SILICON VALLEY

AMES RESEARCH CENTER

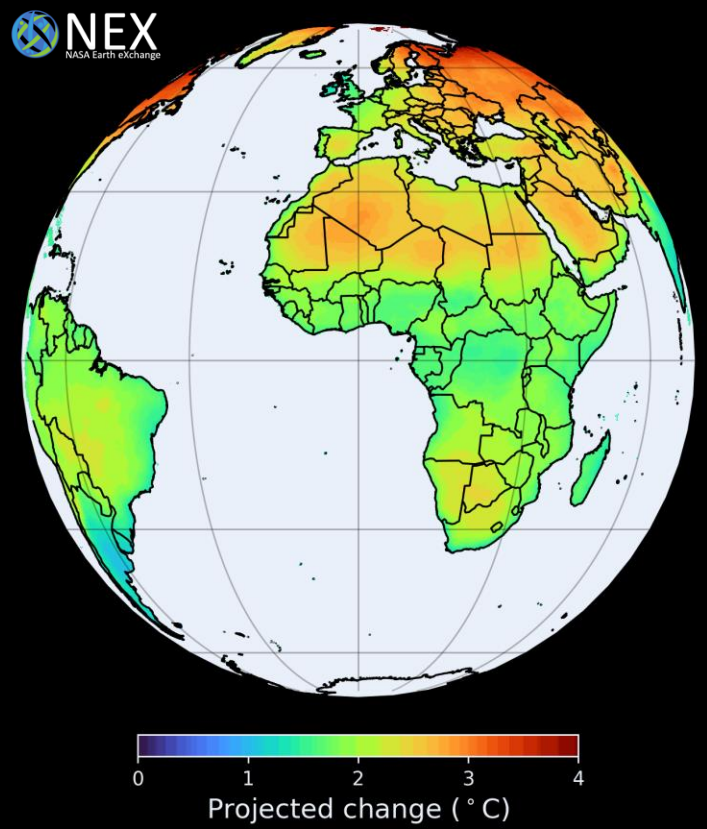
Earth Science Division

Ian G. Brosnan, Ph.D.
Principal Investigator
NASA Earth eXchange (NEX)

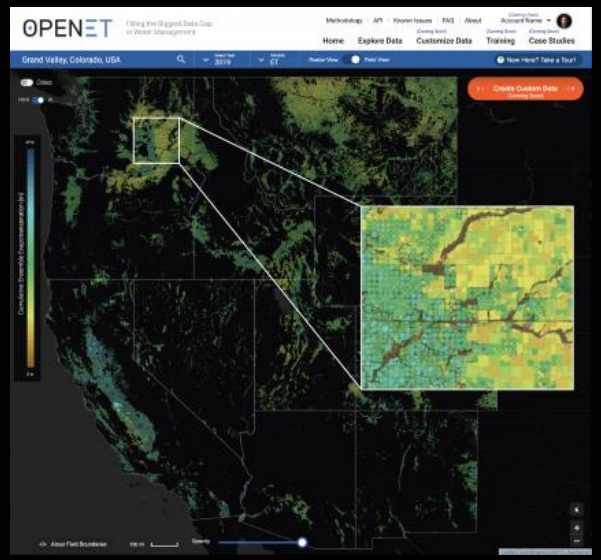
February 26th , 2024

Photo: Reid Wiseman 2014 (NASA/ISS)

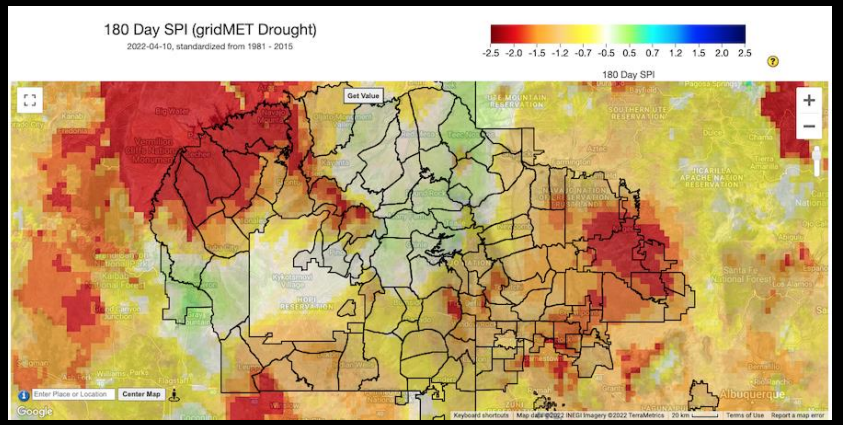
Global to Local Actionable Information



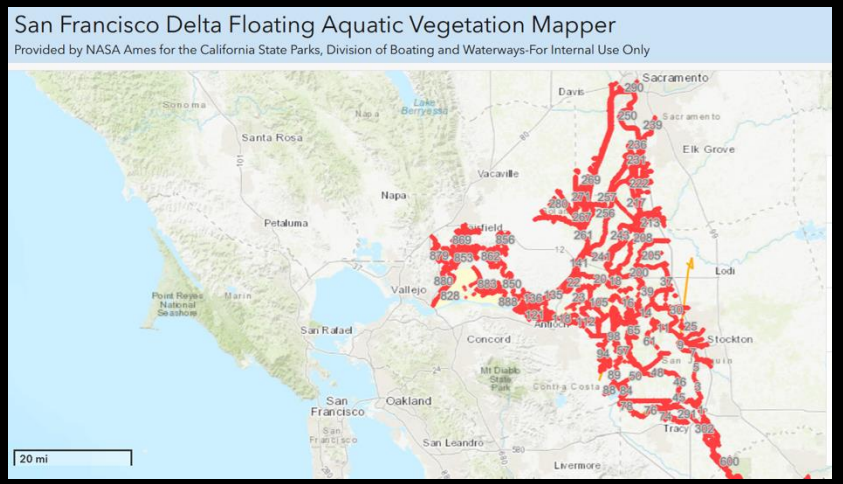
NEX-GDDP-CMIP6: Global daily 25km downscaled climate projections to 2100



OpenET: ET data for improved water management across the western United States

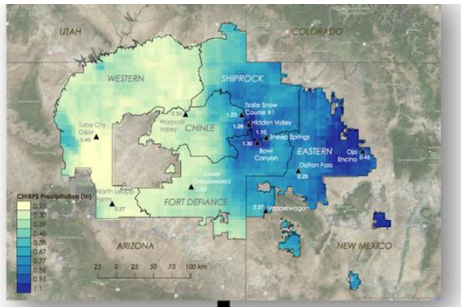


Drought Severity Evaluation Tool (DSET): Improve drought reporting and management in the Navajo Nation.



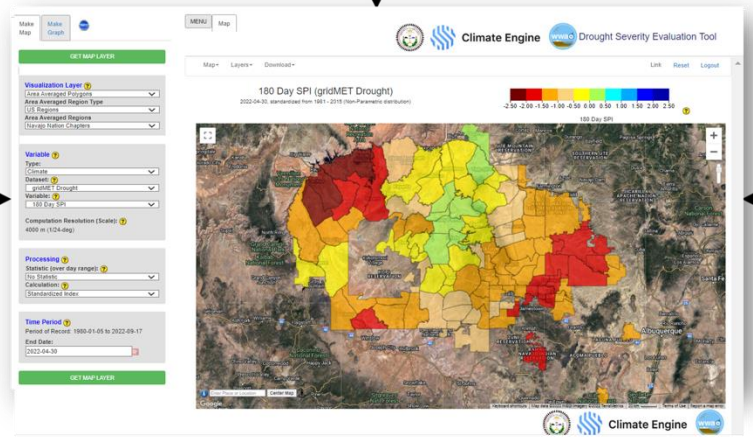
Floating Aquatic Vegetation Mapper: Develop science-based, adaptive-management tools for Invasive Aquatic Vegetation

Navajo Nation Drought Severity Evaluation Tool (DSET)



Navajo Rain Gauge Data

Modeled Data and Drought Indices



Drought Severity Evaluation Tool (DSET)

- Goal to improve upon drought reporting for the Navajo Nation Department of Water Resources
- Partner-driven tool where co-development and sustained relationships were key
- Acknowledgment of preexisting Indigenous knowledge systems and capacity building efforts ensured continued use of the tool

"I'm...Navajo – I grew up on the Navajo Reservation. It is monumental to have an organization like NASA work with us to diversify and augment the water tools we have at our disposal."

Carlee McClellan, Navajo Nation Department of Water Resources

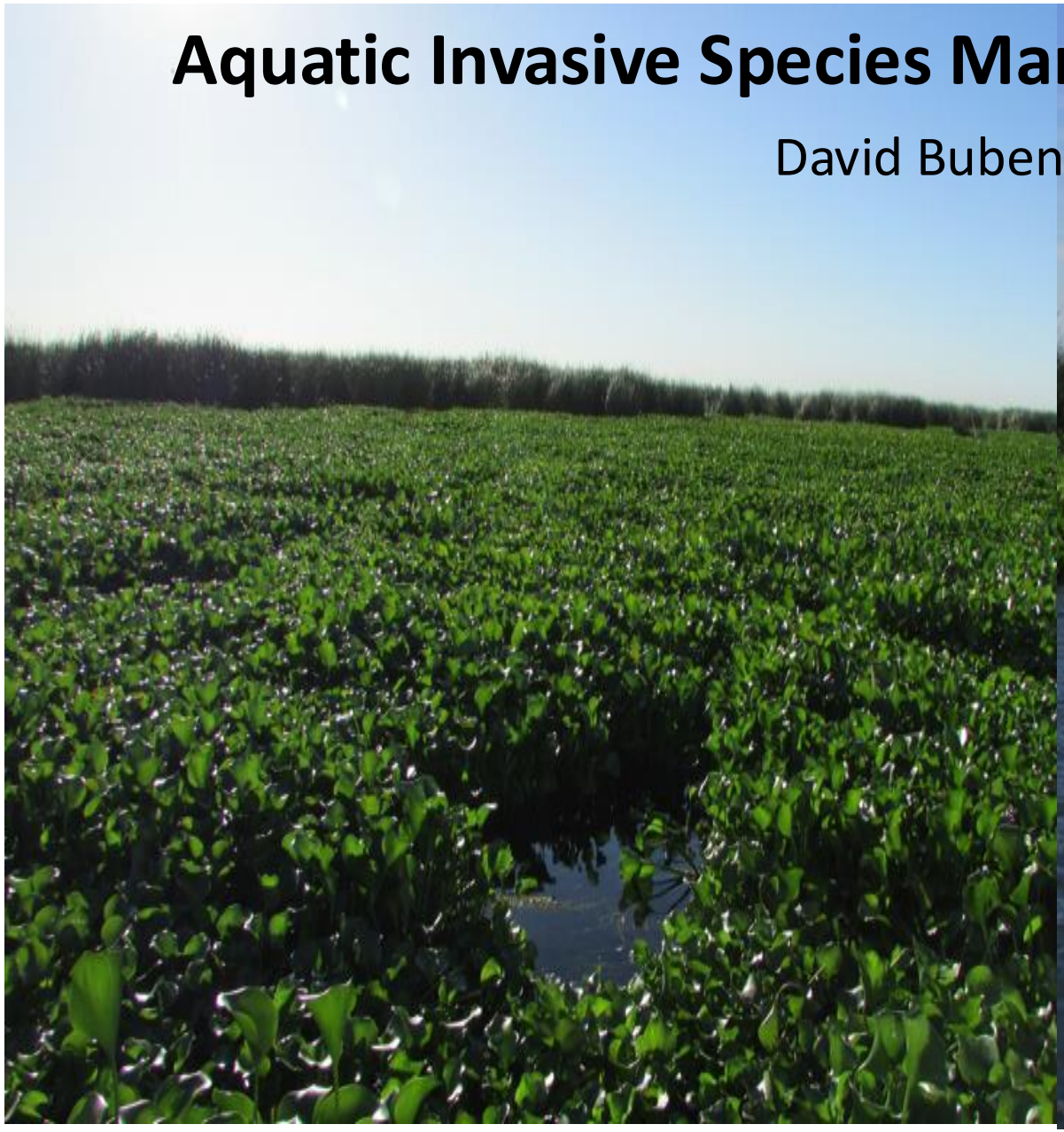
Climate Engine

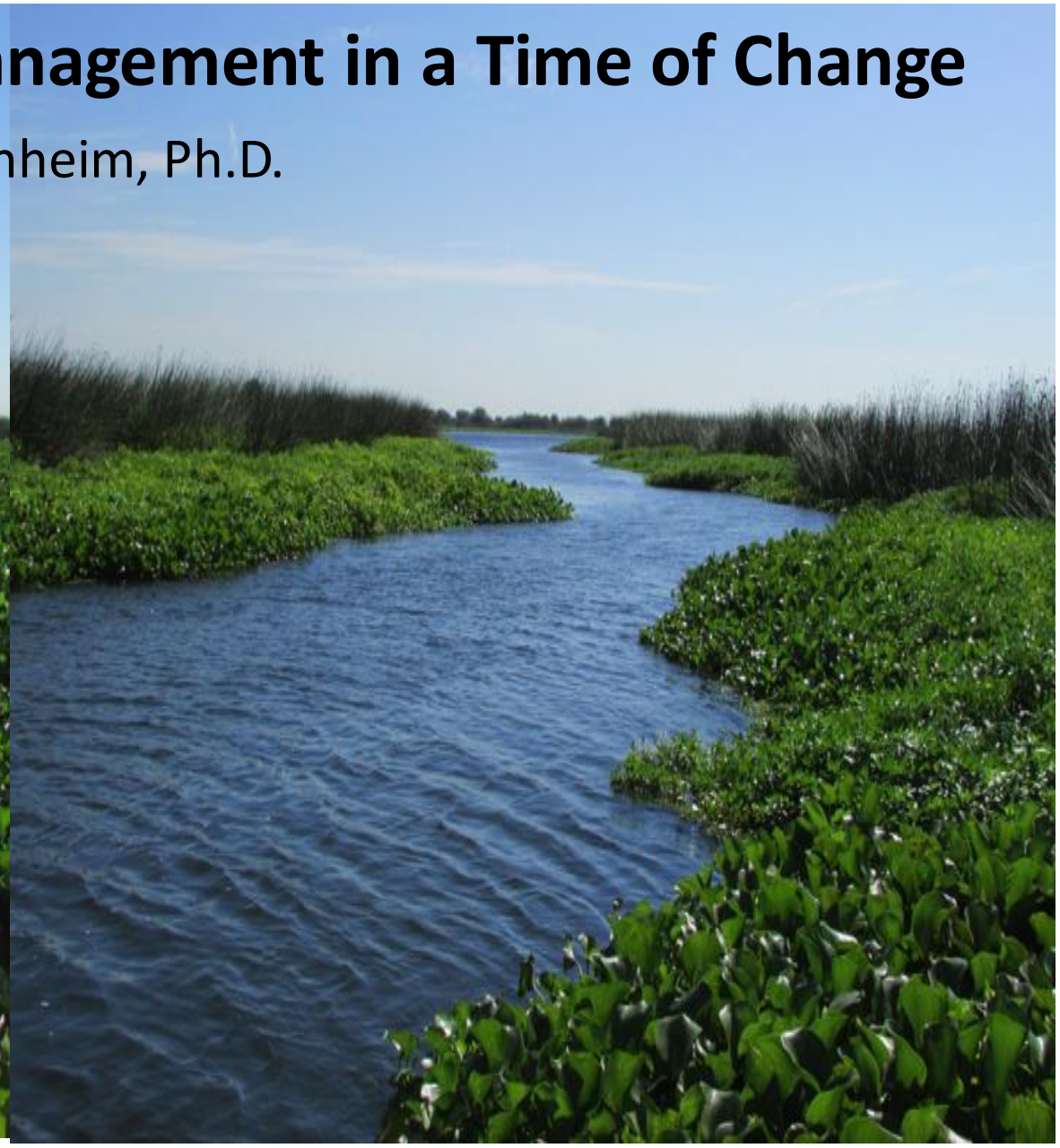
wwao

DRI Desert Research Institute

Aquatic Invasive Species Management in a Time of Change

David Bubenheim, Ph.D.





Aquatic Invasive Species Management in a Time of Change

David Bubenheim, Ph.D.

Problem: Invasive aquatic plants affect waterways worldwide with ecological, economic, and social impacts.

- CA Delta of critical regional and national importance
- Invasives threaten ecology, water, and economies
- Unpredictable response to climate variation

Purpose: Develop science-based, adaptive-management tools for Invasive Aquatic Vegetation

- Satellite mapping
- Operations support
- Management assessment
- Adaptive management
- Operational validation
- Transfer to Resource Managers

California Delta

- Largest freshwater west coast estuary
- Delta agricultural production, $2.7 billion annual.
- Irrigates Central Valley cropland, $30 billion annual value.
- Drinking water for 25 million people in CA.
- Home to 56 rare, threatened, or endangered species.
- Urban population of Delta over 10 million.
- Complex array of stakeholders, regulatory oversight, and competing resource management objectives
- Appropriate validation site for national/international transfer

Partners

NASA

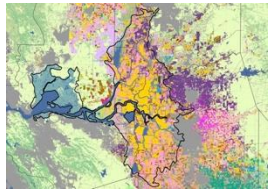
CALIFORNIA STATE PARKS BOATING AND WATERWAYS

UCDAVIS
UNIVERSITY OF CALIFORNIA

USDA

NASA Unique Contribution

Remote Sensing
FAV & SAV Mapping, Operations, Assessment, Management



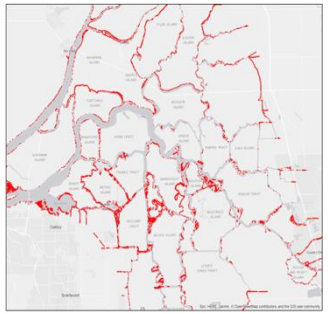
Landscape Scale Modeling
River Watershed Delta Inputs
Delta Land-Use / Water Quality

Biological Impacts (Controlled Environment & Field Studies)
Response to environment variation
Parameterize response models

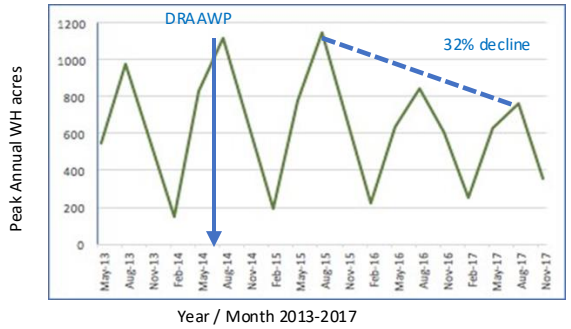
Decision Support
Tools for operations, adaptive management and strategic planning and policy.

Early USDA Sponsored DRAAWP* Results

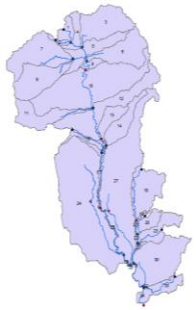
Delta FAV Map Ver 1



Total Delta FAV Coverage

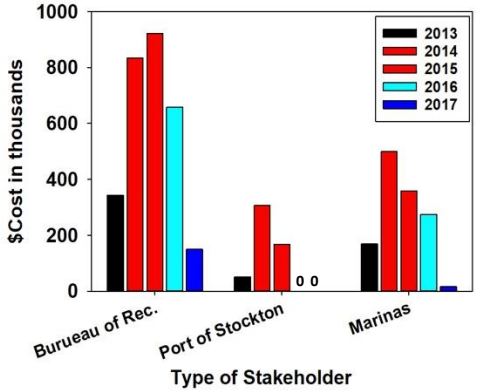


Sacramento River Delta Inputs



San Joaquin River Delta Inputs

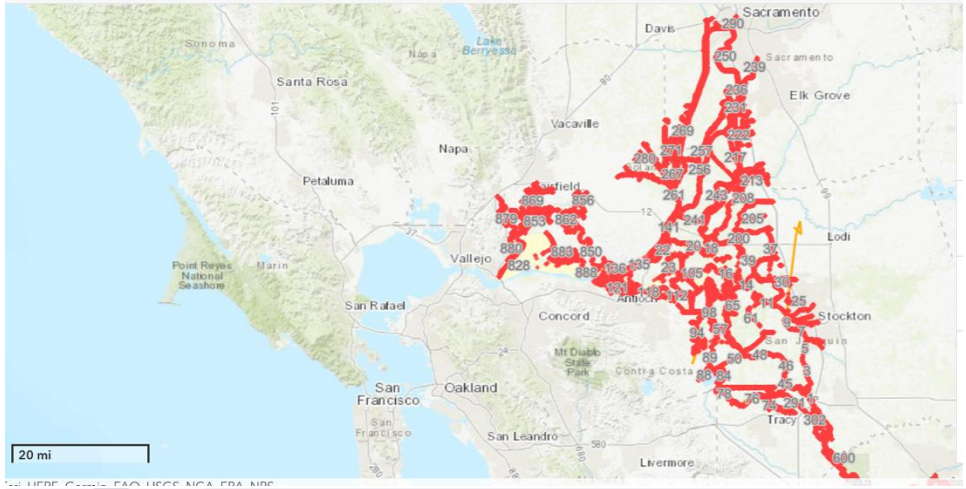
FAV Treatment Cost



*Delta Areawide Aquatic Weed Project (DRAAWP)

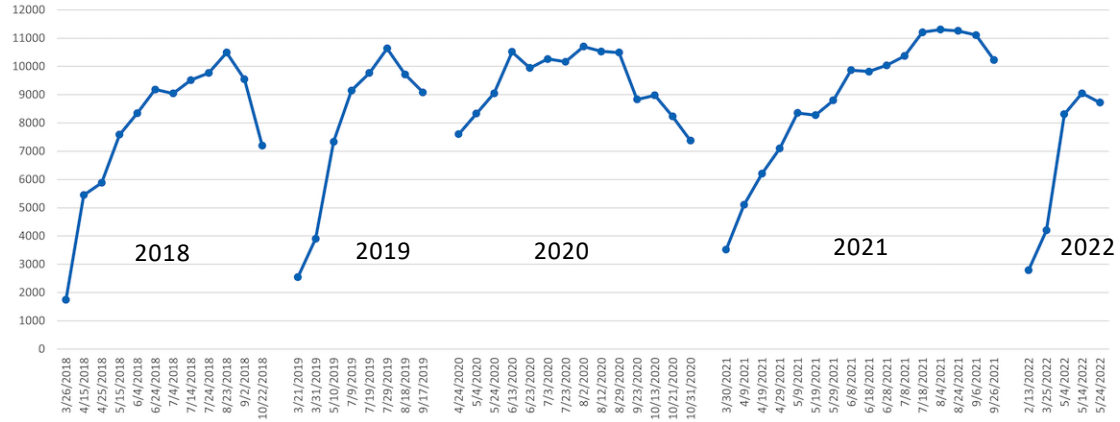
San Francisco Delta Floating Aquatic Vegetation Mapper

Provided by NASA Ames for the California State Parks, Division of Boating and Waterways-For Internal Use Only



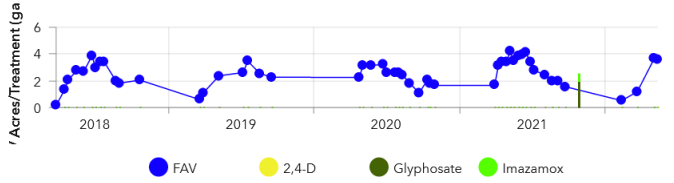
Delta Total Floating Aquatic Vegetation Acres - 2018 to present

Sentinel-2 imagery



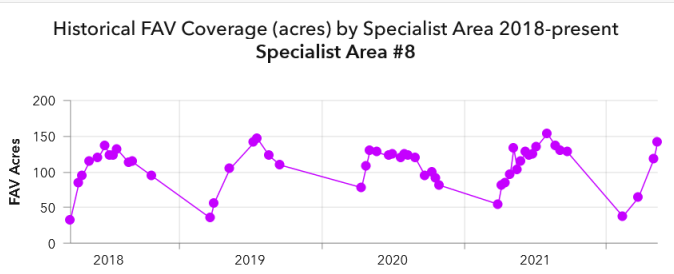
San Francisco Delta Floating Aquatic Vegetation Mapper

Provided by NASA Ames for the California State Parks, Division of Boating and Waterways-For Internal Use Only



FAV Acres by Treatment Site
May 14, 2022

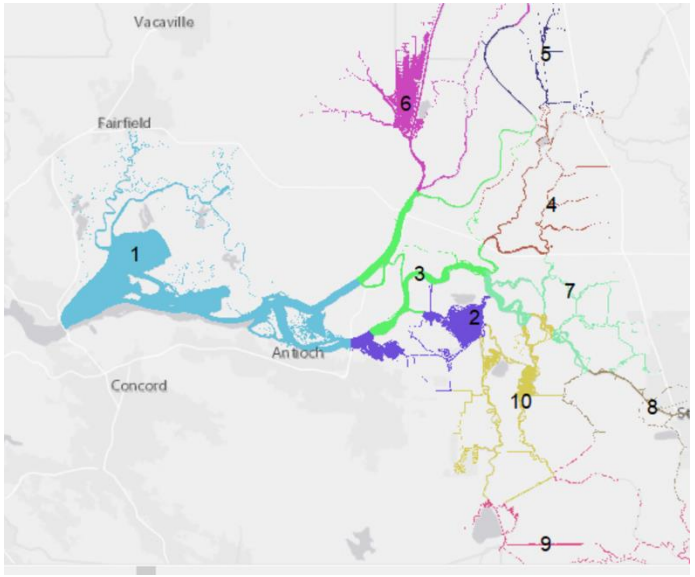
Treatment Sit...	FAV Acres
5	3.63
6	19.94
7	3.61
8	56.22
9	12.92



FAV Acres by Specialist Area
May 14, 2022

Specialist Area	FAV Acres
8	141.32

Delta DBW Specialist Areas



Touchpoints

Grants
ARSET
DEVELOP
Reimbursable