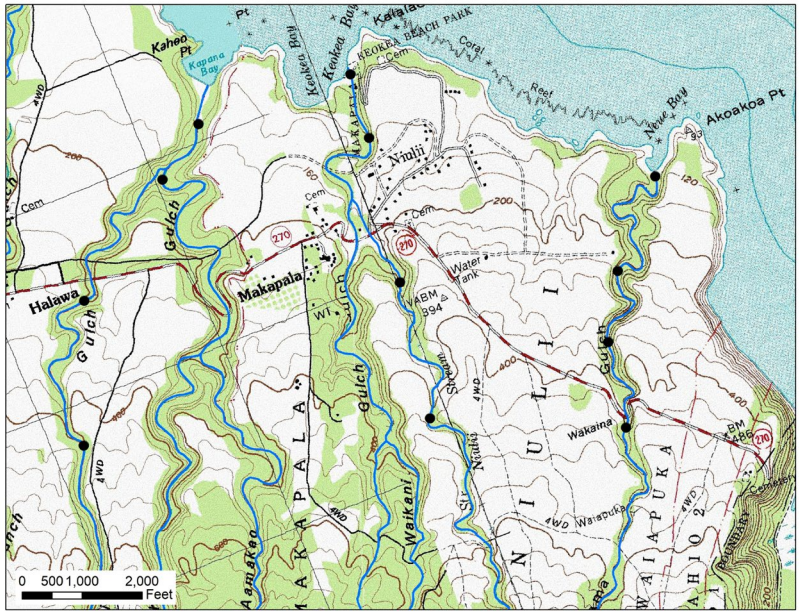


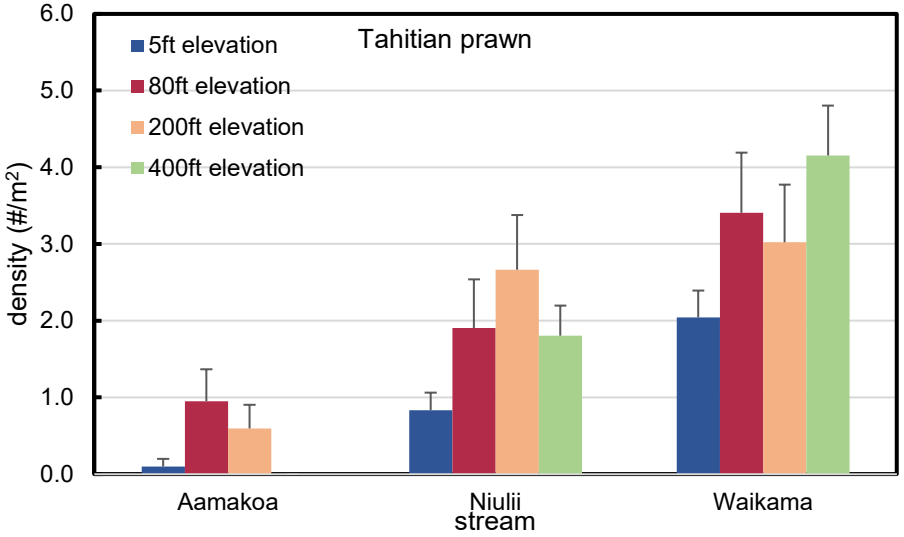




Quantifying Habitat Use by Non-native species





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