Emergency Drought Grant Program

Budget Update for PA 22 Committee

Ian Achimore
Senior Watershed Manager
Santa Ana Watershed Project Authority
April 27, 2017

Emergency Drought Grant Program

Conservation Based Rates Project Milestone and Updates

Ian Achimore
Senior Watershed Manager
Santa Ana Watershed Project Authority
April 27, 2017

Presentation Overview

Action

- March 31, 2017 Milestone Waiver

Receive & File

- Update on California Data Collaborative Rate Tool
- Update on Rates Public Relations Project

March 2017 Milestone

- Milestone date included in contracts
- Cucamonga Valley Water District has delayed schedule as discussed in Dec 2016 PA 22 Meeting
  - Submitted letter to Committee in October
  - Assessing Executive Order final framework
  - Completed review of financial model
- Garden Grove has acquired a rate consultant
  - Issues with data management as the billing information that itemizes customer accounts needs to be cleaned and sorted by landscape measurements using the aerial imagery.
  - In order to increase the pace of the schedule, Garden Grove is expected to sub-contract with a data management consultant to manage the customer account information.

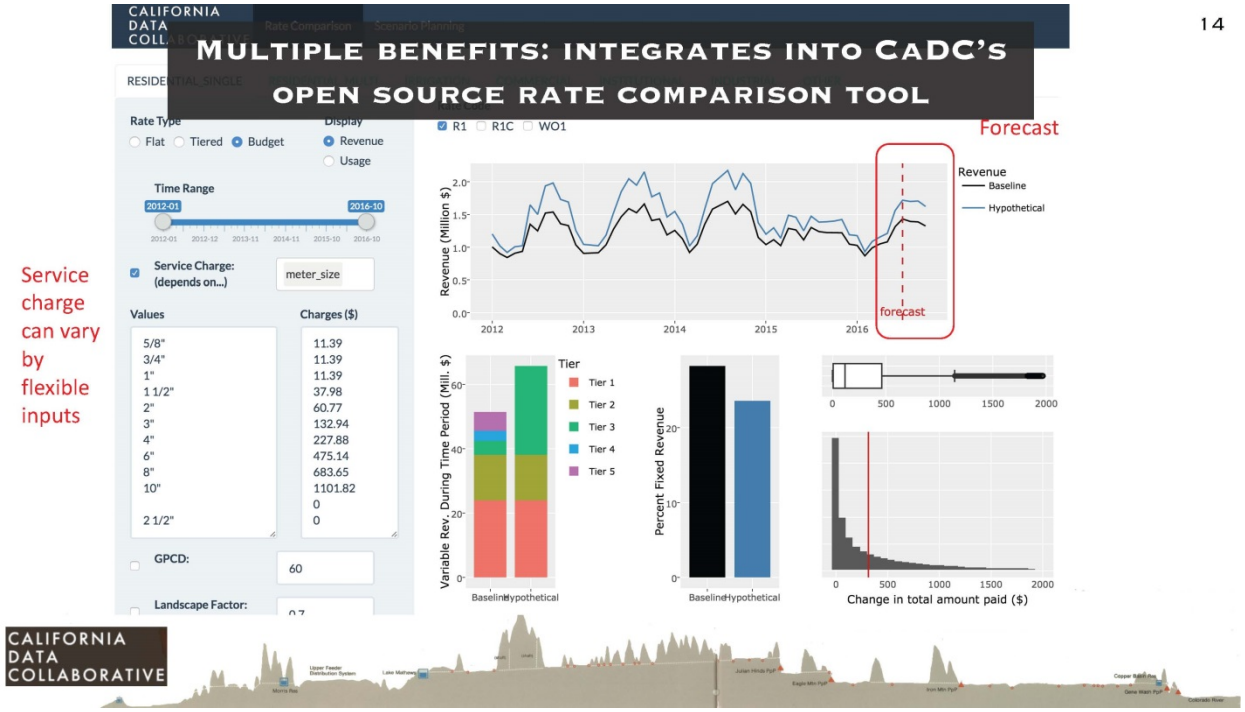
Milestones by Agency

Retailer	Rate Study Begin Date	Rate Study Final Draft Goal	Adoption Goal	Rate Implementation Goal	
East Valley WD	Jul-14	Jan-15	Jun-15	Jun-15	✓
Hemet City	Nov-15	Jul-17	Aug-17	Oct-17	
San Jacinto City	Sep-16	Apr-17	Jun-17	Dec-17	
Chino Hills City	Apr-16	Jun-17	May-18	Jul-18	2018
Chino City	Jan-16	Dec-16	Jun-17	Jul-17	
Rialto City	Sep-15	Jun-17	Nov-17	Jan-18	2018
Tustin City	Aug-16	Jun-17	Sep-17	Mar-18	2018
Garden Grove	Sep-16	Nov-17	Nov-17	Feb-18	2018
Cucamonga VWD	Aug-16	May-17	Feb-18	Jul-18	2018

Incentives for Rate Completion

- Provide further funding as incentive:
  - Further funding upfront does not necessary help as rate study price estimate do not exceed initial grant allotment
  - Further funding toward end of project makes full expenditure of the project's grant funding difficult
- Take away funding as incentive:
  - Was not enthusiastically supported by PA 22 Committee
  - Also presents problems making full expenditure of the project's grant funding difficult

Rate Comparison Tool



- California Data Collaborative Open Source Tool
- Could benefit SARCCUP rate agencies

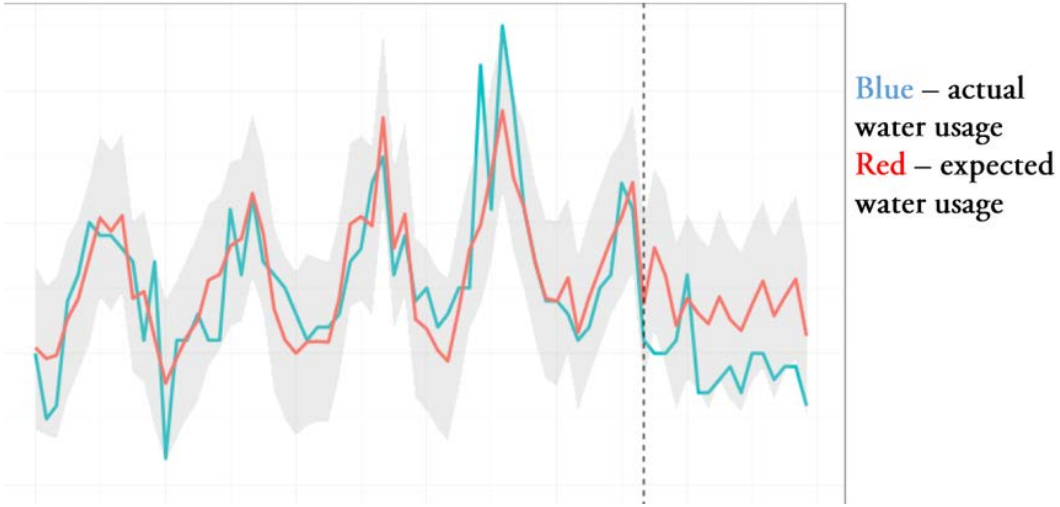
Agencies Do Heavy Lifting Up Front

- ✓ Need to input water usage data, itemized by customer account type (customer account numbers or other identifiable information can be converted to ensure privacy).
- ✓ Need to include the net charges (bills) per individual customer, which is usually identified by billing period

Graphic by CV Strategies

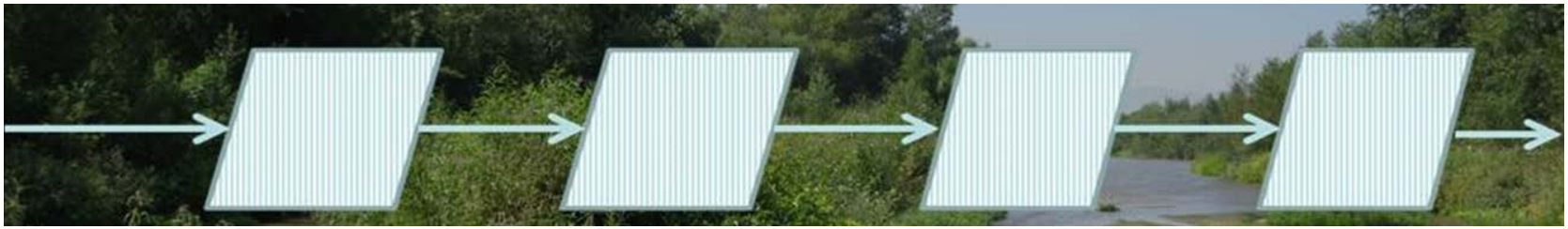
Services CaDC Provides

- Provide kickoff meetings/help for retailer participation and an overview of how tool works
- Work with retailers on data cleaning/ data ingestion
- Integrating participating retailer data into CaDC data infrastructure
- Deploying the rate comparison tool
- Education/training on the tools to travel to each agency
- Additional meetings and workshops with elected officials



Tool Could Serve As SARCCUP Eligibility Gate

- The gate could be formalized by requiring agencies to use the tool to answer questions:
  - What is the amount of revenue an interested retail water agency would have received under budget-based rates?
  - What is the optimal fixed charge to maintain revenue under an extended drought?



CaDC Fee for Service

- $17,500 for less than 15,000 metered connections
- $35,000 for between 15,000 - 150,000 metered connections
- $70,000 for more than 150,000 metered connections

Average

Cost could be **$175,000** for five SARCCUP agencies

SARCCUP Budget

- **$1,214,600** for SARCCUP Rates
- $175,000 for Rate Tool
- $177,000 needed for SAWPA implementation
- $862,600 for contracts with retailers
  - $172,520 per retailer

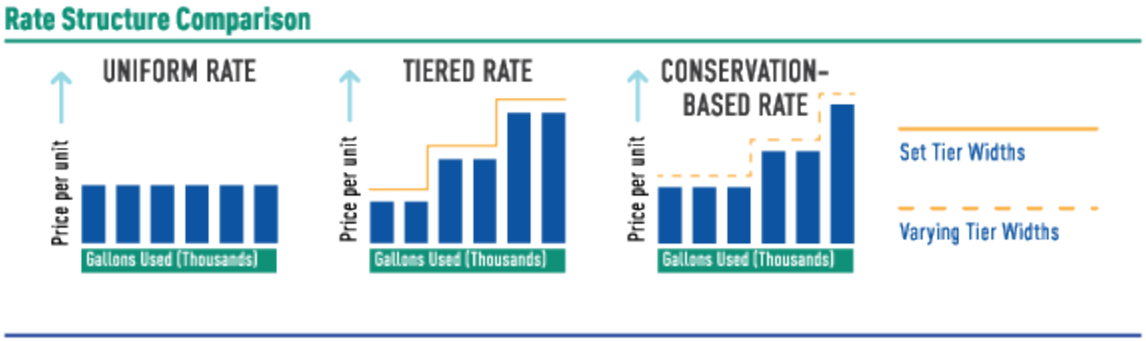
Notes:

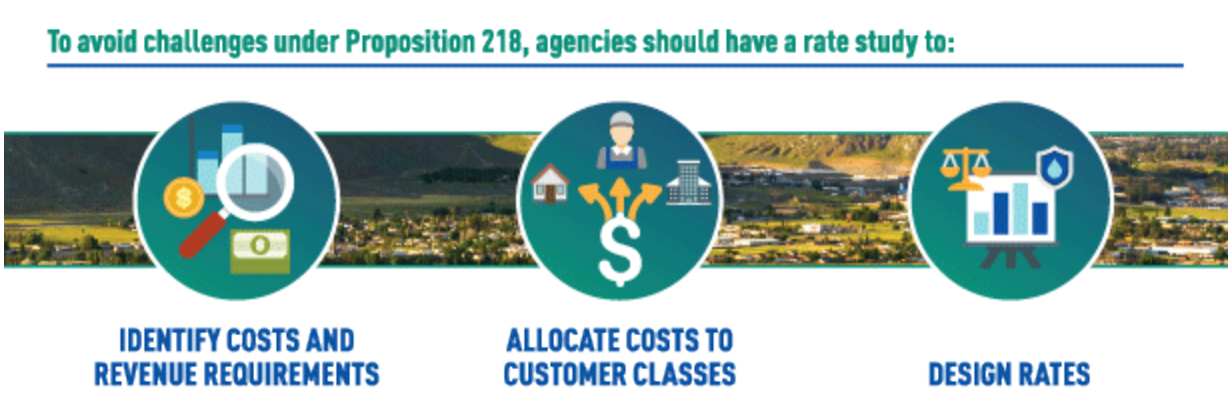
- Smaller amount than Drought Grant
- Support from CaDC upfront could reduce later costs
- Further funding would be needed if some agencies don't adopt after studying rates and invoicing grant

Rates PR Project

- Creation of Frequently Asked Question (FAQ) documents with CV Strategies
- Topics include:
  - Why conservation-based rates and why now?
  - What is the difference between conservation-based and other rate structures?
  - What are the essential components of conducting outreach to customers?
  - What are the legal considerations of conservation-based rates?
- Distribution to retail agencies, SAWPA member agencies, rate consultants, social media, SAWPA website

Rates PR Project





Next Steps

- Future Draft FAQs:
  - Fairness of Budget-Based Rates: How to Create Customized Rates That Are Fair?
  - Connection Between Water and Pricing
  - How to Talk About Fixed Costs
  - Post Hearing – What Now? Rate Structure Implementation and Maintenance

They are scheduled to be released every 2 weeks until **June 31, 2017**.

Recommendation

March 31, 2017 Milestone Waiver

Emergency Drought Grant Program:

Aerial Mapping Project

Calculating the Santa Ana River Watershed's Irrigated and Irrigable Landscape

March 23, 2017

Dean Unger
GIS/IS Department Manager
Santa Ana Watershed Project Authority

Topics Covered

- SAWPA's Approach to Aerial Mapping
- Lessons Learned
- Other Methods of Aerial Mapping
- Comparison Between Methods

Question – how can SAWPA measure the per parcel (landscape) in a way with which the parcel owner will agree

3 inch resolution 4 Band Aerial Imagery

SAWPA TOOK A PICTURE

Watershed Aerial Photography

2400 square miles

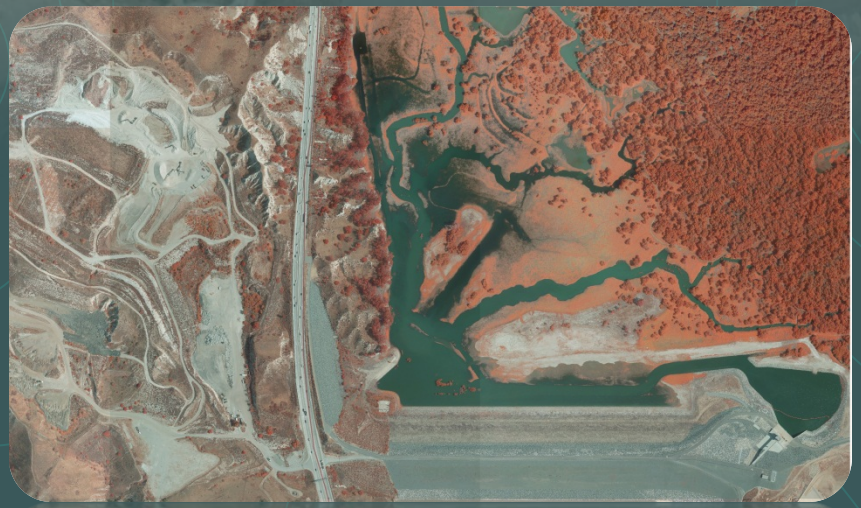
11,300 tiffs

4 terabytes of data

28 flight dates over 48 days

4 Band Imagery

3 inch resolution Aerial Imagery - Every 3 inches on the ground represents 1 pixel on the screen.



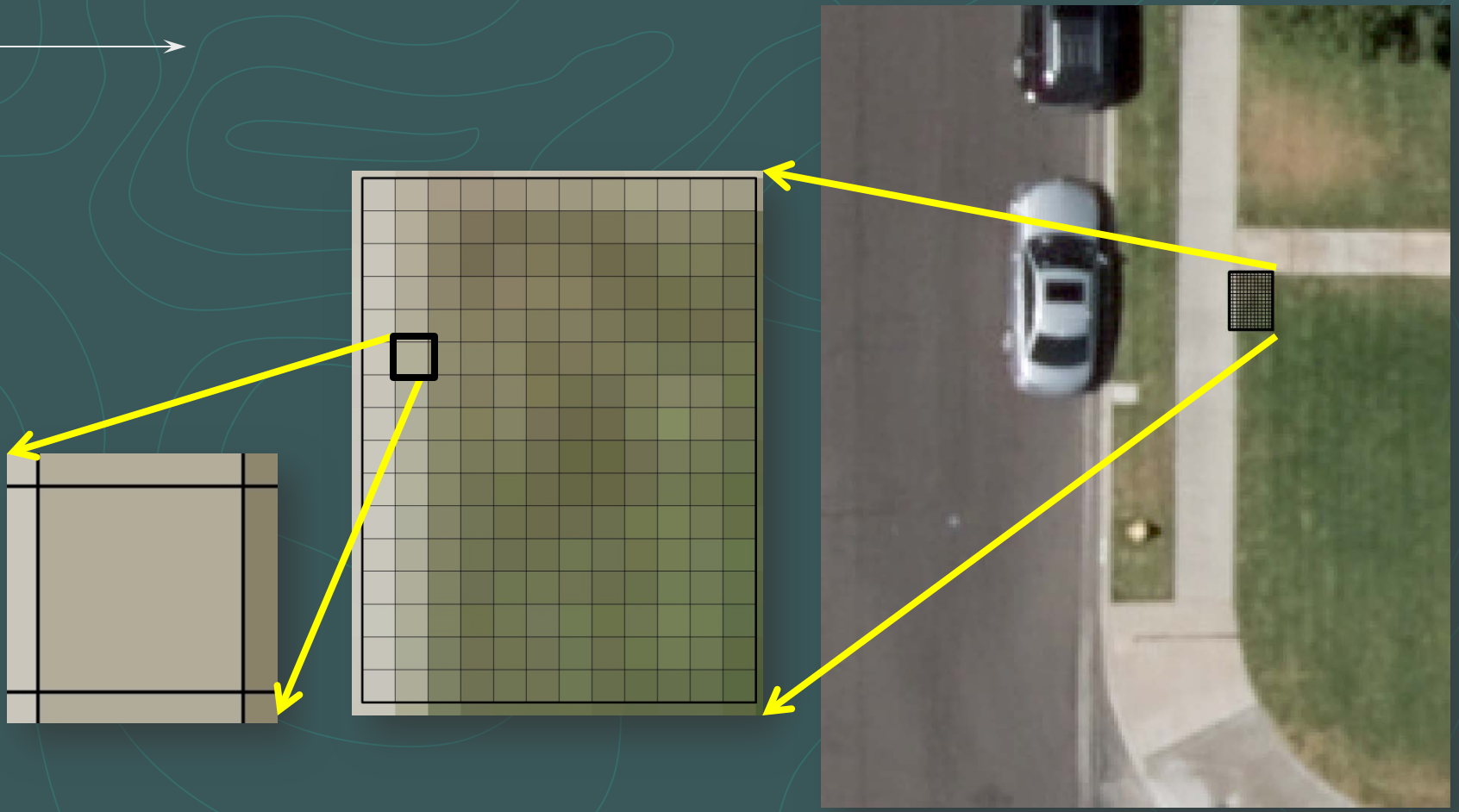
SAWPA's Aerial Mapping Lessons Learned

- Optimal time of year is region specific
  - Consider Cloud Cover, Heat, and state of Vegetation
- Manage/ Design flight Days for:
  - Gridded area per flight optimized for analysis
    - Color consistent across flight day
    - 24 hour analysis turn around - Easy redo if failure
    - Easier to seam together
    - 5 x 5 mile areas = 25 Gigabyte file at 3 inch resolution

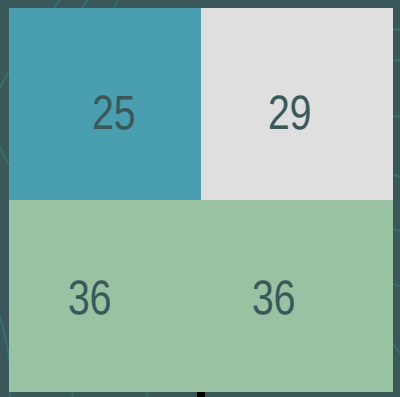
Image Analysis – Remote Sensing of Vegetation

COMPUTER SEES CELLS

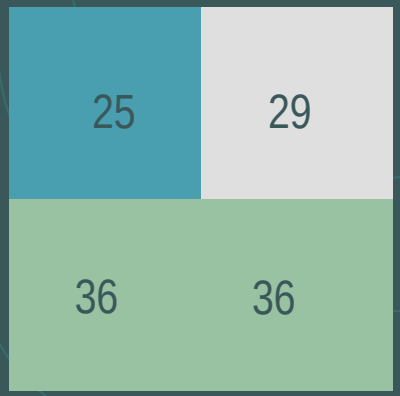
Computer sees cells



SAWPA's Imagery Analysis Method



Imagery

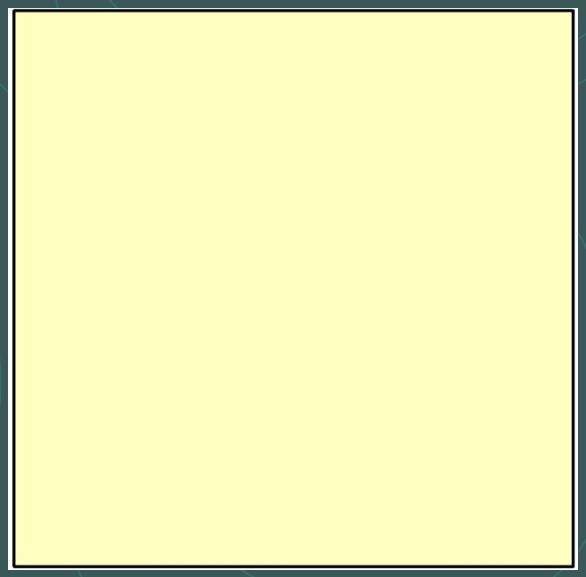


Analysis

- In this example, the 4 cells contains three distinct reference values.
- In the analysis each of the three values are represented in the 4 cells. The value 36 which may represent 80% grass gets a calculation of 80% of the area of each 3 inch cell.

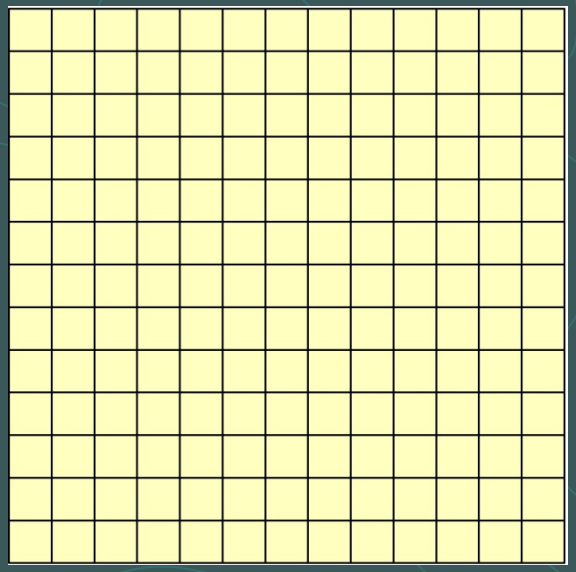
Resolution Comparison

1 meter resolution



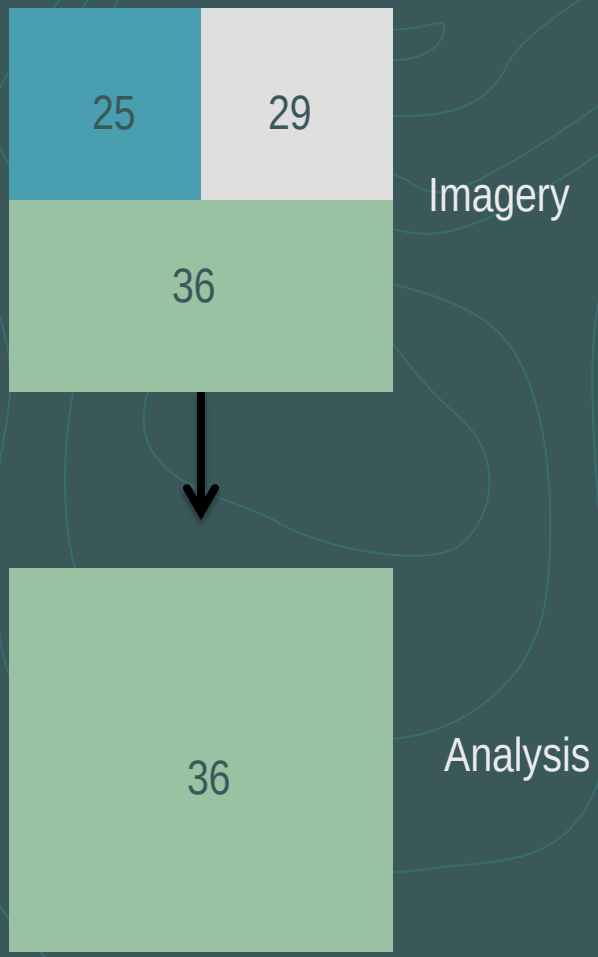
1 Data Point

3 inch resolution



169 Data Points

Other Imagery Analysis Methods



- In this example, the 4 cells contains three reference values.
- In the analysis the attribute value encompassing the largest portion of the cell becomes the value for the cell. The other two values are not represented by that cell in the analysis.

Comparison Between Methods

- SAWPA method does not assume a 100% value just for visual accuracy.
- SAWPA method used high resolution data so it increase the amount of cells(measurements) than would be present in lower resolution data but reducing the ability to re-fly the same area in a very short time.

Data Comparison Between Two Methods

- SAWPA GIS staff comparing Early 2015 Data from outside firm to June 2015 SAWPA data (Veg and Dead Veg)
- Outside firm: 1 meter resolution; did not include entire meter service area (MSA)
- SAWPA: 3 inch resolution; included MSA

Image Analysis – Veg Classification

Unsupervised/NDVI/Supervised

50-80+ classes per flight

For each class identify percent:

Turf
Trees/Shrubs
Pools

→ Irrigated Area

Other Veg – mostly aquatic
Dead Veg → Potential Irrigated Area
Non-Veg
Shadow - Uncertainty
Mapping/display category

RASTER

Table

f_3c_sig_classed.img

OID	Value	Count	Red	Green	Blue	Opacity	Class_Name	VegPC	TURPC	TSHPC	POLPC	OTHPC	DEDPC	NONPC	SHAPC
0	0	28898185514	0	0	0	0	Unclassified	0	0	0	0	0	0	0	0
1	1	1510075758	0.457408	0.501234	0.500622	1	Class 01 water 20 / shadow nonveg 40 / shadow veg 40	40	20	20	0	20	0	40	80
2	2	578004220	0.577258	0.533583	0.550817	1	Class 02 shadow veg 20 / shadow nonveg 40 / nonveg 40	20	10	10	0	0	0	80	60
3	3	381366486	0.717600	0.467967	0.509235	1	Class 03 nrg tree shrub 100	100	0	100	0	0	0	0	0

Add these up

Modify Parcels → Meter Service Area

Sum Veg classes by MSA → Irrigated Area

Answer – Meter Service Area Attributes

Parcel APN
Owner
Address

→ Meter → Water Bill

Meter Service Area Square Feet
Parcel Square Feet
Building Square Feet – Assessor
Pool Square Feet
Slope Correction Factor
Vegetation Square Feet – All Veg (Tree/Shrub, Turf, other)
→ Irrigated Square Feet – (Tree/Shrub, Turf + Pools)
Irrigable Square Feet – (Tree/Shrub, Turf, Pools + Dead Veg)

SHAPE FILE

Table

TustinCity_MSAVEGCLASS

FID	Shape *	MSA_APNX	TURPC_SF	TSHPC_SF	OTHPC_SF	DEDPC_SF	MSA_SF	PAR_SF	BLD_SF	POOL_SF	VEG_SF	IRRIG_SF
0	Polygon ZM		2606.84375	7463.80625	3138.6625	24867.16875	145392.500731	288.661402	0	0	13209.3125	10070.65
1	Polygon ZM	094-082-13	3532.59375	7537.790625	89.115625	729.865625	20090.203118	15999.655162	1703	0	11159.5	11070.384375
2	Polygon ZM	094-082-14	3108.525	6218.434375	113.640625	730.659375	25915.939483	15912.504487	1396	547	9440.6	9873.959375
3	Polygon ZM	094-082-15	1487.60625	3451.6375	20.815625	542.328125	19586.198676	15991.156399	3112	547	4960.059375	5486.24375

Make Answer Pretty

- Groups Raw Data into Classes ”
- Converts percentages to absolute values

Direction of Available Data

- Vendors now using “Meter Service Areas”
- Vendors now providing 3” data
- Data resolution improving with each new deployment of Satellite
- The better the resolution of the imagery, the more things you can analysis but this comes with vast increase in storage size and a needed increase in computer speed.

Resources

- https://www.fsa.usda.gov/Internet/FSA_File/fourband_infosheet_2012.pdf
- The History of the Remote Sensing of Vegetation – Matthew Shubin (SAWPA)

Emergency Drought Grant Program

The Emergency Drought Grant Program is financed by the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006 (Proposition 84), administered by State of California, Department of Water Resources through a grant with SAWPA.

Emergency Drought Grant Program:

Use of Projected Savings for the Emergency Drought Grant Program

Rick Whetsel
Senior Project Manager
Santa Ana Watershed Project Authority

April 27, 2017

Recommendation

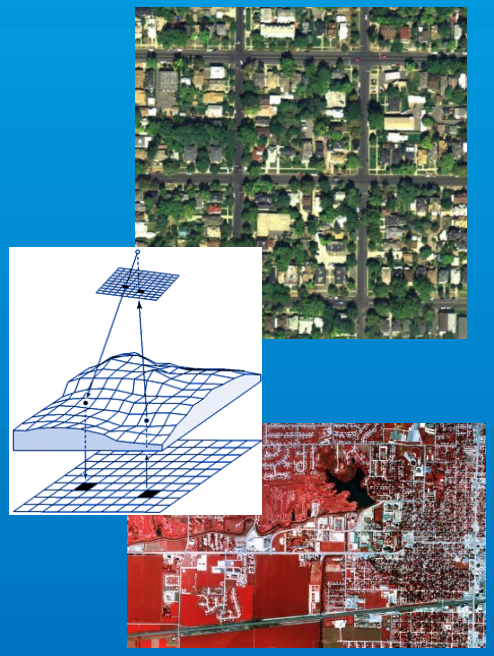
Authorize staff to develop scope of work and budget for the following projects to provide additional technical support to water retailers for an amount not-to-exceed remaining available grant funds:

- Develop an on-line web application and cloud services to provide water retailers access to aerial imagery and landscape measurement data and
- Provide water retailers in the Santa Ana River and Upper Santa Margarita watersheds meter geocoding and North American Industry Classification System (NAICS) coding services

On-line Web Application and Cloud Services Project

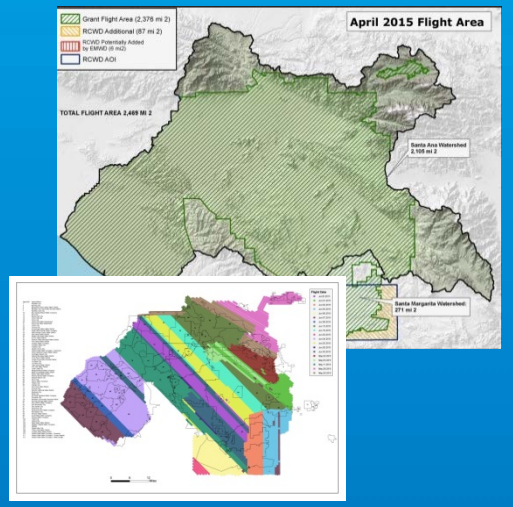
Objective:

- Create an on-line web application for the high resolution aerial imagery and outdoor landscape measurements for outdoor water budgets developed through the Prop 84 Emergency Drought Grant Program accessible to water managers.



SAWPA

On-line Web Application and Cloud Services



Project Highlights:

- Project entails delivering up to fourteen terabytes of raster imagery in a scalable cloud computing environment
- Employs a number of Pre-defined web tools available from ESRI
- The on-line web application will include many of the capabilities of the original data (example: 3 modes of background imagery)
- User will have access to the results of SAWPA's work to analyze the watershed's landscape using aerial imagery and remote sensing analysis.
- User will be able to view landscape analysis results at both the parcel level, as well as the agency level.
- Includes summary of the landscape statistics by land use type.

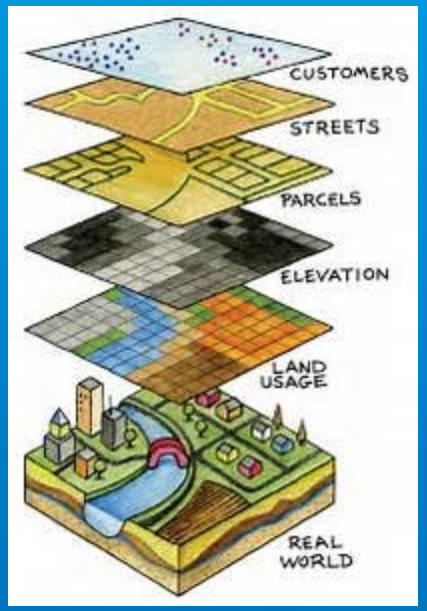
On-line Web Application and Cloud Services

Benefits of Contracting with ESRI:

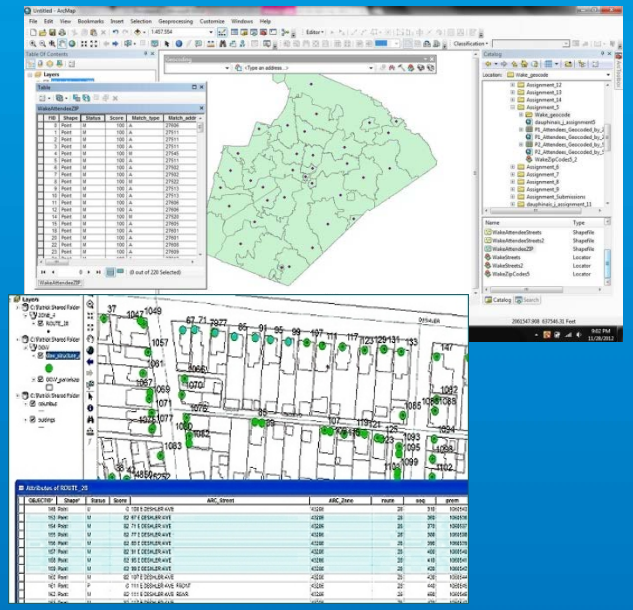
- Utilizes SAWPA's existing license and leverages member agencies license agreements to achieve a significantly (approximately 50%) lower cost for hosting and serving data.
- Employs a number of pre-defined tools greatly reducing the development costs

Benefits to Water Retailers:

- Serving data over the cloud reduces demand on agencies computer data storage/networking services.
- On-line web application provides water agencies, particularly those lacking adequate data storage or GIS capabilities, to access this imagery and data



Meter Geocoding and North American Industry Classification System (NAICS) Coding Services



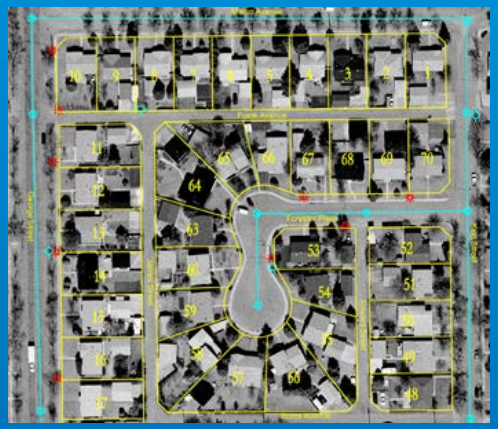
Objective:

- Project provides support to water retailers in addressing the proposed requirements as detailed in the State's final report entitled, Making Water Conservation a California Way of Life, Implementing Executive Order B-37-16 by providing water meter geocoding and classification of commercial, industrial and institutional (CII) accounts using North American Industry Classification System (NAICS) coding.

Meter Geocoding and North American Industry Classification System (NAICS) Coding Services

Next Steps:

- SAWPA staff in coordination with the Conservation Advisory Workgroup will work to prepare and issue a Request for Proposals (RFP) to seek a qualified consultant to provide comprehensive water meter geocoding services to interested water retailers in the Santa Ana River and Upper Santa Margarita watersheds.
- Scope of work will call out for the development of a methodology specifically designed to geocode, classify CII accounts using NAICS and identify mixed CII meters as detailed in the State's report.



Meter Geocoding and North American Industry Classification System (NAICS) Coding Services

Project Scope of Work :

- The proposed project support water retailers in addressing two of the three performance measures as proposed by the State for Commercial, Industrial and Institutional (CII) water suppliers :
  - Classify all CII accounts using the North American Industry Classification System (or another similar classification system selected by the EO Agencies). Where feasible, CII subsector benchmarks will be developed to assist water suppliers in identifying CII accounts with the potential for water use efficiency improvements.
  - Convert all landscapes over a specified size threshold that are served by a mixed meter CII account to dedicated irrigation accounts, either through the installation of a separate landscape meter or the use of equivalent technology.

NAICS Codes

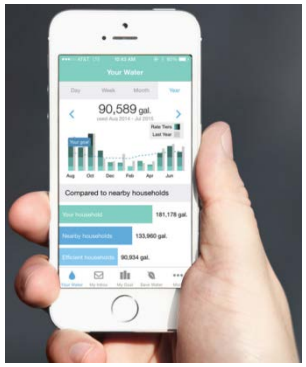
334418	Printed Circuit Assembly (Electronic Assembly) Manufacturing
334416	Electronic Coil, Transformer and other Inductor Manufacturing
334511	Search Detection, Navigation, Guidance, Aerospace
334510	Electromedical and Electrotherapeutic Apparatus Manufacturing
334513	Instruments and related products for manufacturing for measuring, displaying,controlling industrial process variables
334516	Analytical Laboratory Instrument Manufacturing
334519	Other Measuring and Controlling Device Manufacturing
33599	All Other Electrical Equipment and Component Manufacturing
335999	All Other Miscellaneous Electrical Equipment and Component Manufacturing
9271	Space Research and Technology
335931	Current-Carrying Wiring Device Manufacturing
335932	Noncurrent-Carrying Wiring Device Manufacturing
3364	Aerospace Product and Parts Manufacturing
33641	Aerospace Product and Parts Manufacturing
336411	Aircraft Manufacturing
336412	Aircraft Engine and Engine Parts Manufacturing
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing
336414	Guided Missile and Space Vehicle Manufacturing
336415	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing
336419	Other Guided Missile and Space Vehicle Parts and Auxiliary Equipment Manufacturing
336992	Military Armored vehicle, Tank, and Tank Component Manufacturing
3391	Medical Equipment and Supplies Manufacturing
33911	Medical Equipment and Supplies Manufacturing
339112	Surgical and Medical Instrument Manufacturing
5950	Coils and Transformers
5995	Cable, Cord, and Wire Assemblies: Communication Equipment
5963	Electronic Modules
6998	Electrical and Electronic Assemblies, Boards, Cables, and Associated Hardware
1370	Pyrotechnics
3694	Clean workstations, Controlled environment, and related equipment

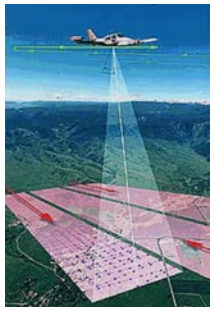
SAWPA

Questions?

Background - Projects

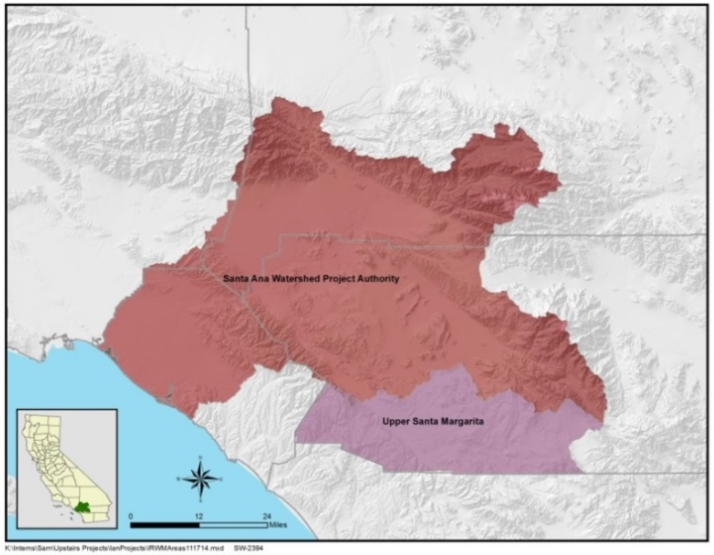
- Project 1: Conservation Based Reporting Tools and Rate Structure Implementation
  - Technical assistance, contract work, consultant management
- Project 2: High Visibility Turf Removal and Retrofit





Background - Projects

- Project 1 Tools/Rates/Mapping: **$7,587,610** in grant funding
- Project 2 Turf: **$5,272,500** in grant funding
- Note: Program is multi-watershed in scope

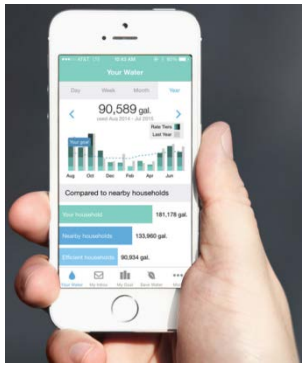


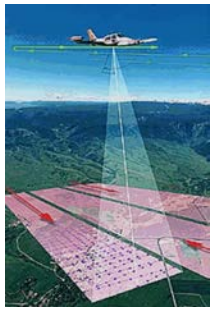
Cost Savings

- By tracking expenses:
  - projected to be approximately $1,400,000 to $1,700,000 in cost savings for the Santa Ana River Watershed.
  - Projected to be approximately $30,000 in cost savings for the Upper Santa Margarita Watershed

Cost Savings

- Savings result of:
  - Completion of the Tech Based Information Tool Project
  - Completion of Aerial Mapping Project





Some Cost Savings to Support Future Implementation

- Additional Budget Category A Funding Projected to be needed.

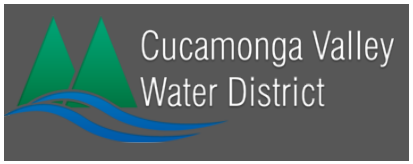
Grant Agreement Structure

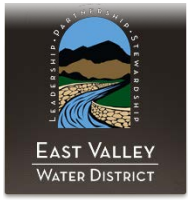
Budget Category	Name	Original Budget
A	Project Admin	$ 875,000
B	Land Purchase	$ -
C	Planning	$ 50,000
D	Construction	$ 6,662,610
		$ 7,587,610

$160K-$180K

- Budget Category A supports not only administration of the PA 22 Committee and Advisory Workgroup, but also grant administration for Project 2 the High Visibility Turf Removal and Retrofit Project.

Agency Coordination



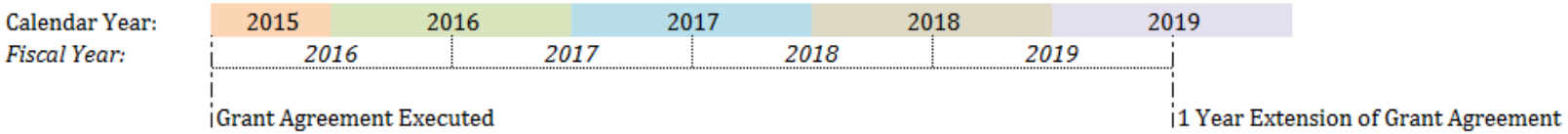


More Agencies

Schedule Increase

Current Grant Agreement

Grant Agreement Extended



Project 2: Turf

What has been invoiced to SAWPA as of February 28, 2017

	EMWD	EMWD USMW	IEUA	OCWD	SBVMWD*	WMWD	WMWD USMW	RCWD	Total
Grant Allocation	$ 906,800	$ 420,000	$ 807,564	$ 880,894	$ 828,499	$ 851,243	$ 52,500	$ 525,000	$ 5,272,500
Match Allocation	$	1,774,485	$ 1,080,050	$ 1,178,123	$ 1,108,049	$	1,208,681	$ 702,145	$ 7,051,533
SF Allocation	848,468	400,000	755,615	824,228	775,204	796,485	50,000	500,000	4,950,000
Grant Billed	$ 29,415	$ -	$ 807,564	$ 2,366	$ -	$ 464,718	$ -	$ 519,600	$ 1,823,663
Match Billed	$ 1,556,130	$ 218,355	$ 1,080,050	$ 1,178,123	$ -	$ 1,208,681	$ -	$ 702,145	$ 5,943,484
SF Removed	1,416,671	110,990	755,615	663,561	174,429	744,852	-	1,037,231	4,903,349
Water Saved (G)	62,333,524	4,883,560	33,247,060	29,196,669	7,674,876	32,773,488	-	45,638,164	215,747,341
% Grant Billed	3%	0%	100%	0.3%	0%	55%	0%	99%	35%
% Match Billed	100%		100%	100%	0%	100%		100%	84%
% SF Removed	167%	28%	100%	81%	23%	94%	0%	207%	99%
% SF Removed**	100%	28%	100%	81%	23%	94%	0%	100%	77%
SF Removed**	848,468	110,990	755,615	663,561	174,429	744,852	-	500,000	3,797,915

*SBVMWD has reported square feet of turf removed through updates to SAWPA.

**Removed >100% outliers (the agencies that have removed more than that is required in their allocation).

Recommendation

Receive and file.