Data and Stewardship at Descanso Gardens

Descanso Gardens

Descanso Gardens

Location - La Canada Flintridge (Los Angeles)

Size - 160 Acres, 90 acres cultivated

Visitation - 500,000 visitors a year

Membership - Over 16,500 members

Staffing - 18 employees in operations, which includes horticulture and maintenance

Collections - Camellias, native plants, roses, oaks, display gardens and cycads.

Climate - Rainfall is limited to 6 months of the year, 100% of the collections require some irrigation for the summer months.

Using data to fulfill Descanso Gardens Mission

Descanso Gardens Mission includes "stewardship of the character and assets of the gardens". These assets are:

- Plants
- Water
- Soil Fertility
- Power and electricity
- Environmental condition (waste and pollutants)
- Wildlife
- Financial assets
- Infrastructure

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What can data do to conserve assets in your gardens?

- Water use - Saved 65% of water purchased by Descanso Gardens
- Financial assets - Cost savings of 60K in one year
- Power and electricity - Savings of 20% on electrical use in one year
- Pollution - Tested horticultural techniques on organic weed control
- Pollution - Strategies to reduce waste stream
- Plants - Helped determine long term collections planning decisions and goals
- Plants - Tested plants for sustainability
- Infrastructure - Mapped systems for management of irrigation and facilities
- Water use/infrastructure - Informed staff of failures and leaks in water systems
- Infrastructure - Determined capacity needed for septic systems, or for maximum visitation

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Steps to using data to manage resources

1. Information gathering, definition of problem
2. Find expert advice
3. Brainstorm solutions
4. Estimate savings, build a case for change
5. Change it
6. Measure success

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Define your problem and describe it

Problem: In the horticulture department, water and labor on our water systems was our largest expense.

What did we know already?

- I gathered the data we had about the system
- I worked with my team to draw a schematic diagram of what we knew, so we could figure out what we didn't know

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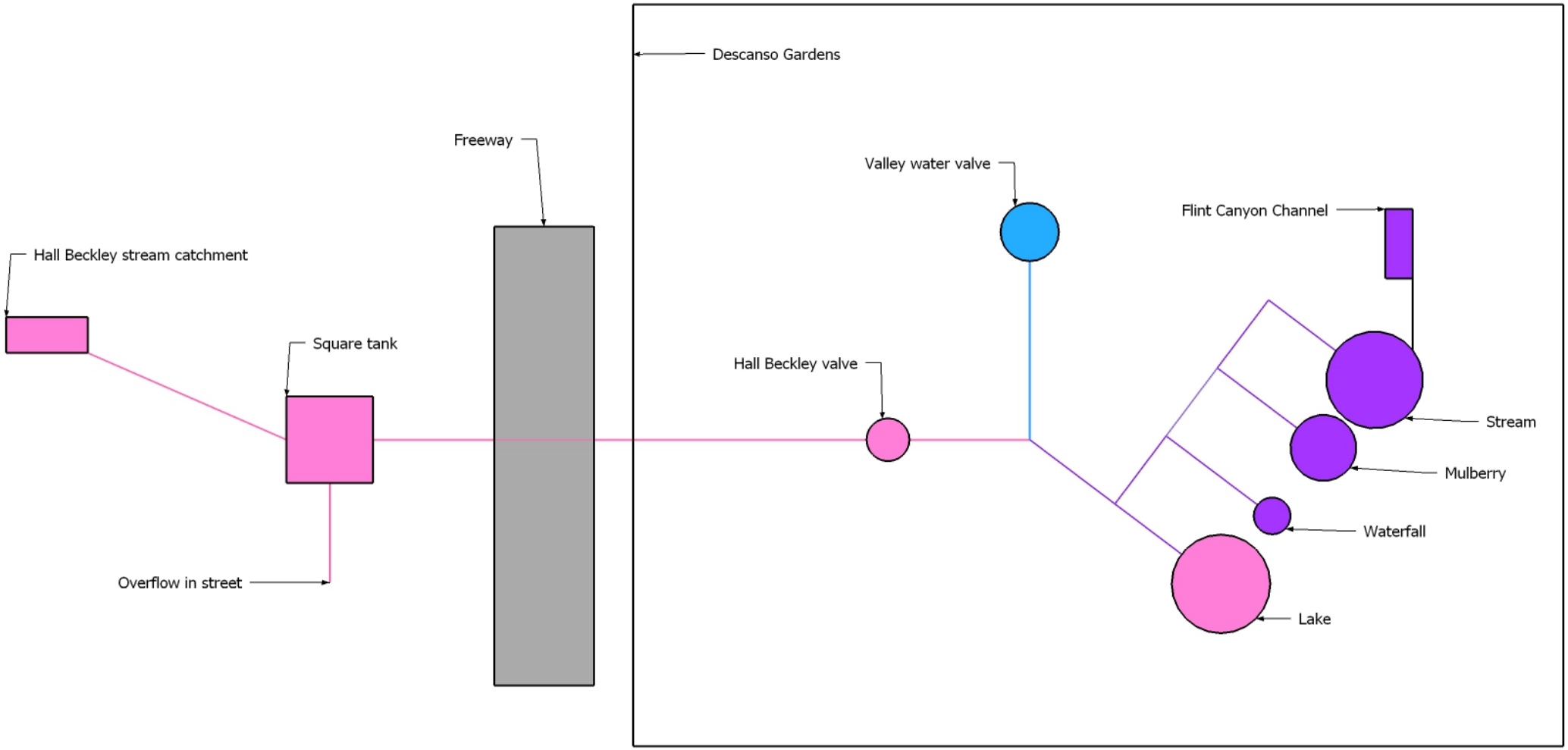
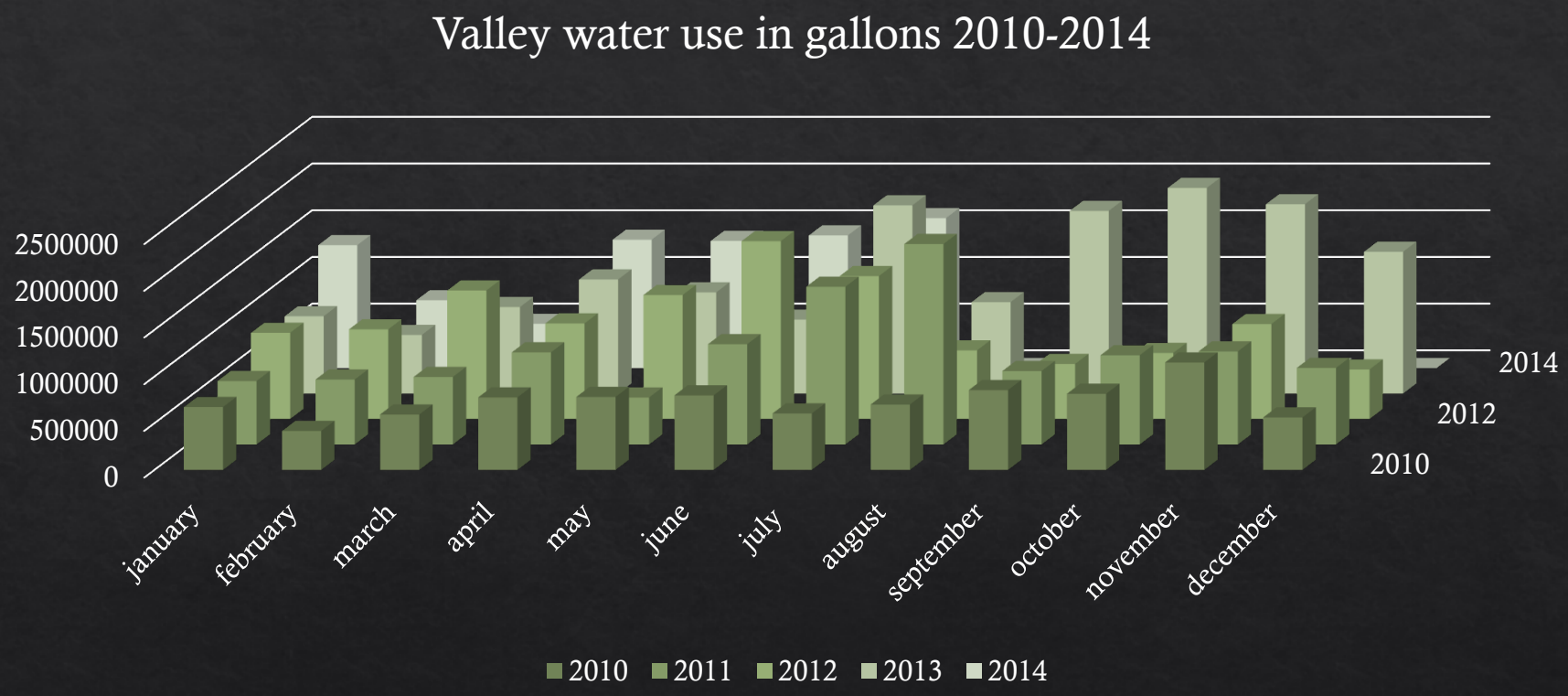

Descanso Gardens
Freeway
Valley water valve
Flint Canyon Channel
Hall Beckley stream catchment
Square tank
Hall Beckley valve
Stream
Mulberry
Waterfall
Overflow in street
Lake

Existing information

1. Labor hours
   - For example : 1.5 hours a day to check water tank = 7800.00 a year in labor
2. Purchased water information
   - Gallons used - 16 million
   - Cost of water
3. Water source data
   - Tank capacity= 56,000 gallons
   - fill rate (fills in approximately 12 hours)
   - Approximate usage = 6 days per week May-November, 7 hours a day.
4. Irrigation data
   - Volume and evaporation rate of water features



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Ask an expert

Reached out to form an advisory committee

- Water company
- Metropolitan water
- LA County Department of Public Works
- City water experts

I showed the committee our existing data and systems

- Asked the question- How do we reduce our drinking water use?
- Their answer : Optimize use of your spring first. Add metering. Then address runoff, leaks and inefficiency.
- Metropolitan Water District provided a free irrigation audit after our meeting

Brainstorm solutions for your problem

Ways to optimize our water sources

- Capture rainwater
- Use more of our spring source
- Add additional water storage
- Use and store more water in water features
- Use real time data on water to schedule irrigation

Our experts recommended that we optimize our use of natural water in order to reduce our use of purchased drinking water

Compare the cost and benefit of your ideas

1. Capture rainwater
   - Cost- high: seasonal rainfall means a large capacity is required
   - Benefit- Low : amount of water that can be captured is limited
2. Use more of the spring source
   - Cost- low: less than 5k
   - Benefit- high: double our available water
3. Add additional water storage
   - Cost- high
   - Benefit- high
4. Use and store more water in water features
   - Cost- low- Less than 10k
   - Benefit- medium- could only use in water features without changing irrigation systems
5. Use real time data on water to schedule irrigation
   - Cost- medium 14k
   - Benefit – medium/unknown : reduce labor cost by 7k per year. Unknown water savings

Do the math to make your case

Tank monitoring

- Checking the water level in the tank cost us 7800.00 per year in labor
- If the tank ran out while irrigating, we would spend an unknown amount on watering with drinking water. I suspected we were running on tap water regularly.
- Installing a solar cellular meter cost 14k. The labor cost alone would pay for itself in 2 years.

Increasing water capture

- We could collect twice as much water if we set up our spring to collect water 24 hours a day. We could produce about 7 Million gallons Worth of additional spring water per year.
- That excess could fill our water features (the features were using about 5 million gallons of the spring water per year)
- The cost for materials and labor for this project was less than 10k, and would pay for itself in less than 3 months.

Overall, I estimated that we would save 20% of our drinking water use

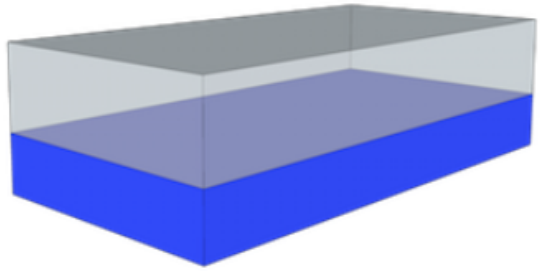
Make Changes

Control Pages

Alta Canyada Tank

Open | Closed

Hatch State

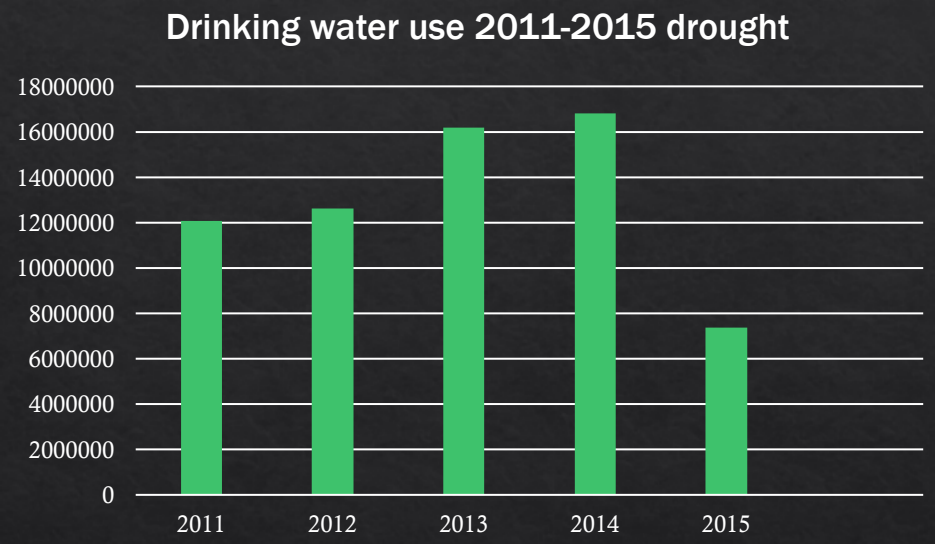


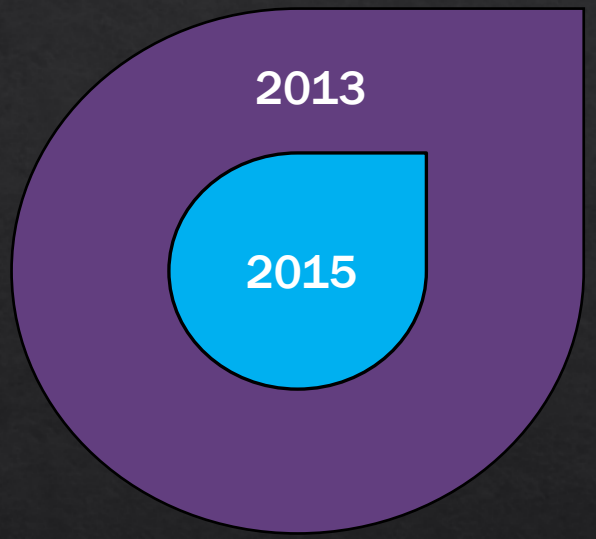
Tank is Not Overflowing

Tank Overflow Status

Tank Level - Percent Full:	41 %
Tank Level - Inches Full:	46 " (Max of 111")
Tank Level - Gallons Available:	21470 Gallons (Max of 51810 Gallons)
Temperature at Tank:	58.4 F
Humidity at Tank:	92%
Solar System Voltage:	12.68 VDC

Measure your success





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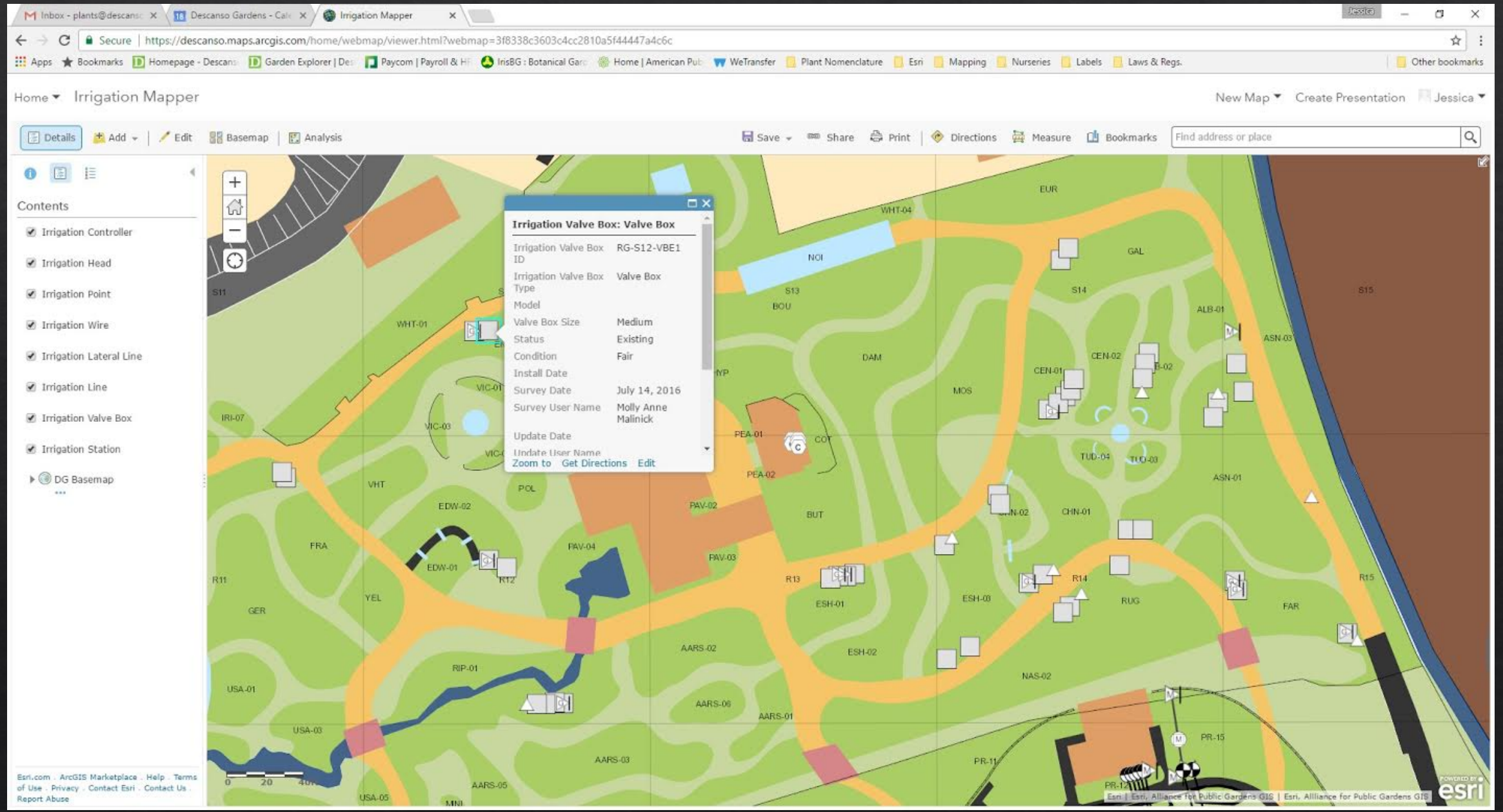
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Create Presentation
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Save
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Contents
Irrigation Controller
Irrigation Head
Irrigation Point
Irrigation Wire
Irrigation Lateral Line
Irrigation Line
Irrigation Valve Box
Irrigation Station
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Thanks to

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- Fred Bernhardt- Maintenance Coordinator

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