

Envisioning an Open Access
Platform for
Evapotranspiration Data in
the Western United States

The Vision:

*A low-cost, automated, and widely accessible ensemble of evapotranspiration (ET) data are available at user-defined scales and timeframes through a web-based platform.

*Front-end applications, tailored to specific end users, transform this data so it can be used to inform effective water trading programs, irrigation scheduling and management, water budget and groundwater planning, and other land and water management efforts across the Western U.S.

An Improvement on the Status Quo

ET Applications	Today	In 2021
Cost	High	Low
Comparability and Trust	Variable	High
Scope	Limited	Broad
Accessibility	Low	High

Critically Overdrafted Groundwater Basins – January 2016



The Platform Could Benefit a Variety of Potential End Users



End User Group	Potential Case Studies	Benefits of the Program
Agricultural Irrigators and Businesses	Specialty Crop groups, Irrigation Consultants or Districts, Growers, Agricultural Investors	Recognition for demonstrated improvements in on-farm water management
		Increased profitability as result of real-time information about the effects of crop or irrigation changes
SGMA Implementers	GSAs, Irrigation Districts, Counties	Cost effective means of tracking and reporting basinwide groundwater use (as required by SGMA)
		Reduced regulatory uncertainty
		Open access to real-time data for adaptive management, groundwater trades, and irrigation decisions
System Conservation	Participating Landowners and Public or Private Investors	Means of demonstrating the effectiveness of conservation projects
		Increased trust and transparency between Conservation Program participants

A Four Year Collaborative Effort:

Phase 1:
Building Cooperation and Refining Algorithms (2017 – 2018)

Phase 2:
Applying the Technology (2019 – 2020)

Phase 3:
Transitioning to Long-term Ownership and Funding (2021)

Phase 1: Building Cooperation and Refining Algorithms (2017 – 2018)

- Unique end user needs are documented and understood by Front End Developers
- Algorithms/models are successfully implemented on the Earth Engine data platform
- Data protocols/standards are developed and approved by End Use Representatives
- Prototype web interfaces/applications are integrated with the Earth Engine data platform

Phase 2:

Applying the Technology (2019 – 2020)

- Protocols are developed to guide use of platform algorithms
- Training and outreach materials are developed and available
- Operational web-based platform offers access to an ensemble of models that can support both automated and supervised production of ET data
- End user groups feel comfortable querying the data and know how to use a front-end application to translate that data into useful and actionable information.
- Completed front end applications successfully interact with the data sources and summarize the data in a way that satisfies the needs of each end user group

Phase 3: Transitioning to Long-term Ownership and Funding (2021)

- Examples of Program impacts and benefits for land and water management are documented and widely distributed
- Adequate annual funding is secured to maintain the technology and Program, long-term
- State or other entity assumes ownership of the Program
- The Program is viewed as a win-win for agriculture and the environment

What Might an Application Look Like?

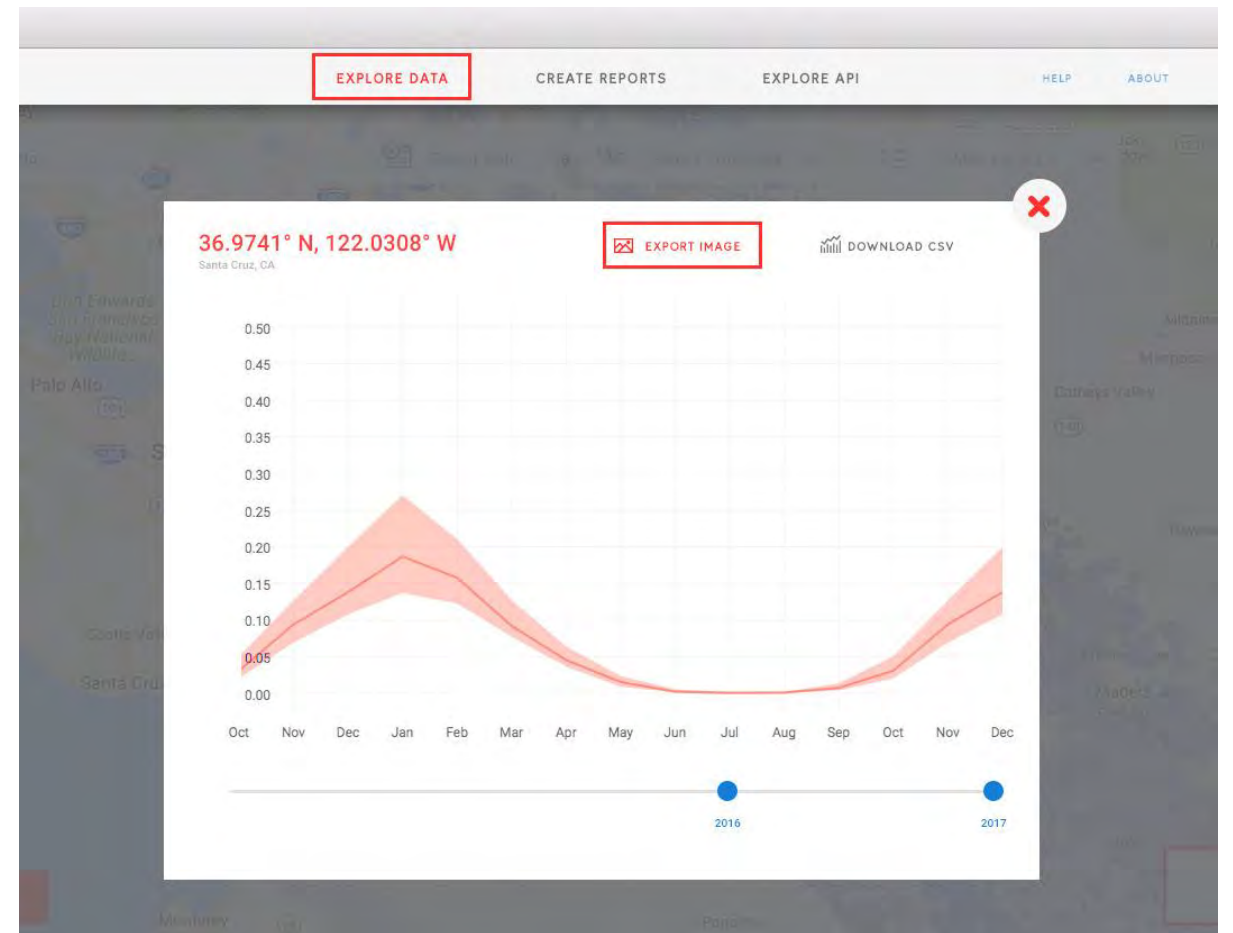
The screenshot shows the 'SIMS' application interface with a navigation bar containing 'EXPLORE DATA', 'CREATE REPORTS', 'EXPLORE API', 'HELP', 'ABOUT', 'CONTACT', and 'SHARE'. The main heading is 'Create a Report'. Below it are three steps:

- STEP 1:** Name your report (input field)
- STEP 2:** Single Field or Multiple Fields (dropdowns)
- STEP 3:** Define Area of Interest (Limited to 200 Acres) (checkbox)

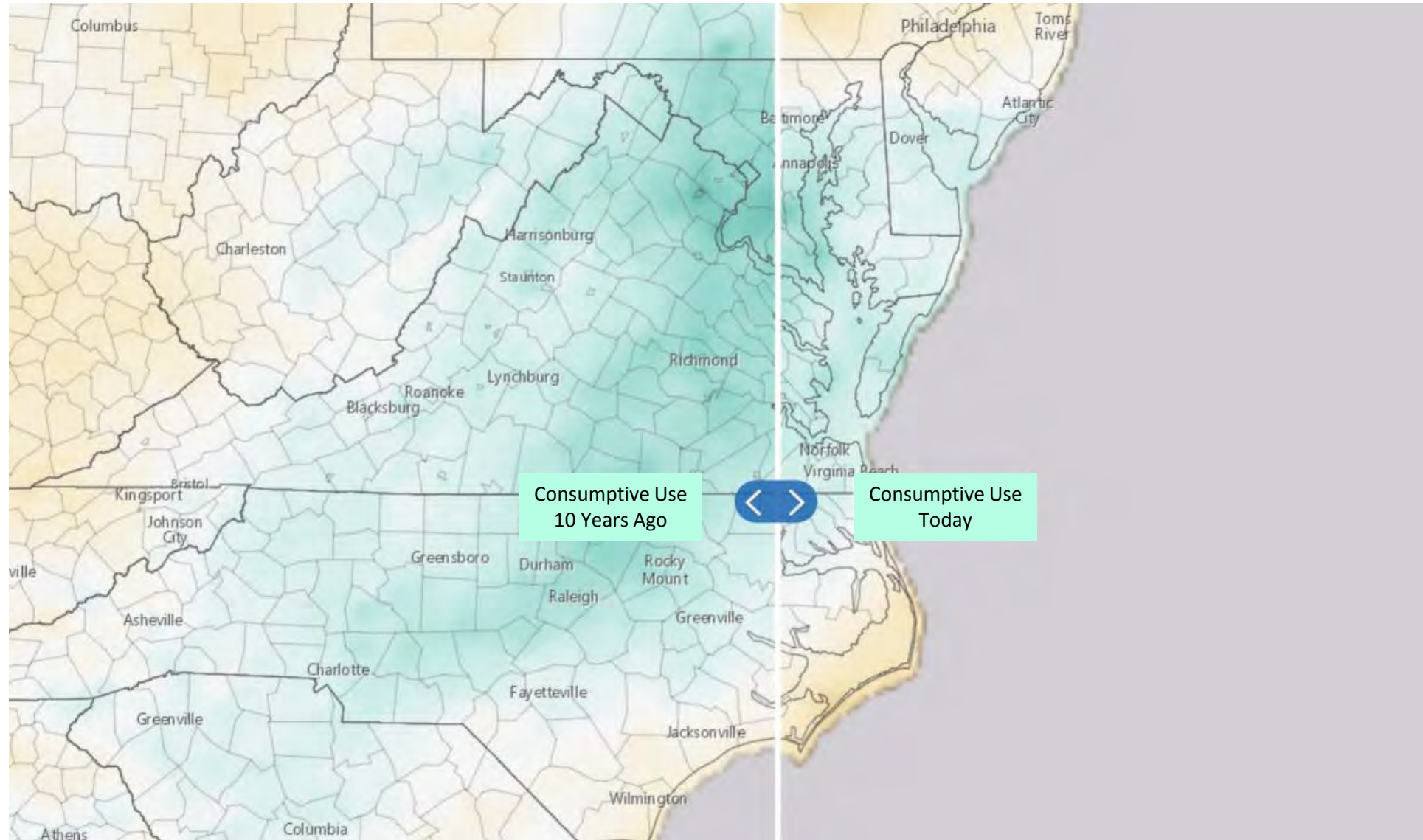
A map of California is shown with a red polygon highlighting an area in the Central Valley. Below the map are four more steps:

- STEP 4:** Select Crop Type (dropdown)
- STEP 5:** Select Irrigation Type (dropdown)
- STEP 6:** Select Data Layer (dropdown menu with options: NDVI, Fc, Kcb, ETcb)
- STEP 7:** Select Date (dropdown)

At the bottom right, there is a 'Select Interval' button.



What Might an Application Look Like?



Project Team

Purpose: Develop plan & budget for building an Open Access ET Platform and End Use Applications, then serve as core Project Team in implementing that plan

Composition

- **Project Leads:** Robyn Grimm (EDF), Forrest Melton (NASA) and Maurice Hall (EDF)
- **Technical Team** (Remote Sensing Experts and Data Scientists):

Name	Institution	ET Algorithm / Method
Forrest Melton	NASA, CSU Monterey	SIMS
Justin Huntington	UNR Desert Research Inst.	METRIC
Christopher Hain	NASA	ALEXI / disALEXI
Mutlu Ozdogan	University of Wisconsin	ALEXI / disALEXI
Martha Anderson	USDA ARS	ALEXI / disALEXI
Gabriel Senay	USGS	SSEBop
Josh Fisher	NASA JPL	Prestley-Taylor
Wim Bastiaanssen	UNESCO IHE Delft	SEBAL

- **Google Earth Engine Lead:** Tyler Erickson (Google)
- **2 - 4 End Use Representatives:** TBD
- **1 - 2 Front End Developers:** TBD

Meeting Frequency: ~Bi-Monthly (Ideally in late July, October, and December this year)