Informational Briefing:
Current Drought Conditions, Instream Flow Standards In Honokōhau, and Water Use in West Maui

September 16, 2025

Outline

A. The Honokōhau System Overview
B. Quantifying Water Availability
    1. long-term vs short term
    2. groundwater-surface water interactions
C. Current Drought Conditions
D. Impacts to Water Use
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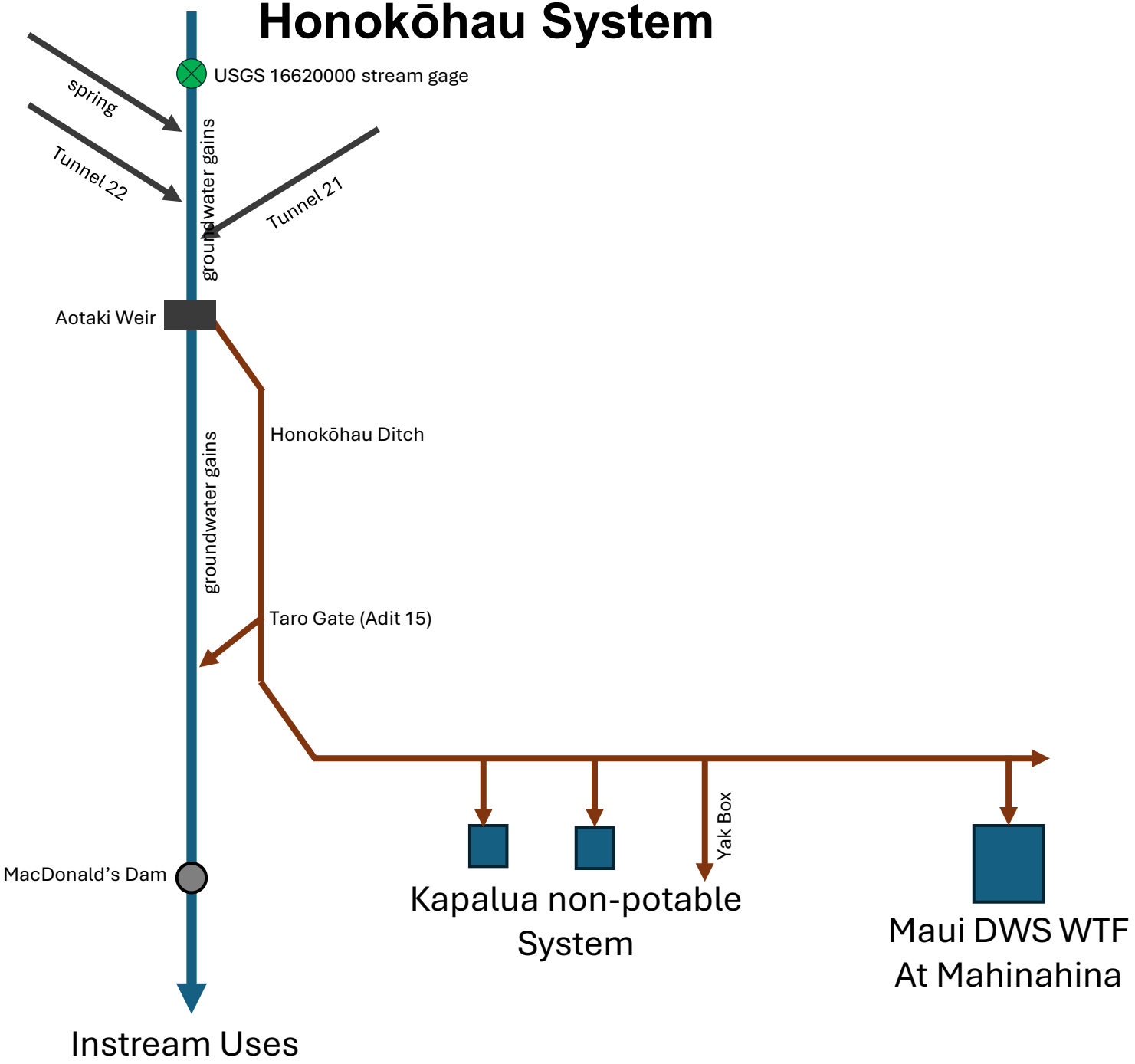
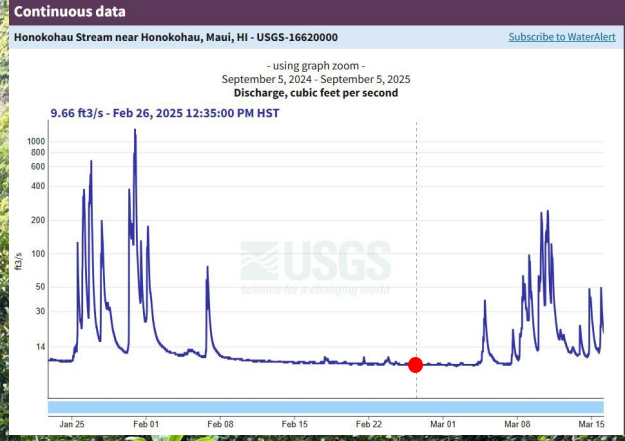
        2. Traditional and Customary Practices
        3. Instream Habitat
        4. Recreational Uses
        5. Nearshore impacts
    2. Non-instream Uses
        1. Maui DWS Water Treatment Facility
        2. Kapalua Resort non-potable System
E. Suggested Improvements

Honokōhau System



Honokōhau Stream at USGS 16620000 installed in 1912



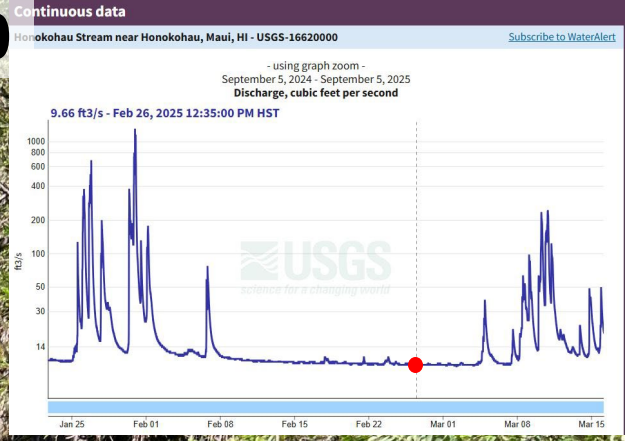
Honokōhau Development Tunnels

Tunnel 22

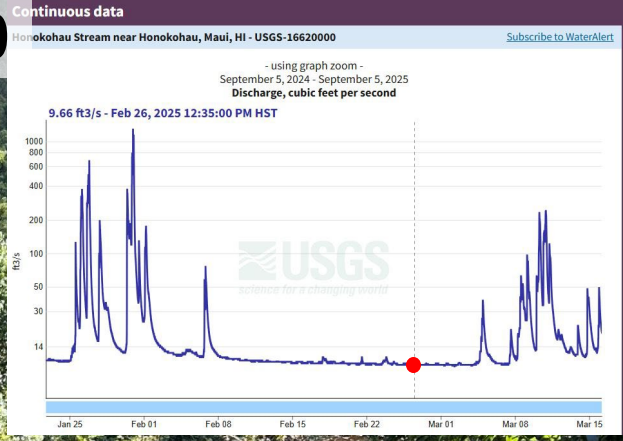
Tunnel 21

Spring Discharge

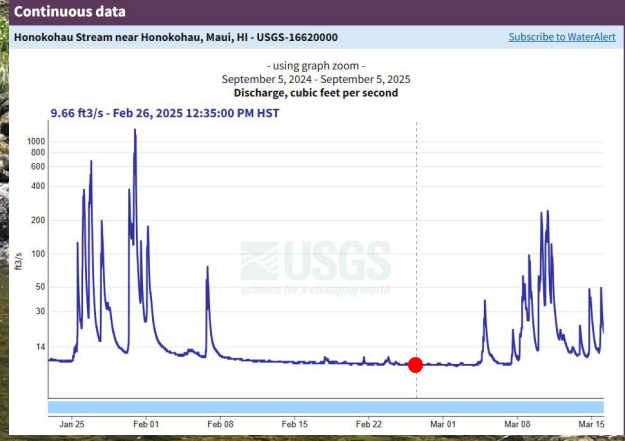
Honokōhau Stream below USGS 16620000



Honokōhau Stream below USGS 16620000



Honokōhau Stream at Aotaki Weir



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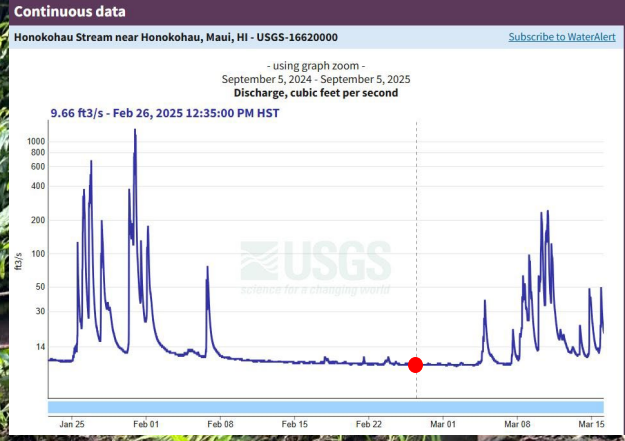
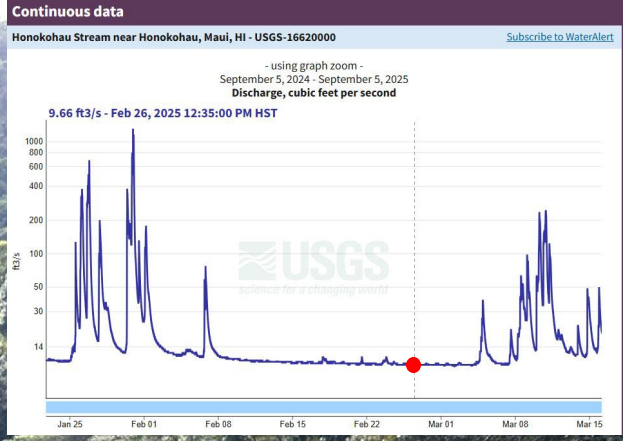


Honokōhau Ditch at Adit 6

Honokōhau Stream below Aotaki Weir



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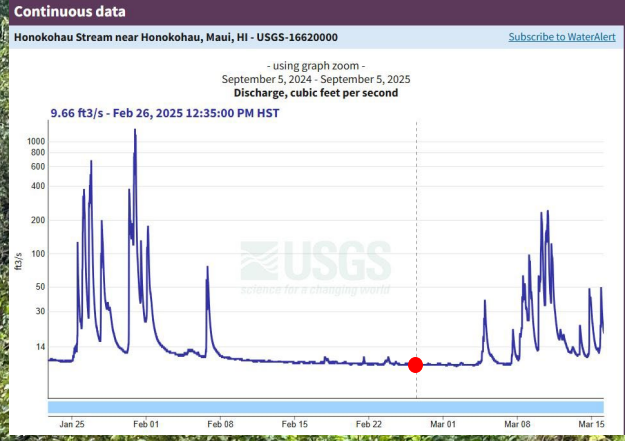

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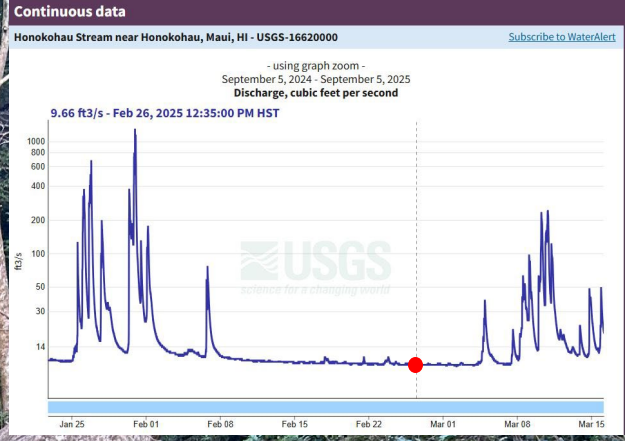


Honokōhau Stream at MacDonald's Dam

Honokōhau Ditch at Taro Gate (Adit 15)

Honokōhau Ditch at Taro Gate (Adit 15)

Honokōhau Ditch at Adit 16

Honokōhau Ditch at Honolua

Honokōhau Ditch at Intake #2 to Plantation Reservoir

Plantation Reservoir Pipeline

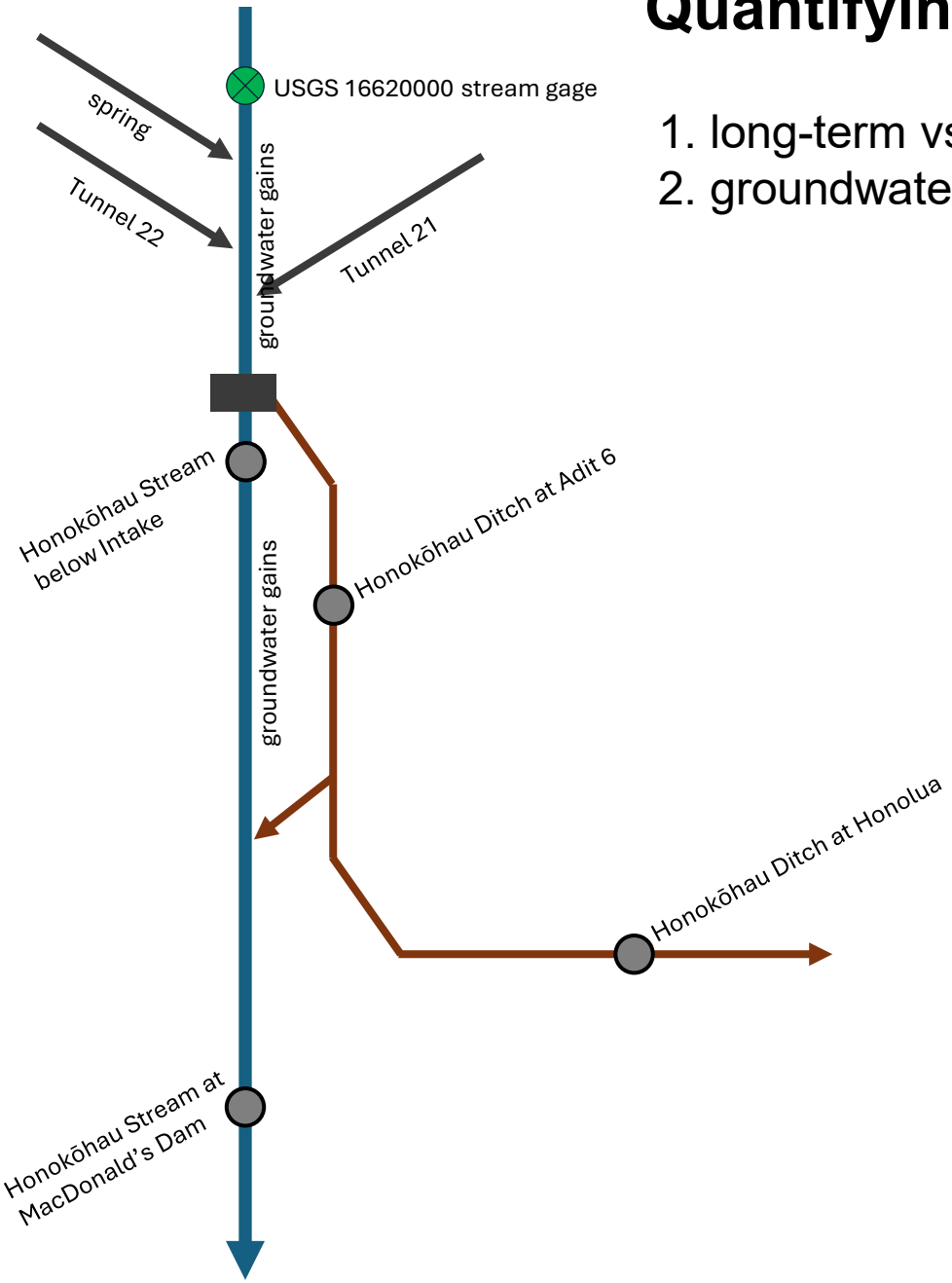
Honokōhau Ditch at Intake #1 to Village Reservoir

Village Reservoir

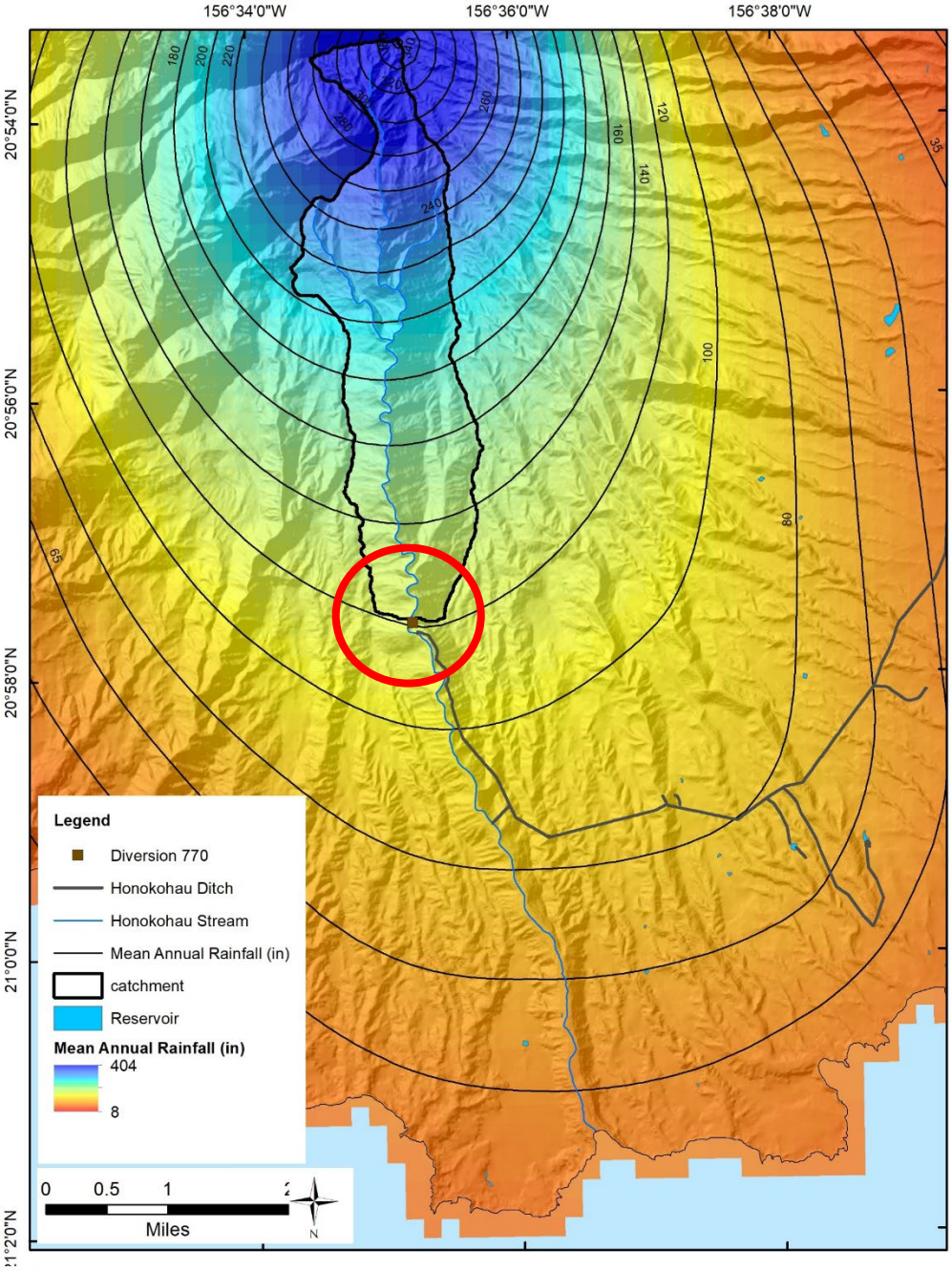
Maui DWS intake to Mahinahina Reservoir

Quantifying Water Availability

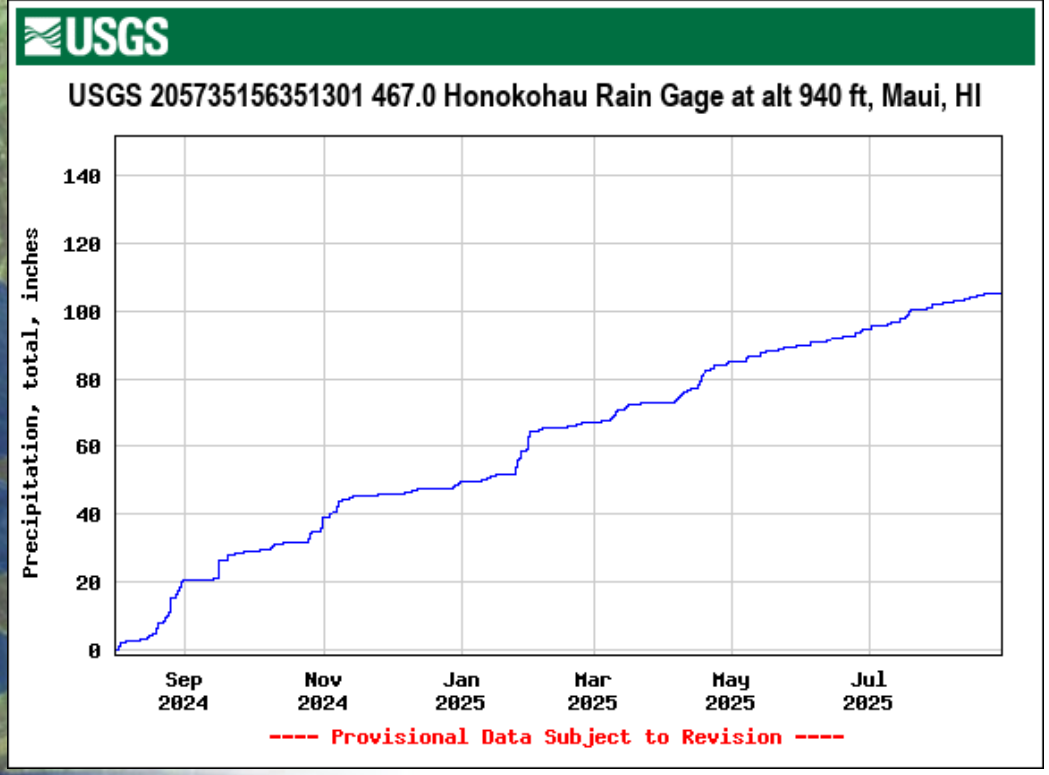
1. long-term vs short term rainfall
2. groundwater-surface water interactions

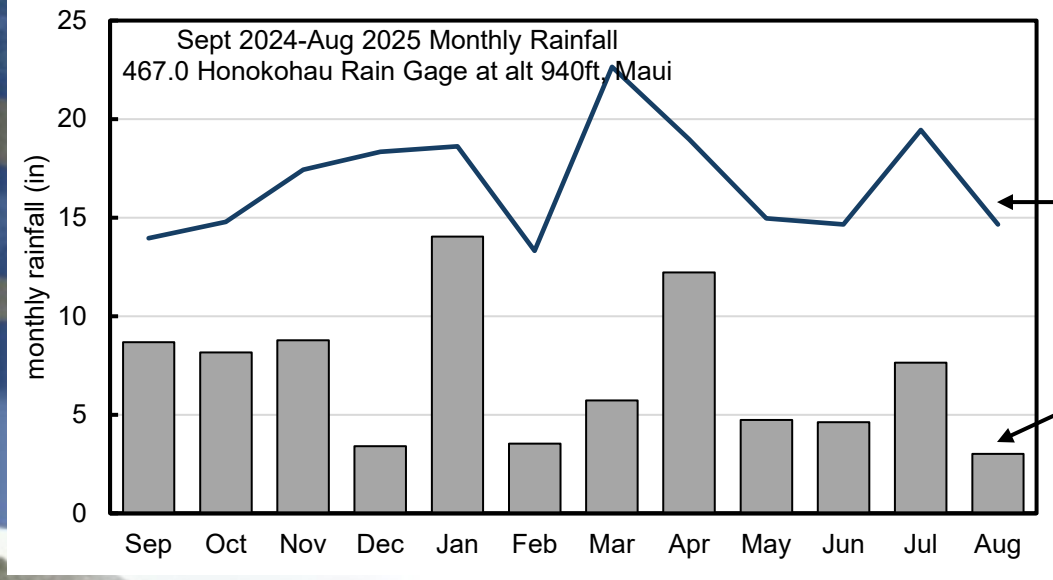


Quantifying Water Availability



HONOKŌHAU





1984-2013 mean rainfall
at USGS 16620000

2024-2025 measured rainfall
at USGS 16620000

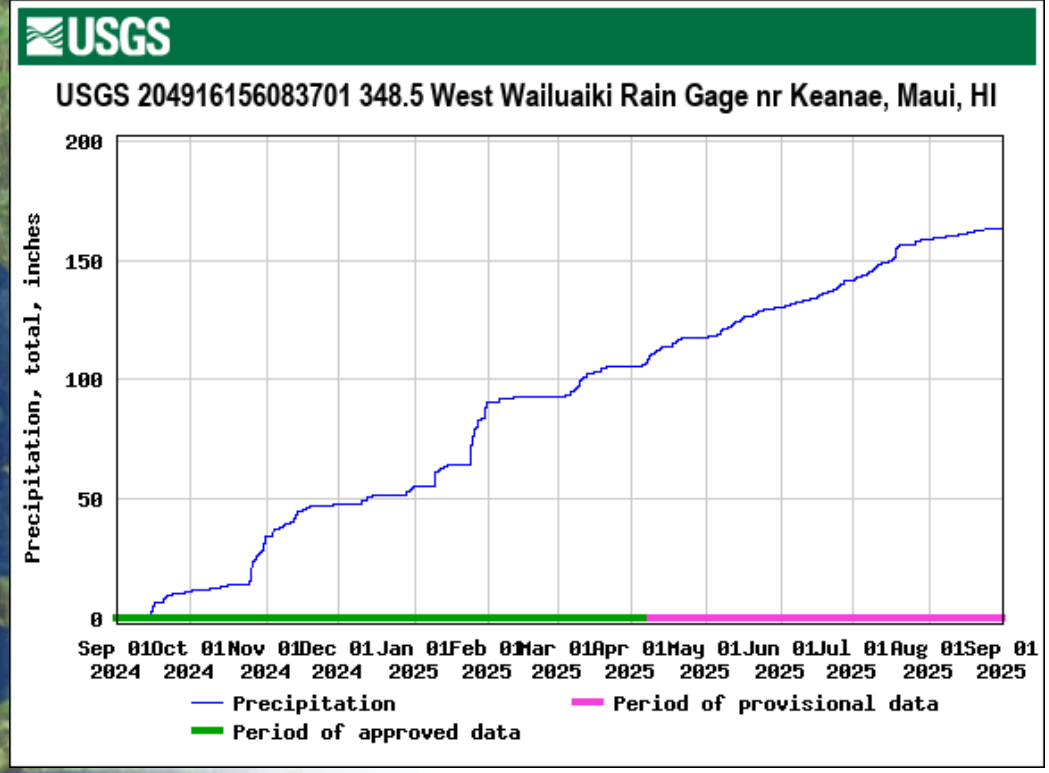
Annual Rainfall

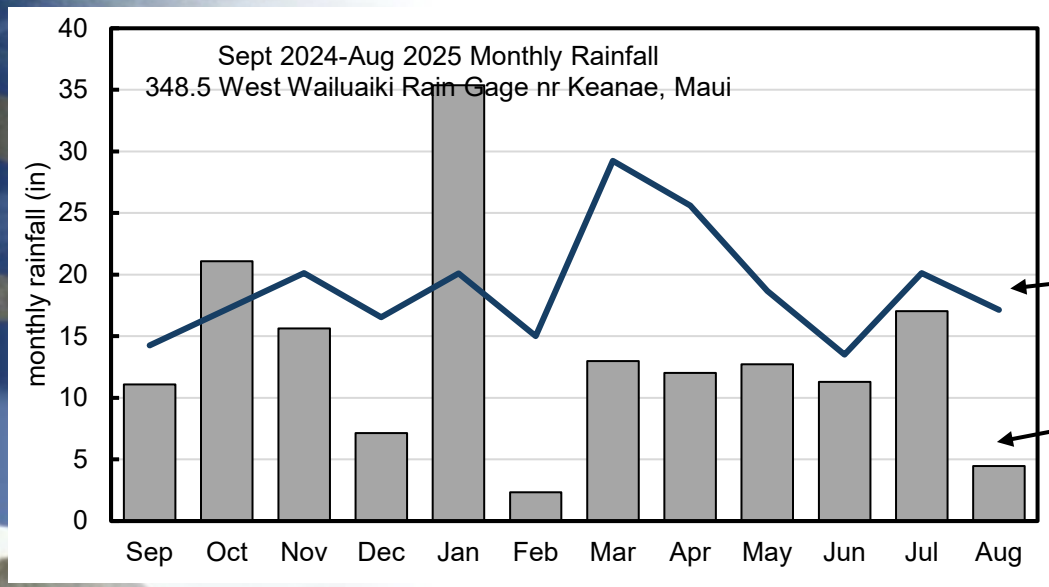
1984-2013 station mean: 183.1 in

Sep 2024-Aug 2025 total: 84.6 in

→ 46% of normal

EAST MAUI



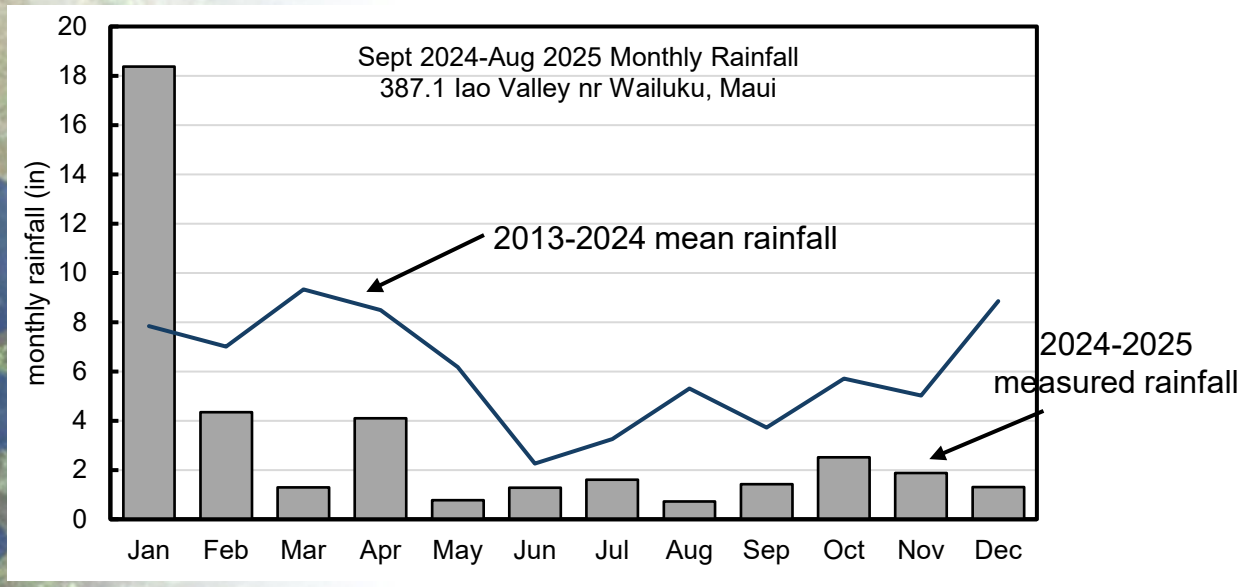


Annual Rainfall

1984-2013 station mean:	227.6 in
Sep 2024-Aug 2025 total:	163.2 in

→ 72% of normal

ʻĪao Valley

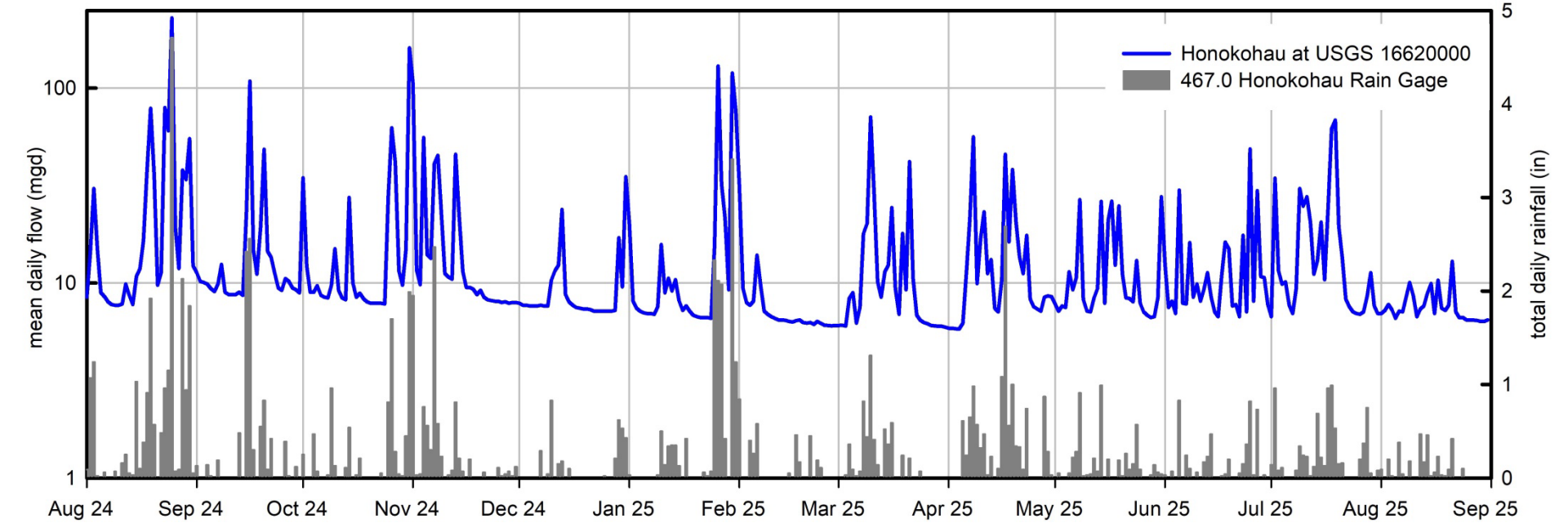


Annual Rainfall

2013-2024 station mean:	73.0 in
Sep 2024-Aug 2025 total:	39.6 in

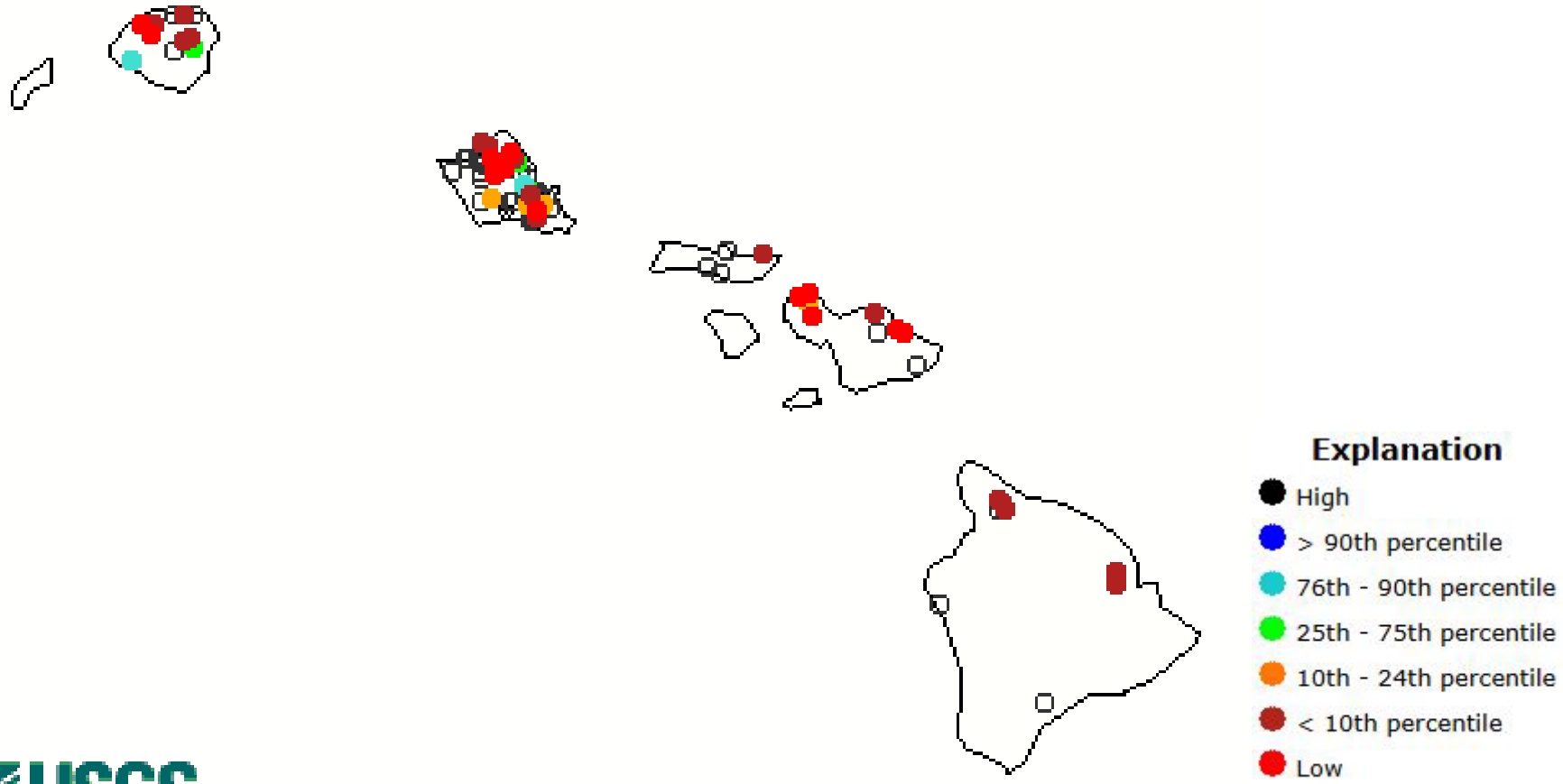
→ 54% of normal

Rainfall and Runoff in Honokōhau



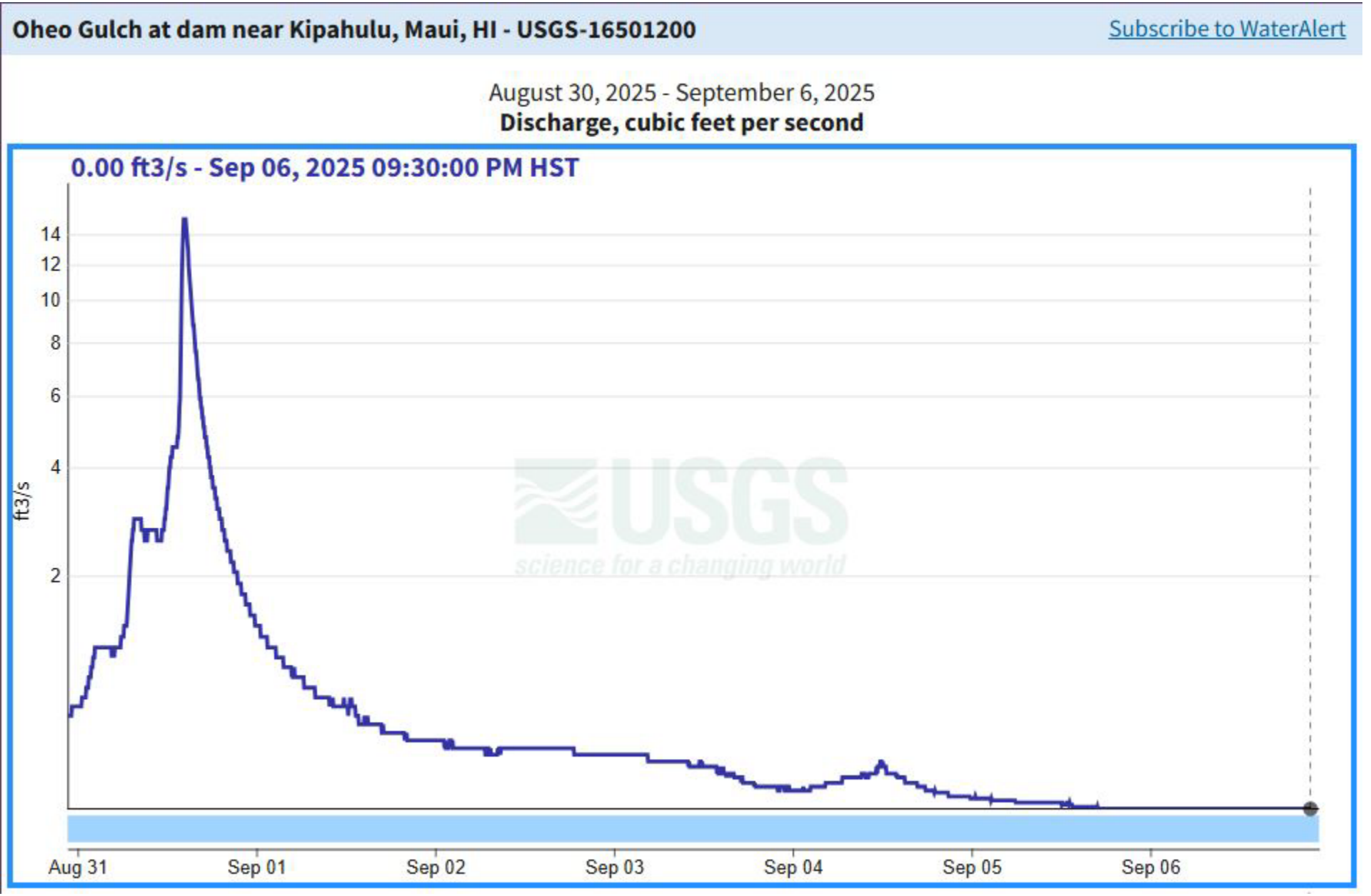
Statewide Drought Current Conditions

Sunday, September 07, 2025 04:30ET

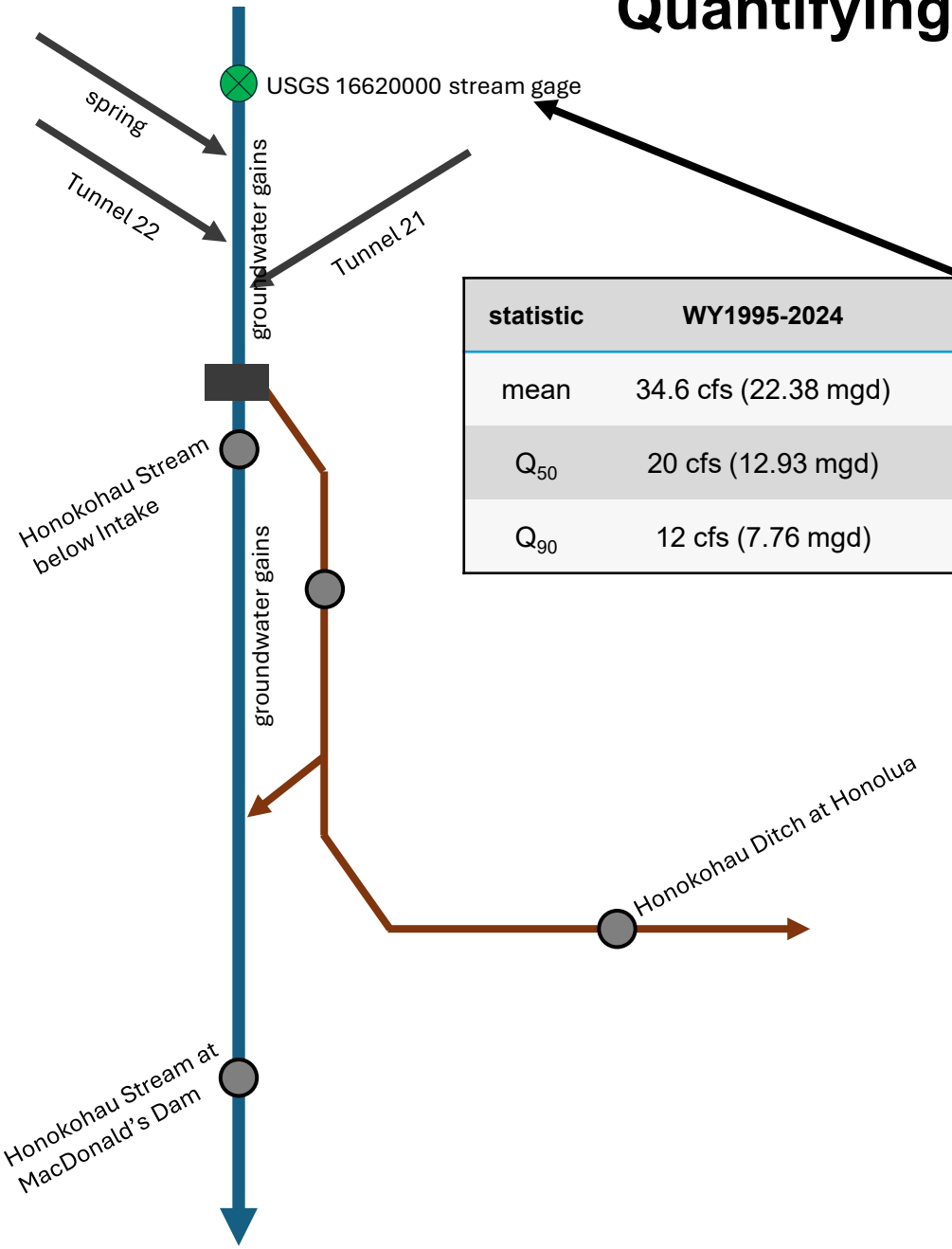


USGS

Statewide Drought Current Conditions

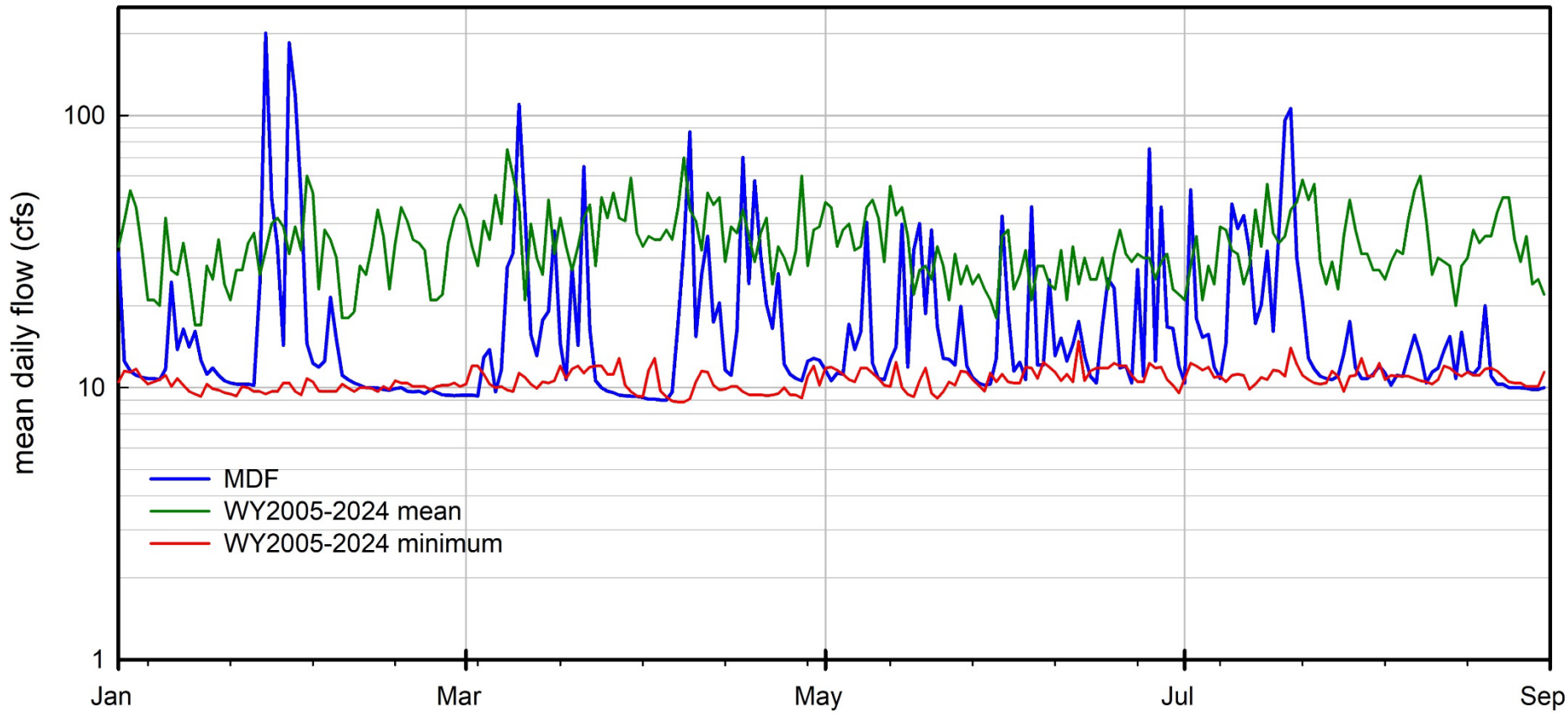


Quantifying Water Availability

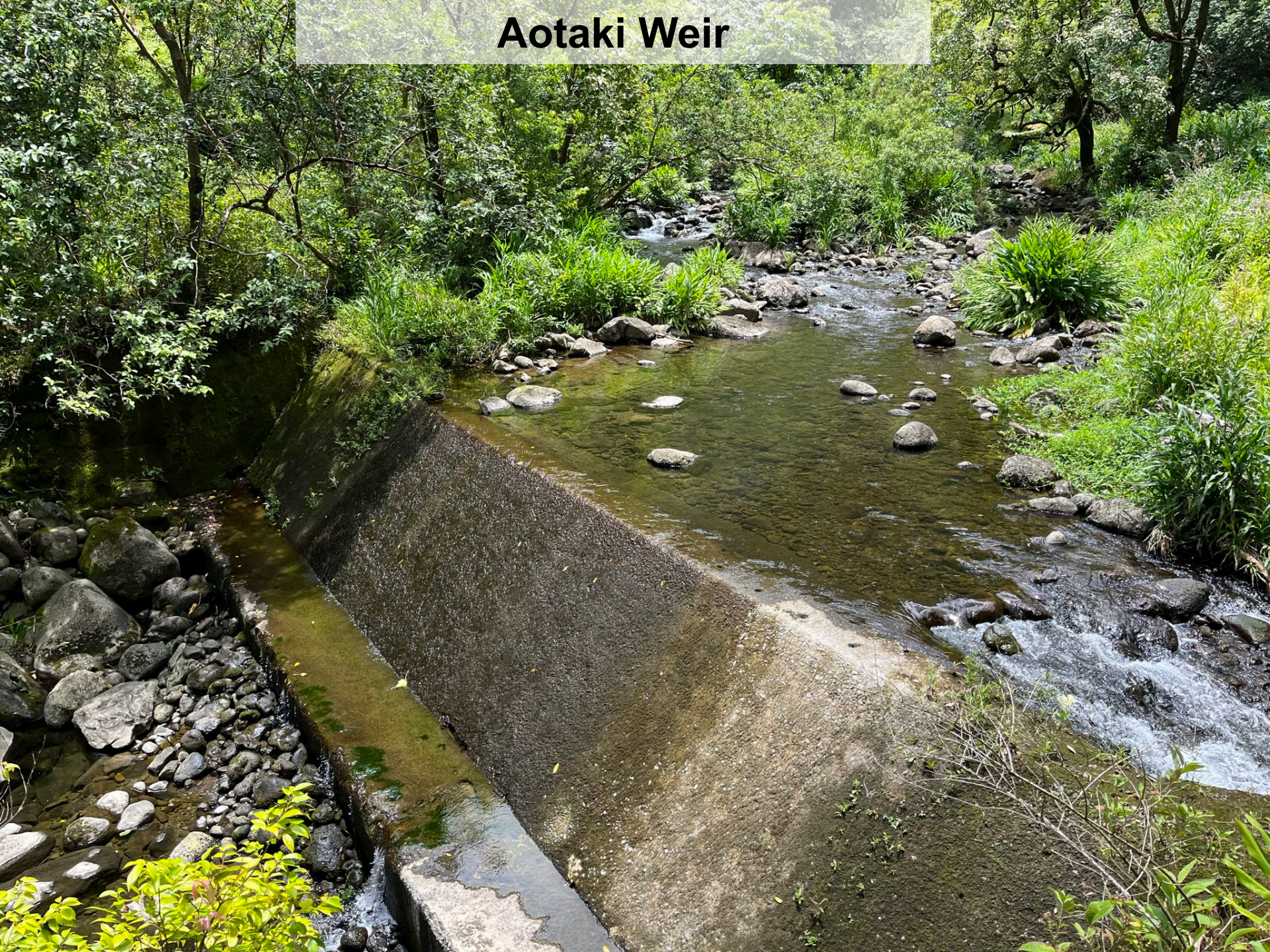


statistic	WY1995-2024	WY2025	% difference
mean	34.6 cfs (22.38 mgd)	21.1 cfs (13.61 mgd)	**-39%**
Q_{50}	20 cfs (12.93 mgd)	12.4 cfs (8.01 mgd)	**-38%**
Q_{90}	12 cfs (7.76 mgd)	9.65 cfs (6.12 mgd)	**-20%**

2025 Extreme Low Flows



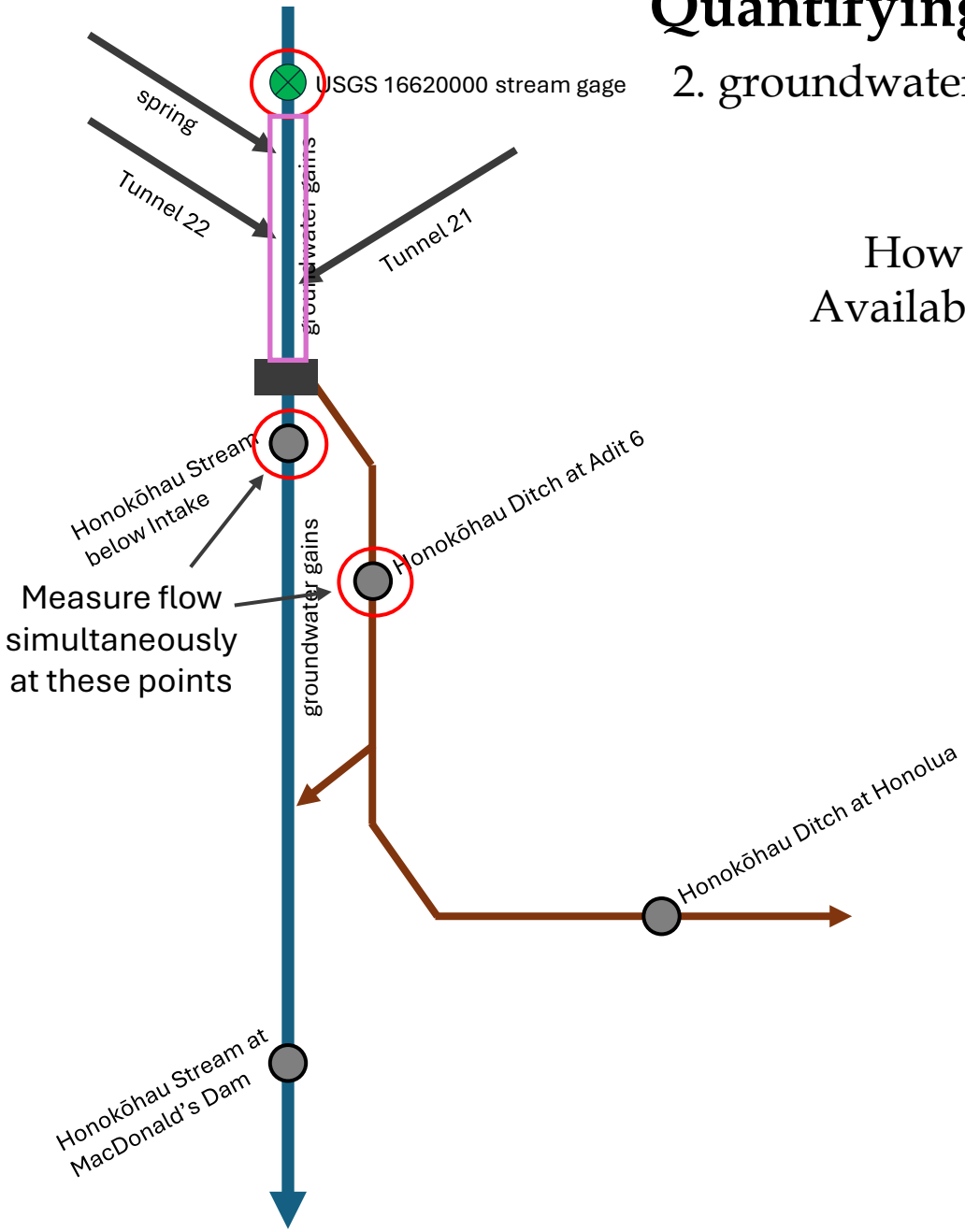
Aotaki Weir



Quantifying Water Availability

2. groundwater-surface water interactions

How Much Water Is Available at Aotaki Weir?



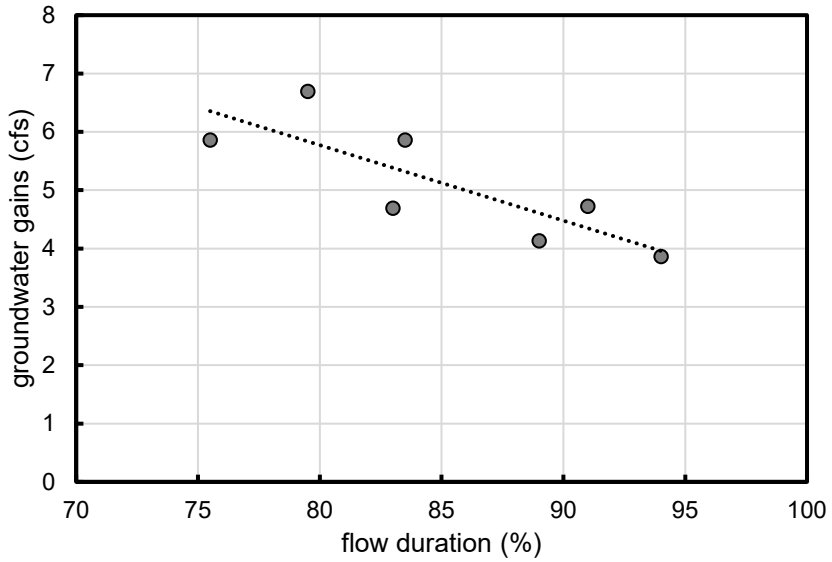
Quantifying Groundwater Gains Between USGS 16620000 and Aotaki Weir

Honokōhau Ditch at Adit 6

Honokōhau Stream below Intake

Quantifying Groundwater Gains Between USGS 16620000 and Aotaki Weir

date	USGS 1662000 (cfs)	2005-2024 Flow Duration Value (%)	Honokōhau Stream blw Intake (cfs)	Honokōhau Ditch at Adit 6 (cfs)	Total Water (cfs)	GW Gains Blw USGS station (cfs)
11/2/2021	12.1	83.5	10.7	7.26	17.96	5.86
8/25/2022	12.2	83	7.52	9.37	16.89	4.69
7/10/2023	13.1	75.5	10.29	8.67	18.96	5.86
10/10/2023	11.4	89	11.34	4.19	15.53	4.13
12/4/2023	11.1	91	10.8	5.02	15.82	4.72
8/13/2024	12.6	79.5	10.31	8.98	19.29	6.69
2/26/2025	11.7	94	10.95	4.61	15.56	3.86



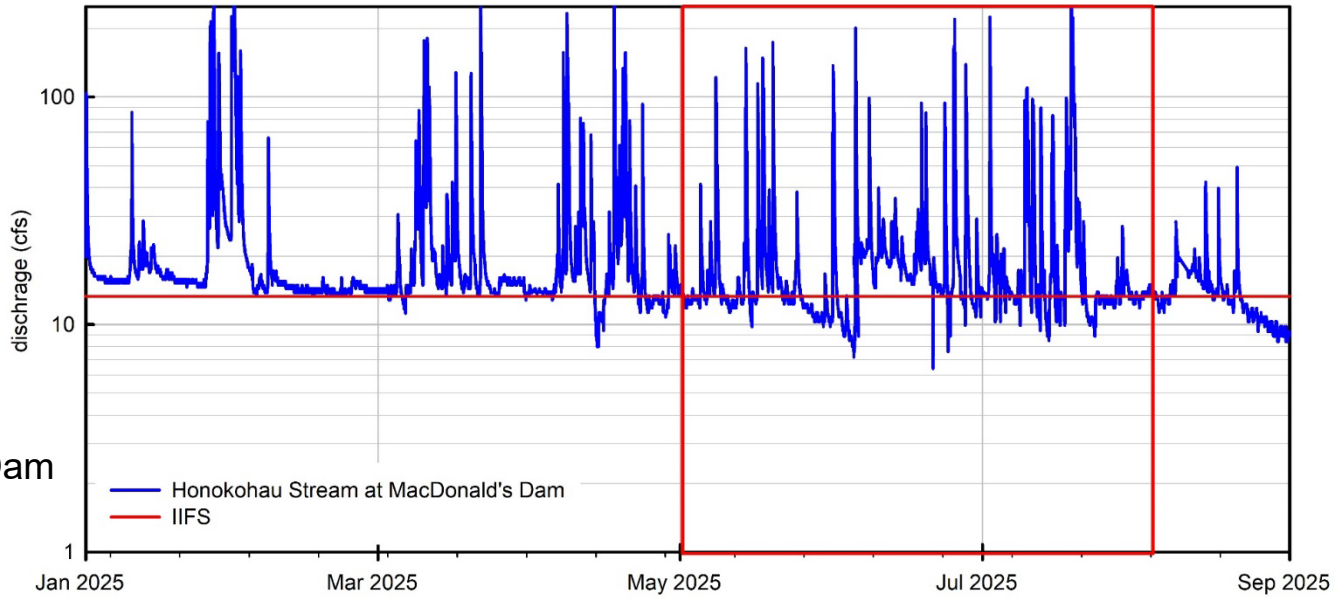
→ Groundwater discharge to stream varies with antecedent rainfall conditions

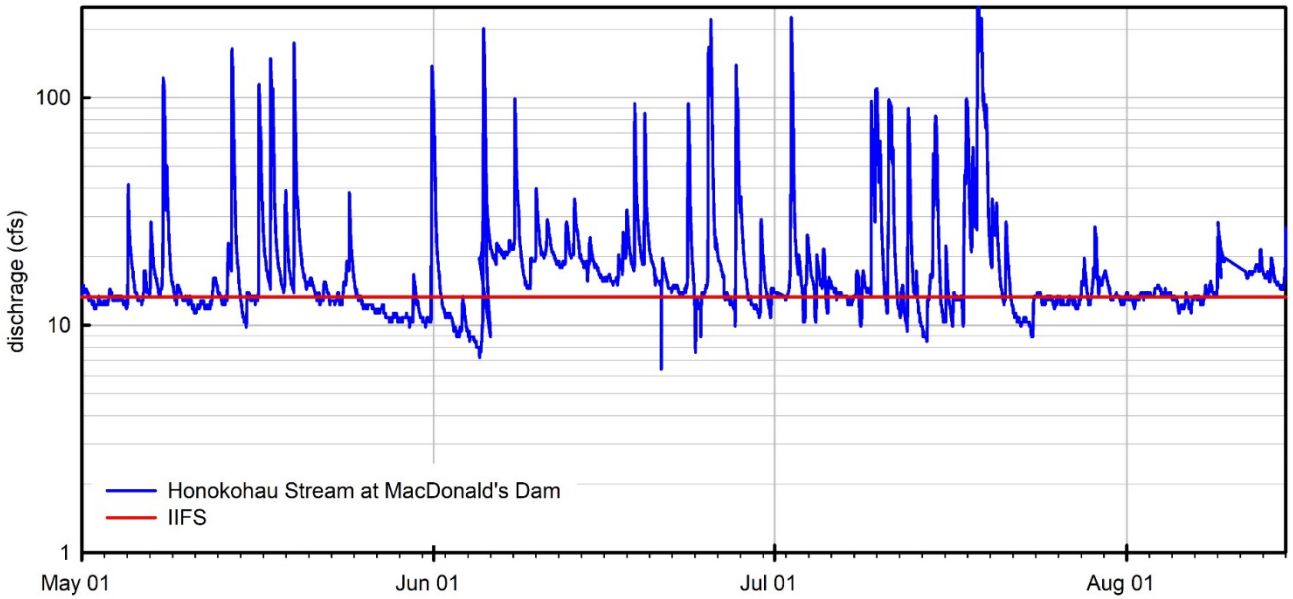
Interim Instream Flow Standard Monitoring at MacDonald's Dam

Interim Instream Flow Standard Monitoring at MacDonald's Dam

Interim Instream Flow Standard Monitoring at MacDonald's Dam

IIFS =13.3 cfs at MacDonald's Dam
For 3 days or 4 out of 7 days



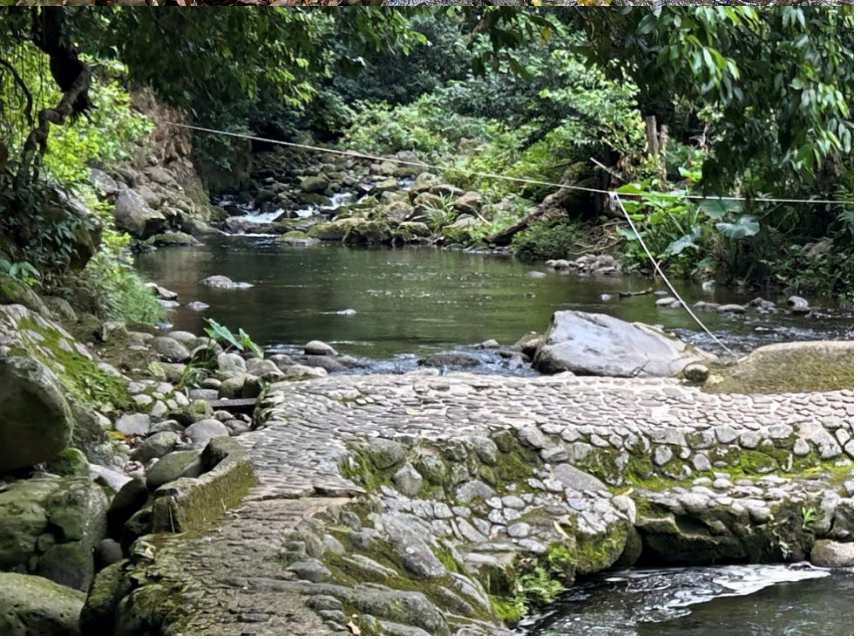


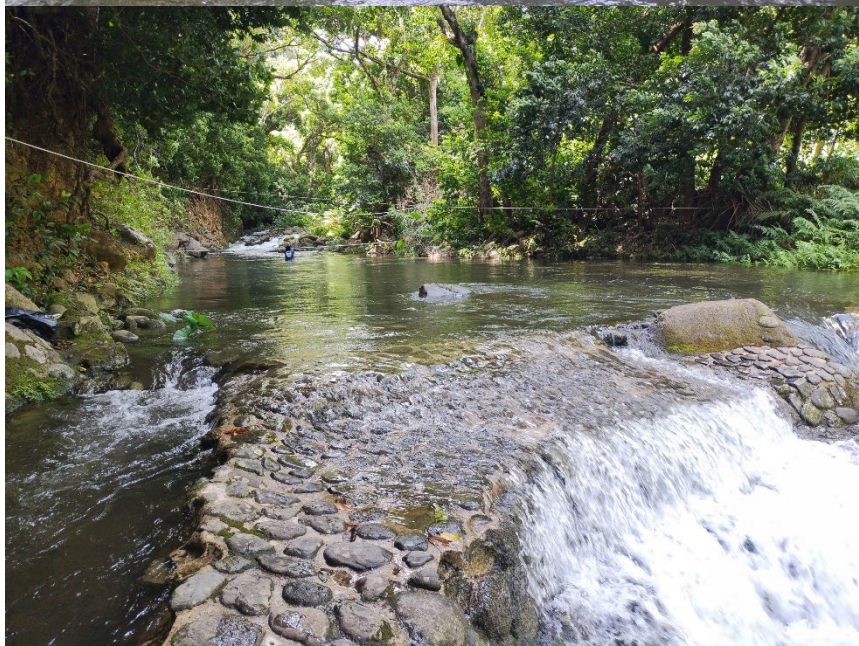
How Come It's So Hard to Measure/Monitor?

1. Difficult access to upper elevation reaches

How Come It's So Hard to Measure/Monitor?

2. Surface water monitoring is inherently challenging

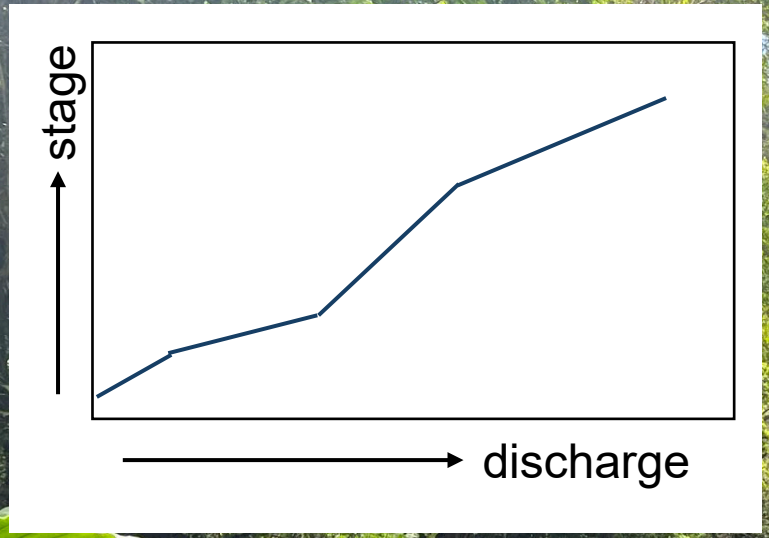





MacDonald's
Dam at high flow
Control


MacDonald's Dam
at median flow
Control


MacDonald's Dam
at low flow
Control



different controls at different stages

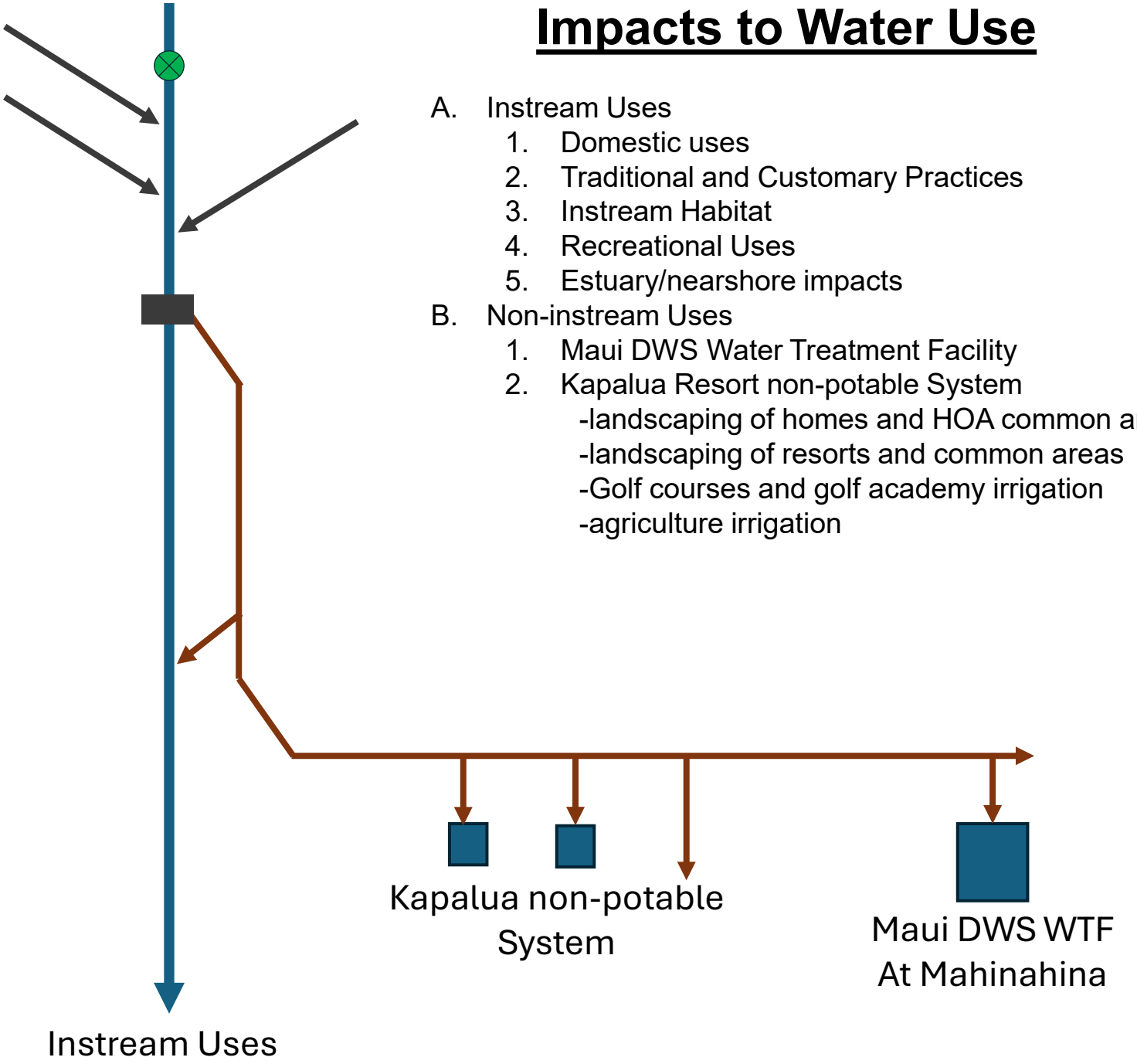
Proposed Improvements to IIFS Monitoring

1. Clean control of debris
2. Replace missing boards with metal weir

Impacts to Water Use

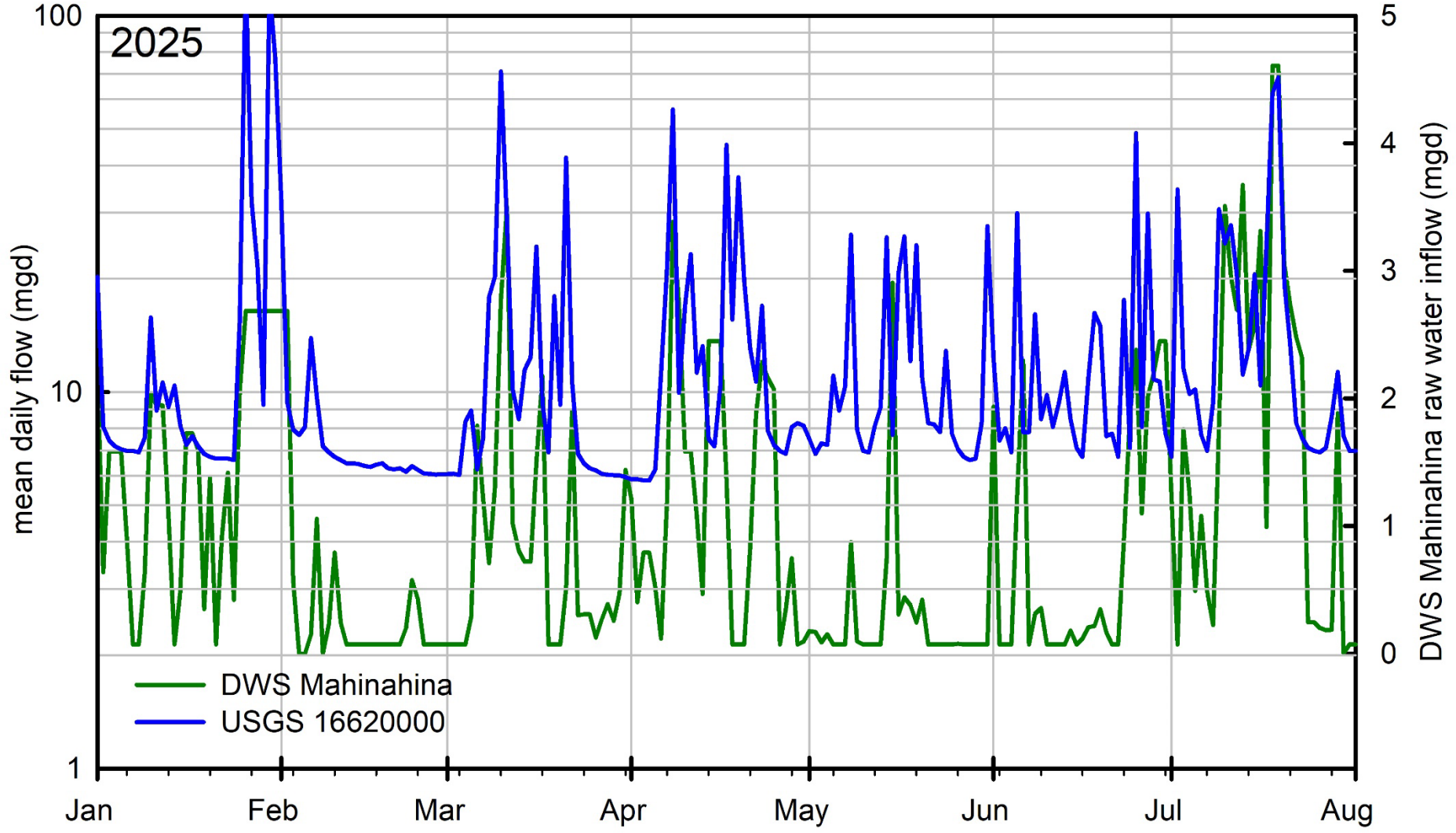
A. Instream Uses
   1. Domestic uses
   2. Traditional and Customary Practices
   3. Instream Habitat
   4. Recreational Uses
   5. Estuary/nearshore impacts

B. Non-instream Uses
   1. Maui DWS Water Treatment Facility
   2. Kapalua Resort non-potable System
      -landscaping of homes and HOA common areas
      -landscaping of resorts and common areas
      -Golf courses and golf academy irrigation
      -agriculture irrigation

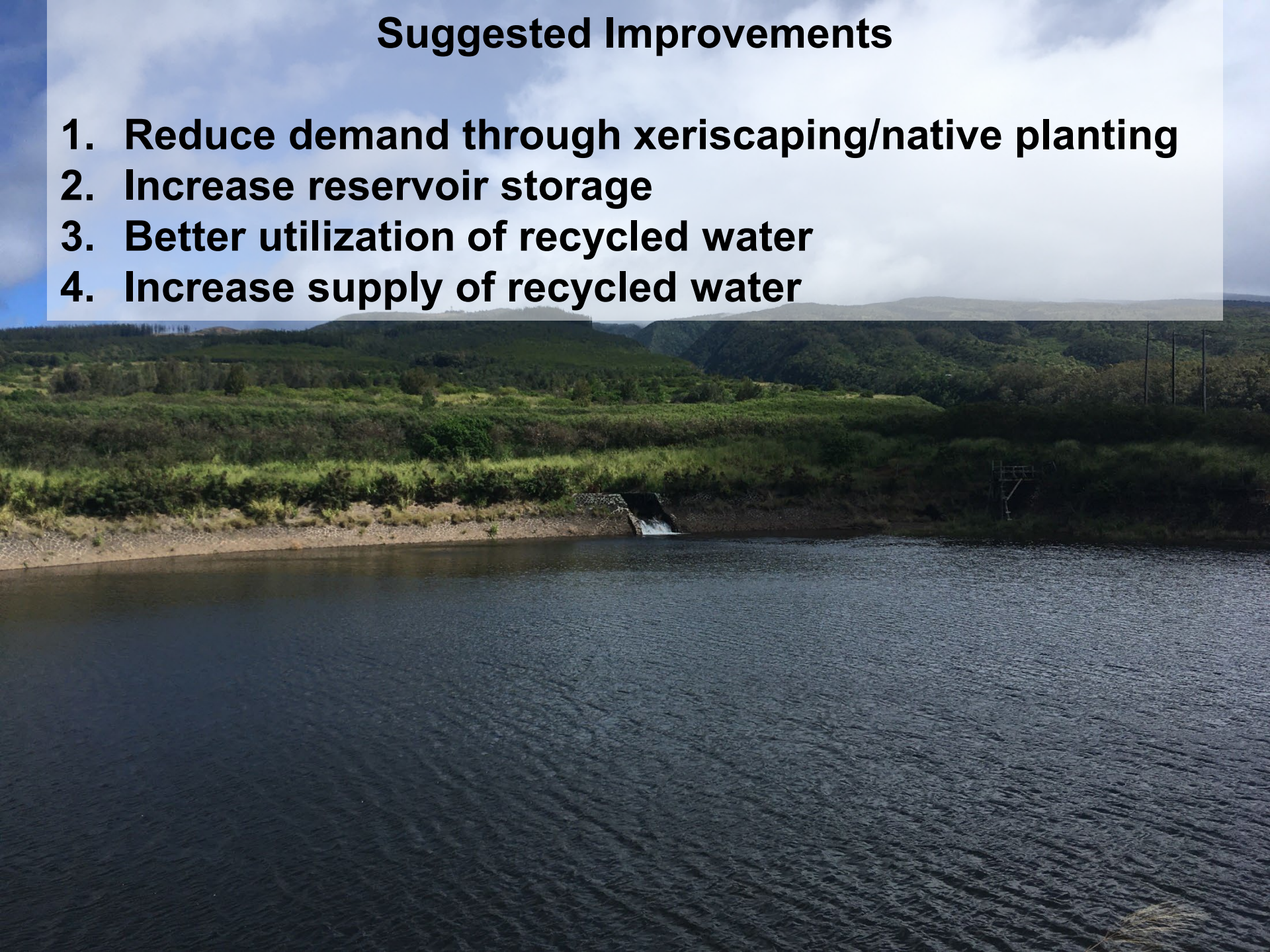


2025 Extreme Low Flows Impact on Maui DWS

Jan-Aug 2025 mean = 0.833 mgd
System demand = 1.700 mgd
→ Need a reliable backup source for drought



Kapalua Non-Potable Water System



Suggested Improvements

1. Reduce demand through xeriscaping/native planting
2. Increase reservoir storage
3. Better utilization of recycled water
4. Increase supply of recycled water