

Lahaina Surface Water and Groundwater Management Area Designation

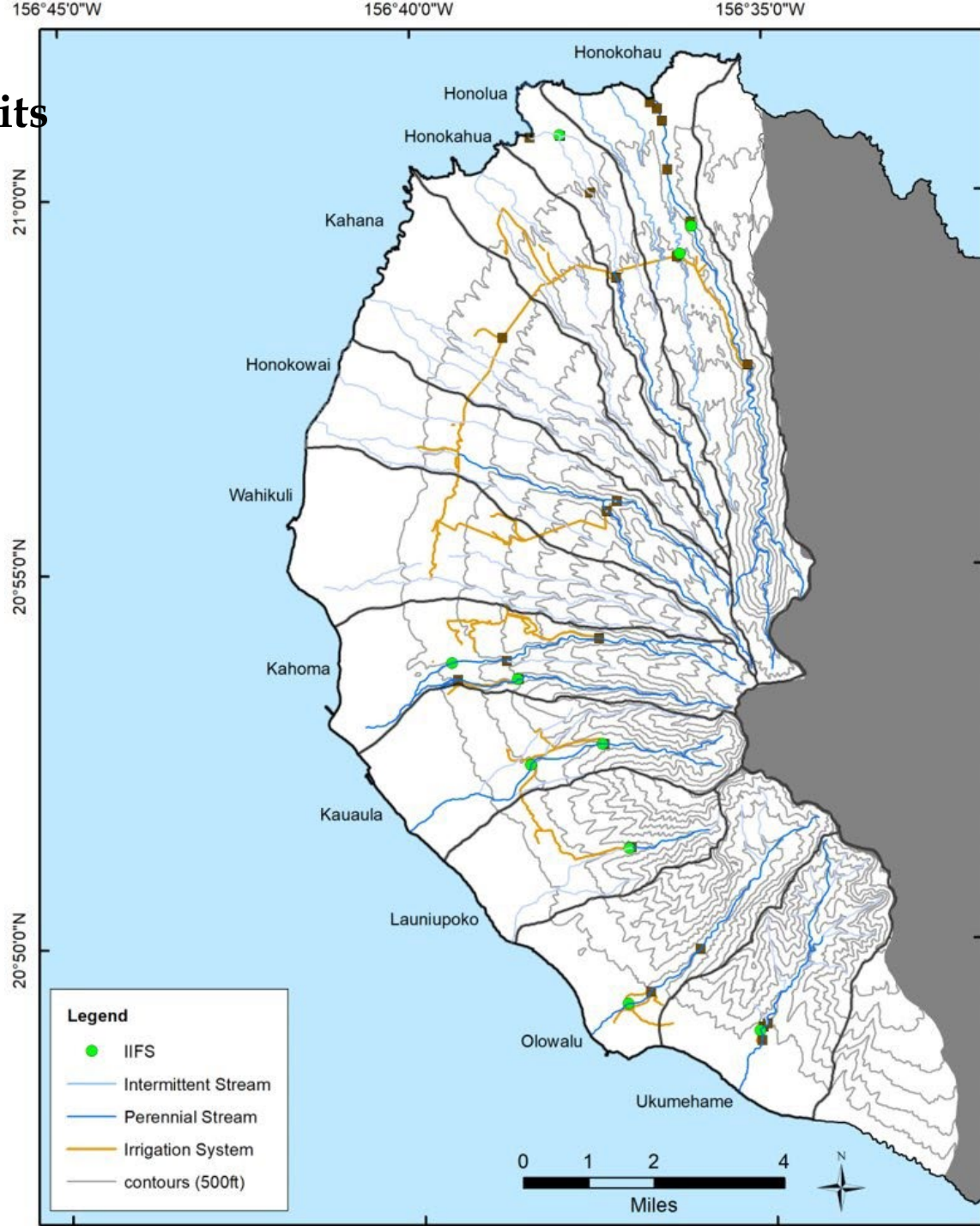
COMMISSION ON WATER RESOURCE MANAGEMENT

Ke Kahuwai Pono

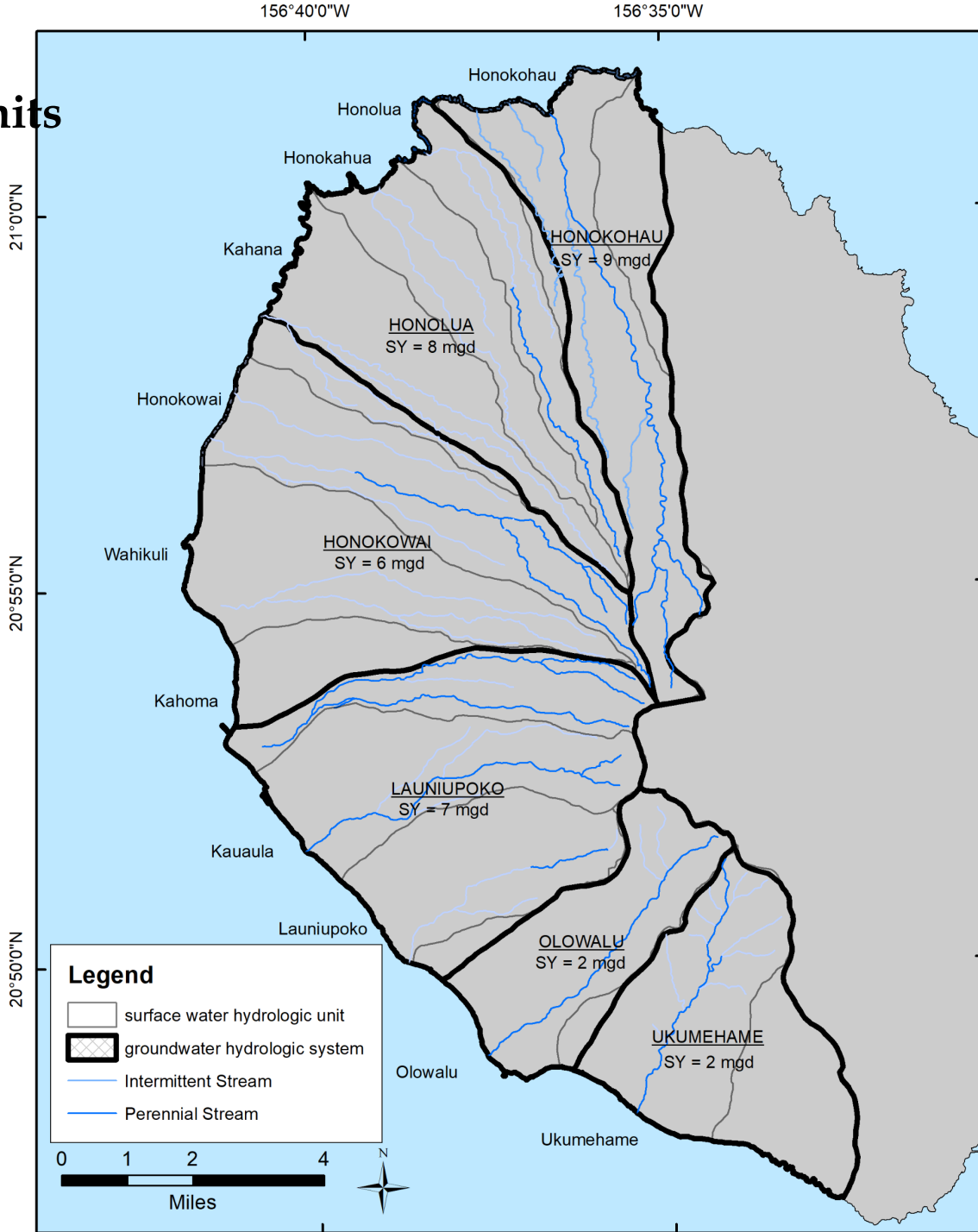
"The trustee who oversees the rightful sharing of water."



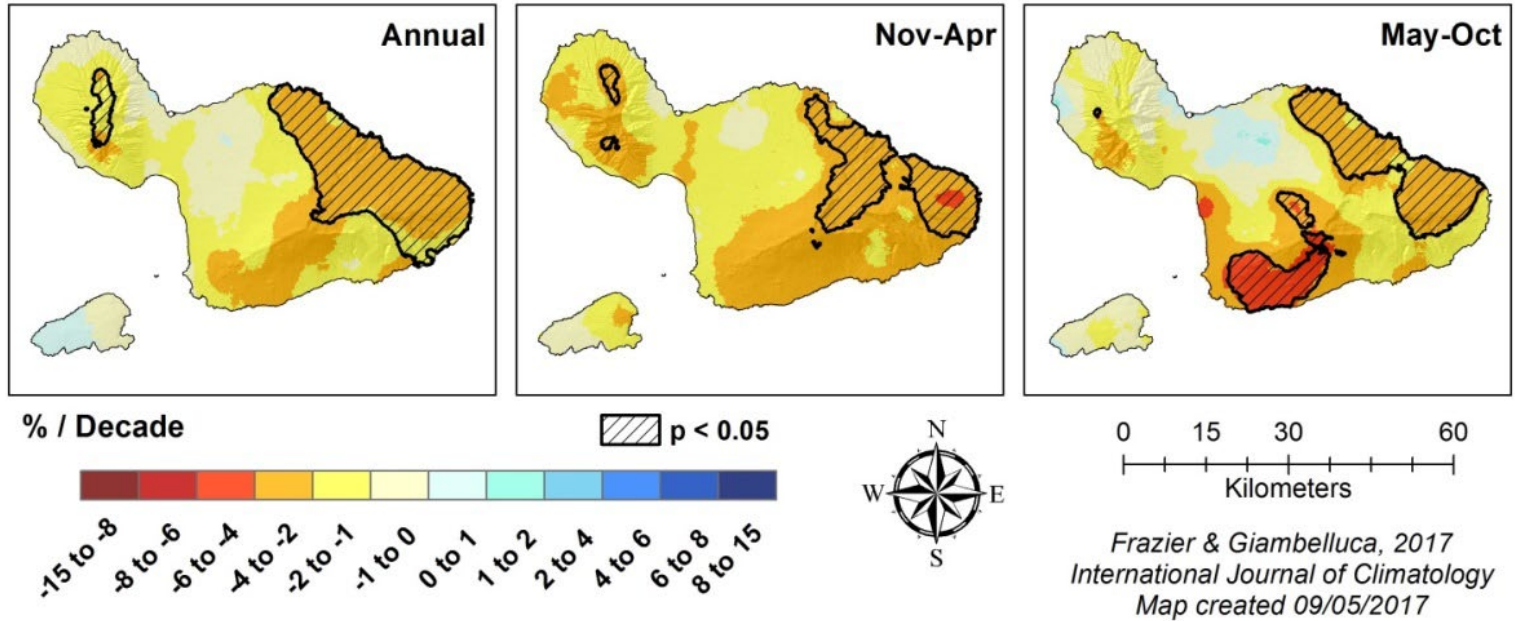
West Maui Surface Water Hydrologic Units



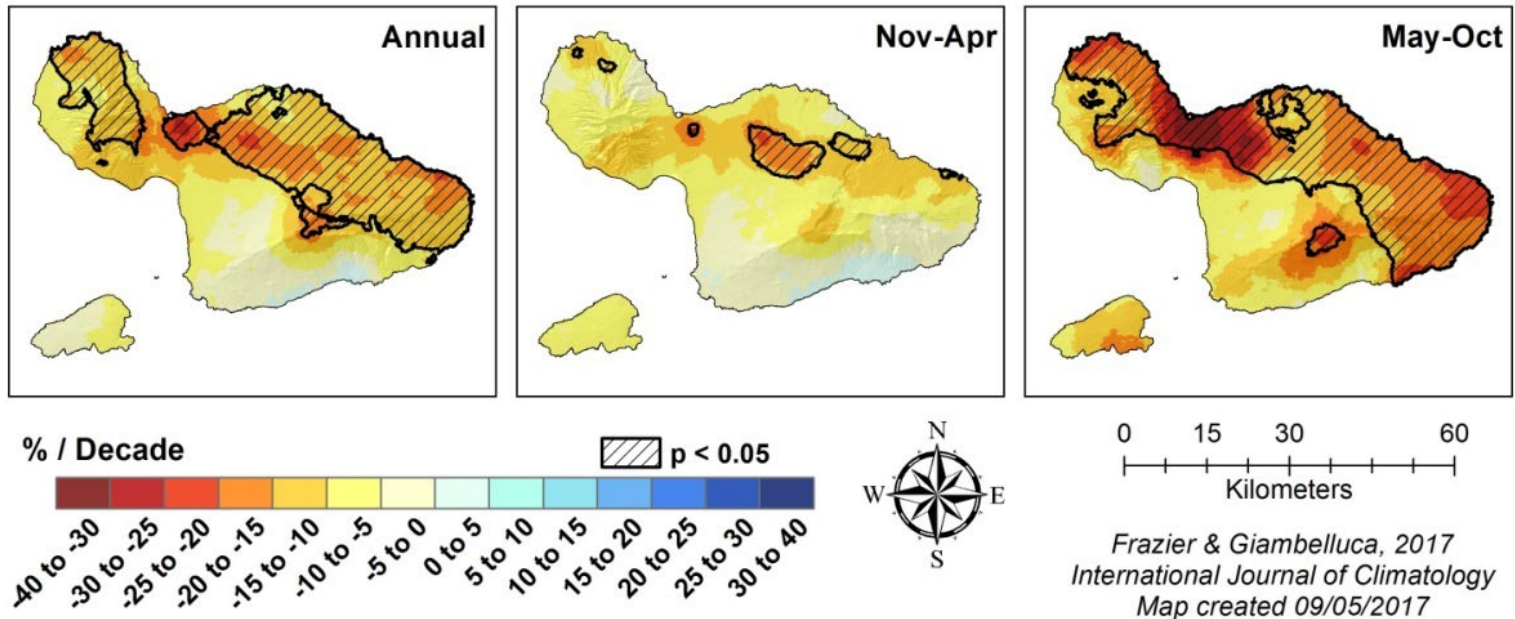
West Maui Ground Water Hydrologic Units



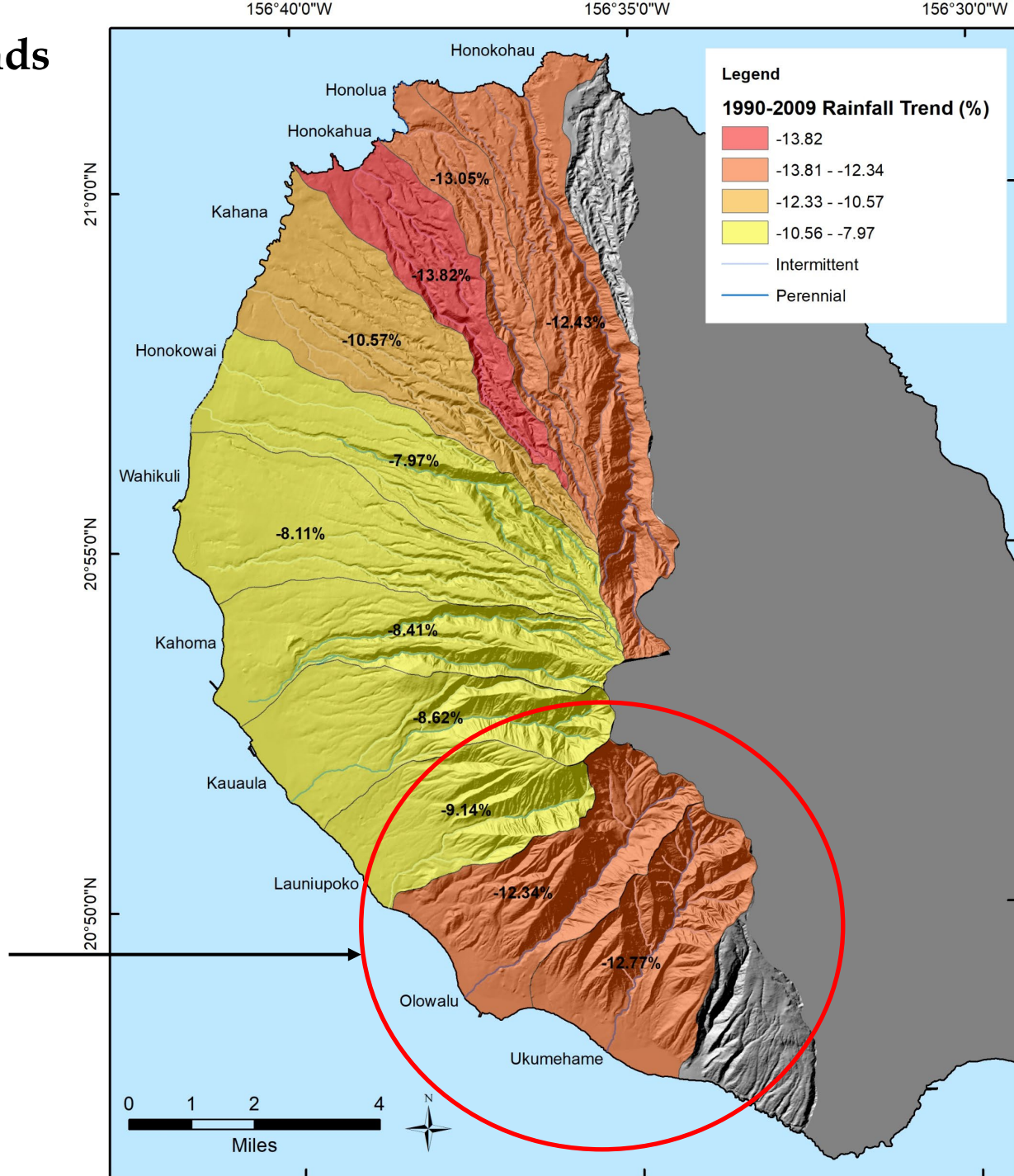
Maui & Kaho'olawe Rainfall Trends: 1920-2012



Maui & Kaho'olawe Rainfall Trends: 1983-2012



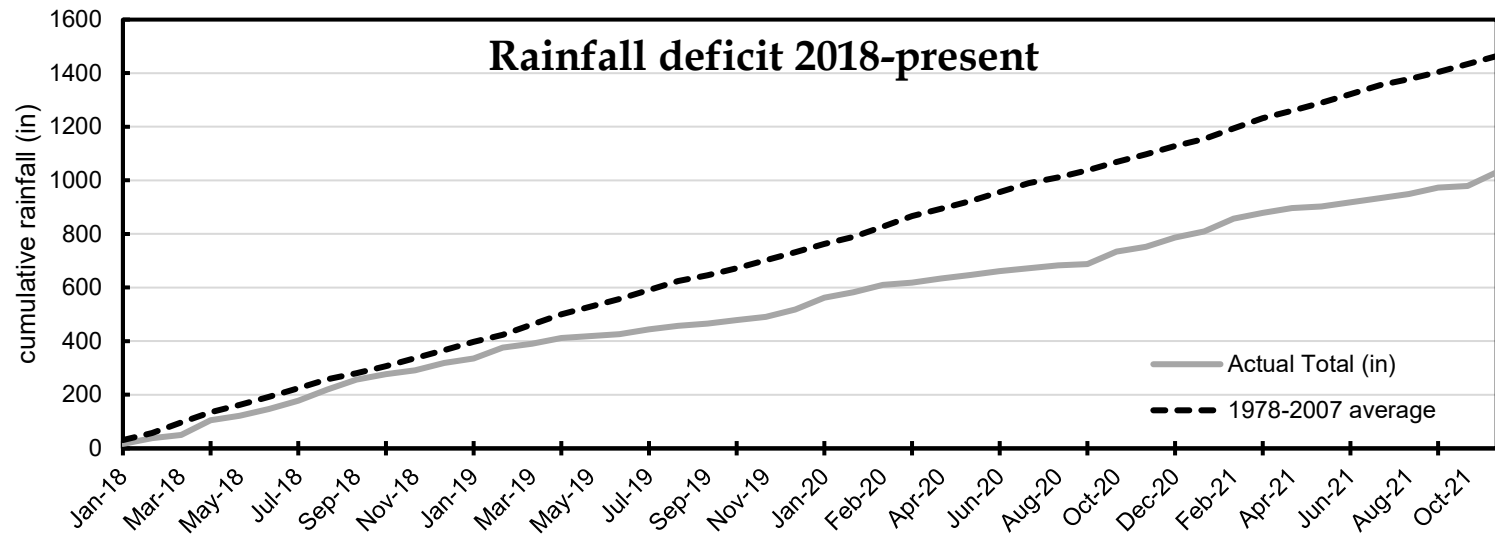
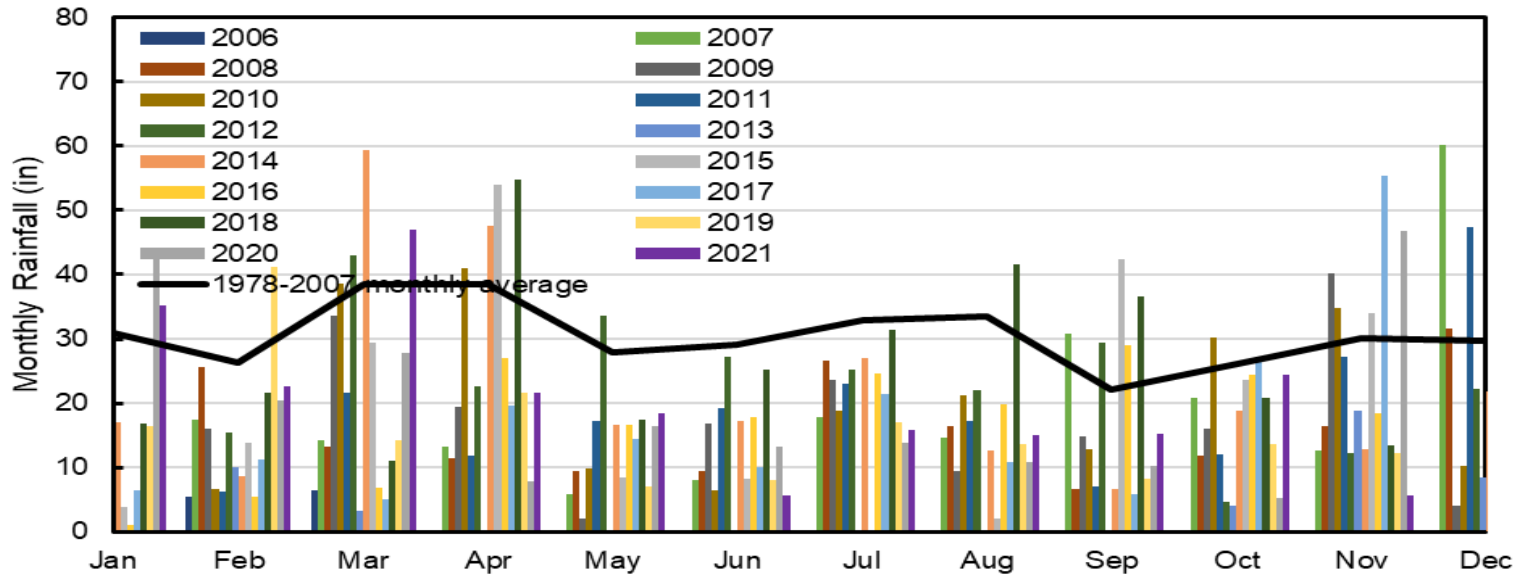
1990-2009 Rainfall Trends



Strong agreement among projection models of large declines in rainfall here

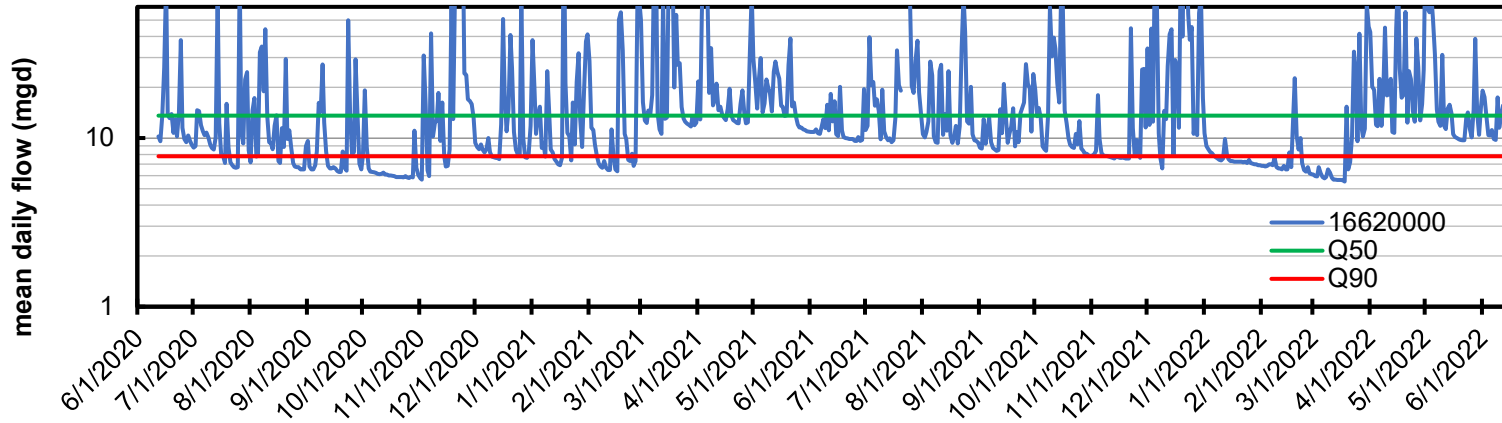
West Maui

Recent Trends in Rainfall on Pu'u Kukui

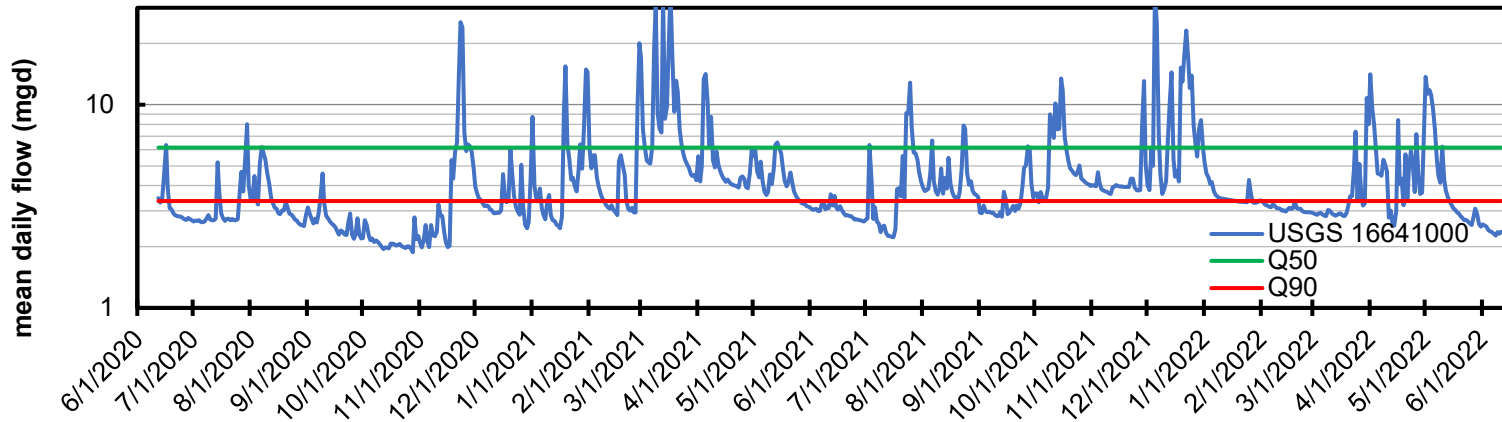


Surface water sources are flowing more regularly below long-term Q₉₀

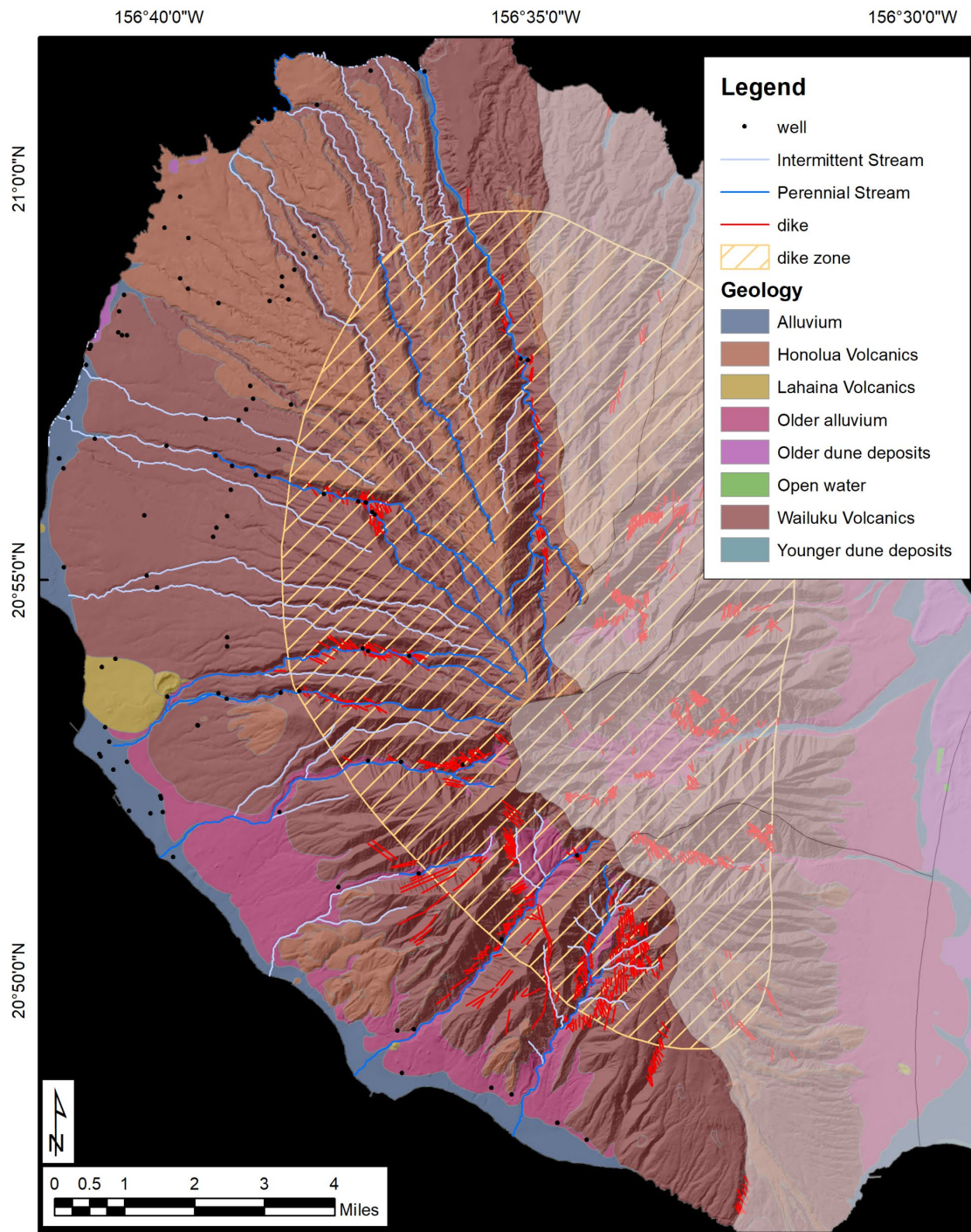
USGS 1662000 Honokōhau Stream



USGS 1662000 Kau'a'ula Stream



Geology



Groundwater Withdrawal: Development Tunnels

Tunnel 22
Honokōhau Gulch
Honokōhau hydrologic unit



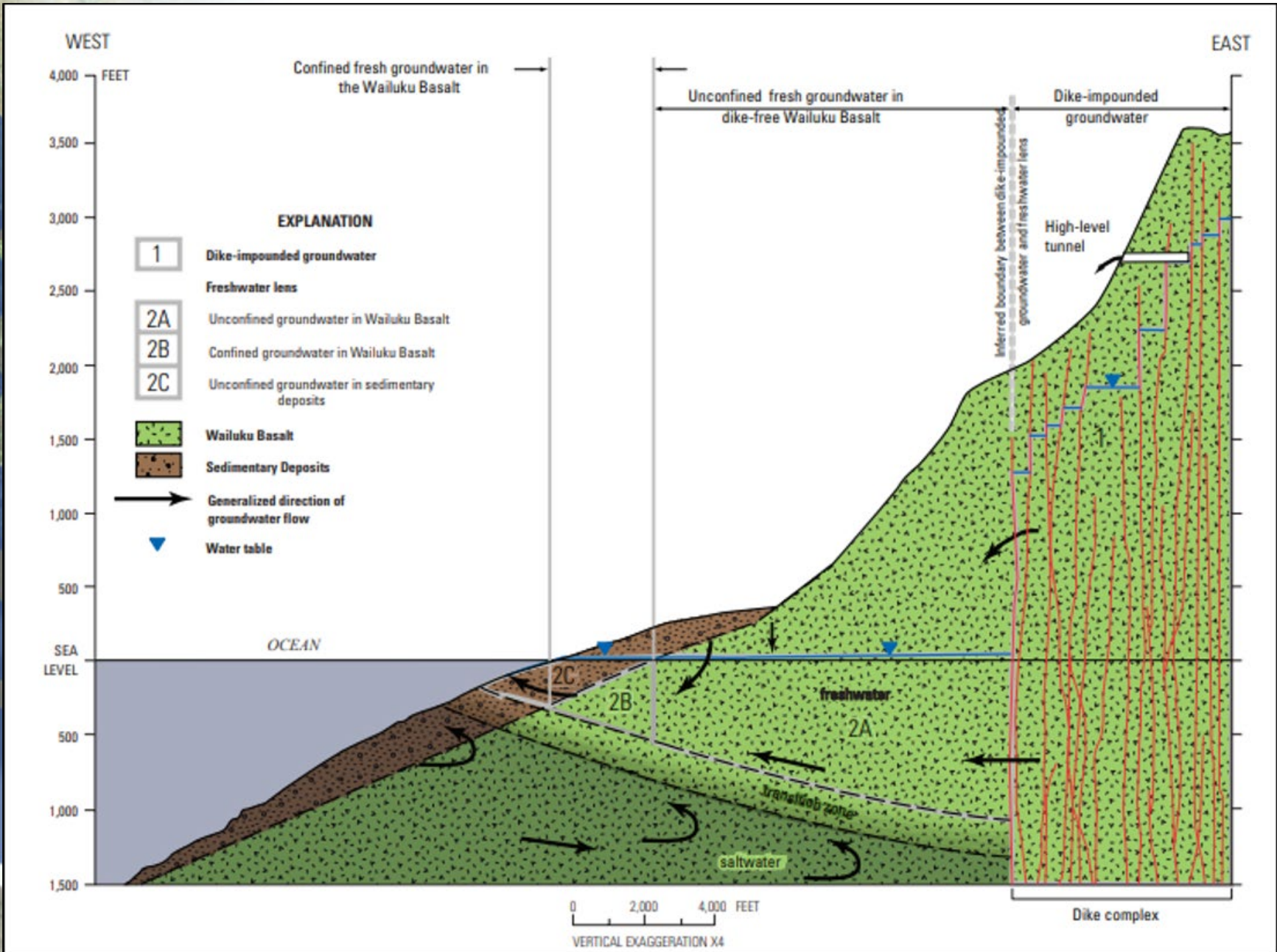
Tunnel 20-A
Honokōwai Gulch
Honokōwai hydrologic unit



Tunnel 18
Kahoma Valley
Launiupoko hydrologic unit



Geology

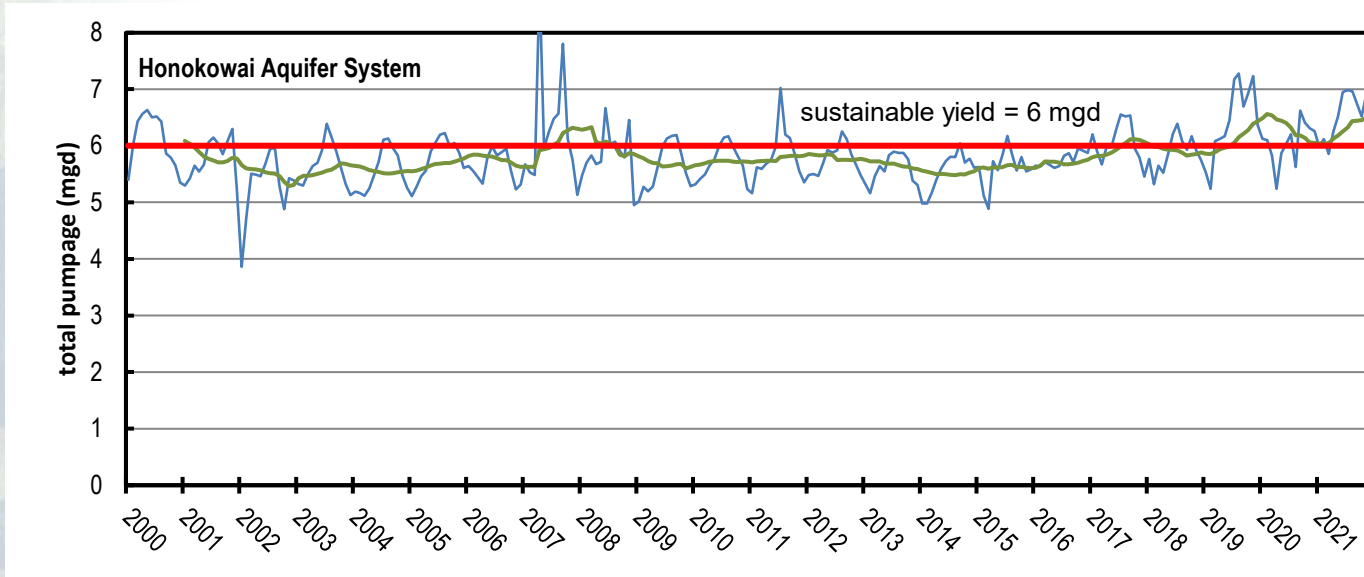


Groundwater Withdrawal: Development Tunnels

| well number | common name | Aquifer System | receiving stream | elevation (ft) | length (ft) | yield (mgd) | recent measurements (mgd) |
|-------------|-------------|----------------|------------------|----------------|-------------|-------------|---------------------------|
| 6-5134-001 | Tunnel-14 | Olowalu | Olowalu | 1,710 | 3,000 | 0.00 | |
| 6-5136-001 | Tunnel-15 | Launiupoko | Launiupoko | 1,425 | 1,320 | 0.10 | 0.00 |
| 6-5236-001 | Tunnel-16 | Launiupoko | Kaua'ula | 2,920 | 656 | 2.00 | -- |
| 6-5437-001 | Tunnel-17 | Launiupoko | Kahoma | 1,923 | 2,500 | dry | 0.00 |
| 6-5437-002 | Tunnel-18 | Launiupoko | Kahoma | 1,984 | 2,500 | 1.90 | 1.92 |
| 6-5436-001 | Tunnel-19 | Launiupoko | Kahoma | 2,350 | 739 | 0.01 | <0.01 |
| 6-5537-001 | Tunnel-20a | Honokōwai | Honokōwai | 1,700 | 1,250 | 2.00 | 1.93 |
| 6-5537-002 | Tunnel-20b | Honokōwai | Honokōwai | 1,600 | 1,050 | 0.50 | 0.50 |
| 6-5537-003 | Tunnel-20c | Honokōwai | Honokōwai | 1,650 | -- | dry | 0.00 |
| 6-5735-001 | Tunnel-21 | Honokōhau | Honokōhau | 880 | 720 | 1.35 | 0.65 |
| 6-5735-002 | Tunnel-22 | Honokōhau | Honokōhau | 900 | 1,015 | 2.40 | 2.52 |



Groundwater withdrawals



| Aquifer System | SY | 2020 12-MAV | 2021 12-MAV | Develop. tunnel discharge | APU* | total existing + APU | % SY | other perm. well capacity | total incl. other perm. well capacity | % SY |
|-------------------|----------|--------------|--------------|---------------------------|--------------|----------------------|-------------|---------------------------|---------------------------------------|-------------|
| Ukumehame | 2 | 0.042 | 0.065 | 0 | 1.08 | 1.145 | 57% | 0 | 1.145 | 57% |
| Olowalu | 2 | 0.082 | 0.069 | 0.1 | 0.003 | 0.167 | 8% | 0.065 | 0.167 | 8% |
| Launiupoko | 7 | 1.637 | 1.303 | 3.91 | 1.036 | 6.249 | 89% | 1.433 | 7.682 | 110% |
| Honokōwai | 6 | 3.48 | 4.008 | 2.5 | 2.533 | 9.041 | 151% | 0 | 9.041 | 151% |
| Honolua | 8 | 2.131 | 2.534 | 0 | 1.969 | 4.503 | 56% | 0 | 4.503 | 56% |
| Honokōhau | 9 | 0 | 0 | 3.75 | 0.001 | 3.751 | 42% | 0 | 3.751 | 42% |



Water Use: County DWS vs Large Private Systems

| System | Owner/Manager | Wells | 12-MAV (mgd) | Active Development Tunnels | Stream Diversions | Estimated reasonable non-potable/potable use of SW (mgd) | estimated flow available at Q ₅₀ minus IIFS (mgd) | estimated flow available at Q ₉₀ minus IIFS (mgd) |
|------------------------|--|-------|--------------|----------------------------|-------------------|--|--|--|
| Ukumehame | Uka, LLC | 3 | 0.066 | 0 | 0 | n/a | n/a | n/a |
| Ukumehame | Uka, LLC | 0 | n/a | 0 | 1 | 0.092 | 0.33 | 0.00 |
| Olowalu | Olowalu Water Company | 1 | 0.067 | 0 | 1 | 0.487 | 0.58 | 0.00 |
| Launiupoko non-potable | Launiupoko Irrigation Company | 1 | 0.122 | 1 | 2 | 2.17 | 3.08 | 0.30 |
| Mahanalua Nui | Launiupoko Water Company | 3 | 0.373 | 0 | 0 | n/a | n/a | n/a |
| Lahaina | Maui DWS | 4 | 0.541 | 0 | 1 | 0.243/1.70 | 2.67 | 1.10 |
| Kahoma | Kamehameha Schools | 0 | n/a | 2 | 1 | 0.113 | 0.26 | 0.00 |
| Kaanapali non-potable | Kaanapali Land Management | 1 | 0.093 | 2 | 2 | 1.648 | 3.49 ^a | 2.32 ^a |
| Kaanapali | Hawaii Water Service | 9 | 3.897 | 0 | 0 | n/a | n/a | n/a |
| Napili-Kaanapali | Maui DWS | 2 | 1.943 | 2 | 1 | 2.10 | 12.2 | 2.4 |
| Kapalua | Hawaii Water Service | 3 | 0.574 | 0 | 0 | n/a | n/a | n/a |
| Kapalua non-potable | Maui Land & Pineapple/Hawaii Water Service | 0 | n/a | 2 | 1 | 7.52/2.10 | 12.2 | 2.4 |

^ano interim instream flow standard established

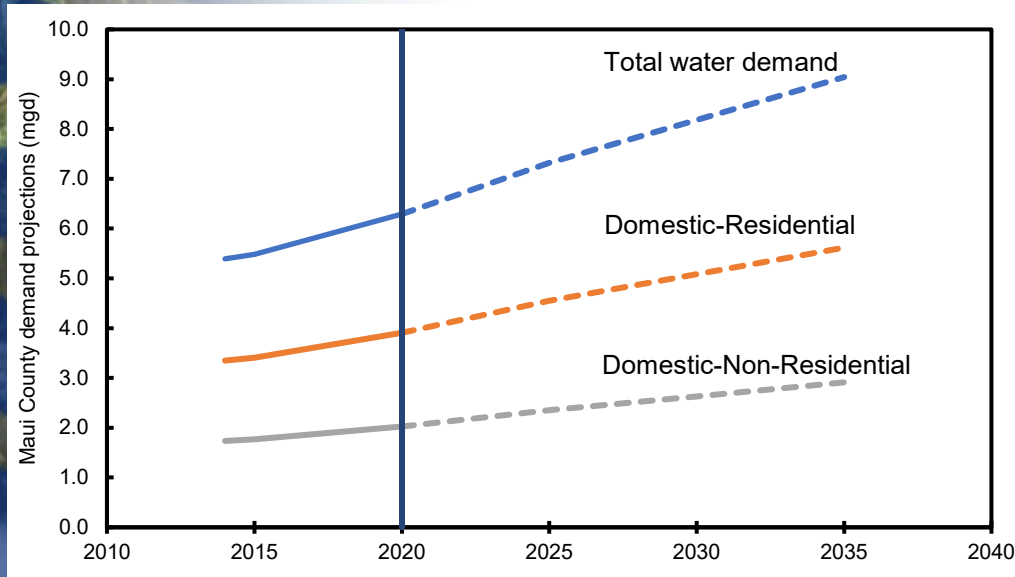


Need to integrate Surface and Groundwater Use

- Maui DWS only accounts for ~23% of total water use
- County has no jurisdiction over private companies

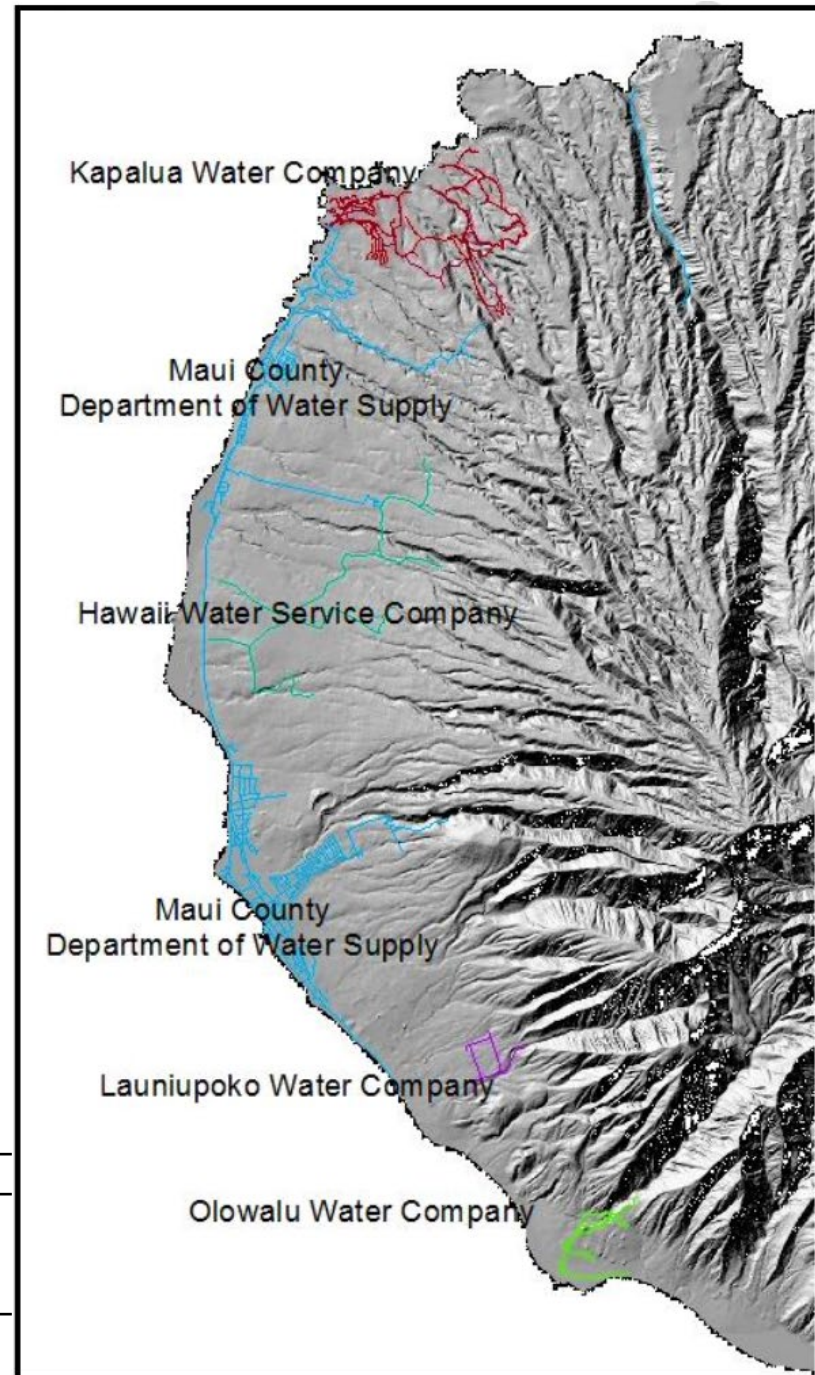
2022 12-MAV GW + reasonable SW use

| | | | |
|----------------------|-----------------|------------|-----|
| Maui DWS | Municipal Use | 5.217 mgd | 23% |
| Private | Potable Use | 4.977 mgd | 22% |
| Private | Non-potable Use | 12.442 mgd | 55% |
| Total potable demand | | 10.194 mgd | |



2020 projected from 2014

| | |
|--------------------------|-----------|
| domestic residential | 3.908 mgd |
| domestic non-residential | 2.022 mgd |
| domestic total | 5.930 mgd |
| total | 6.288 mgd |

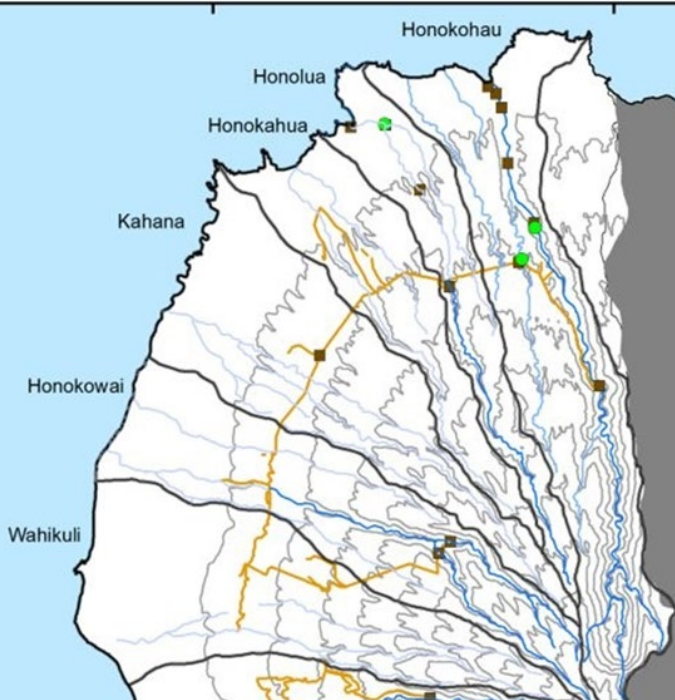


There exists an integration of ground and surface water sources to meet both potable and non-potable demands

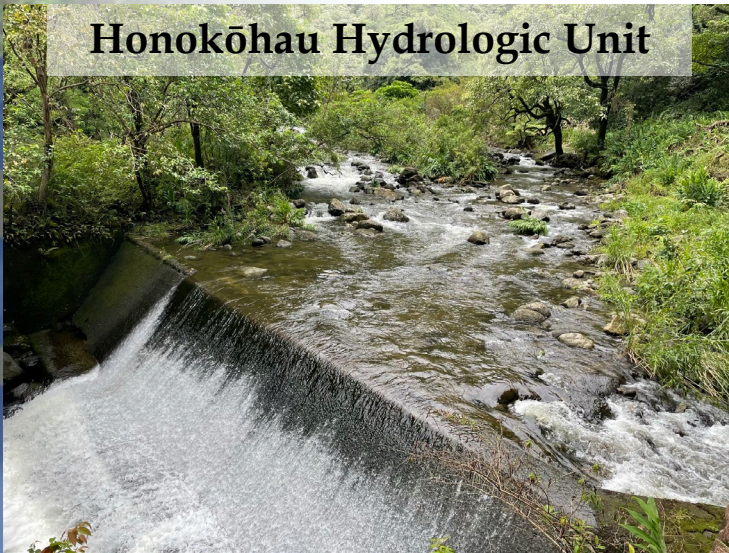
The use of one source (ground or surface water) offsets the use of the other

→ Cannot issue a water use permit for an existing use that is met with both ground and surface water if both are not designated

***County DWS Mahinahina WTF was shut down twice in the last six months due to a lack of surface water



Honokōhau Hydrologic Unit



Honokōhau Stream at Div 770
→ used to meet demands across multiple hydrologic units

Honokōwai Hydrologic Unit



Honokōhau Ditch at Mahinahina
→ potable and non-potable use
→ Maui DWS, DHHL, Private uses

