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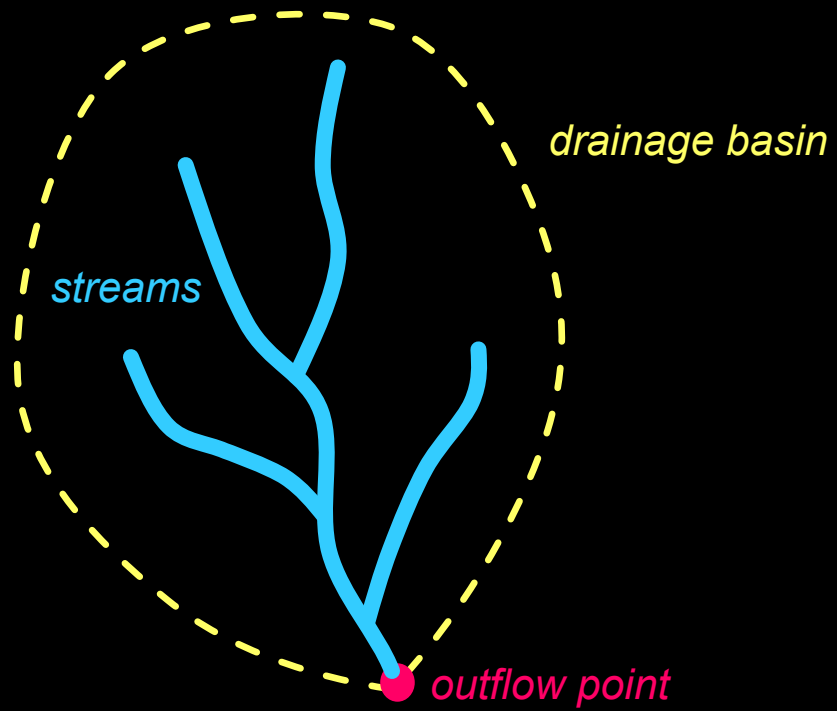
Pacific Islands Water Science Center

StreamStats Web Application

https://streamstats.usgs.gov/ss/



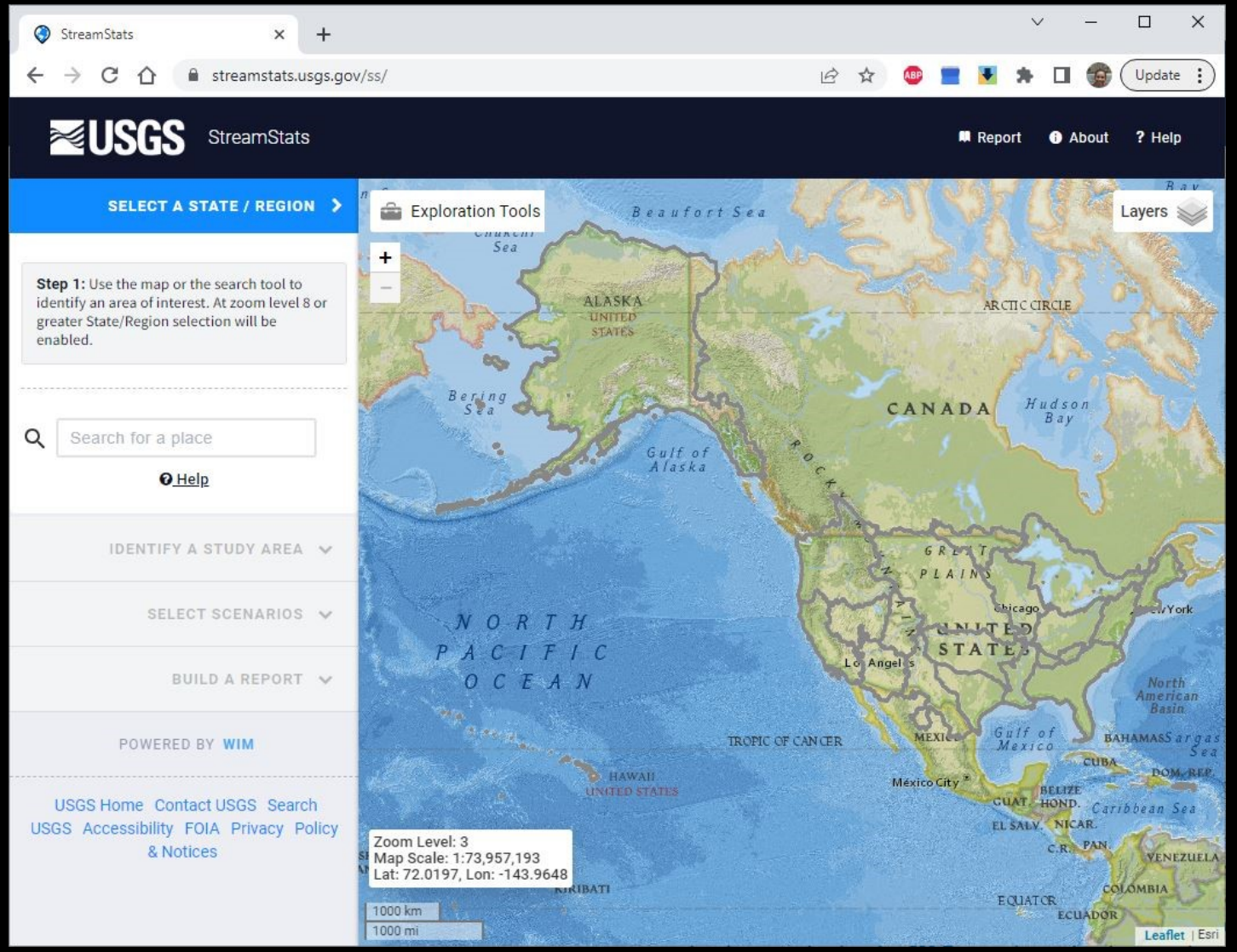
Sarah N. Rosa
EARTH 2023 Workshop
July 11, 2023

U.S. Department of the Interior
U.S. Geological Survey

What is StreamStats?

- Web-based application
- Tools for water-resources planning and management, and for engineering
- Map-based user interface delineates drainage areas for user-selected sites on streams
- Provides basin characteristics and estimates of flow statistics.

https://streamstats.usgs.gov/ss/



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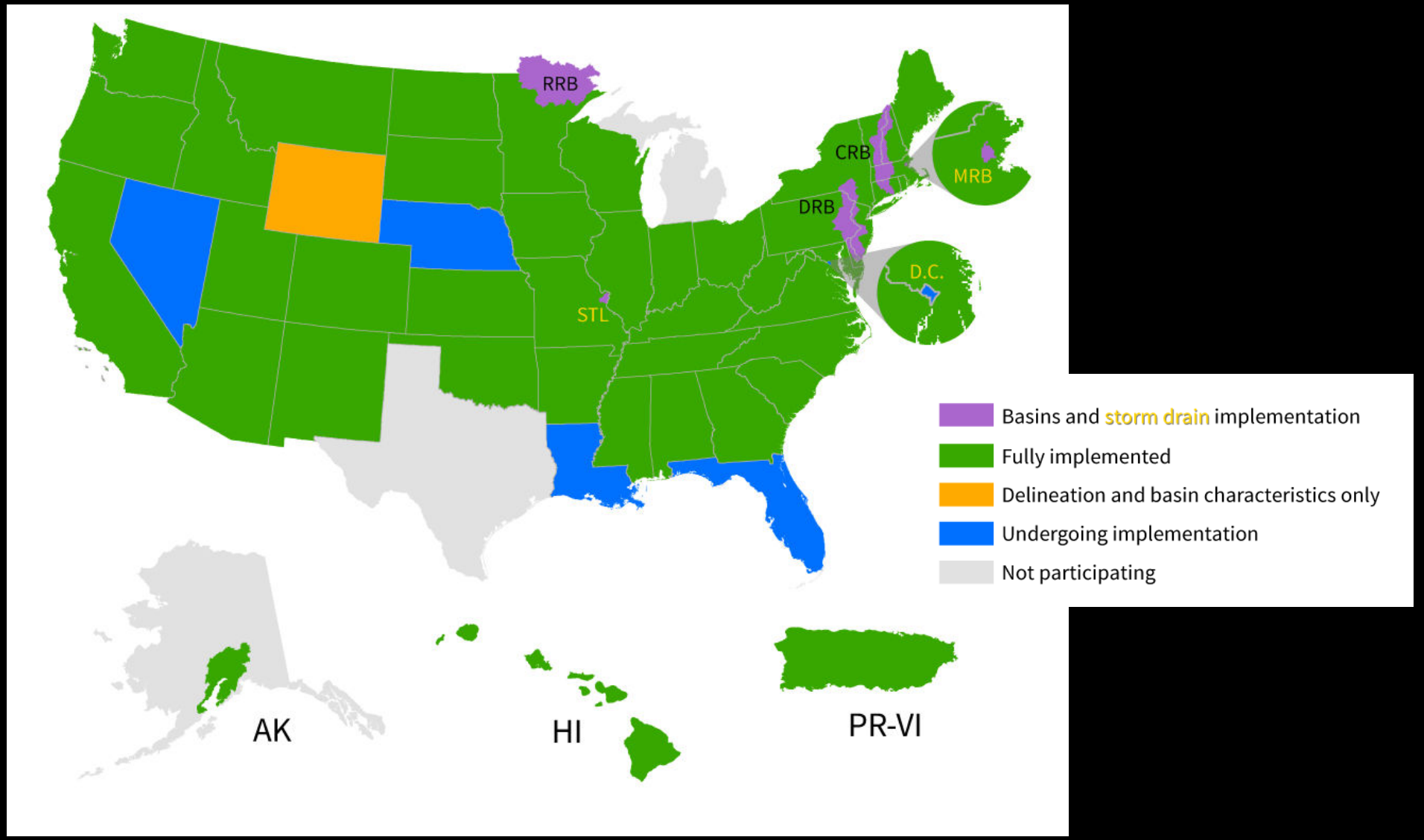
StreamStats Implementation Status



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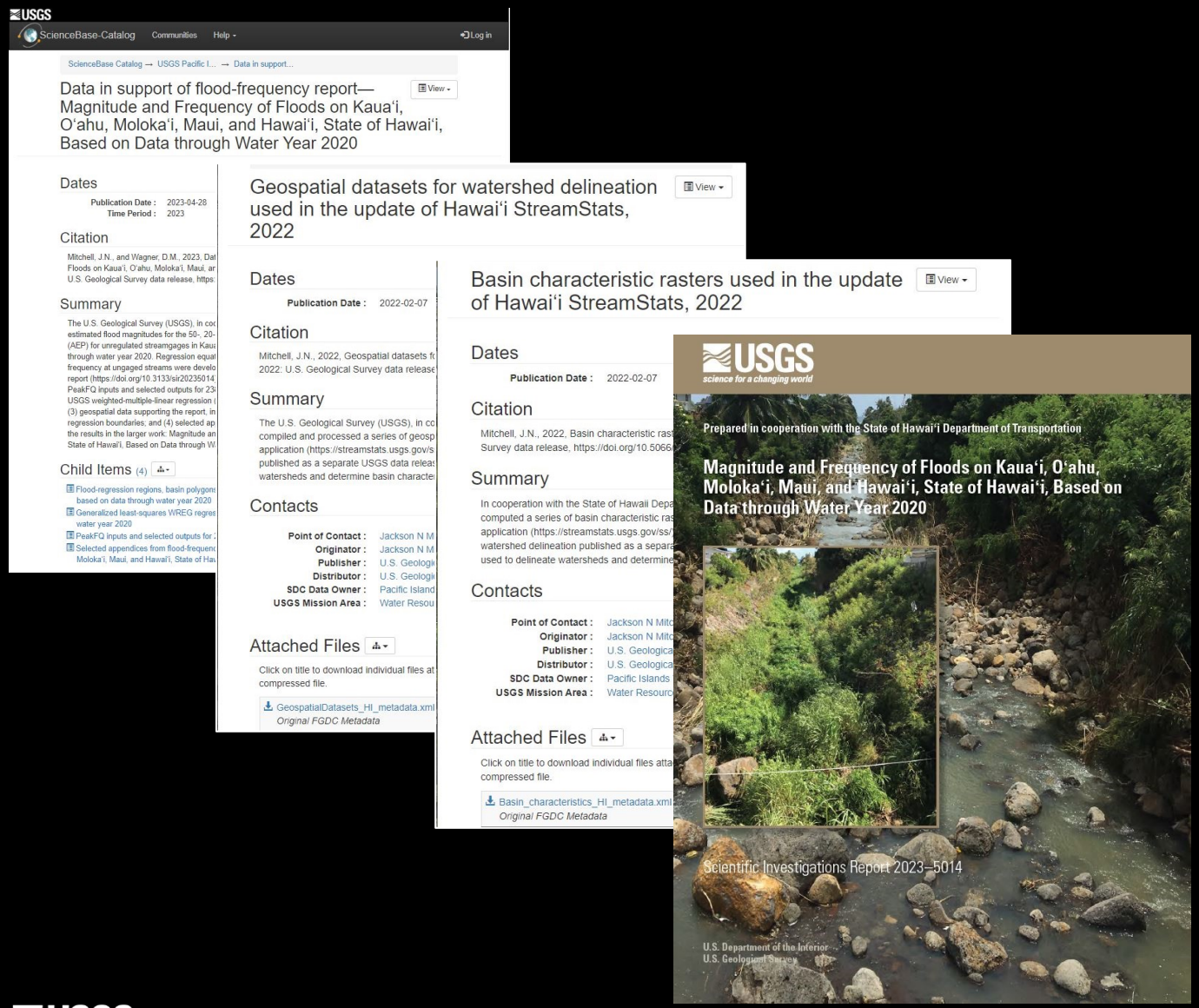
How does StreamStats work?



StreamStats incorporates:

1) Map-based user interface for the site selection.

2) A relational data base for estimating streamflow statistics at streamgages and user-selected sites.

3) GIS for delineating the drainage basin and computing the basin characteristics at user-selected sites.

4) Geospatial representations of surface topography, water features, climate, soils, and land use.

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How to use StreamStats?

- StreamStats Version 4 operates through your Web browser window.
- HOW-TO GUIDES page: https://www.usgs.gov/streamstats/how-guides
- Help button near the upper right corner

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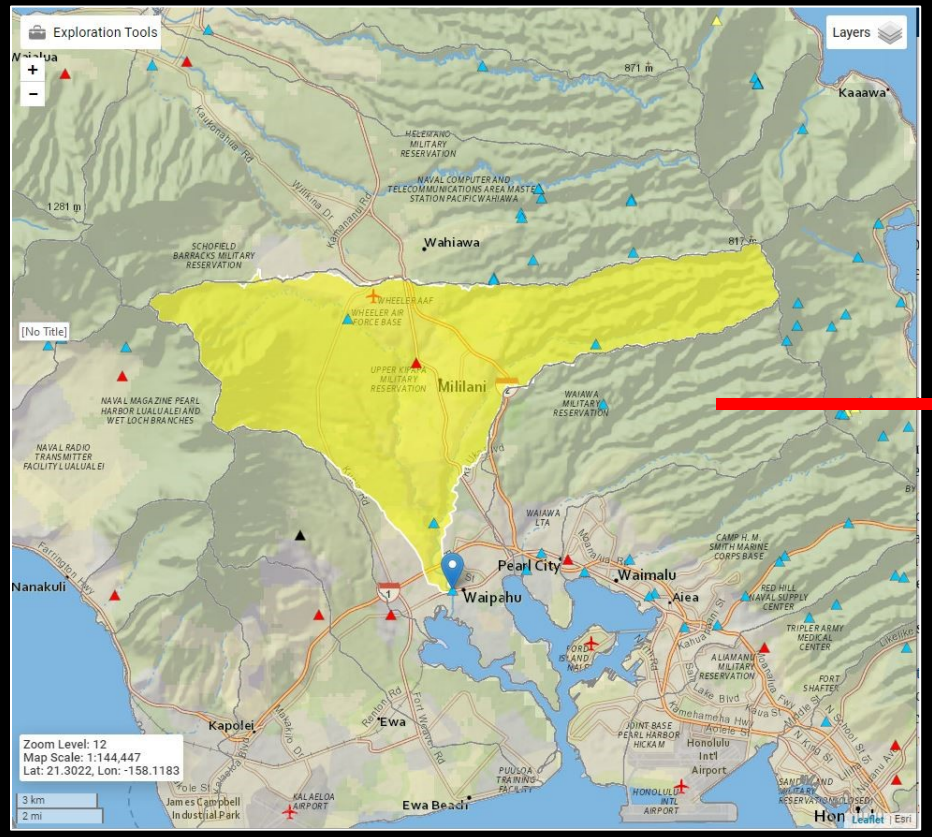
Primary StreamStats Products

Basin characteristics:



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BASINPERIM	Perimeter of the drainage basin as defined in SIR 2004-5262	57.7	miles
BSLDEM10M	Mean basin slope computed from 10 m DEM	25.9	percent
CENTROIDY	Basin centroid vertical (y) location in state plane units	2373518.5	meters
COMPRAT	A measure of basin shape related to basin perimeter and drainage area	2.42	dimensionless
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	68.1	feet per mi
DRNAREA	Area that drains to a point on a stream	45.1	square miles
ELEV	Mean Basin Elevation	984	feet
ELEVMAX	Maximum basin elevation	3110	feet
I24H100Y	Maximum 24-hour precipitation that occurs on average once in 100 years	15.5	inches
IMPNLCD01	Percentage of impervious area determined from NLCD 2001 impervious dataset	11.3	percent
LC01BARE	Percentage of area barren land, NLCD 2001 category 31	0	percent
LC01CROP	Percentage of area crop, NLCD 2001 category	17	percent
LC01DEV	Percentage of land-use from NLCD 2001 classes 21-24	28.5	percent
LC01DEVHI	Percentage of area developed, high intensity, NLCD 2001 category 24	4	percent
LC01DEVMD	Percentage of area developed, medium intensity, NLCD 2001 category 23	9	percent
LC01EVERG	Percentage of area evergreen forest, NLCD 2001 category 42	42	percent
LC01OPNLO	Percentage of area developed, open space and low intensity combined, NLCD2001 cat. 21 and 22	16	percent
LFPLENGTH	Length of longest flow path	24.3	miles
MINBELEV	Minimum basin elevation	9.78	feet
PERM12IN	Area-weighted average soil permeability for top 12 inches of soil	3.25	inches per hour
PERM24IN	Area-weighted average soil permeability for top 24 inches of soil	3.01	inches per hour
PRECIP	Mean Annual Precipitation	71.7	inches
RELIEF	Maximum - minimum elevation	3100	feet
RELRELF	Basin relief divided by basin perimeter	53.8	feet per mi

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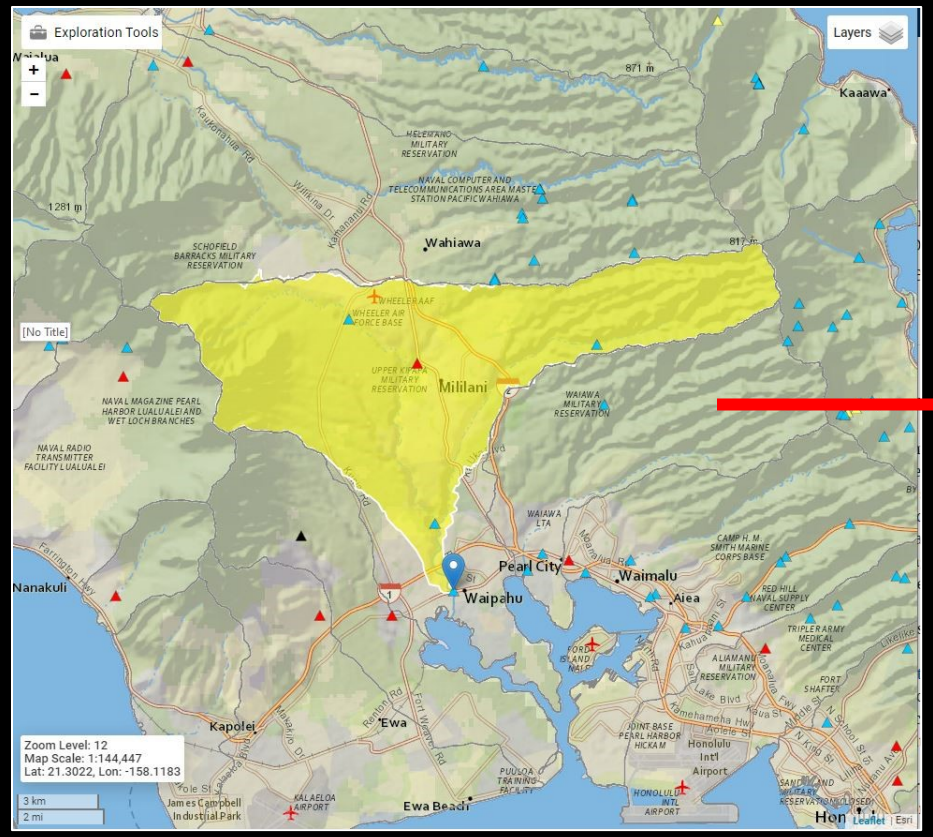
Primary StreamStats Products

Streamflow statistics:



https://streamstats.usgs.gov/information-portal/

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Hawaii Peakflow 3 leeward Oahu 2023 5014]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	45.1	square miles	0.57	45.13
PRECIP	Mean Annual Precipitation	71.7	inches	33.59	233.3
PERM24IN	PERM24IN	3.01	inches per hour	0.49	8.88

[No Title]

Peak-Flow Statistics Flow Report [Hawaii Peakflow 3 leeward Oahu 2023 5014]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	PIu	ASEp
50-percent AEP flood	4360	ft^3/s	1600	11900	49.7
20-percent AEP flood	8370	ft^3/s	3980	17600	35.8
10-percent AEP flood	11700	ft^3/s	5920	23100	32.6
4-percent AEP flood	16600	ft^3/s	8530	32300	31.6
2-percent AEP flood	20800	ft^3/s	10700	40500	31.4
1-percent AEP flood	25300	ft^3/s	12900	49600	31.5
0.5-percent AEP flood	30300	ft^3/s	15400	59600	31.4
0.2-percent AEP flood	37400	ft^3/s	19000	73400	30.7

Peak-Flow Statistics Citations

Mitchell, J.N., Wagner, D.M., and Veilleux, A.G.2023, Magnitude and frequency of floods on Kaua'i, O'ahu, Moloka'i, Maui, and Hawai'i, State of Hawai'i, based on data through water year 2020: U.S. Geological Survey Scientific Investigations Report 2023–5014, 66 p. plus 4 appendixes

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Estimates of Streamflow Statistics at Streamgages

StreamStats Data-Collection Station Report

Gage Information

Name	Value
USGS Station Number	16310700
Station Name	Ohia Stream near Kahuku, Oahu, HI
Station Type	Peak Flow, partial record
Latitude	21.6761907379
Longitude	-157.967702828
NWIS Latitude	21.67625
NWIS Longitude	-157.9678889
Is regulated?	false
Agency	United States Geological Survey

Physical Characteristics Filter By Statistic Group: 1 Checked Filter By Citation: Select

Basin Dimensional Characteristics

Characteristic Name	Value	Units	Citation
Drainage Area	2	square miles	231
Basin Perimeter	12.8	miles	231
Compactness Ratio	2.55	dimensionless	231

USGS StreamStats Report About Help

SELECT A STATE / REGION

Step 2: You have zoomed in sufficiently to select a state or regional study area. Your selection will dictate the data used to perform basin delineation and flow statistics calculation.

Click to select a State or Regional Study Area

Hawaii

Search for a place

Help

IDENTIFY A STUDY AREA

SELECT SCENARIOS

BUILD A REPORT

POWERED BY WIM

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Accessibility FOIA Privacy Policy & Notices

Exploration Tools

Station ID: 16310700
Station Name: Ohia Stream near Kahuku, Oahu, HI
Latitude: 21.6761907379
Longitude: -157.967702828
Station Type: Peak Flow, partial record

Open StreamStats Gage Page

Layers

Base Maps

Application Layers

Streamgages

- Gaging Station, Continuous Record
- Low Flow, Partial Record
- Peak Flow, Partial Record
- Peak and Low Flow, Partial Record
- Stage Only
- Low Flow, Partial Record, Stage
- Miscellaneous Record
- Unknown

National Layers

Tuscaloosa Seamount
Honolulu
Kahului
HAWAI'I
UNITED STATES
Dutton Seamount
Indianapolis Seamount
Kalaoa
Mauna Kea
Kailua-Kona
Kolualoa
Jaggar Seamount
Loihi Seamount
Bishop Seamount
Cross Seamount
McCall Seamount

Zoom Level: 8
Map Scale: 1:2,311,162
Lat: 22.6039, Lon: -158.7799

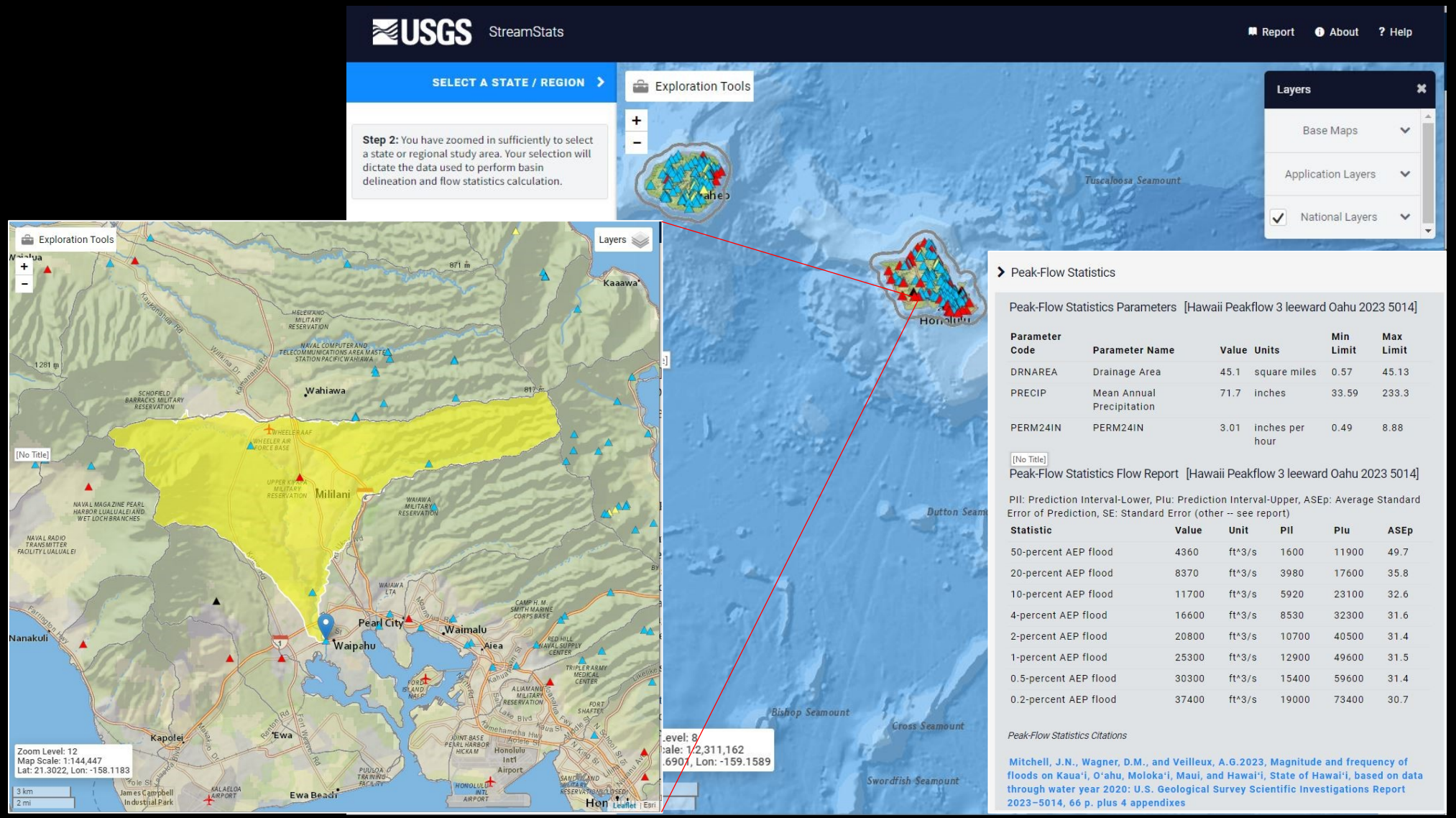
50 km
30 mi

usgs.gov

Leaflet | Esri

USGS

Estimates of Streamflow Statistics at User-Selected Sites



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Value of StreamStats

Simplicity — Simple web-based interface (no installation required), easy to use, publicly available

Adaptability — Can be used to deliver different types of information to meet varying needs of stakeholders

Versatility — It has a suite of spatial analytical tools that can be used for analyses other than estimating flow characteristics

Consistency — Reproducible results – different users arrive at same flow estimates for a selected stream location

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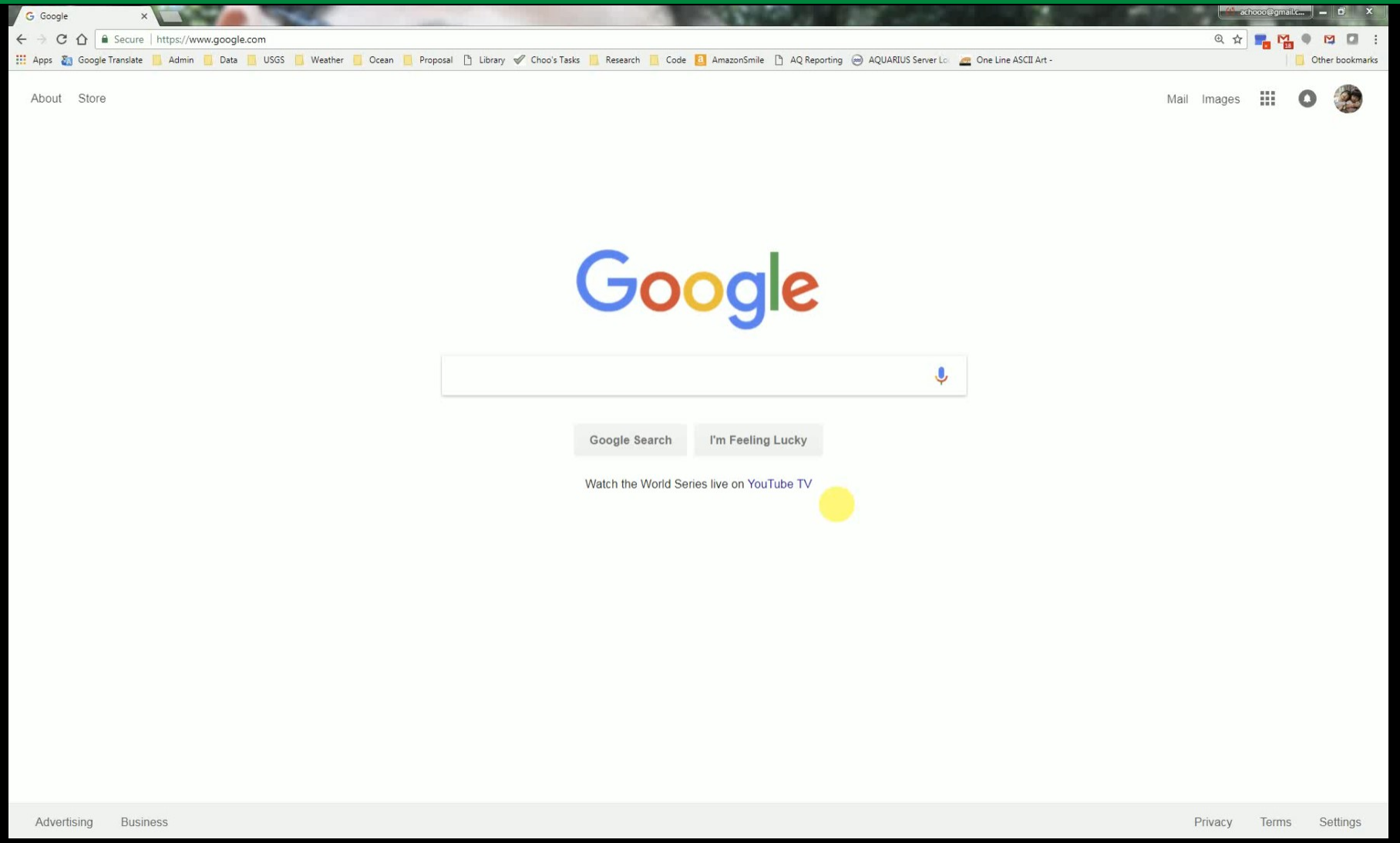
StreamStats Demo



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Mahalo!

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Work Phone: 808-690-9593


Kawela, Molokaʻi


Puʻu Kukui Watershed Preserve, Maui

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