VISION:

A Multi-Agency Information and Analysis Network (CalMAIN)

PROPOSAL and DISCUSSION:
Development of a statewide platform for
watershed information sharing, data analysis, and evaluation

Vision

- Vision – establish a collaborative framework where each agency:
  - Contributes (and maintains) authoritative information
  - Accesses a shared feedback loop to communicate data and operational issues
  - Has access to shared applications, workflows, and analyses (e.g. THP review, grant program awards)
  - Has immediate/continuous access to other agencies' *current* info
  - Enjoys the maximum benefit realized through multi-agency strategy and application

Principles

- Shared data and mutually-informed decision-making leads to better decisions
- Each agency is best positioned to operate and maintain its own core database(s)
- It shouldn’t be owned by any one agency
- It must be useful to all agencies AND easy to use
- It must be adaptive to new data and information inputs
- Building blocks are in place to develop this vision: don’t duplicate efforts

Background: setting

- Geographic information is central to how most resource agencies make decisions
- Existing efforts can inform this concept:
  - AB 1755: CA law requiring a statewide integrated water data platform and protocols related to water data
  - AB 1492: Among other objectives, a CA law requiring the identification of ecological performance measures to evaluate forest/watershed health
  - DataBasin: Geographic-based database allowing for visualization of data layers in concert
  - Forest Management Task Force: EO B-52-18, May 10, 2018, with the intent of improving forest health, mitigating wildfire, and meeting CA climate goals
  - Watersheds as infrastructure: AB 2480 (2016) and AB 2551 (2018) build on each other to recognize the importance of headwaters forests to CA water infrastructure

Current Participants:

Governor's Forest Management Task Force

AB 1492 implementation

AB 1755 implementation

Cannabis and water availability

DataBasin and RePlan

Background: challenges

- Current shared data landscape:
  - Frustration with data existing in silos (though moving toward open data)
  - Incredible data repositories, much of which are unavailable (either in hard copy or siloed)
  - Data isn't easily accessed by the public or even by agency staff
- Leads to:
  - Single-issue project application in the absence of collaborative agency planning
  - Opaque policy and regulatory decisions
  - Inefficient granting or other project implementation
  - Don't effectively meet administrative priorities for moving California into a future of climate change, population growth, and habitat stress

Visualization

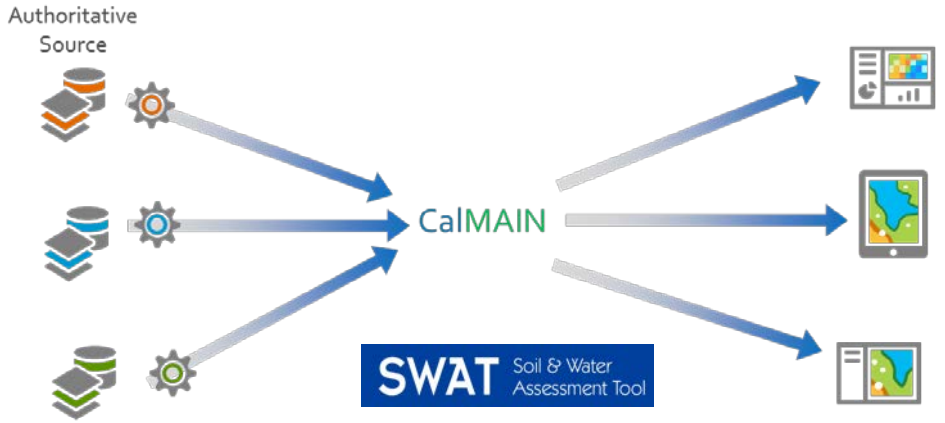
- The following is a BASIC visualization of the concept
- ONLY for illustrative purposes
- Neither tools nor analytical models are set in stone

Soil & Water Assessment Tool (SWAT) Hydrologic Model

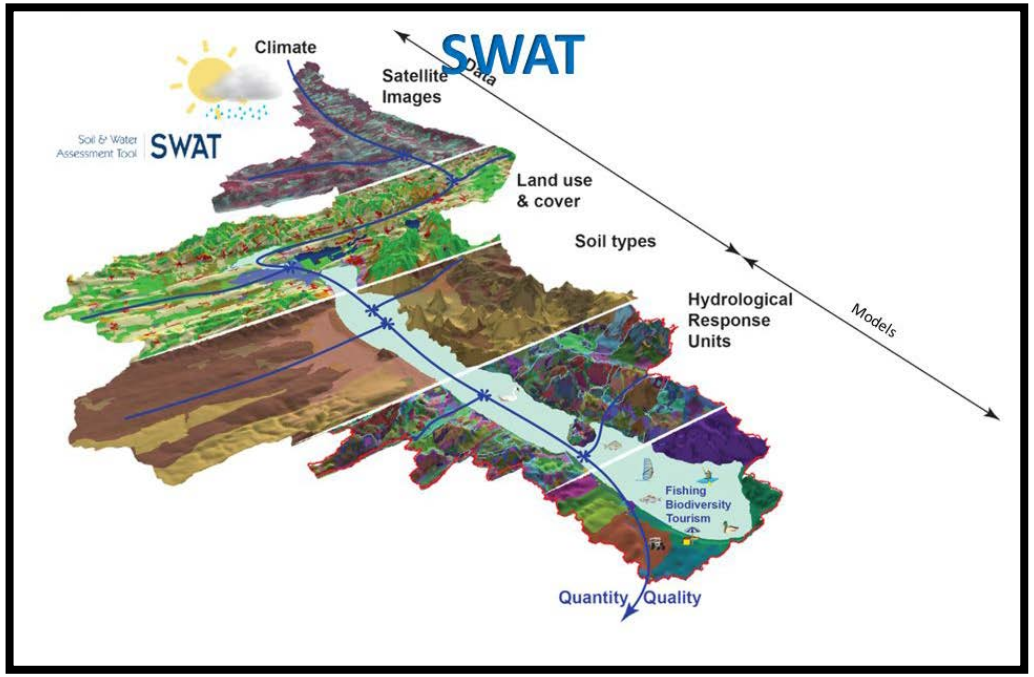
- USDA – ARS, 30 years of research and continued expansion
- Internationally accepted (3,000+ peer reviewed journal articles)
- Spatially distributed, continuous, daily-timestep
- Water, sediment, and nutrient yield in complex watersheds
- Impacts of alternative management practices

Major User Groups

- U.S. EPA: Integrating Point and Nonpoint Sources (BASINS) software package
- USDA: Conservation Effects Assessment Project (CEAP), to evaluate the effects of conservation practices on water quality
- State of CA: DWR, DPR, Regional Board – MPEP, Cannabis



Watershed Assessment, Cumulative Impact Toolset



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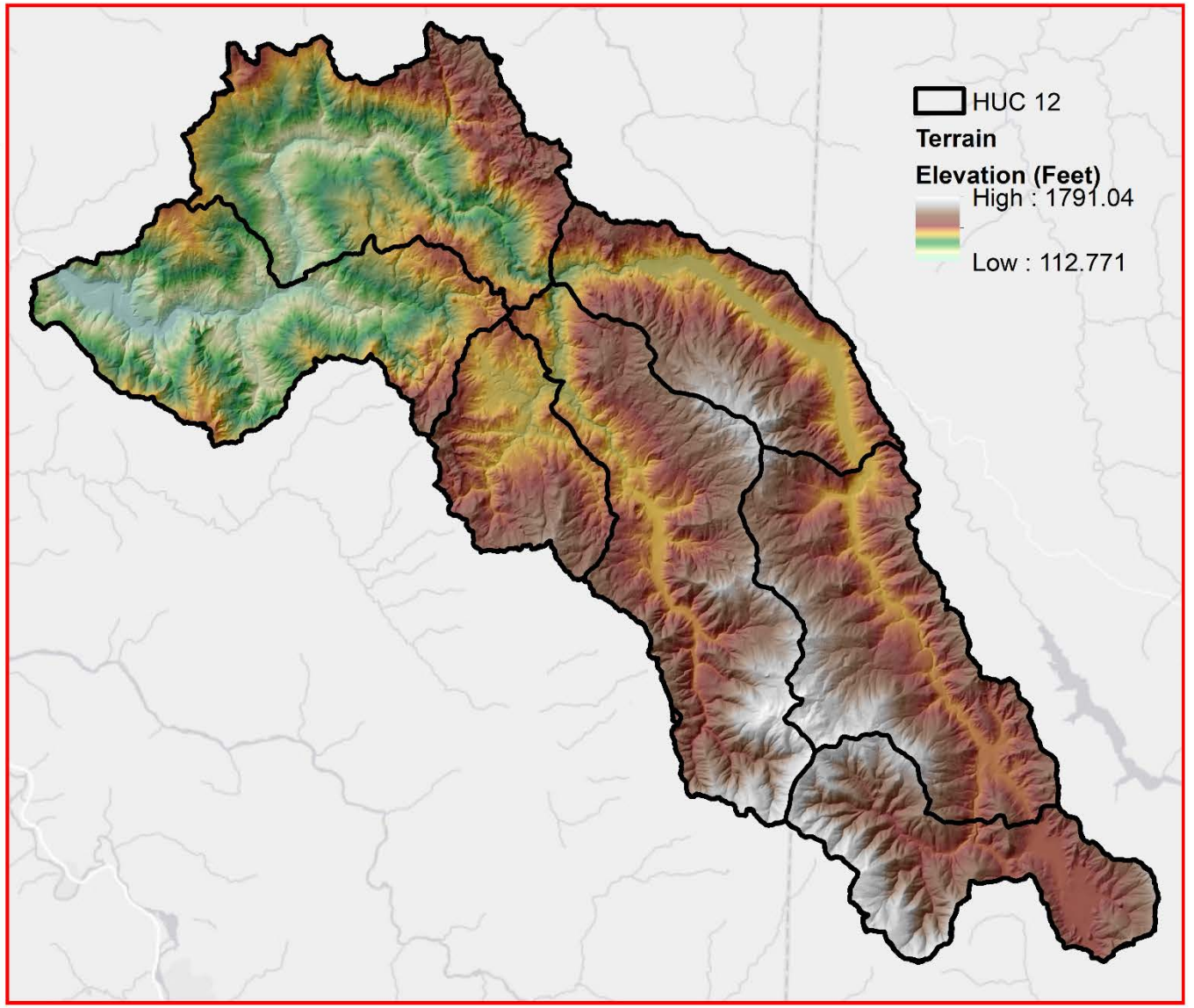
In California, SWAT is being used for several applications. The following are a few large-scale applications of SWAT within California:

- DWR SGMA: Applicability of SWAT for characterizing landscape-level water balances.
- DWR: Estimate natural and unimpaired flows for the Central Valley California.
- NRCS: In-depth assessment of the hydrology and water quality.
- DPR: Examine fate and transport of agrichemicals.
- Alta Irrigation District, CV-SALTS: Quantify percolation and nitrate loading under four irrigation and fertilizer management scenarios
- SSJV MPEP, Irrigated Lands Regulatory Program: Model and monitor nitrate leaching

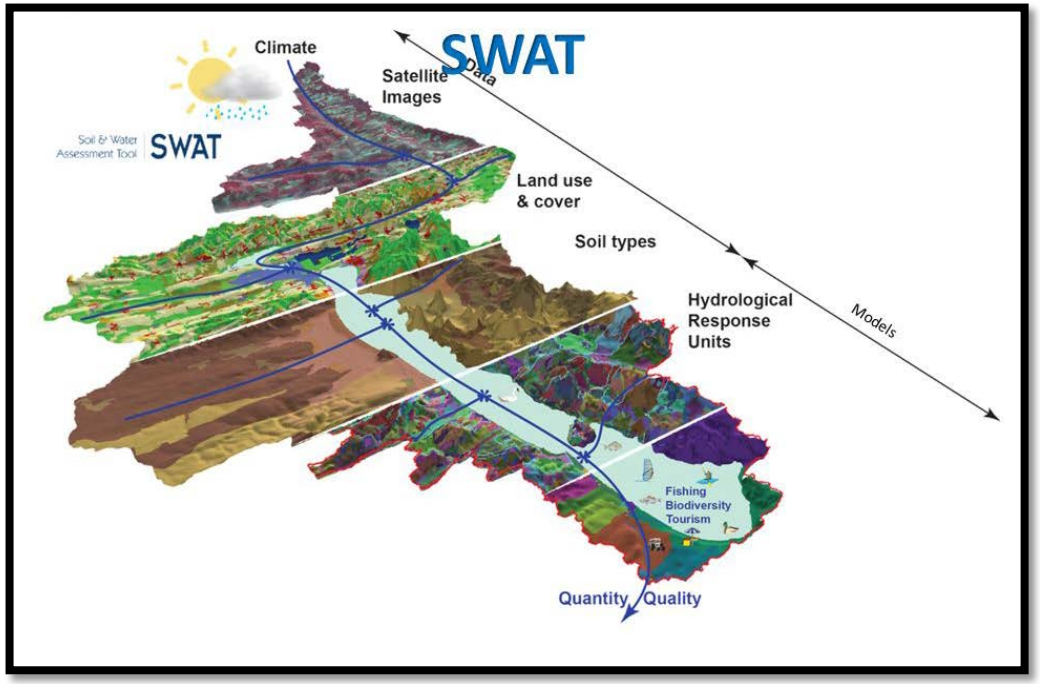
- NOTE: While subsequent slides were developed using the SWAT tool, this is simply for illustrative purposes and no tool has been identified as a frontrunner for analysis.

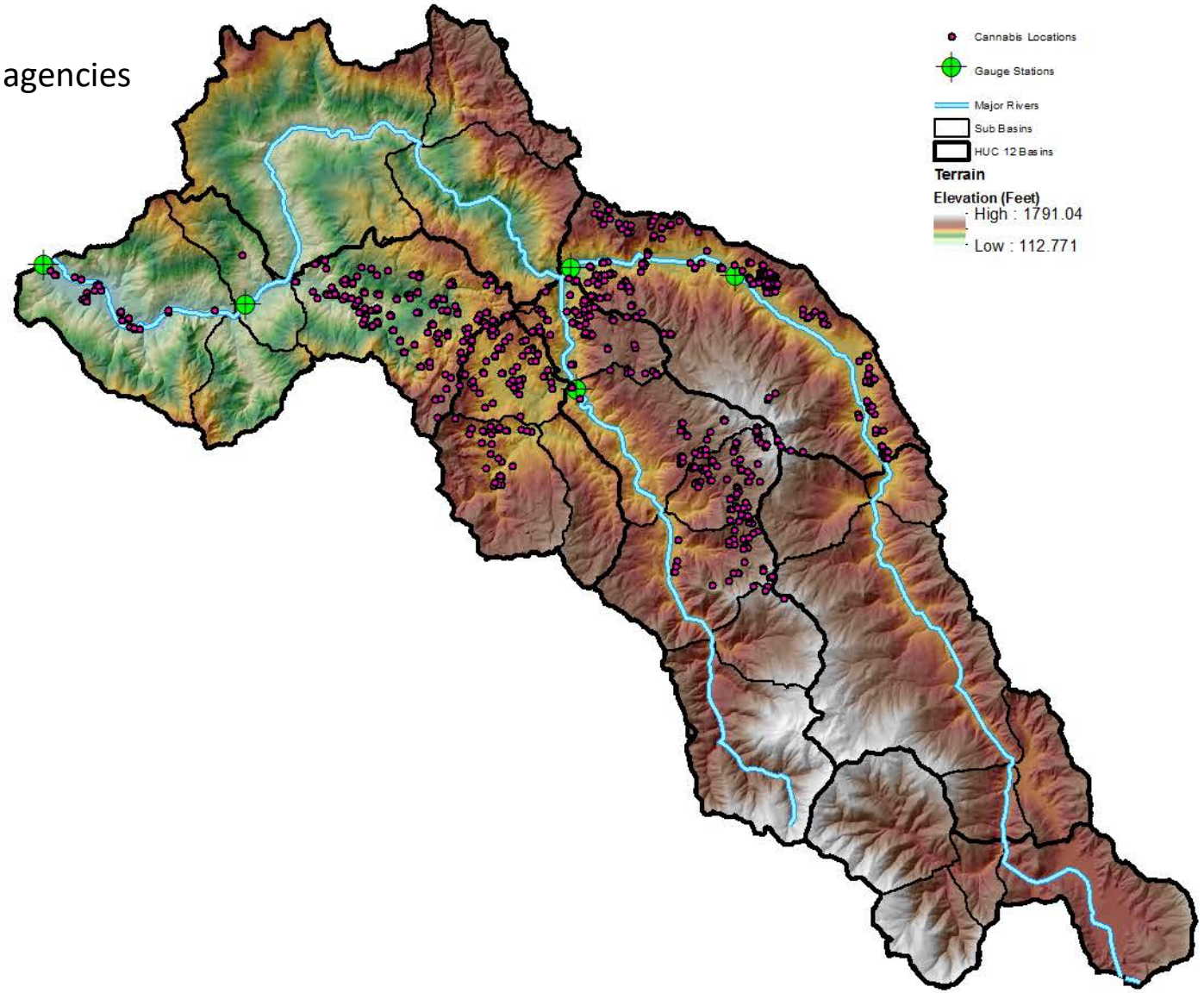
Watershed Prioritization Example



Watershed Prioritization Example

- Data readily accessible and updated (not just viewing) by all agencies
- Data services used as inputs for modeling and assessment
- Data maintained and updated by individual agencies
- Shared watershed analysis tools and results





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Watershed Prioritization Example

CalETa

STATEWIDE IMAGE ANALYSIS FRAMEWORK

Image Processing

- Automated Imagery Download (Landsat & MODIS)
- Automated Cloud Screen
- Conversion to Surface Reflectance
- Derive Physical & Biophysical Variables

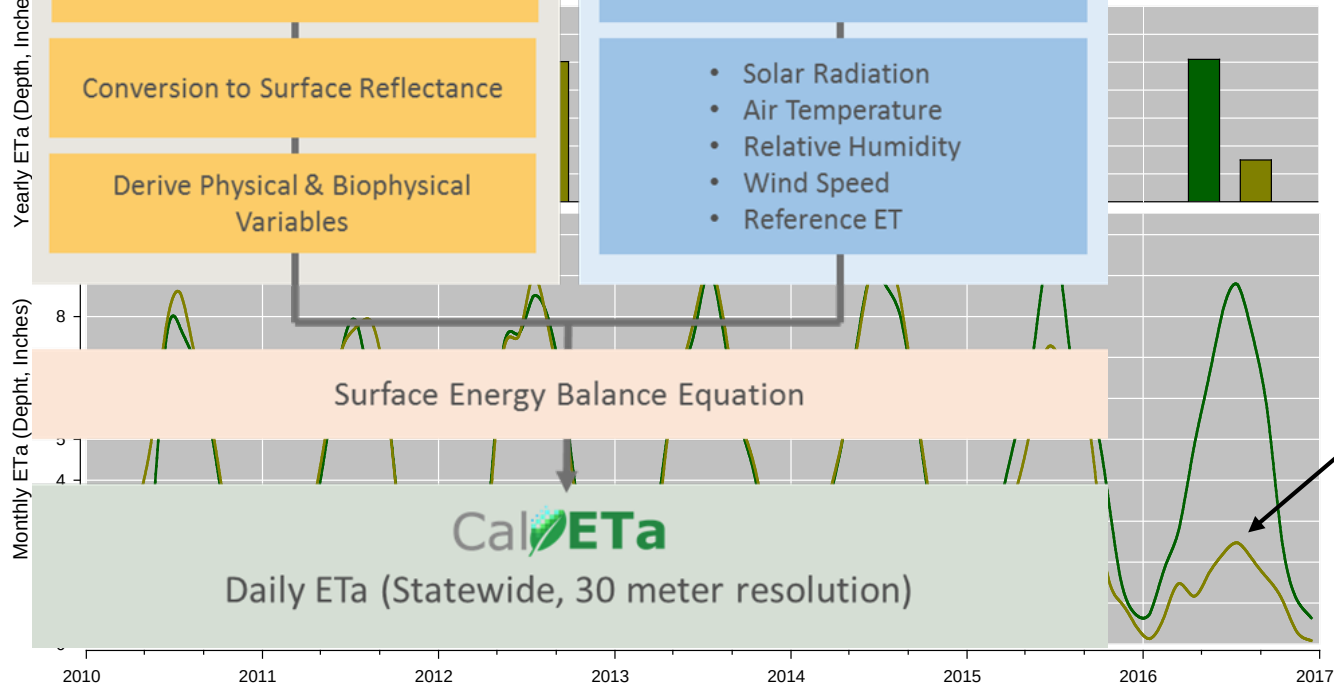
Climate / Weather

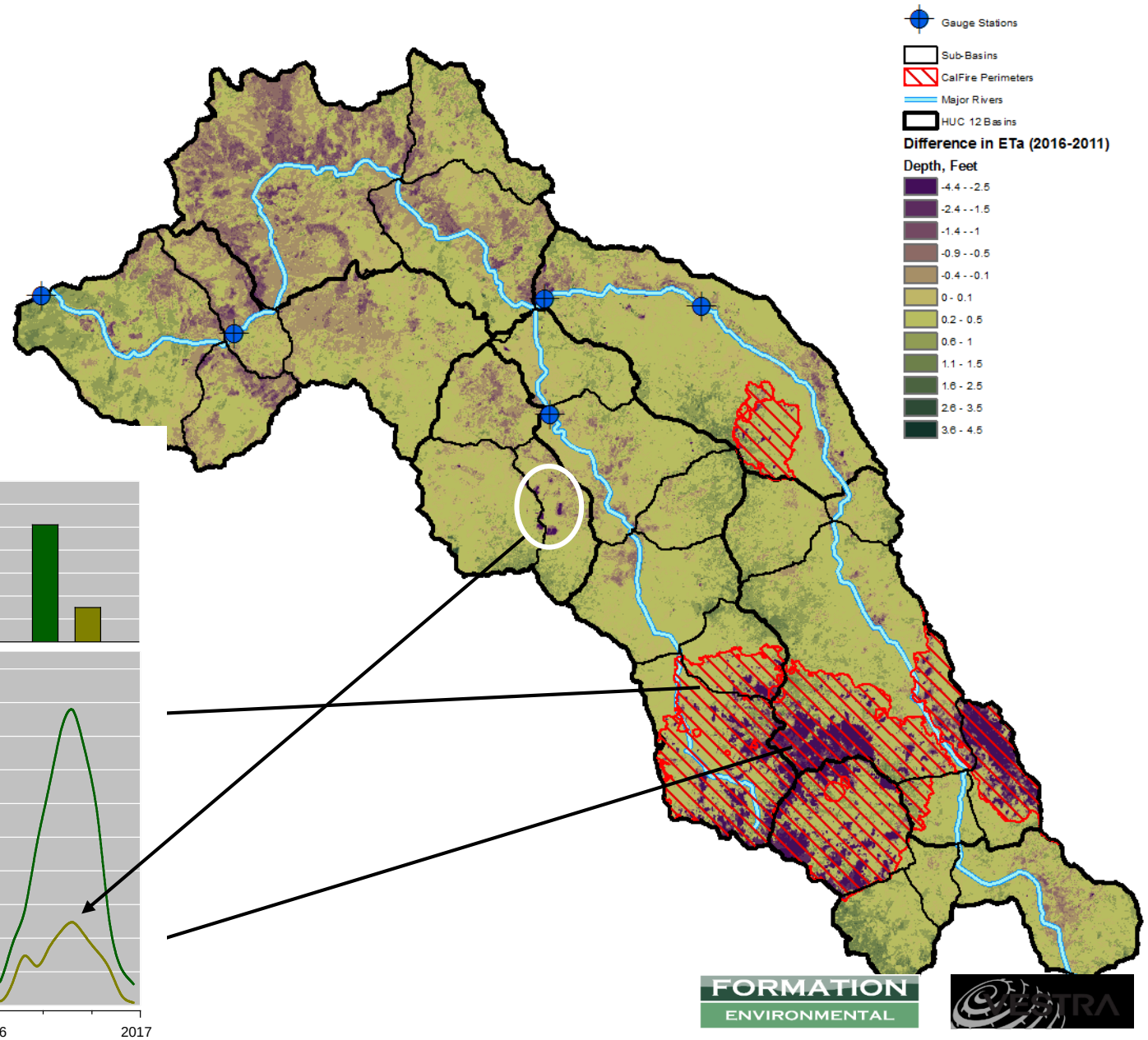
- Conditions at Satellite Overpass
- Spatial CIMIS: Daily Reference ET
- Solar Radiation
- Air Temperature
- Relative Humidity
- Wind Speed
- Reference ET

Surface Energy Balance Equation

CalETa

Daily ETa (Statewide, 30 meter resolution)





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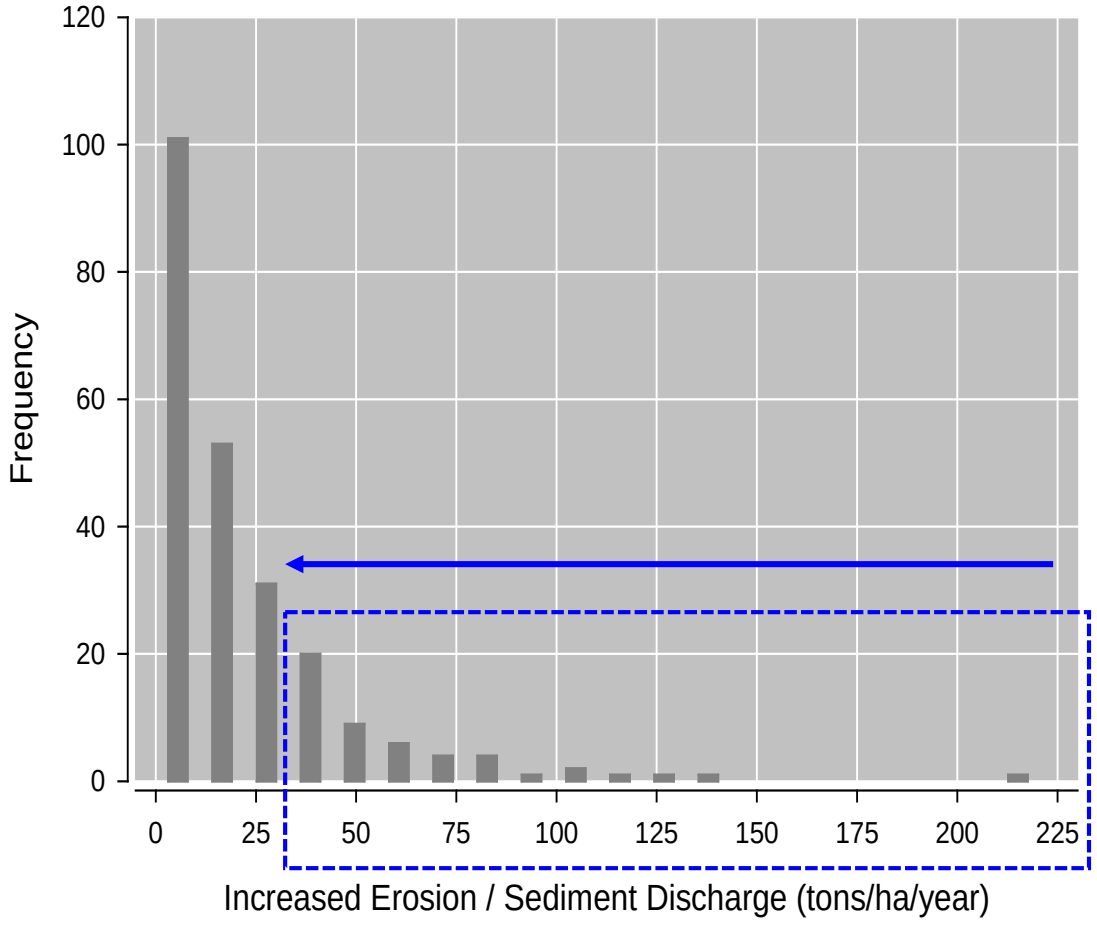
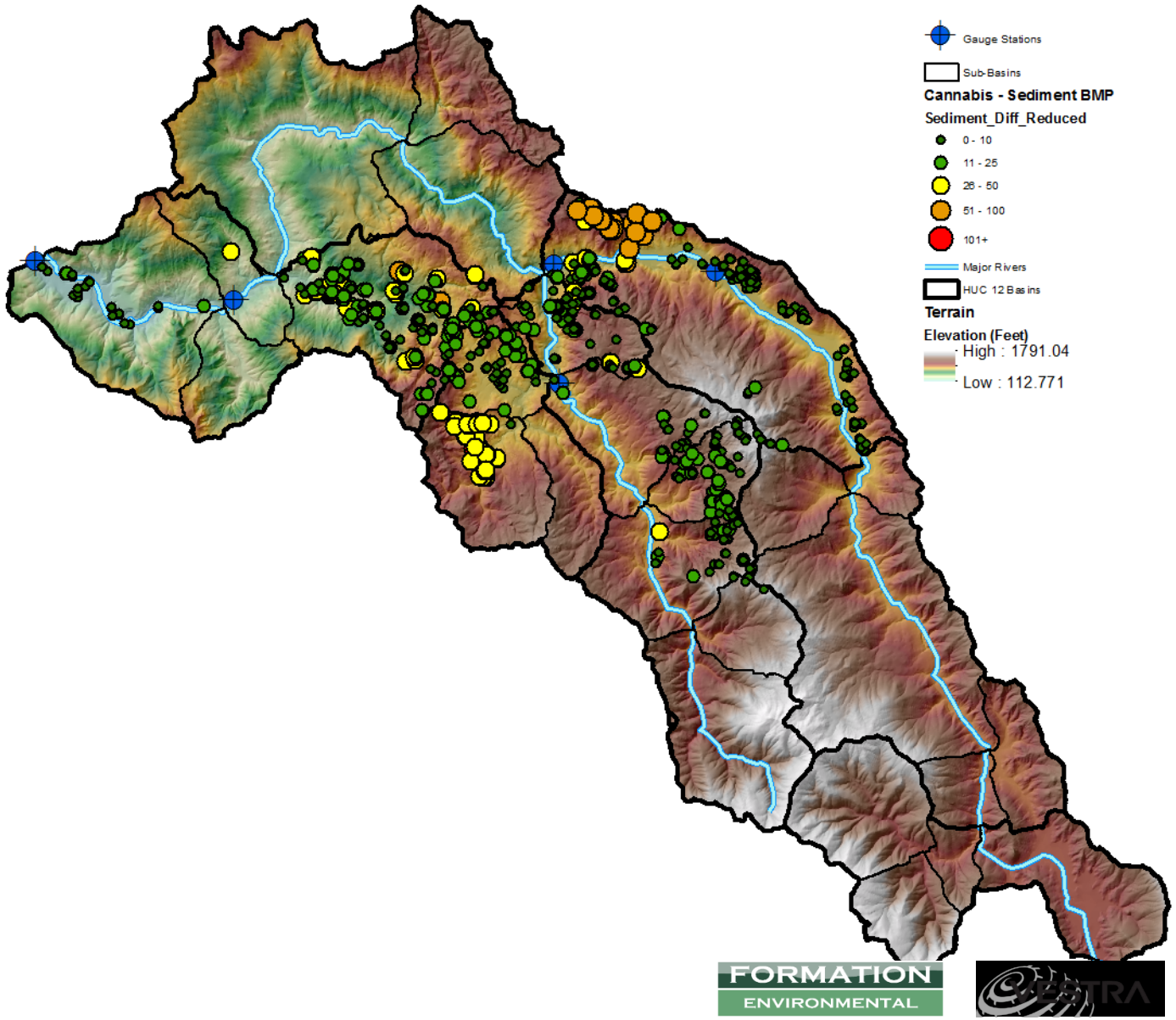
Watershed Prioritization Example

Estimate Cannabis Impacts Independently





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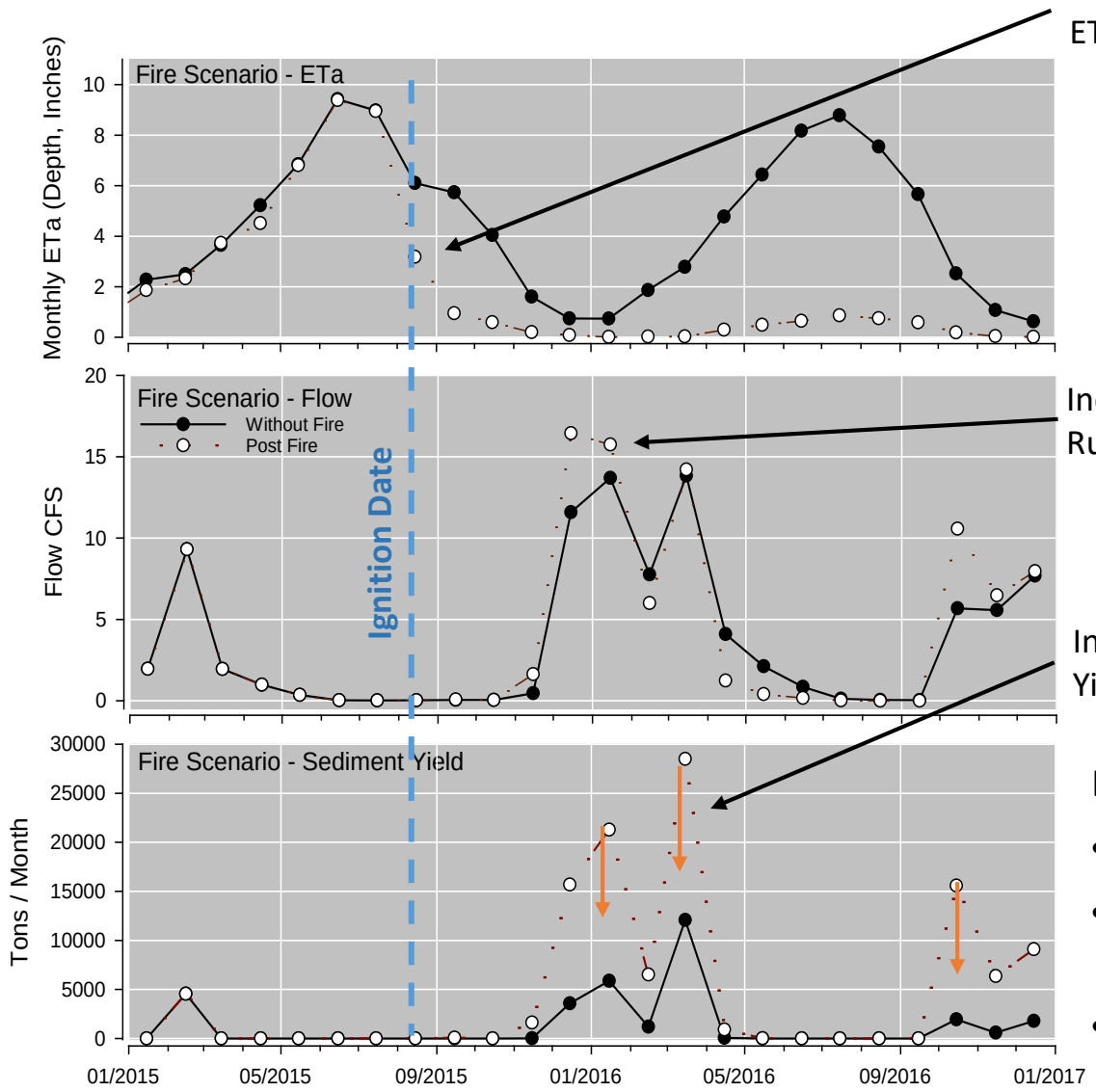
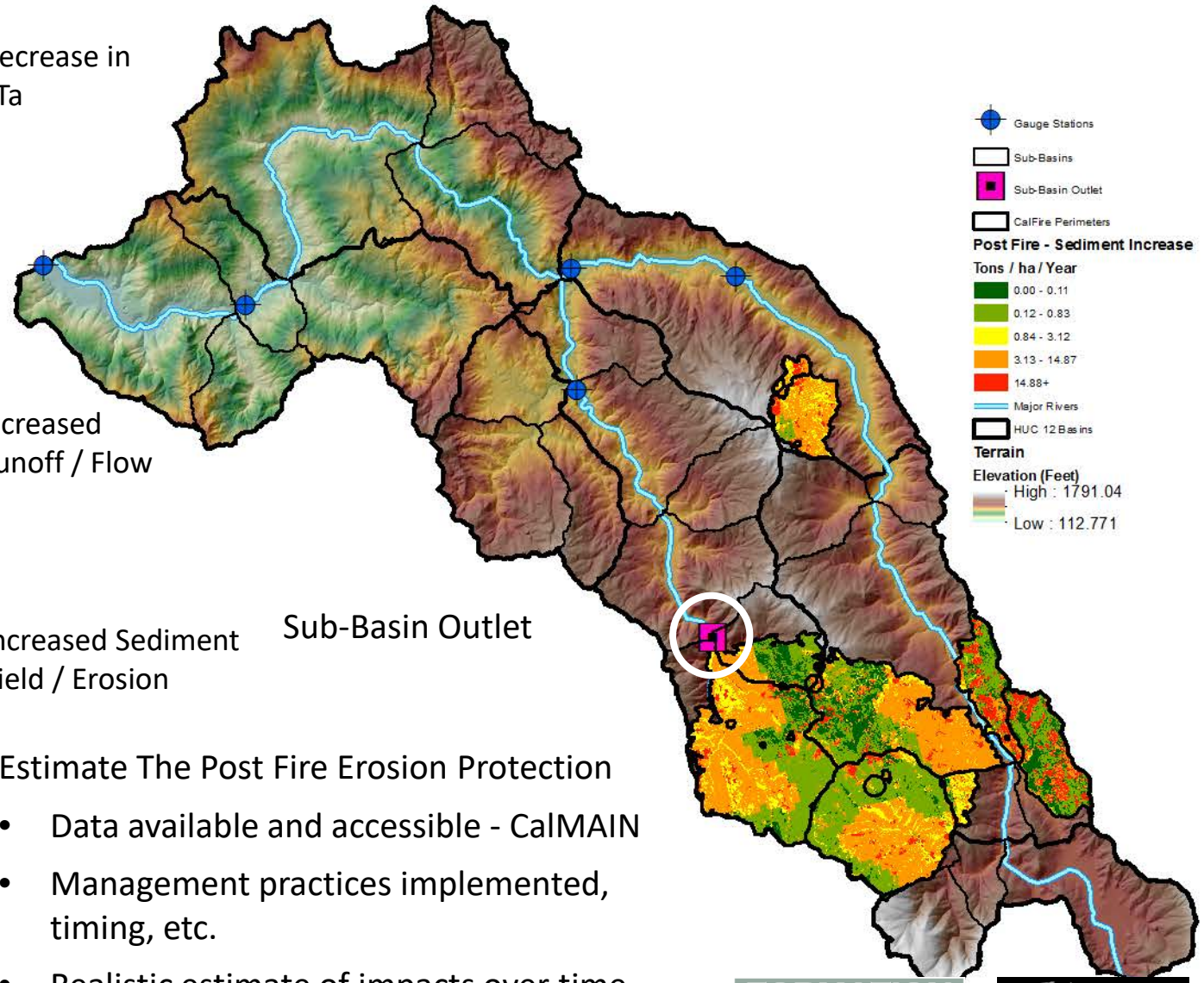
Watershed Prioritization Example



Decrease in ETa

Increased Runoff / Flow

Increased Sediment Yield / Erosion



Sub-Basin Outlet

Estimate The Post Fire Erosion Protection

- Data available and accessible - CalMAIN
- Management practices implemented, timing, etc.
- Realistic estimate of impacts over time

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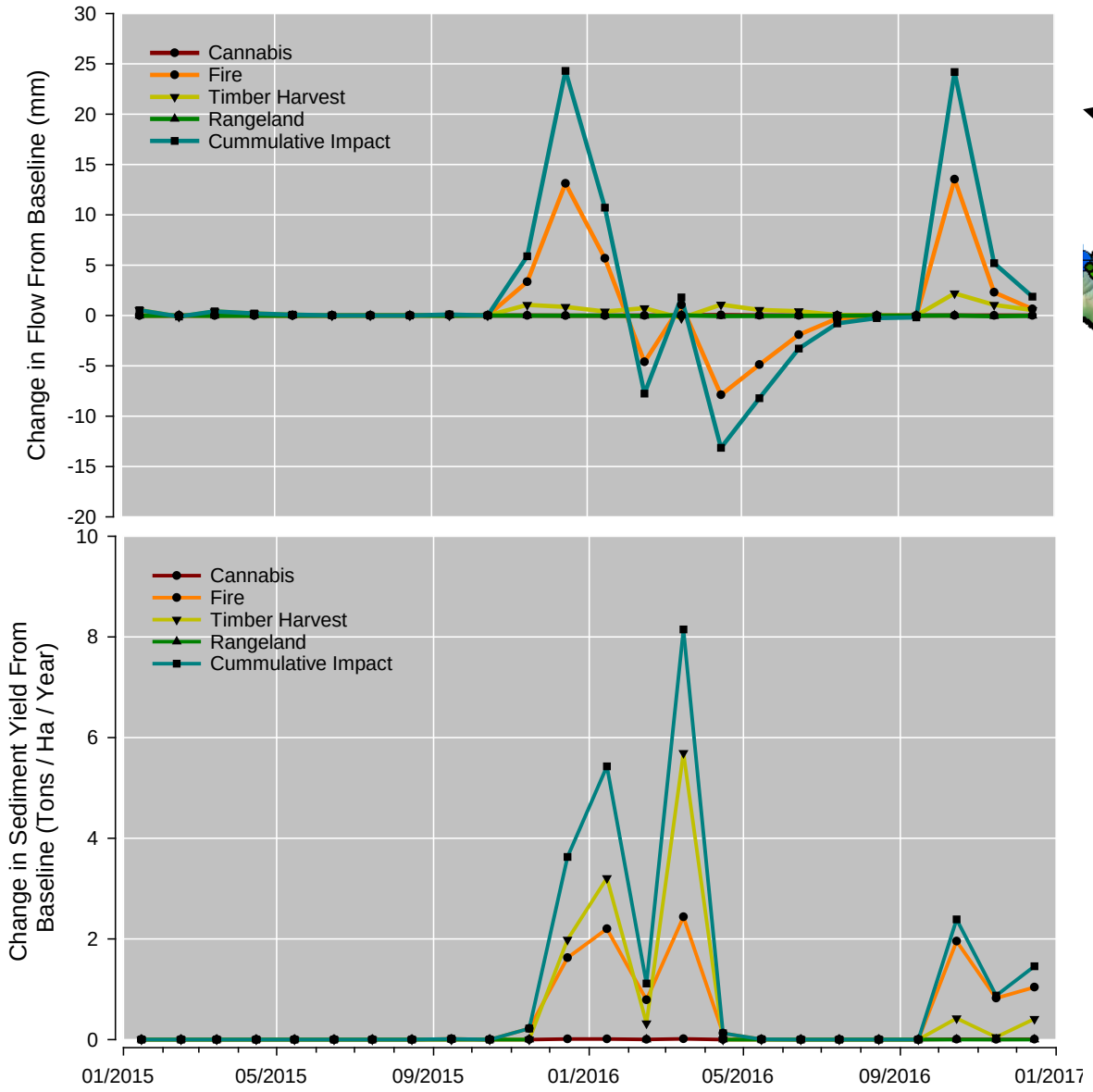
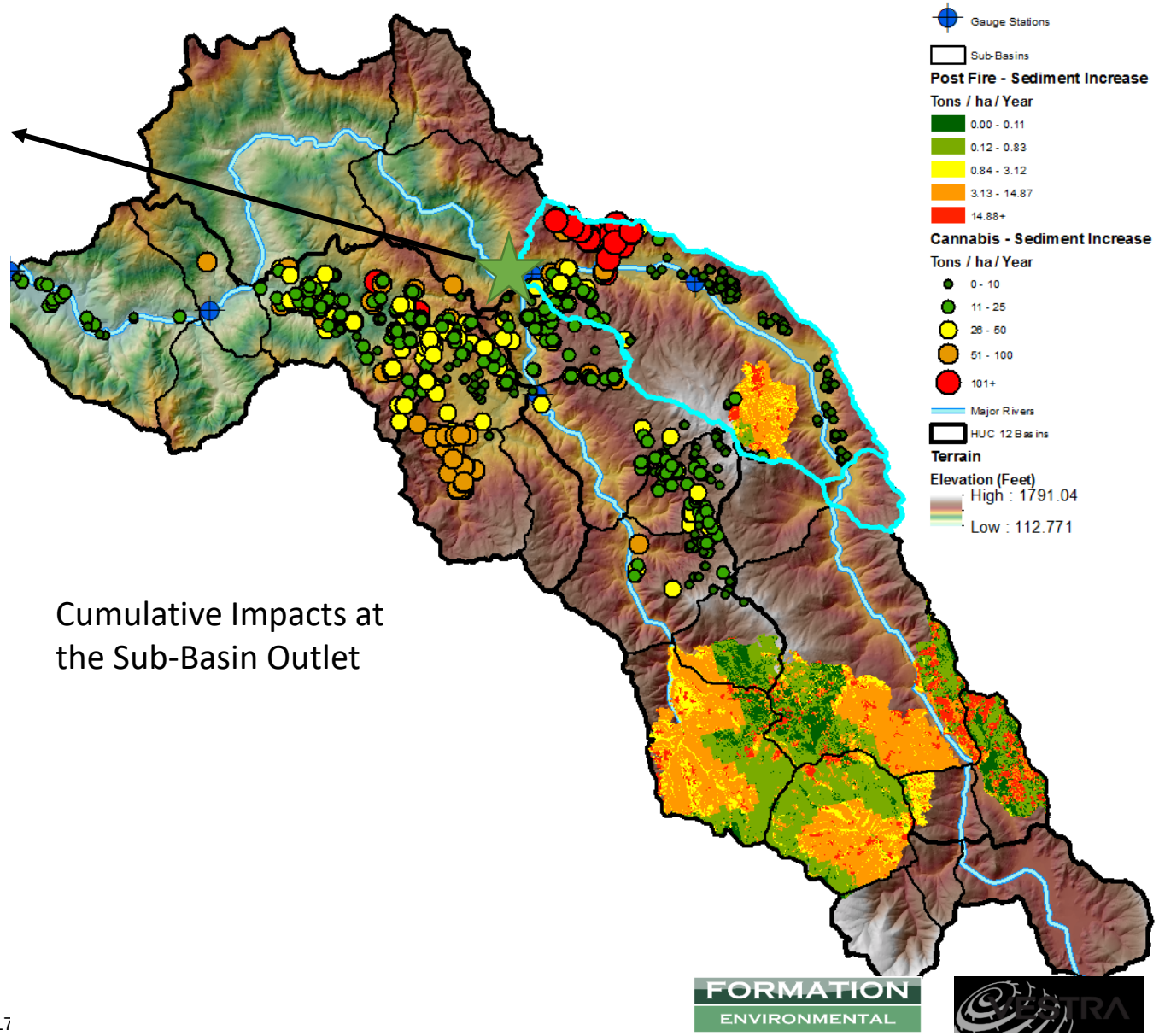
Watershed Prioritization Example





Cumulative Impacts at the Sub-Basin Outlet

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Potential Benefits

- Work past existing silos
- A holistic and integrated value set for state agencies
- Trusted data sources and analytical tools for reliable outputs
- Capability of getting to cumulative impacts
- Defensible and consistent methodology for analysis and decision-making
- Trust and transparency to the public
- Efficient use of public funds
- A focus for budgetary allocations
- Effective implementation of Administration’s priorities

Synergistic Potential

- AB 1755 (DWR)
- Data Basin and RePlan (SGC)
- AB 1492 (CNRA)
- Forest Management Task Force

Next Steps

- Complete scope document
  - Draft working its way around partner agencies
- Develop a governance structure
  - Take advantage of existing frameworks
- Implement use case/test bed scenarios

For more information

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