This presentation premiered at WaterSmart Innovations

watersmartinnovations.com
Do Homeowners Who Remove Turf Influence Their Neighbors to Follow?

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Santa Margarita Water District (SMWD)
165,000 Residents & growing
57,000 Service Connections
36,000 Single Family Residences
- Budget-Based Tiered Rate Structure

Total Water Supply:
30,500 Acre-Feet

Los Angeles
Landscape Change Program Participants (PP)

January 2014 – May 2018
- 970 Single Family Residential (SFR) participants
- 843,000 sq.ft. turf removed (mean = 867 sq.ft.; median = 640 sq.ft.)

Represents Known Change (only 2.5% of SFR parcels)
Turf Removal Stats & Warts

970 total projects
Synthetic Turf rebates = 60% of participation
Aesthetics: subjective ranking of all projects; “1-3”

Highly Scientific Aesthetic Score
“1” = Blah
“2” = Meh
“3” = Yeah!
Budget-Based Rate Structure Implementation (2015)

Aerial Imagery & Land Use Classification*

Spatial Trend in Land Use Study*

Key Questions of Study

1) How are SFR landscapes changing?
2) Is there a residual effect of Program Participation (PP) on land use?
3) Are there Explanatory Variables that “provoke” residual land use change?

* Consultants: Eagle Aerial & Quantum Spatial
Q1: Can We Identify Landscape Change?

Red = Impervious / Dark Green = Turf / Light Green = Shrub / Black = Syn. Turf / Purple = Irrigable, Not Irrigated
SFR Landscape Change Trends - Net Change -

Largest removals to net land use:
- **Irrigated Turf**
- **Irrigated Vegetation**

Largest additions to net land use:
- **Impervious Surface**
- **Synthetic Turf**

<table>
<thead>
<tr>
<th>Class Description</th>
<th>Impervious</th>
<th>Pools</th>
<th>Landscape</th>
<th>Turf</th>
<th>Nat. Lands</th>
<th>Irr. Net</th>
<th>Irrigated</th>
<th>Horse Corral</th>
<th>Open Water</th>
<th>Artificial Turf</th>
</tr>
</thead>
</table>
Q2: Is There a Spatial Pattern in Land Use that Extends from Program Participation (PP)?

- Heatmaps constructed for:
  - PP & each of the major land change vectors (4)

**Cool colors =** lower than expected rate of change
(-2 std.dev a significant cold spot)

**Warm colors =** higher than expected rate of change
(+2 std.dev a significant hotspot)

Getis-Ord Gi* spatial statistic

If there is a residual effect of land use change based on proximity to PP, then PP hotspots and landscape change vector hotspots should line up.
Spatial Analysis Findings:

Being in a hotspot neighborhood for Program Participation had a strong residual impact on:

- Addition of: • Impervious Surface

- Removal of: • Irrigated Vegetation • Irrigated Turf

- Effect most strongly observed with Irrigated Turf
  • Removal rate 45% higher than would be expected if change were randomly distributed

- Addition of synthetic turf occurred close to the rate one would expect to see by chance → other factors drive synthetic turf addition...
Demographic Analysis

Q3: Are there certain types of homes to target to “provoke” landscape change?

Do demographics of program participants differ significantly from non-participants?

Data available at the parcel level:

- Home Age
- **Owner Occupancy**
- Time Since Last Sale
- Assessed Value of Home

**Bold** = statistically & practically significant
Demographic Analysis

**Q3: Are there certain types of homes to target to “provoke” landscape change?**

Do demographics differ between landscape change hot spots and cold spots? **YES**

<table>
<thead>
<tr>
<th></th>
<th>Home Age</th>
<th>Time Since Last Sale</th>
<th>Owner Occupancy</th>
<th>Assessed Home Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artificial Turf Addition</td>
<td>significantly younger</td>
<td>significantly more recently sold</td>
<td>significantly higher owner occupancy</td>
<td>significantly higher values</td>
</tr>
<tr>
<td>Impervious Surface Addition</td>
<td>significantly older</td>
<td>significantly less recently sold</td>
<td>significantly higher owner occupancy</td>
<td>significantly lower values</td>
</tr>
<tr>
<td>Irrigated Turf Removal</td>
<td>significantly older</td>
<td>significantly less recently sold</td>
<td>significantly higher owner occupancy</td>
<td>significantly higher values</td>
</tr>
<tr>
<td>Irrigated Vegetation Removal</td>
<td>significantly older</td>
<td>No statistical difference between hot and cold spots</td>
<td>significantly higher owner occupancy</td>
<td>significantly lower values</td>
</tr>
</tbody>
</table>

For each cell, read “Hotspot homes are....”
HOA’s

Finding:
HOA parcels show a significantly higher rate of residual landscape change impact.

HOA “Strictness” & Demographics:
How strict HOA landscape enforcement and restrictions are may matter.

Logic-Based Conclusions:
• Rebate marketing to parcels in strictness “2” HOA’s may be most effective:
  • High owner occupancy
  • Older homes
  • Much less recently sold
Application & Next Steps

Finding:
We know which parcels are more prone to undertake landscape changes.

Target efforts for specific landscape change

Phase 3 & 4 of Study:
Network Analysis:
Further explore how people may move through community & how that influences landscape change.
  • Corner lot? Key influencers?
  • HOA & City turf removal... what affect?

Water Savings Study:
We know the how & where of turf removal.
Need to know the what: water savings!

Partner with HOA’s for Landscape Design Templates
Thank You.

Questions?

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