An Update on Modern Tree Inventories, Heat Mitigation, & Educational Efficacy

By: Nikolas Smilovsky, PhD, GISP
ISA Certified Arborist, WE-9505A
FAA Certified UAS Remote Pilot, 4222403

today's agenda

a quick discussion on…

- technological paradigm shifts (as they are related to tree inventories),
- no excuses - it is time to use geographic information systems (GIS),
- how we do it at ASU's Design School,
- the West Mesa River Community Heat Action Project aka "cool islands,"
- Urban Forestry Roundtable (UFRT) – data committee efforts,
- and some final thoughts…

a technology revolution

we are currently in a “location based,” technological revolution!!!

smart devices & new wearables, high-accuracy gps & gnss, autonomous vehicles, augmented reality & other mixed reality formats, drones with high definition sensors like lidar & photogrammetry, etc…

“new technologies mean new methodologies, new power, and a new responsibility”


a technology
revolution

NO excuses!!!

"esri offers all students *free* access to GIS software and lessons" – August 6th, 2020

access found here: learn.arcgis.com

Learn ArcGIS Student Program Provides Self-Directed Learning Resources

REDLANDS, Calif.–August 6, 2020–Esri, the global leader in location intelligence, today announced that it will provide free access to its ArcGIS platform and learning resources through the learn.arcgis.com website to higher education students eager to acquire geospatial skills through self-directed learning.

Beginning September 1, 2020, the Learn ArcGIS Student Program will provide free access for one year to software, lessons, and a community of learners through Learn ArcGIS to qualified students globally. The Learn ArcGIS Student Program empowers students in any academic program to acquire geospatial skills even if their institution offers no formal courses in GIS.

"Students in fields such as data science, public health, business, and journalism know the value GIS brings to their work yet often lack access to software and training," said Jack Dangermond, Esri founder and president. "This program provides these motivated students who can't access ArcGIS through their institution with a way to learn independently and acquire additional skills that expand their career options in the digital economy."

Students will receive access to ArcGIS Online and over 20 apps including ArcGIS Pro, along with a library of lessons that cultivate skills in spatial analysis, data science, coding, and storytelling with maps. Access is available globally to students ages 18 and over.

Learn ArcGIS promotes learning by doing through guided lessons base
problems in industries such as urban planning and
public health have just been
advanced

NO excuses!!!

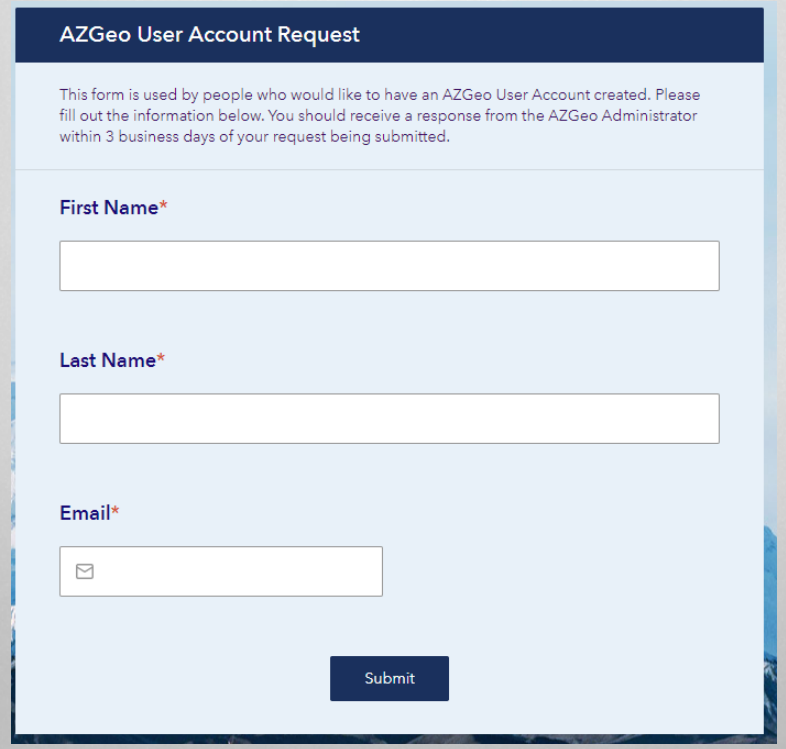
the state of Arizona now offers *free* Esri ArcGIS Online (AGOL) access to all residents

managed through ASLD and the AZGEO Data Hub:
https://azgeo-data-hub-agic.hub.arcgis.com/

NO excuses!!!

1st - sign up for AZGeo Data Hub (link on previous slide)

2nd – fill out account request form here:
https://survey123.arcgis.com/share/796b062799c746c788b81e67d71a704a



ARCGIS ONLINE

1 DATA
Find authoritative data sources

2 APPS
Build mobile and field apps

3 MAPS
Design web maps and scenes

4 SHARE
Collaborate with your organization

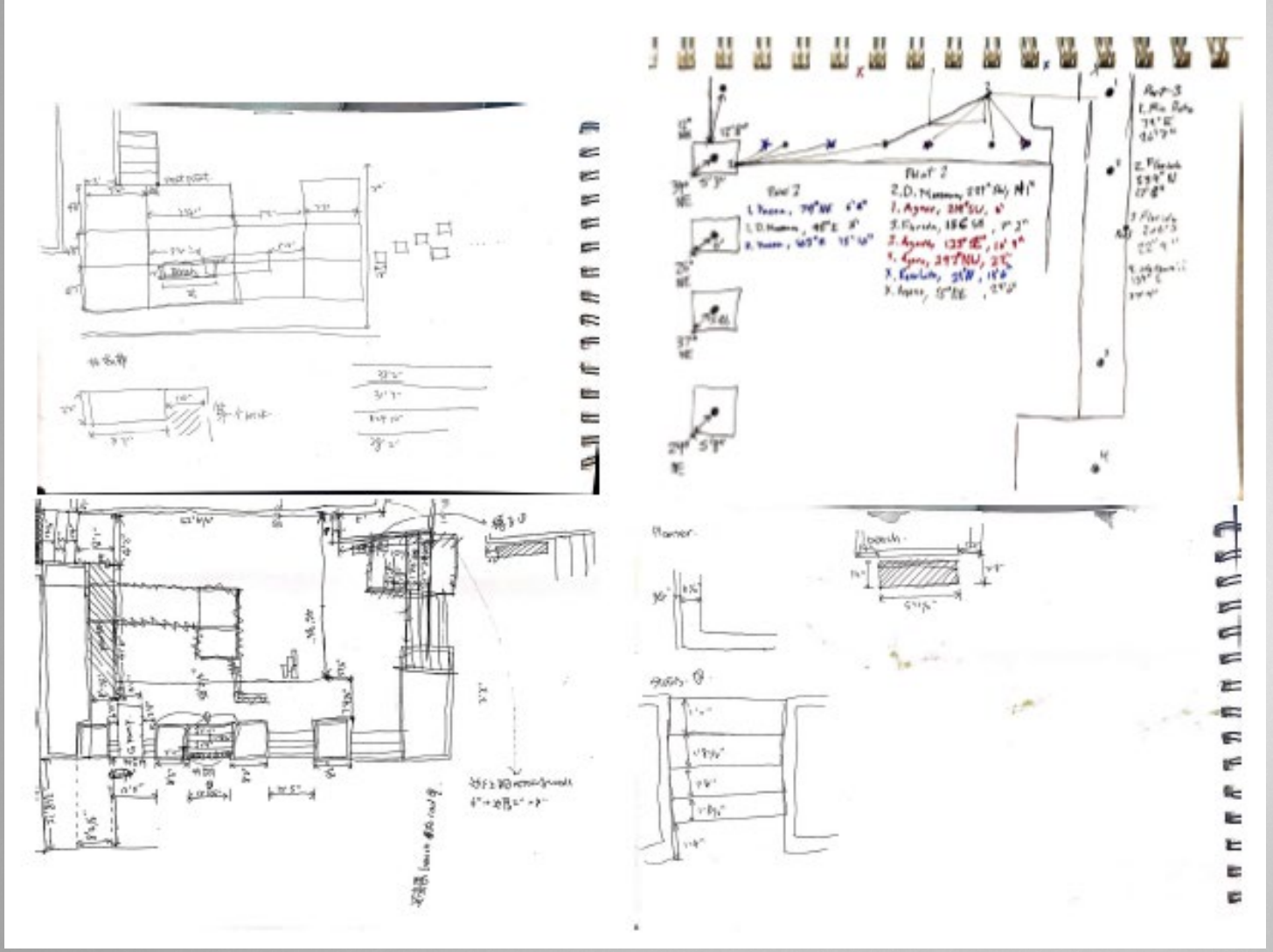

Maps
Collector
All Maps
Community Addressing
Damage Assessment...
Exposed Pipe Inspections
Open
Details
Recreation
Service Request
Story Map Collector Template
Cancel
Collect
Collect another feature
Like the last one
Copy attributes and location
Like the last one, at my location
Copy attributes only
At the same location
Different feature, copy location
New feature
Don't copy anything

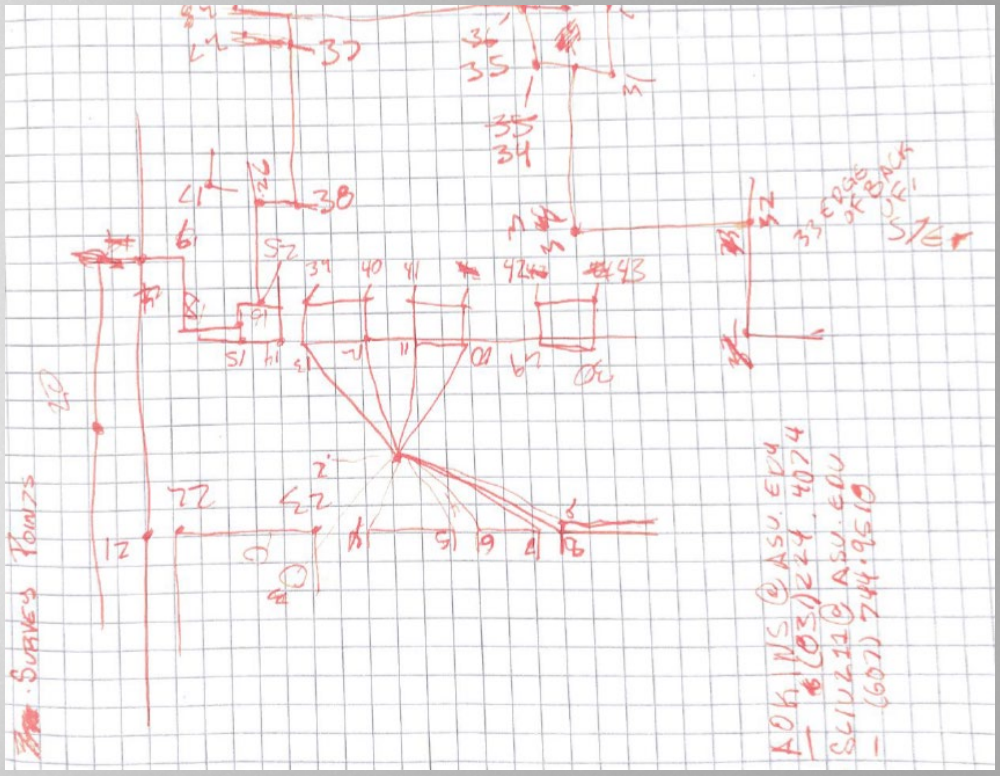
how we do it at ASU

four places where modern tree inventories are happening at ASU:

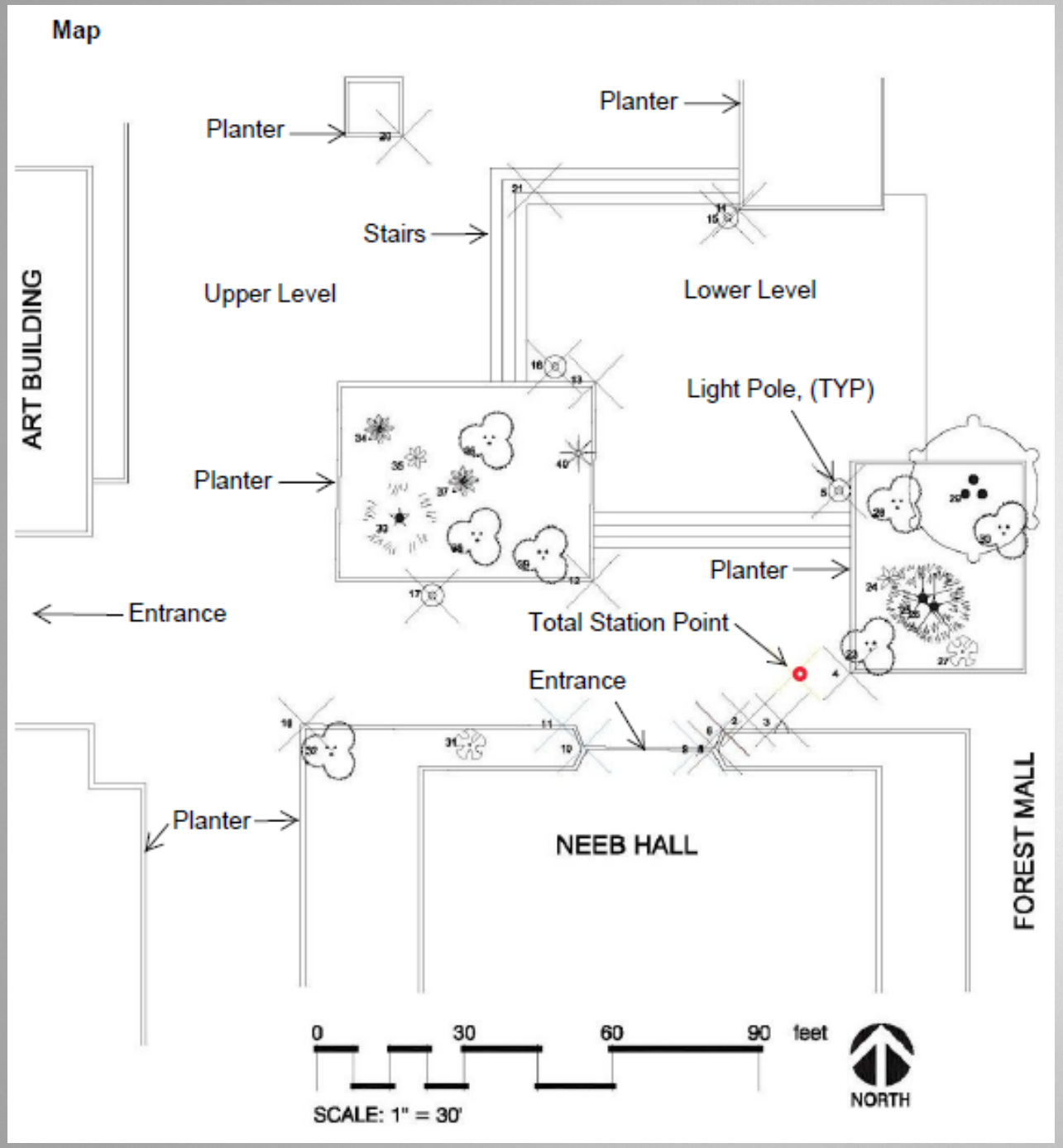
1. LAP494 – Advanced GIS Applications in Environmental Design
2. LDE362 – Landscape Architecture Studio - Site Inventory and Planning
3. LAP494 – Landscape Surveying and Mapping
4. GPH630 – GIS Data Sources

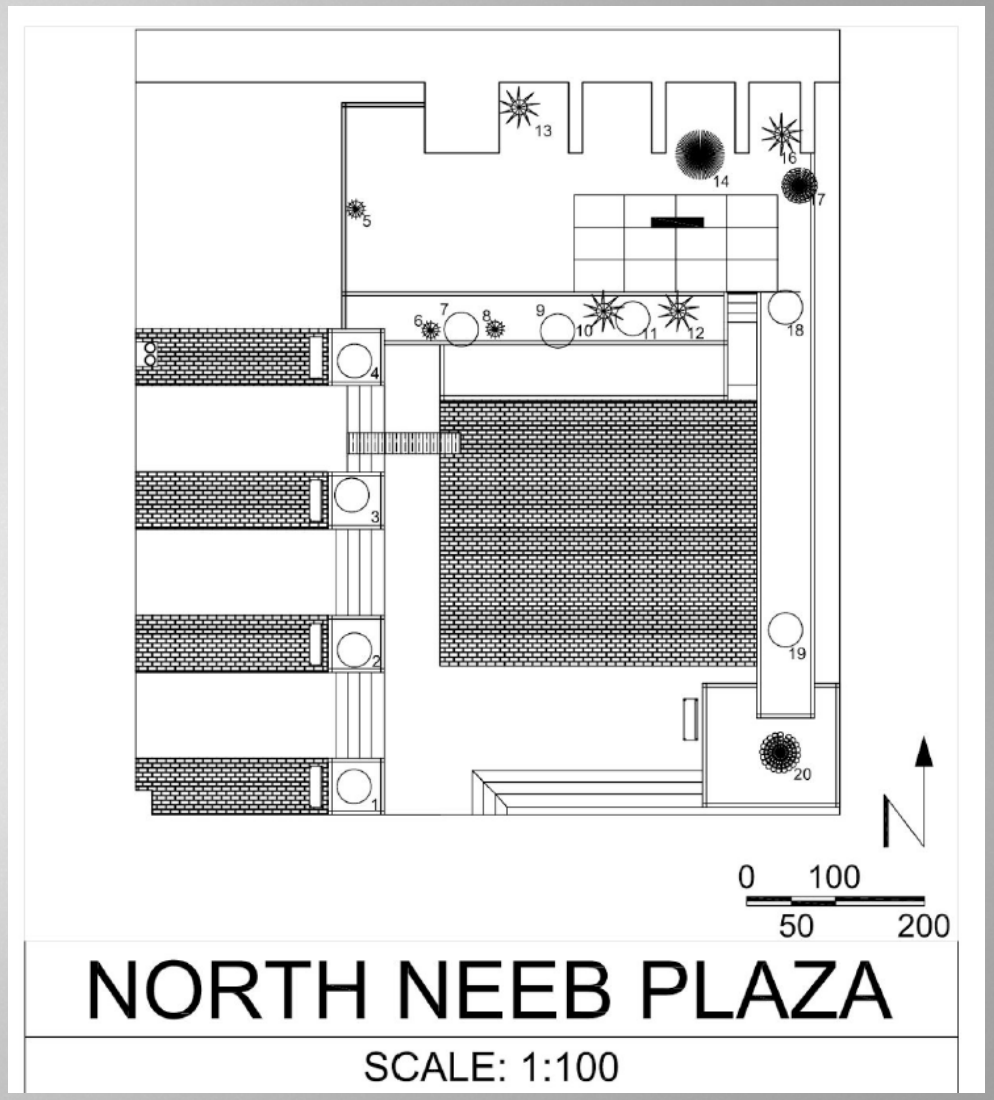
neeb hall inventory





neeb hall inventory





neeb hall inventory

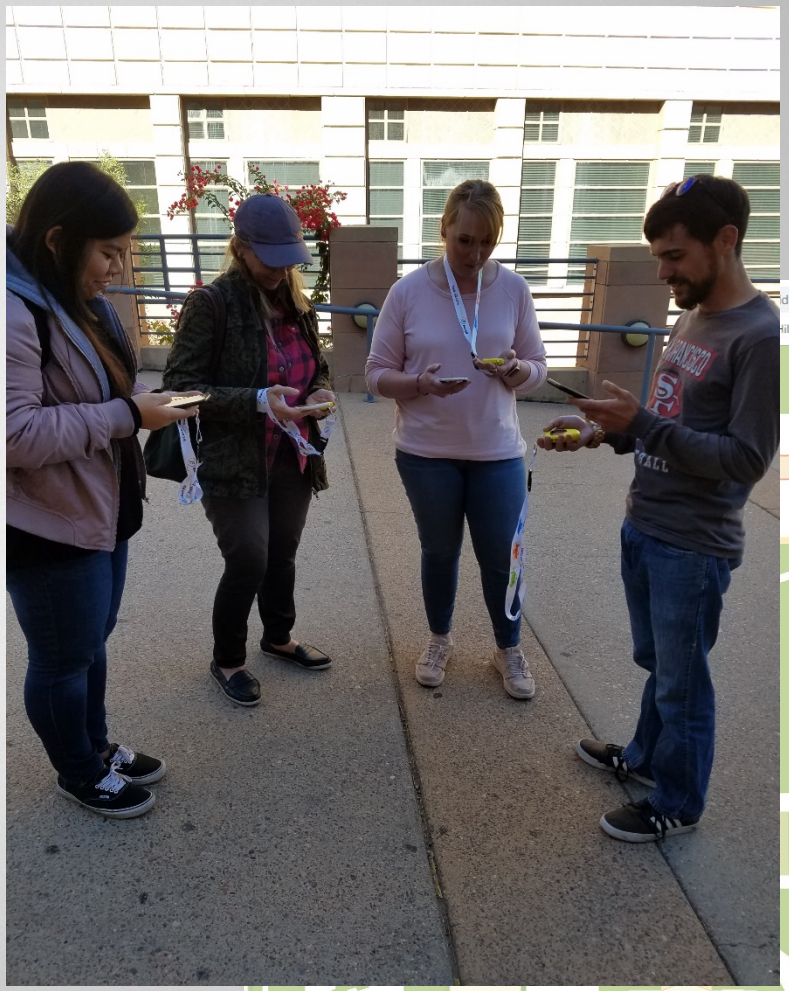
Plant 12

Agave vivipara
Carribean Agave

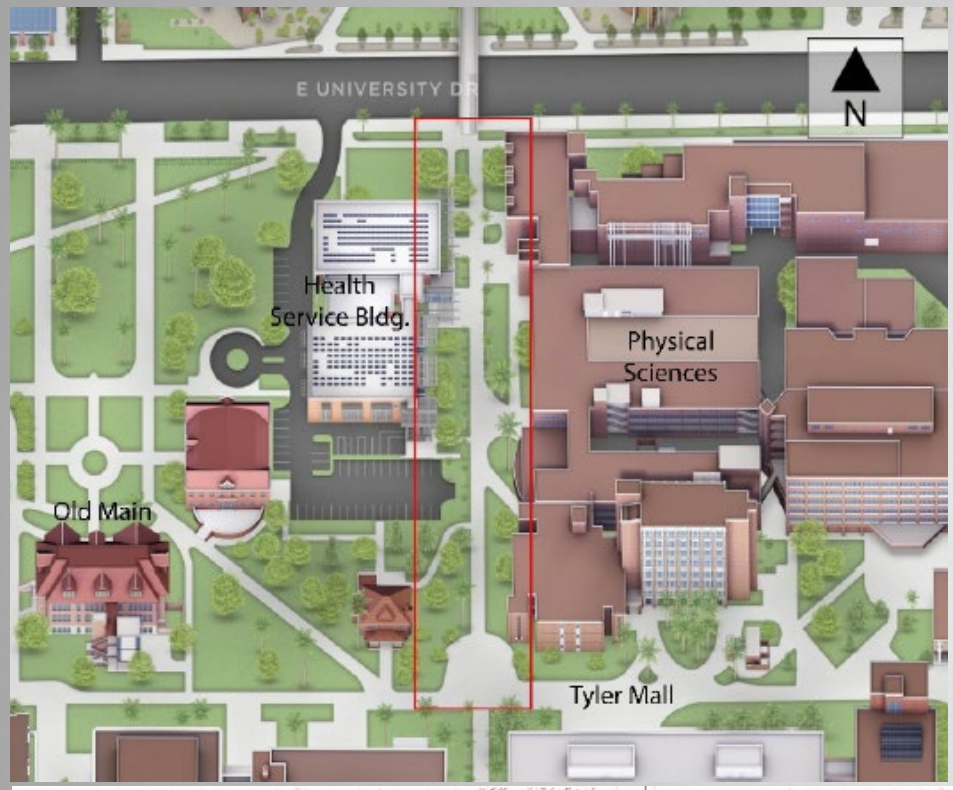
Plant 1

Parkinsonia florida
Blue Palo Verde

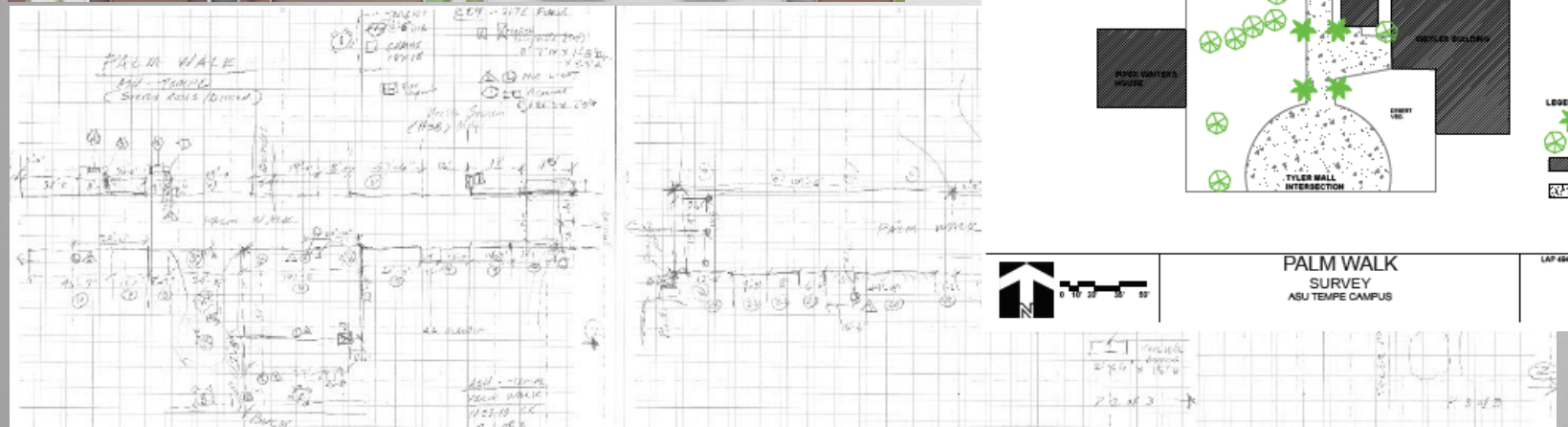
palm walk tree inventory



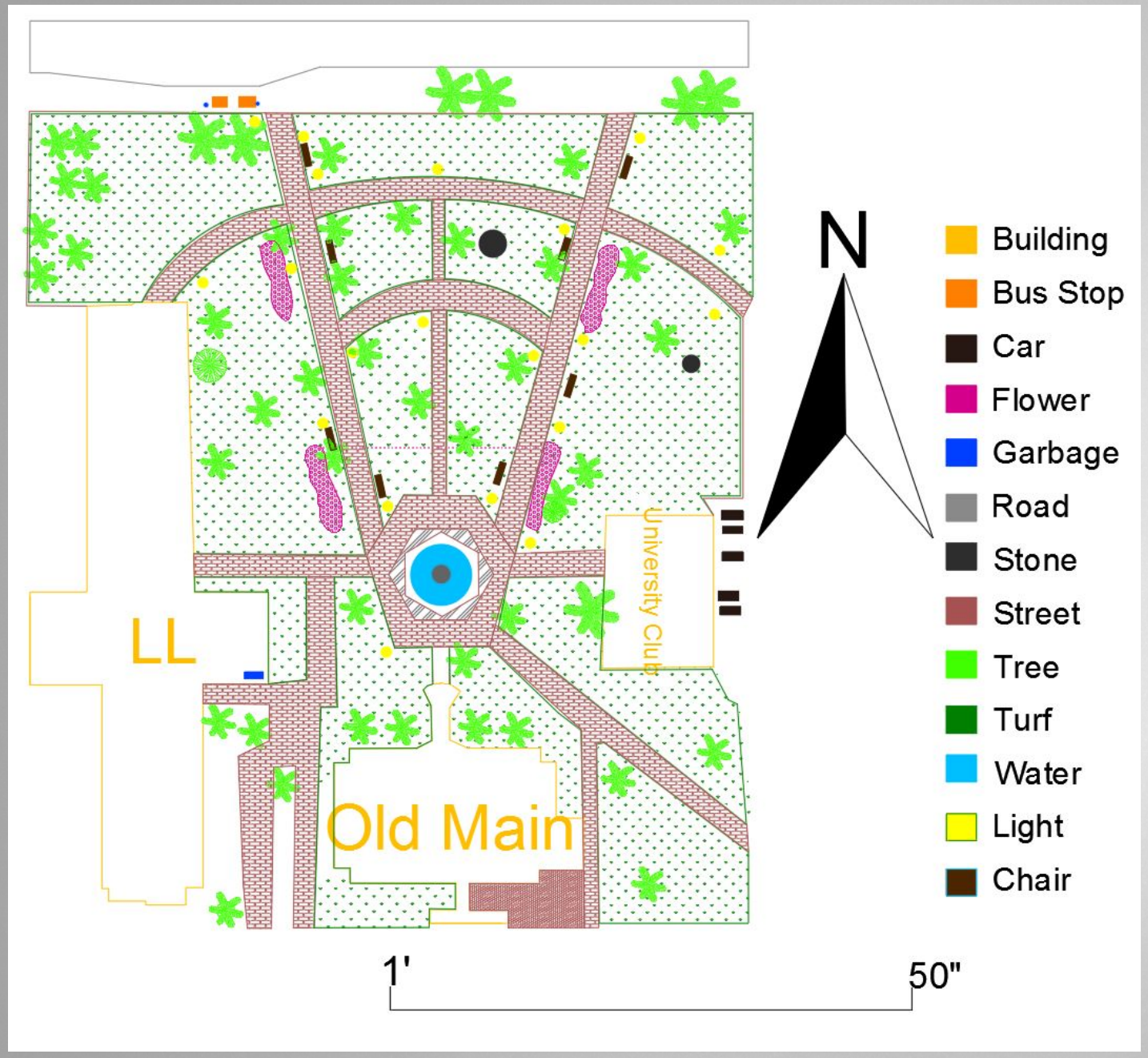
palm walk tree inventory

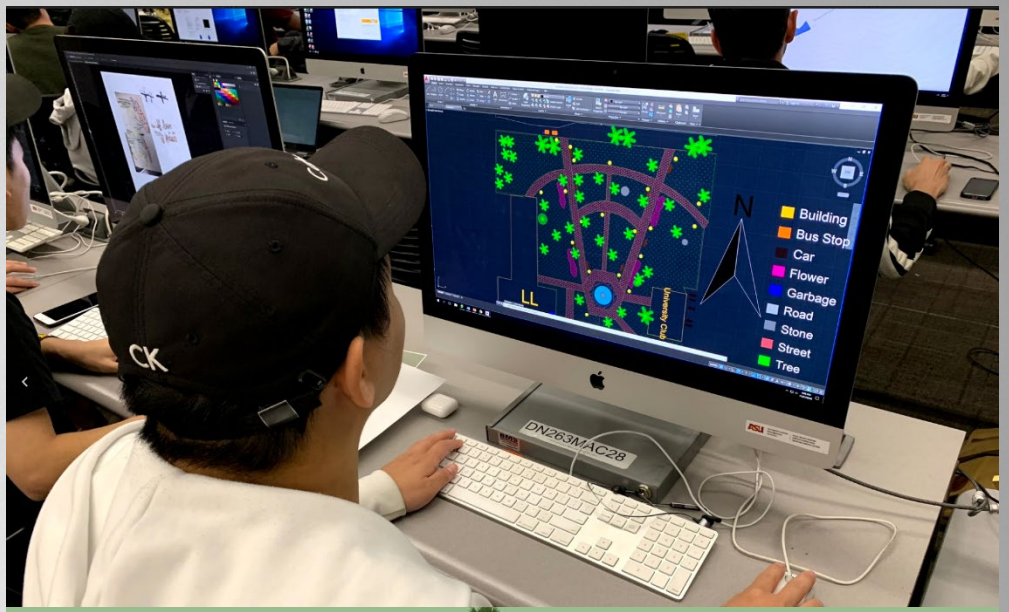


4. Date Palm



old main site inventory





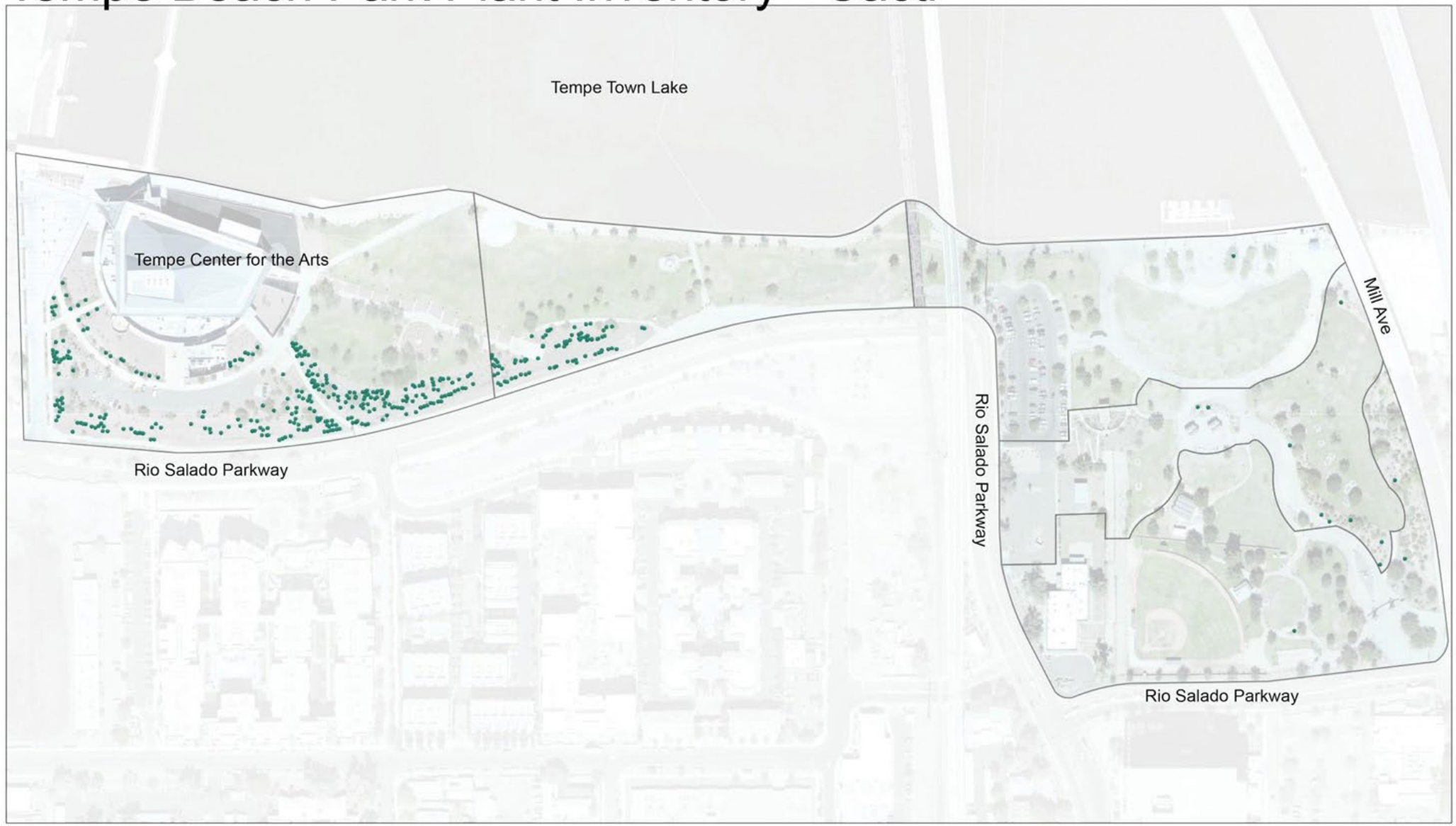
old main
site inventory

tempe beach park site inventory

Tempe Beach Park Plant Inventory - Trees

Tempe Beach Park Plant Inventory - Shrubs

Tempe Beach Park Plant Inventory - Cacti



Legend

- Cacti

N

0 0.03 0.05 0.1 0.15 0.2 Miles

Tempe Beach Park Plant Inventory

Tempe Beach Park Plant Inventory - Turf

Legend

Turf 535,057 sqft. (12.28 acres)

Annual Water Use: 18,804,000 gal.*

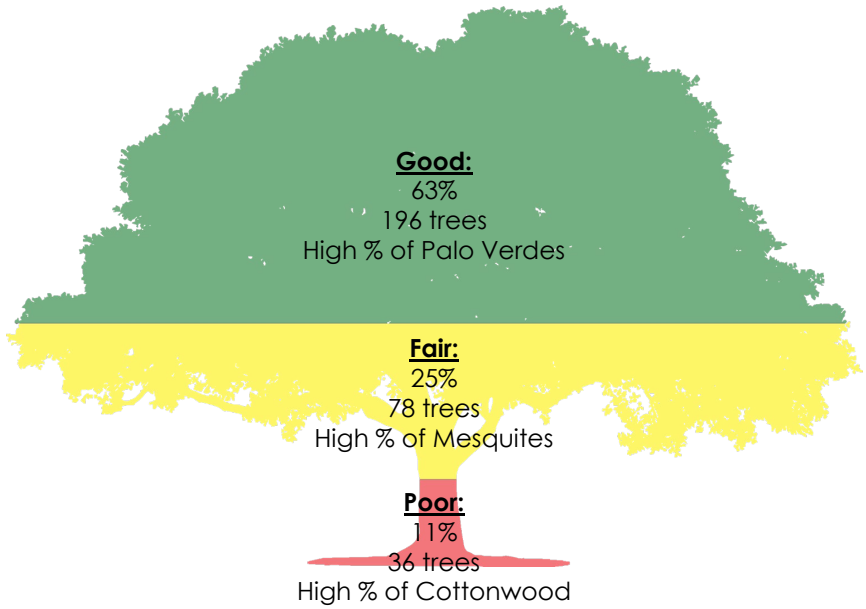
Annual Water Cost: $77,475.96*

*Estimates from the City of Mesa Water Calculator

0 0.03 0.05 0.1 0.15 0.2 Miles

N

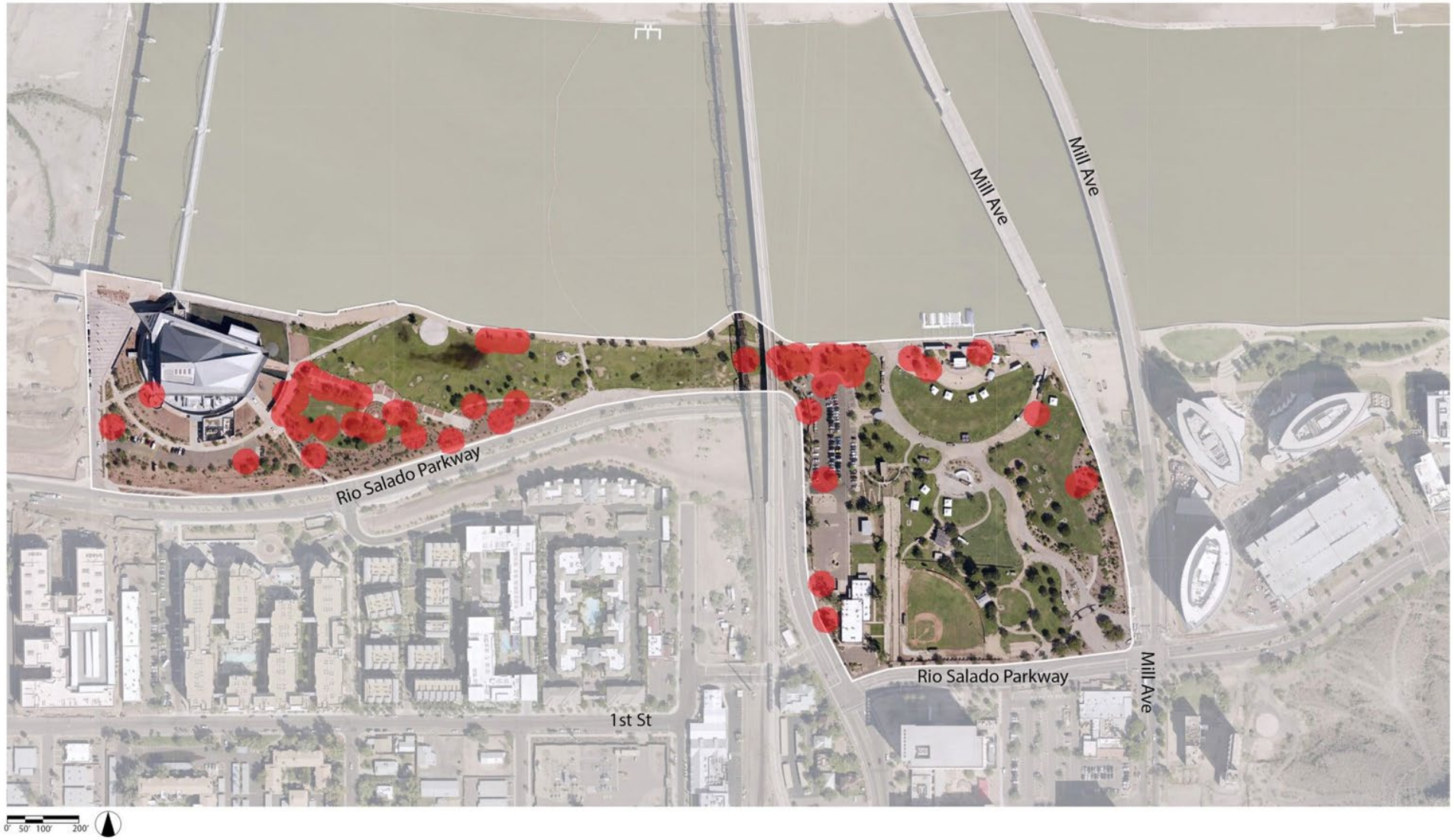
Tree Conditions



Tree Conditions - Good

Tree Conditions - Fair

Tree Conditions - Poor

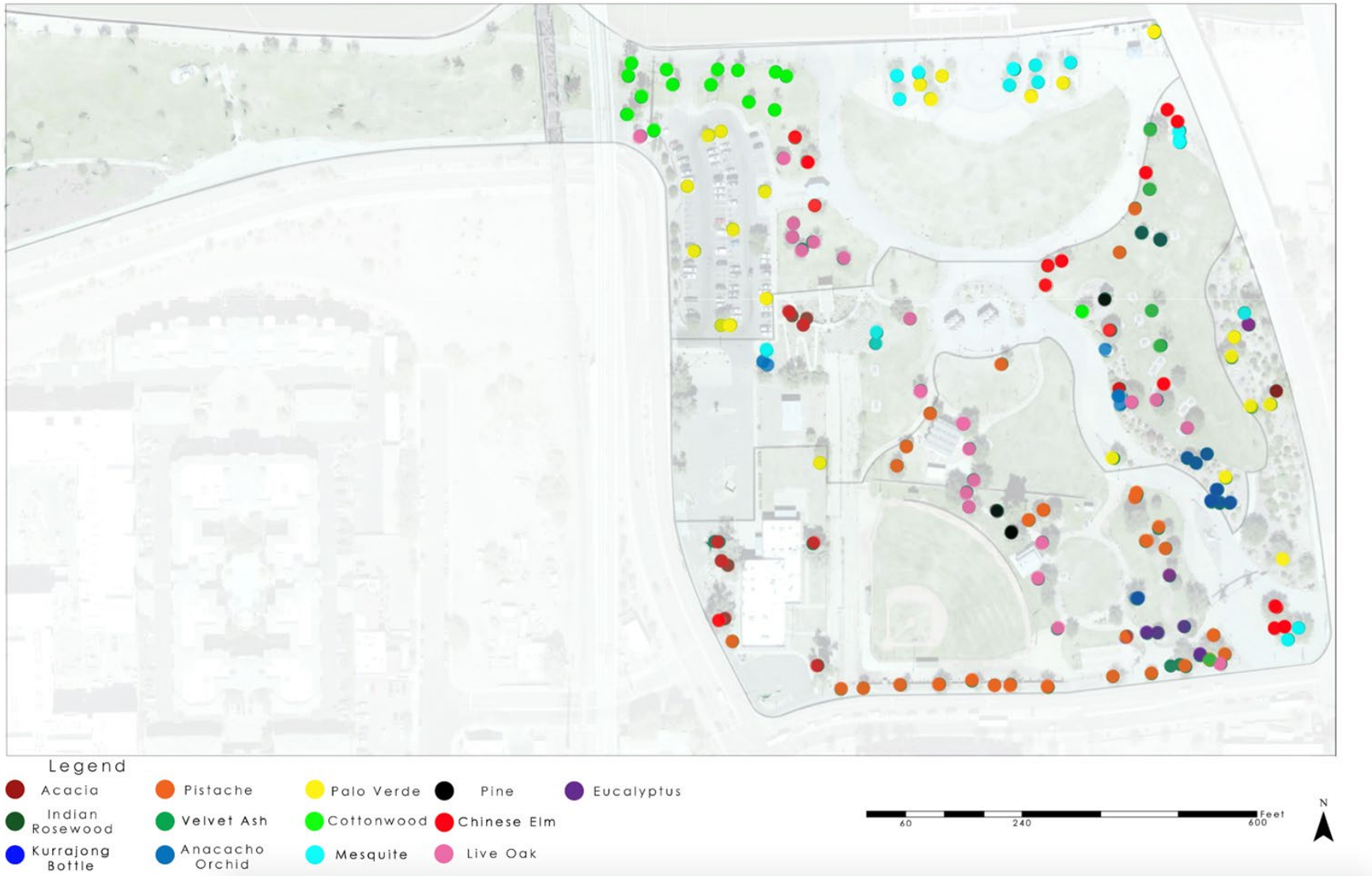


Tree Species

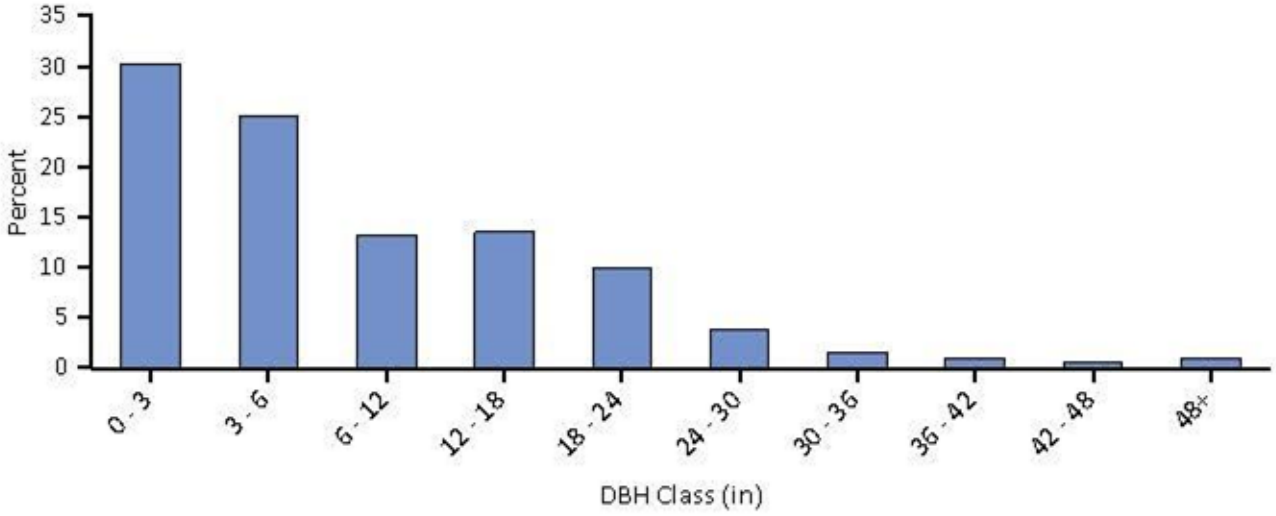
Species	*Oxygen (pound)*	*Gross Carbon Sequestration (pound/yr)*	*Number of Trees*	*Leaf Area (acre)*
Prosopis	3,387.37	1,270.26	93	1.63
Parkinsonia	2,444.10	916.54	76	1.35
Pistacia	1,082.97	406.11	34	0.15
Acacia	833.39	312.52	13	0.41
Fraxinus	807.72	302.89	39	0.52
Populus	801.34	300.50	16	0.32
Parrotia	472.93	177.35	4	0.19
Quercus	397.49	149.06	6	0.16
Ceratonia	259.94	97.48	4	0.15
Ulmus	228.82	85.81	8	0.18
Eucalyptus	221.04	82.89	3	0.08
Chilopsis	118.21	44.33	4	0.07
Dalbergia	107.54	40.33	4	0.06
Morus	47.45	17.79	1	0.03
Brachychiton	26.64	9.99	1	0.01
Bauhinia	3.94	1.48	2	0.01
Pinus	2.98	1.12	1	0.00
Ebenopsis	2.74	1.03	1	0.00
Borassus	1.96	0.73	1	0.18

Tree Species

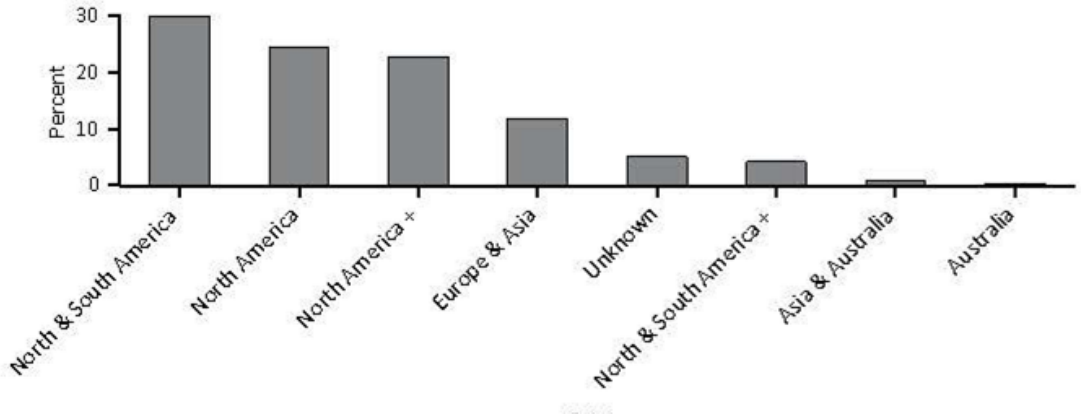
Tree Species



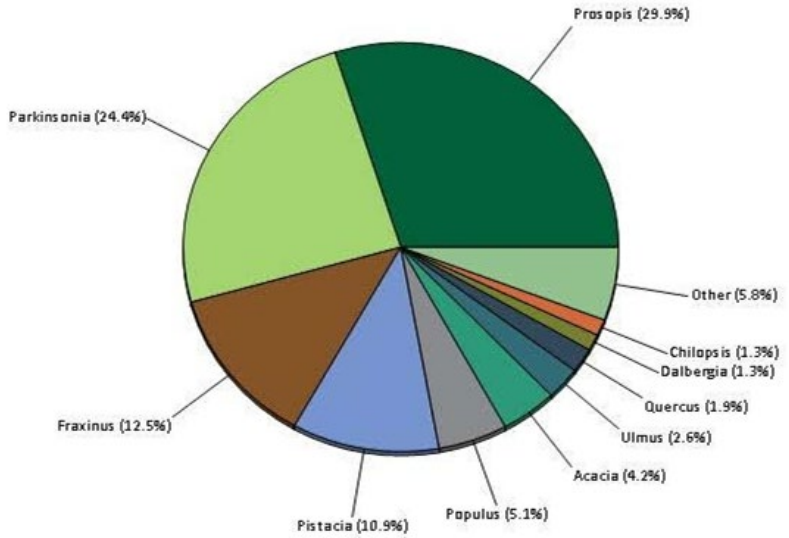
Tree Species



30% of trees have a 0 - 3" DBH



More than 25% are native to South America



311 Trees

4.1% Tree Canopy

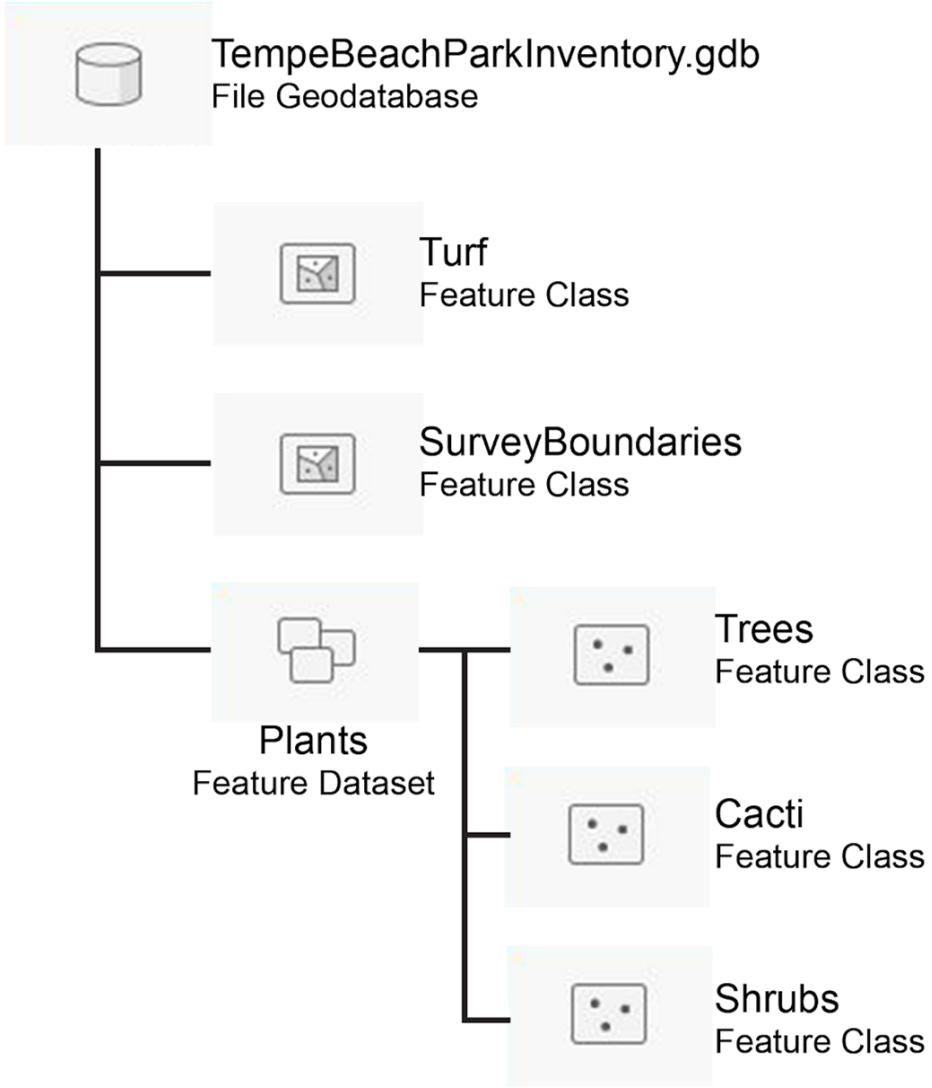
Mesquite

Palo Verde

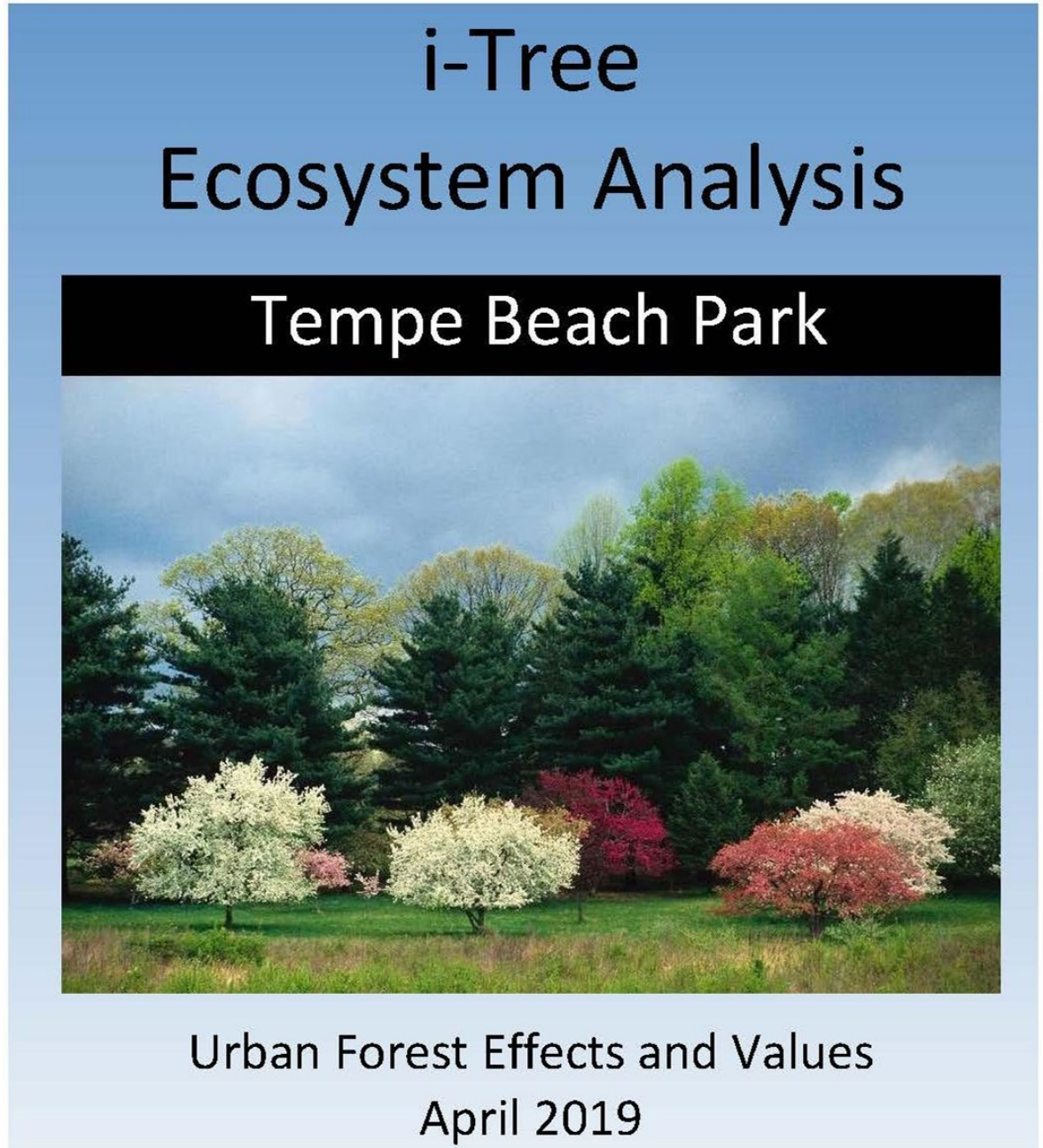
Ash

Pistache

Geodatabase



iTree Report



iTree Data

ID	CATE	COMMENT	LONG	LATI	Height	DBH	Spec	Crown Condition	Itree code
1	2	Multitrunk	Missing	Missing	15	12	Parkinsonia florida	Fair	PAI3
2	2	Multitrunk	Missing	Missing	15	12	Parkinsonia florida	Fair	PAI3
3	2		33.43090117	-111.9422332	30	8	Prosopis chilensis	Good	PR6
4	2		33.430942	-111.9422272	30	9	Prosopis chilensis	Fair	PR6
5	2		33.43185917	-111.9403353	10	2	Mesquite	Good	PR6
6	2		33.4177733	-111.943964	10	2	Mesquite	Good	PR6
7	2		33.430965	-111.9420725	50	1	Quercus virginian	Good	QU
8	2		33.41074867	-111.9439478	10	4	Mesquite	Good	PR6
9	2	Multitrunk	33.431317	-111.9413421	20	14.5	Prosopis velutina	Fair	PR6
10	2		33.43173967	-111.944005	12	3	Mesquite	Good	PR6
11	2		33.43176667	-111.9440222	8	2	Mesquite	Good	PR6
12	2		33.42981317	-111.9404092	25	11	Umus parvifolia	Good	ULS
13	2		33.43159333	-111.9439918	30	3	Mesquite	Good	PR6
14	2		33.42981933	-111.9403022	20	15	Prosopis grandulosa	Good	PR6
15	2		33.4319065	-111.9440357	8	1	Mesquite	Fair	PR6
16	2		33.431865	-111.9413765	15	3	Parkinsonia florida	Fair	PAI3
17	2	Extensive roots showing on top of ground.	Missing	Missing	21	1	Cottonwood	Good	PO
18	2		33.43187633	-111.9441168	11	2	Mesquite	Good	PR6
19	2		33.42980817	-111.9404018	25	4	Umus parvifolia	Good	ULS
20	2		33.43172817	-111.944065	12	3	Mesquite	Good	PR6
21	2		33.43196067	-111.9415038	18	8	Prosopis velutina	Poor	PR6
22	2		33.43174683	-111.9440913	14	3	Mesquite	Good	PR6
23	2		33.43172817	-111.9443183	13	4	Mesquite	Good	PR6
24	2		33.431752	-111.9441485	10	3	Mesquite	Good	PR6
25	2		33.43172083	-111.9442037	12	3	Mesquite	Good	PR6
26	2		33.43189367	-111.9414907	18	8.5	Prosopis velutina	Fair	PRO
27	2		33.43174183	-111.9442278	13	4	Mesquite	Good	PR6
28	2		33.4189665	-111.9442287	12	4	Mesquite	Good	PR6
29	2	Acting as mother plant for Ocotillo	Missing	Missing	9	4	Prosopis velutina, Velvet mesquite	Good	PR6
30	2		33.43172083	-111.9443302	12	4	Sissoo	Good	DA2
31	2	Multitrunk	33.43194317	-111.9415228	12	9.5	Parkinsonia florida	Fair	PAI3
32	2		33.43180717	-111.9443147	8	2	Mesquite	Good	PR6
33	2		33.43189417	-111.9443803	12	2	Mesquite	Good	PR6
34	2		33.43182067	-111.9444188	12	3	Mesquite	Good	PR6
35	2		33.43189417	-111.9416215	18	7	Prosopis velutina	Fair	PR6
36	2		33.43173533	-111.9444142	15	4	Mesquite	Good	PR6
37	2	Possibly volunteer plant	Missing	Missing	6.5	1	Chilopsis linearis	Fair	CH16
38	2		33.43177583	-111.9444383	13	2	Mesquite	Good	PR6
39	2	Multitrunk	33.43194467	-111.9415985	15	15	Prosopis velutina	Fair	PR6
40	2		33.43193033	-111.942036	12	10	Prosopis velutina	Fair	PR6
41	2	Multitrunk	33.43188967	-111.9402285	18	10	Parkinsonia florida	Fair	PAI3
42	2		33.4297175	-111.94063182	10	2	Pistacia chinensis	Good	PI21
43	2	Multitrunk	33.43181267	-111.9415827	15	18	Parkinsonia florida	Poor	PAI3
44	2		33.43185117	-111.942125	18	10	Prosopis velutina	Fair	PR6
45	2		33.43296655	-111.9407952	7	1.5	Eversonia eleano	Good	EIE
46	2	Multitrunk	33.43192	-111.9421343	12	12.5	Prosopis velutina	Poor	PR6
47	2		33.42971283	-111.9407317	30	12	Eucalyptus camaldulensis	Good	EUL
48	2		33.429701	-111.940489	15	1	Pistacia chinensis	Good	PI21
49	2		33.4296645	-111.9409752	20	8	Pistacia Chinensis	Good	PI21
50	2		33.42967133	-111.9408168	20	6	Pistacia Chinensis	Fair	PI21
51	2		33.42968267	-111.9406363	22	5	Quercus virginiana	Good	QU
52	2		33.4296315	-111.9414488	18	8	Pistacia Chinensis	Good	PI21
53	2		33.42959267	-111.9414448	25	12	Pistacia Chinensis	Fair	PI21
54	2		33.42960367	-111.9416167	25	12	Pistacia Chinensis	Good	PI21
55	2		33.43102215	-111.9419216	10	2	Acacia farnesiana	Fair	ACSP2
56	2		33.43197533	-111.9442348	30	13	Mesquite	Fair	PR6
57	2		33.431861	-111.944425	13	4	Mesquite	Good	PR6
58	2		33.43192433	-111.9443335	20	5	Mesquite	Fair	PR6
59	2	Restive Truman	Missing	Missing	20	4.5	Parkinsonia microphylla	Fair	PAI3
60	2		33.43197033	-111.9444388	20	5	Pistachio	Good	PI21
61	2		33.43197283	-111.944507	18	3	Ash	Fair	FR
62	2		33.43191267	-111.9444888	17	3	Mesquite	Good	PR6
63	2	Multi trunk	Missing	Missing	20	2	Parkinsonia Microphylla	Good	PAI3
64	2		33.4317325	-111.9445745	16	2	Mesquite	Good	PR6
65	2	Dry leaves	33.43199617	-111.9425478	10	4	Acacia farnesiana	Fair	ACSP2
66	2		33.43177567	-111.944622	14	1	Mesquite	Fair	PR6
67	2		33.43171333	-111.9446585	16	3	Sissoo	Good	DA2
68	2	Tagged with lowers initials	33.431491	-111.9467353	22	12	Parkinsonia mycrophylla	Fair	PAI3
69	2		33.43179353	-111.944709	40	16	Mesquite	Good	PR6
70	2		33.43182367	-111.944724	9	1	Mesquite	Fair	PR6
71	2		33.43182767	-111.9446687	10	1	Mesquite	Good	PR6
72	2	48" box size tree	33.43148567	-111.9448213	20	9	Parkinsonia Microphylla	Poor	PAI3
73	2		33.430972	-111.942765	15	2	Acacia farnesiana	Good	ACSP2
74	2		33.431977	-111.944636	40	13	Cottonwood	Fair	PO
75	2		33.43196583	-111.9447717	38	15	Cottonwood	Fair	PO
76	2		33.43100717	-111.9426133	10	3	Acacia farnesiana	Good	ACSP2
77	2	Support Stake never removed	33.43152017	-111.9419868	10	3	Parkinsonia Microphylla	Fair	PAI3
78	2		33.43198917	-111.9449138	36	13	Cottonwood	Good	PO
79	2		33.431999	-111.944999	38	17	Cottonwood	Good	PO
80	2		33.430876	-111.9427303	20	8	Prosopis chilensis	Good	PR6
81	2		33.43200333	-111.9451202	38	7	Bottle	Fair	BR1
82	2	No leaves on the tree	33.43149433	-111.9468938	8	2	Parkinsonia Mycrophylla	Poor	PAI3
83	2		33.43198183	-111.945201	29	9	Cottonwood	Good	PO
84	2		33.4316175	-111.9431385	9	2	Pistache	Good	PI21
85	2		33.431854	-111.9451512	33	8	Pistache	Good	PI21
86	2	This tree squeals in the wind	33.43117765	-111.9457827	20	12	Acacia farnesiana	Fair	ACSP2
87	2		33.43177633	-111.9453343	40	9	Pistache	Good	PI21
88	2		33.43183467	-111.9427458	7	1	Bauhinia lunarioides	Good	BA13
89	2		33.4317108	-111.9450903	8	1	Pistache	Fair	PI21
90	2		33.43174567	-111.9452037	9	1	Pistache	Good	PR6
91	2		33.43192	-111.946271	4	0.5	Bauhinia lunarioides	Good	BA13
92	2		33.43177333	-111.9449643	9	2	Mesquite	Good	PR6
93	2		33.43178483	-111.9448688	12	6	Mesquite	Good	PR6
94	2		33.43166133	-111.9451865	9	1	Pistache	Good	PI21
95	2		33.43119683	-111.945447	30	8	Umus parvifolia	Good	ULS
96	2		33.43171733	-111.9452503	39	15	Mesquite	Good	PR6
97	2		33.431706	-111.9453803	10	2	Mesquite	Good	PR6
98	2		33.43121155	-111.945386	30	8	Umus parvifolia	Good	ULS
99	2		33.43163083	-111.9453068	9	2	Pistache	Good	PI21
100	2	Kept whacking me in the face	33.43132633	-111.9466165	9	4	Prosopis velutina	Good	PR6
101	2		33.43161617	-111.9453362	23	10	Mesquite	Good	PR6
102	2		33.43121267	-111.945457	20	6	Umus parvifolia	Good	ULS
103	2		33.43156617	-111.9454427	6	2	Mesquite	Good	PR6
104	2		33.43169883	-111.9453862	8	2	Mesquite	Good	PR6
105	2	Several volunteer wildflowers underneath	Missing	Missing	4	0	Washingtonia bacata	Good	WA4
106	2		33.43102367	-111.941291	50	8	Morus alba	Good	MO
107	2		33.43177283	-111.9452215	27	10	Pistache	Good	PI21
108	2		33.43183917	-111.9452387	20	7	Pistache	Good	PI21
109	2		33.43193217	-111.9452755	7	4	pistache	Fair	PI21
110	2		33.43186833	-111.945172	9	1	pistache	Good	PI21
111	2		33.4312485	-111.9451187	10	5	Pistacia Chinensis	Good	PI21
112	2		33.43186233	-111.9454228	10	3	Palo verde	Good	PA13
113	2	Dry north facing	33.431295	-111.9459328	20	9	Delbergia sissoo	Fair	DA2
114	2		33.4319125	-111.9456412	43	10	Pistacia chinensis	Good	PI21
115	2	Dry north facing	33.431324	-111.9451065	20	10	Delbergia sissoo	Fair	DA2
116	2		33.43181853	-111.9454482	11	4	Fraxinus velutina	Fair	FR
117	2		33.43174015	-111.9456192	23	8	Populus fremontii	Good	PO
118	2	Right next to the road	Missing	Missing	8	1	Parkinsonia microphylla	Good	PAI3
119	2		33.43117155	-111.945554	28	6	Fraxinus velutina	Fair	FR
120	2		33.431417	-111.9414478	10	2	Pistacia chinensis	Good	PI21
121	2		33.431724	-111.9455097	37	11	Palo verde	Good	PA13
122	2		33.43164017	-111.9455642	7	3	Mesquite	Good	PR6
123	2		33.43168767	-111.9456827	15	5	Fraxinus velutina	Poor	FR
124	2		33.43167883	-111.9458325	15	6	Fraxinus velutina	Good	FR
125	2		33.43172517	-111.945853	30	8	Palo verde	Good	PA13
126	2	Escape posts are hanging from tree. Not suppor	33.43125933	-111.9456388	9	6	Prosopis velutina	Good	PR6
127	2		33.43168867	-111.9459108	40	10	Fraxinus velutina	Fair	FR
128	2		33.431718	-111.9459785	30	12	Fraxinus velutina	Good	FR
129	2		Missing	Missing	36	10	Fraxinus velutina	Good	FR
130	2		33.43165167	-111.9462065	33	13	Fraxinus velutina	Good	FR
131	2		33.43167433	-111.9462665	24	11	Palo verde	Good	PA13
132	2		33.43158833	-111.946347	40	24	Prosopis velutina	Good	PR6
133	2		33.43153367	-111.9464552	19	4	Prosopis velutina	Good	PR6
134	2		33.432085	-111.946211	23	13	Populus fremontii	Fair	PO
135	2		33.43174583	-111.9403555	15	4	Umus parvifolia	Good	ULS
136	2		33.43206783	-111.9460417	29	13	Populus fremontii	Poor	PO
137	2		33.43210633	-111.9458863	30	14	Populus fremontii	Poor	PO
138	2		33.43204867	-111.9457843	32	15	Populus fremontii	Poor	PO
139	2		33.43203367	-111.9456442	40	19	Populus fremontii	Fair	PO
140	2		33.43149665	-111.9455218	8	3	Prosopis velutina	Good	PR6
141	2		33.43115055	-111.9452585	10	1	Parkinsonia florida	Fair	PAI3
142	2		33.43148117	-111.9456422	10	6	Prosopis velutina	Good	PR6
143	2		33.43143317	-111.9458577	8	5	Prosopis velutina	Good	PR6
144	2		33.43145667	-111.9458185	12	7	Prosopis velutina	Good	PR6
145	2		33.43139783	-111.9459752	10	4	Prosopis velutina	Good	PR6
146	2		33.43154433	-111.9460262	13	4	Prosopis velutina	Good	PR6
147	2		33.432506	-111.9462258	10	4	Prosopis velutina	Fair	PR6
148	2		33.43192126	-111.9464712	10	6	Desert willow	Good	CH16
149	2		33.43138717	-111.9465297	12	7	Chilopsis linearis	Good	CH16
150	2		33.431423	-111.9465857	10	6	Prosopis velutina	Good	PR6
151	2		33.43142767	-111.9465763	14	8	Chilopsis linearis	Good	CH16
152	2		33.43132117	-111.9463108	11	4	Prosopis velutina	Good	PR6
153	2		33.43130333	-111.946436	10	2	Prosopis velutina	Good	PR6
154	2		33.431205	-111.9462918	11	3	Parkinsonia florida	Good	PAI3
155	2		33.43130217	-111.9462463	7	2	Parkinsonia florida	Good	PAI3
156	2		33.43133117	-111.9462177	11	3	Parkinsonia florida	Good	PAI3
157	2		33.43136583	-111.9461762	13	4	Parkinsonia florida	Good	PAI3
158	2		33.43135417	-111.946106	12	3	Parkinsonia florida	Good	PAI3
159	2		33.43139667	-111.9459765	7	1	Parkinsonia florida	Good	PAI3
160	2		33.4314355	-111.9458708	7	4	Prosopis velutina	Good	PR6
161	2		33.43183033	-111.9424778	22	4	Fraxinus velutina	Fair	FR
162	2		33.43180667	-111.947041	26	9	Fraxinus velutina	Good	FR
163	2		33.4315935	-111.9434217	20	4	Fraxinus velutina	Fair	FR
164	2		Missing	Missing	8	3	Pistacia chinensis	Good	PI21
165	2		33.43213783	-111.9474198	12	2	Pistacia chinensis	Fair	PI21
166	2	Dead	33.42981617	-111.9417832	25	12	Pistacia Chinensis	Dead	PI21
167	2		Missing	Missing	25	6	Fraxinus velutina	Good	FR
168	2		33.432145	-111.947796	20	6	Fraxinus velutina	Good	FR
169	2		33.42960545	-111.9411941	26	14	Pistacia Chinensis	Fair	PI21
170	2		33.42960167	-111.9421165	25	12	Pistacia Chinensis	Fair	PI21
171	2		Missing	Missing	10	4	Parkinsonia	Poor	PAI3
172	2		33.43173617	-111.9477468	25	8	Parkinsonia	Fair	PAI3
173	2		33.4317475	-111.9477001	25	15	Parkinsonia	Fair	PAI3
174	2		33.4295855	-111.9423902	25	10	Pistacia Chinensis	Fair	PI21
175	2		33.432719	-111.9473553	10	1	Parkinsonia	Poor	PAI3
176	2		33.43116605	-111.9475678	6	1	Parkinsonia	Poor	PAI3
177	2		33.42967585	-111.9424496	40	24	Acacia	Fair	ACSP2
178	2		Missing	Missing	10	3	Parkinsonia	Poor	PAI3
179	2		33.43163867	-111.947477	30	16	Acacia	Fair	ACSP2
180	2		33.43165983	-111.9474038	11	1	Parkinsonia	Poor	PAI3
181	2		33.43162833	-111.9473708	26	20	Parkinsonia	Fair	PAI3
182	2		33.43164717	-111.9473178	19	12	Parkinsonia	Poor	PAI3
183	2		33.431618	-111.9472868	20	14	Parkinsonia	Good	PAI3
184	2		33.42976767	-111.9428852	12	6	Pistacia chinensis	Good	PI21
185	2		33.43163067	-111.9472268	23	26	Parkinsonia mircophylla	Poor	PAI3
186	2		33.4298535	-111.9429225	40	30	Acacia	Poor	ACSP2
187	2		33.43158817	-111.9471878	8	1	Parkinsonia	Good	PAI3
188	2		33.429847	-111.9429427	8	4	Umus parvifolia	Good	ULS
189	2		33.43153555	-111.947222	20	6	Parkinsonia	Good	PAI3
190	2		33.43139917	-111.947207	26	10	Parkinsonia	Poor	PAI3
191	2		33.431315	-111.9471545	30	26	Parkinsonia	Poor	PAI3
192	2		33.430122	-111.9430115	30	50	Borassus	Good	BO5
193	2		Missing	Missing	12	2	Parkinsonia	Good	PAI3
194	2		33.43147673	-111.9419668	30	14	Acacia	Poor	ACSP2
195	2		33.43139967	-111.9469833	20	9	Parkinsonia	Good	PAI3
196	2		33.43129183	-111.9471173	20	16	Mesquite	Good	PR6
197	2		33.4300745	-111.9423367	45	18	Acacia	Fair	ACSP2
198	2		33.43126783	-111.9472003	20	20	Mesquite	Poor	PR6
199	2		33.43105575	-111.9429075	45	15	Acacia	Fair	ACSP2
200	2		33.43124317	-111.9472773	20	16	Mesquite	Fair	PR6
201	2		Missing	Missing	12	4	Chinese Pistache	Good	PI21
202	2		33.43132217	-111.9472383	30	16	Mesquite	Poor	PR6
203	2		33.43013917	-111.9425187	40	15	Acacia	Good	ACSP2
204	2		Missing	Missing	9	2	Chinese Pistache	Good	PI21
205	2		Missing	Missing	9	2	Mesquite	Poor	PR6
206	2		33.43137683	-111.9475432	14	13	Mesquite	Poor	PR6
207	2		33.431423	-111.9476485	19	18	Mesquite	Good	PR6
208	2		Missing	Missing	12	6	Velvet Ash	Fair	FR
209	2		33.43138767	-111.9478547	8	1	Velvet Ash	Poor	FR
210	2		33.43044667	-111.9424863	25	14	Parkinsonia florida	Good	PAI3
211	2		33.43133017	-111.9478528	13	6	Velvet Ash	Fair	FR
212	2		Missing	Missing	10	2	Velvet Ash	Good	FR
213	2		Missing	Missing	9	3	Velvet Ash	Poor	FR
214	2		Missing	Missing	10	5	Velvet Ash	Good	FR
215	2		Missing	Missing	16	7	Velvet Ash	Good	FR
216	2		33.43133095	-111.9478546	12	7	Velvet Ash	Good	FR
217	2		33.430616	-111.9419857	30	8	Pistacia Chinensis	Good	PI21
218	2		33.43101	-111.9421917	25	9	Pistacia Chinensis	Good	PI21
219	2		33.4313158	-111.9478233	9	4	Velvet Ash	Fair	FR
220	2		Missing	Missing	10	3	Velvet Ash	Fair	FR
221	2		33.43177083	-111.9494367	14	5	Velvet Ash	Good	FR
222	2		33.4317067	-111.9494212	13	6	Velvet Ash	Good	FR
223	2		33.43190045	-111.9454107	30	15	Ceratonia siliqua	Good	CE15
224	2		Missing	Missing	12	2	Velvet Ash	Fair	FR
225	2		Missing	Missing	10	13	Pistacia Chinensis	Fair	PI21
226	2		Missing	Missing	13	4	Velvet Ash	Good	FR
227	2		33.431427	-111.9493383	10	3	Velvet Ash	Fair	FR
228	2		33.42981467	-111.9414025	20	10	Ceratonia siliqua	Good	CE15
229	2		33.43136417	-111.9491022	11	3	Velvet Ash	Fair	FR
230	2		33.43113345	-111.9490017	12	5	Velvet Ash	Good	FR
231	2		33.42977767	-111.9409932	25	10	Eucalyptus camaldulensis	Good	EUL
232	2		33.43127933	-111.9489073	12	4	Velvet Ash	Good	FR
233	2		33.42902867	-111.9410378	30	15	Ceratonia siliqua	Good	CE15
234	2		33.43129675	-111.9414655	30	12	Eucalyptus camaldulensis	Good	EUL
235	2		33.43082333	-111.9416563	25	10	Pistacia Chinensis	Good	PI21
236	2		33.43168717	-111.949509	10	1	Velvet Ash	Fair	FR
237	2		33.43131817	-111.9414467	25	10	Parkinsonia	Fair	PAI3
238	2		33.430197	-111.9409417	28	12	Parkinsonia	Fair	PAI3
239	2		33.43014783	-111.941	25	12	Parkinsonia	Fair	PAI3
240	2		33.43038533	-111.9409392	30	12	Parkinsonia	Good	PAI3
241	2		33.4307231	-111.9404045	15	18	Acacia	Fair	ACSP2
242	2		33.43045685	-111.9401567	25	10	Parkinsonia	Good	PAI3
243	2		33.43084717	-111.9406077	30	15	Parkinsonia	Good	PAI3
244	2		33.43097183	-111.9405292	12	1	Ceratonia siliqua	Poor	CE15
245	2		33.4309265	-111.9405595	20	20	Parkinsonia	Poor	PAI3
246	2		33.43101783	-111.9405498	12	5	Prosopis grandulosa	Fair	PR6
247	2		33.431205	-111.9466443	8	1	Mesquite	Good	PR6
248	2		33.43120417	-111.9466883	9	1	Parkinsonia	Good	PAI3
249	2		33.43117617	-111.9467257	10	3	Parkinsonia	Fair	PAI3
250	2		33.43128117	-111.9467817	12	2	Parkinsonia	Good	PAI3
251	2		Missing	Missing	12	5	Parkinsonia	Good	PR6
252	2		Missing	Missing	8	5	Mesquite	Good	PR6
253	2		Missing	Missing	12	4	Velvet Ash	Good	FR
254	2		33.43118653	-111.94927	10	4	Velvet Ash	Good	FR
255	2		Missing	Missing	16	11	Parkinsonia	Good	PAI3
256	2		33.43118117	-111.9465198	4	1	Parkinsonia	Poor	PAI3
257	2		33.4313455	-111.9469237	12	8	Parkinsonia	Good	PAI3
258	2		33.43134883	-111.9469793	12	4	Parkinsonia	Fair	PAI3
259	2		33.43131767	-111.9469372	23	8	Parkinsonia	Good	PAI3
260	2		Missing	Missing	10	2	Velvet Ash	Fair	FR
261	2		33.43131633	-111.9469128	13	7	Parkinsonia	Good	PAI3
262	2		33.43115233	-111.9465048	12	6	Parkinsonia	Good	PAI3
263	2		33.43108817	-111.949498	10	7	Parkinsonia	Good	PAI3
264	2		33.43111417	-111.9494065	18	19	Iron wood	Good	PA
265	2		33.43110033	-111.9469465	20	13	Iron wood	Good	PA
266	2		33.4311245	-111.9469303	12	9	Parkinsonia	Good	PAI3
267	2		33.43106917	-111.9480365	10	10	Mesquite	Good	PR6
268	2		33.43105033	-111.9487362	10	12	Mesquite	Good	PR6
269	2		33.43102653	-111.9488415	8	4	Parkinsonia	Good	PAI3
270	2		Missing	Missing	8	12	Mesquite	Good	PR6
271	2		33.431058	-111.9482338	18	18	Mesquite	Good	PR6
272	2		33.43110845	-111.9480823	16	9	Mesquite	Good	PR6
273	2		33.43109017	-111.9480033	12	7	Mesquite	Good	PR6
274	2		33.43121217	-111.9480178	8	4	Parkinsonia	Good	PAI3
275	2		33.43129267	-111.9481205	17	5	Velvet Ash	Good	FR
276	2		33.43123953	-111.948021	8	4	Parkinsonia	Good	PAI3
277	2		33.431239	-111.9479747	12	6	Mesquite	Good	PR6
278	2		33.43130883	-111.9479415	7	4	Parkinsonia	Good	PAI3
279	2		33.43124317	-111.9479807	7	2	Parkinsonia	Good	PAI3
280	2		33.43111655	-111.9479079	8	5	Mesquite	Good	PR6
281	2		33.431178	-111.9478115	8	2	Parkinsonia	Good	PAI3
282	2		33.43110817	-111.9477363	8	1	Parkinsonia	Fair	PAI3
283	2		Missing	Missing	33	25	Mesquite	Good	PR6
284	2		33.43134117	-111.947522	8	1	Parkinsonia	Fair	PAI3
285	2		33.431406	-111.947774	10	5	Mesquite	Good	PR6
286	2		Missing	Missing	8	1	Parkinsonia	Good	PAI3
287	2		Missing	Missing	20	12	Parkinsonia	Fair	PAI3
288	2		33.43113	-111.9476633	9	4	Mesquite	Good	PR6
289	2		33.43114567	-111.9475287	18	16	Iron wood	Good	PA
290	2		33.43113133	-111.947335	18	14	Iron wood	Good	PA
291	2		Missing	Missing	9	1	Mesquite	Fair	PR6
292	2		Missing	Missing	8	3	Mesquite	Good	PR6
293	2		33.4310925	-111.947086	7	1	Mesquite	Good	PR6
294	2		Missing	Missing	7	1	Parkinsonia microphylla	Good	PAI3
295	2		Missing	Missing	9	2	Mesquite	Fair	PR6
296	2		33.43183967	-111.9433022	25	14	Populus fremontii	Poor	PO
297	2		33.43182767	-111.9433173	15	8	Populus fremontii	Poor	PO
298	2		33.43183533	-111.9428875	12	6	Populus fremontii	Poor	PO
299	2		33.43191767	-111.9426412	10	6	Populus fremontii	Poor	PO
300	2		33.43148183	-111.942601	12	6	Umus parvifolia	Fair	ULS
301	2		33.43160683	-111.9426537	15	8	Quercus virginiana	Good	QU
302	2		33.43128683	-111.9429673	15	12	Quercus virginiana	Good	QU
303	2		33.43107233	-111.9427298	8	4	Parkinsonia florida	Fair	PAI3
304	2	Multitrunk	33.4309715	-111.9428643	8	7	Parkinsonia florida	Fair	PAI3
305	2		33.43140683	-111.943032	8	4	Parkinsonia florida	Poor	PAI3
306	2		33.43148033	-111.9427388	12	6	Prosopis velutina	Good	PR6
307	2		33.4310715	-111.9431862	40	1	Pinus eldrica	Good	PI2
308	2		33.43038017	-111.9426338	20	4	Parkinsonia microphylla	Fair	PAI3
309	2		33.43097717	-111.9410628	40	12	Quercus virginian	Good	QU
310	2		33.43068833	-111.9409477	25	15	Quercus virginian	Good	QU
311	2		33.43080183	-111.9409267	20	15	Fraxinus velutina	Poor	FR
312	2		33.4310265	-111.9409722	20	24	Fraxinus velutina	Poor	FR

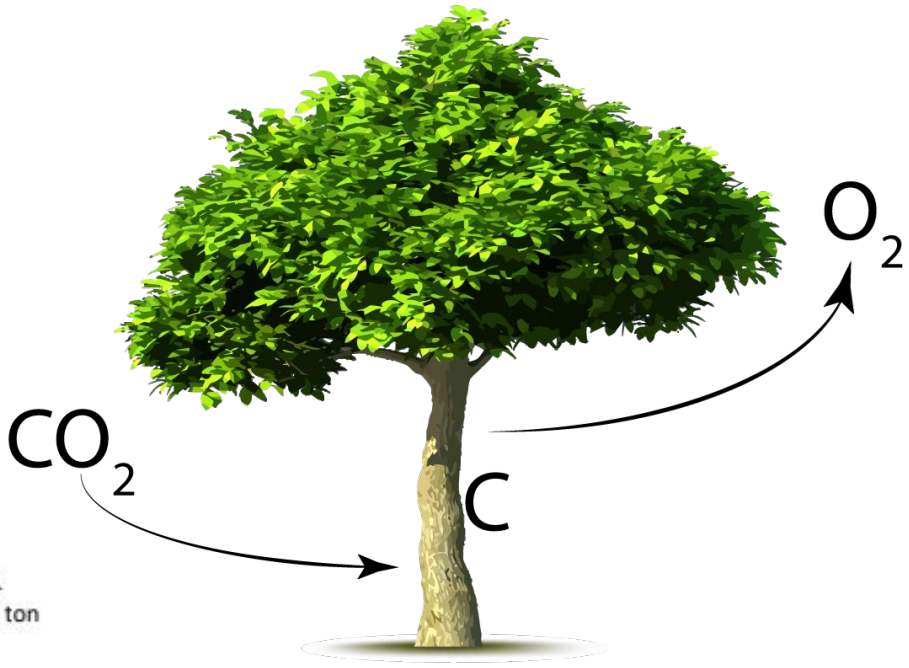
Summary

- Number of trees: 311
- Tree Cover: 4.1 %
- Most common species of trees: Prosopis, Parkinsonia, Fraxinus
- Percentage of trees less than 6" (15.2 cm) diameter: 55.3%
- Pollution Removal: 81.59 pounds/year ($203/year)
- Carbon Storage: 51.18 tons ($8.73 thousand)
- Carbon Sequestration: 2.109 tons ($360/year)
- Oxygen Production: 5.624 tons/year
- Avoided Runoff: 1.135 thousand cubic feet/year ($75.9/year)
- Structural values: $269 thousand

iTree Data - Overall Benefits

Species	Trees Number	Carbon Storage (ton)	Carbon Storage ($)	Gross Carbon Sequestration (ton/yr)	Gross Carbon Sequestration ($/yr)	Avoided Runoff (ft³/yr)	Avoided Runoff ($/yr)	Pollution Removal (ton/yr)	Pollution Removal ($/yr)	Structural Value ($)
Acacia	13	7.28	1,242.17	0.16	26.65	84.40	5.64	0.00	15.08	21,513.33
Bauhinia	2	0.00	0.13	0.00	0.13	1.30	0.09	0.00	0.23	61.92
Borassus	1	0.08	14.01	0.00	0.06	36.69	2.45	0.00	6.56	135.30
Brachychiton	1	0.07	12.64	0.00	0.85	1.93	0.13	0.00	0.34	550.83
Ceratonia	4	0.95	161.98	0.05	8.31	30.53	2.04	0.00	5.46	5,965.28
Chilopsis	4	0.22	37.71	0.02	3.78	13.93	0.93	0.00	2.49	2,565.64
Dalbergia	4	0.32	54.42	0.02	3.44	12.12	0.81	0.00	2.17	2,289.06
Ebenopsis	1	0.00	0.20	0.00	0.09	0.68	0.05	0.00	0.12	30.96
Eucalyptus	3	0.71	121.19	0.04	7.07	16.37	1.09	0.00	2.93	4,837.97
Fraxinus	39	2.97	506.25	0.15	25.83	107.54	7.19	0.00	19.22	22,560.38
Morus	1	0.10	17.88	0.01	1.52	6.14	0.41	0.00	1.10	947.09
Parrotia	4	1.95	332.60	0.09	15.12	39.40	2.63	0.00	7.04	11,782.87
Parkinsonia	76	14.28	2,436.10	0.46	78.16	279.30	18.67	0.01	49.91	57,160.79
Pinus	1	0.00	0.20	0.00	0.10	0.23	0.02	0.00	0.04	43.05
Pistacia	34	3.38	575.69	0.20	34.63	30.17	2.02	0.00	5.39	23,052.30
Populus	16	4.42	753.74	0.15	25.63	66.89	4.47	0.00	11.95	19,974.91
Prosopis	93	12.75	2,174.62	0.64	108.32	338.09	22.60	0.01	60.42	80,830.43
Quercus	6	1.20	204.63	0.07	12.71	32.65	2.18	0.00	5.83	9,027.79
Ulmus	8	0.48	81.91	0.04	7.32	36.46	2.44	0.00	6.52	5,608.98
Total	**311**	**51.18**	**8,728.06**	**2.11**	**359.71**	**1,134.81**	**75.86**	**0.04**	**202.80**	**268,938.88**

Carbon storage and gross carbon sequestration value is calculated based on the price of $170.55 per ton.
Avoided runoff value is calculated by the price $0.067/ft³. The user-designated weather station reported 7.5 inches of total annual precipitation.
Pollution removal value is calculated based on the prices of $1,379.71 per ton (CO), $1,934.60 per ton (O3), $287.54 per ton (NO2), $130.24 per ton (SO2), $274,184.42 per ton (PM2.5).
Structural value is the compensatory value calculated based on the local cost of having to replace a tree with a similar tree.
A value of zero may indicate that ancillary data (pollution, weather, energy, etc.) may not available for this location or that the reported amounts are too small to be shown.

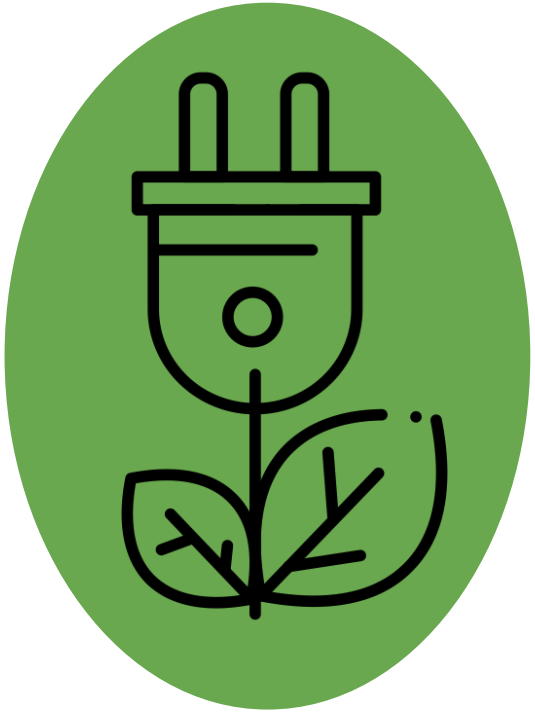


iTree Data - Structure

Species	Trees Number	SE	Leaf Area (ac)	SE	Leaf Biomass (ton)	SE	Tree Dry Weight Biomass (ton)	SE	Average Condition (%)
Prosopis	93	±0	1.631	±0.000	0.545	±0.000	25.501	±0.000	76.91
Parkinsonia	76	±0	1.347	±0.000	0.450	±0.000	28.567	±0.000	67.24
Fraxinus	39	±0	0.519	±0.000	0.208	±0.000	5.937	±0.000	68.28
Pistacia	34	±0	0.146	±0.000	0.066	±0.000	6.751	±0.000	74.78
Populus	16	±0	0.323	±0.000	0.097	±0.000	8.839	±0.000	57.81
Acacia	13	±0	0.407	±0.000	0.439	±0.000	14.567	±0.000	63.27
Ulmus	8	±0	0.176	±0.000	0.053	±0.000	0.961	±0.000	80.00
Quercus	6	±0	0.158	±0.000	0.069	±0.000	2.400	±0.000	82.50
Ceratonia	4	±0	0.147	±0.000	0.049	±0.000	1.899	±0.000	71.25
Chilopsis	4	±0	0.067	±0.000	0.022	±0.000	0.442	±0.000	77.50
Dalbergia	4	±0	0.058	±0.000	0.020	±0.000	0.638	±0.000	72.50
Parrotia	4	±0	0.190	±0.000	0.063	±0.000	3.900	±0.000	82.50
Eucalyptus	3	±0	0.079	±0.000	0.046	±0.000	1.421	±0.000	82.50
Bauhinia	2	±0	0.006	±0.000	0.002	±0.000	0.002	±0.000	82.50
Borassus	1	±0	0.177	±0.000	0.132	±0.000	0.164	±0.000	82.50
Brachychiton	1	±0	0.009	±0.000	0.004	±0.000	0.148	±0.000	62.50
Ebenopsis	1	±0	0.003	±0.000	0.001	±0.000	0.002	±0.000	82.50
Morus	1	±0	0.030	±0.000	0.011	±0.000	0.210	±0.000	82.50
Pinus	1	±0	0.001	±0.000	0.000	±0.000	0.002	±0.000	82.50
Study Area	**311**	**±0**	**5.474**	**±0.000**	**2.280**	**±0.000**	**102.351**	**±0.000**	**71.93**

About the area that can be shaded
Overall $ 268,938.88

*The structural value of the trees (Nowak et al. 2002a) is based on methods from the Council of Tree and Landscape Appraisers (CTLA 1992). Compensatory value is based on four tree/site characteristics: trunk area (cross-sectional area at dbh), species, condition, and location.

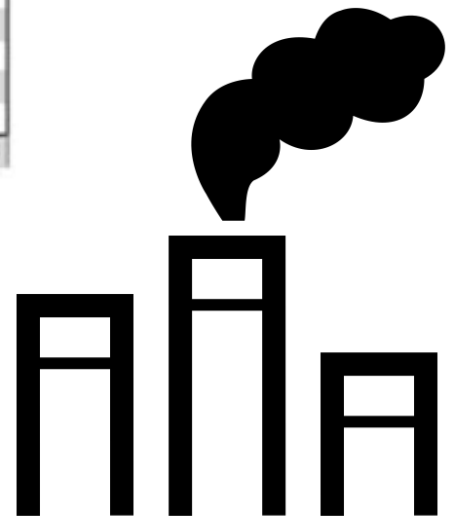


iTree Data - Air Quality

Most common parts of Air Pollutants-NO2, O3, PM2.5, SO2

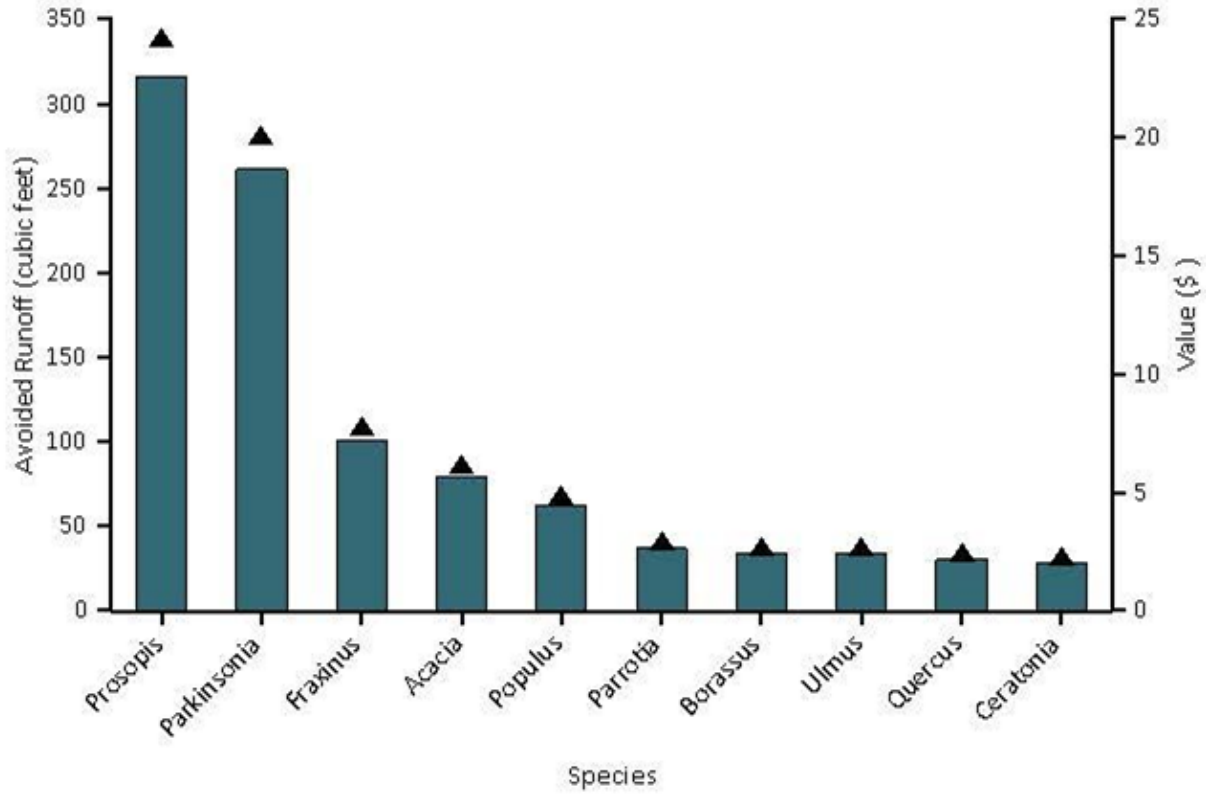
	NO2		O3		PM2.5		SO2	
	Incidence (Reduction/yr)	Value ($/yr)	Incidence (Reduction/yr)	Value ($/yr)	Incidence (Reduction/yr)	Value ($/yr)	Incidence (Reduction/yr)	Value ($/yr)
Acute Bronchitis					0.000	0.00		
Acute Myocardial Infarction					0.000	0.43		
Acute Respiratory Symptoms	0.001	0.04	0.017	1.43	0.009	0.91	0.000	0.00
Asthma Exacerbation	0.020	1.65			0.005	0.44	0.000	0.03
Chronic Bronchitis					0.000	1.45		
Emergency Room Visits	0.000	0.01	0.000	0.00	0.000	0.00	0.000	0.00
Hospital Admissions	0.000	1.16	0.000	0.33			0.000	0.06
Hospital Admissions, Cardiovascular					0.000	0.08		
Hospital Admissions, Respiratory					0.000	0.03		
Lower Respiratory Symptoms					0.000	0.01		
Mortality			0.000	52.27	0.000	139.66		
School Loss Days			0.004	0.39				
Upper Respiratory Symptoms					0.000	0.00		
Work Loss Days					0.002	0.26		
Total	**0.021**	**2.86**	**0.021**	**54.43**	**0.016**	**143.28**	**0.000**	**0.08**

EPA Environmental Benefits Mapping and Analysis Program http://www.epa.gov/airquality/benmap/index.html
Incidence: the total number of adverse health effects avoided in a year due to a change in pollution concentration
Value: the economic value that is associated with the incidence of adverse health effects



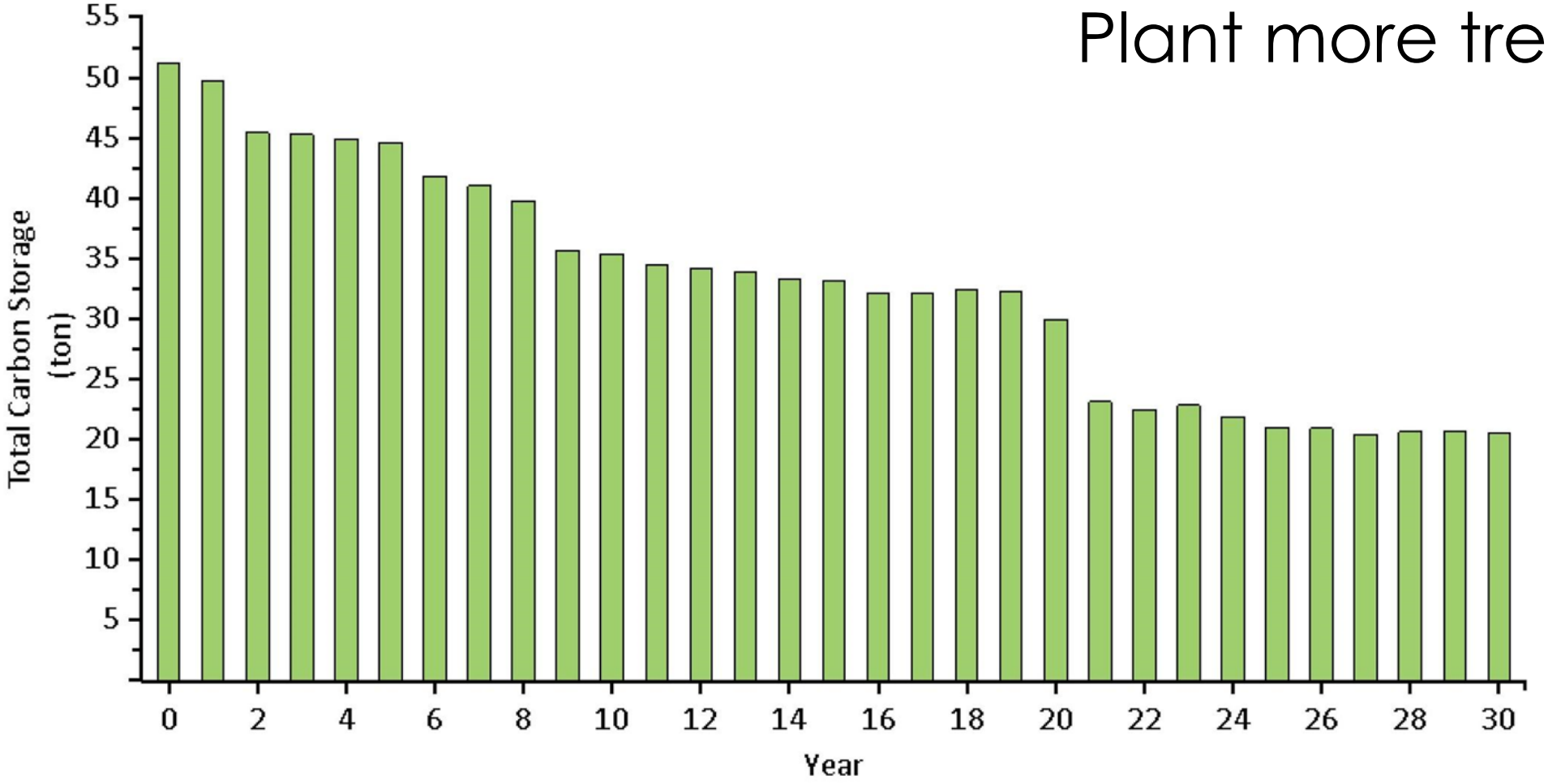
Overall reduce 0.058 ton/year , save $203

iTree Data - Avoided Runoff



Reduce 1135 cubic feet/year , save $75.9/year

30-years Forecast
Carbon Storage

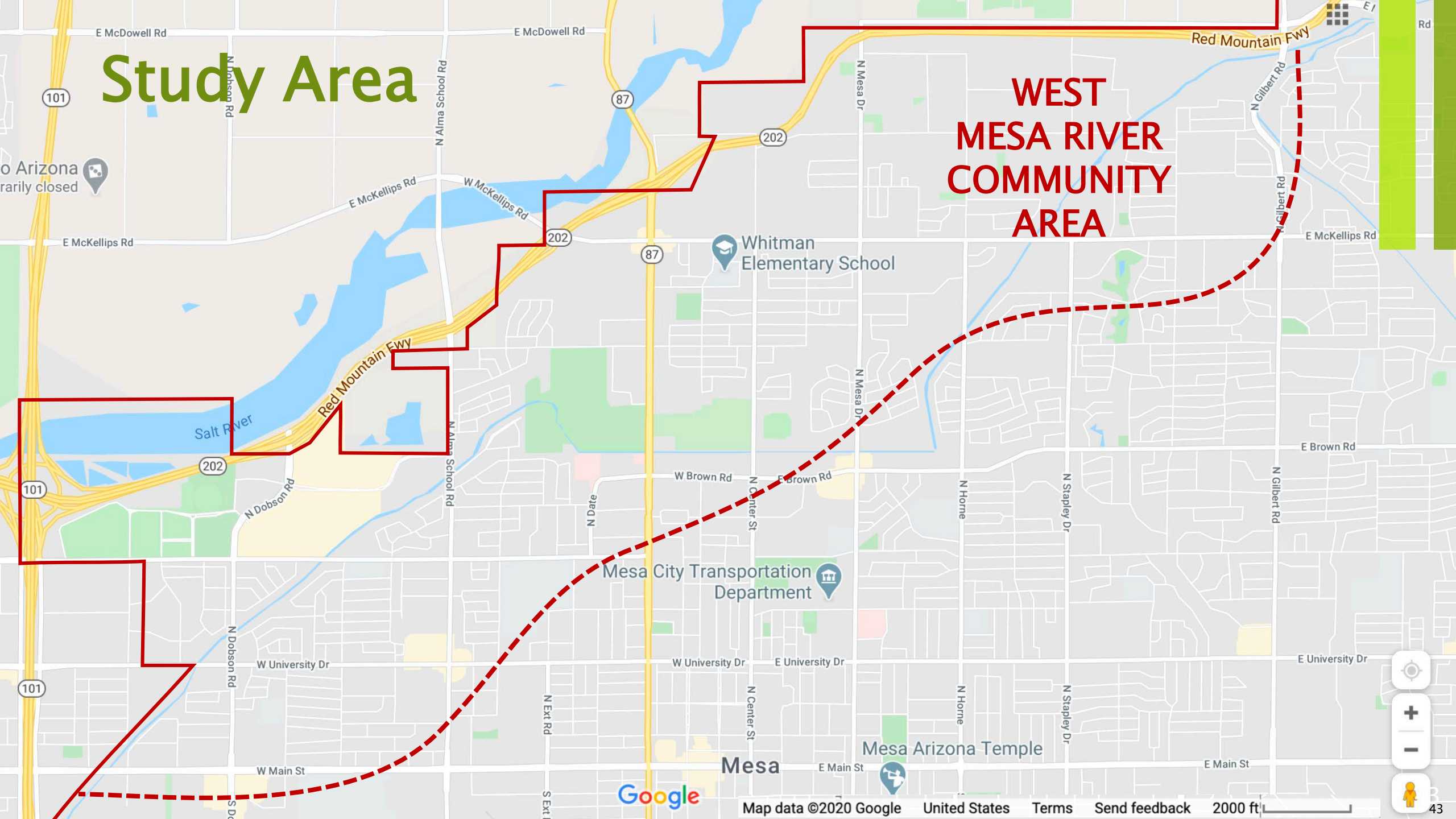


Plant more tree!!!

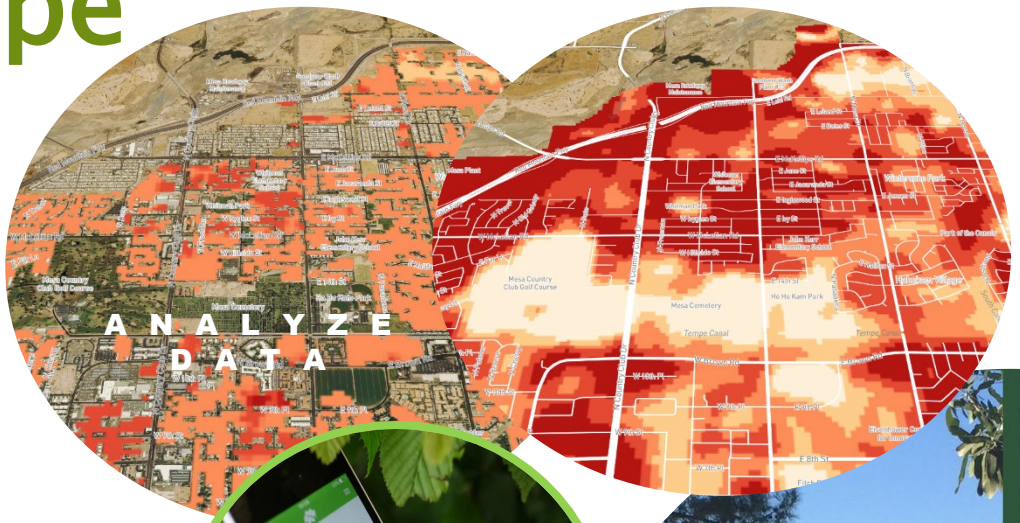
how it is being done in the community

OVERALL PROJECT GOALS:

1. **align with Nature's Cooling System (NCS) framework**
2. **expand reach and impact of NCS framework**, making it a standard, contributes to NCS "community of practice"
3. **facilitate community learning** about heat and community advocacy through action (i.e. tree planting)
4. **build capacity of frontline communities** and local non-profits
5. **connect dots** (grassroot projects) to City led investments/policy (e.g. Edison Eastlake)
6. **link local actors + actions** to regional heat action groups to nurture new leaders, grow, and diversify the coalition and reach new audiences

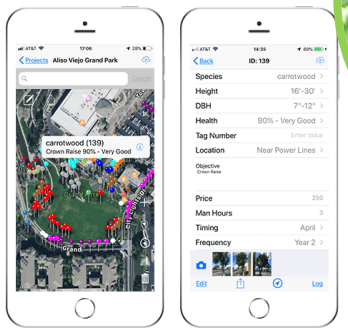

Study Area
WEST MESA RIVER COMMUNITY AREA
E McDowell Rd
N Dobson Rd
N Alma School Rd
101
87
202
Red Mountain Fwy
N Mesa Dr
N Gilbert Rd
E McKellips Rd
W McKellips Rd
Whitman Elementary School
Salt River
N Dobson Rd
W Brown Rd
E Brown Rd
N Center St
N Horne
N Stapley Dr
Mesa City Transportation Department
W University Dr
E University Dr
N Ext Rd
Mesa
Mesa Arizona Temple
W Main St
E Main St
Google
Map data ©2020 Google
United States
Terms
Send feedback
2000 ft

Scope


ANALYZE
DATA


Arizona's Heat
Past, Present, & Future
COMMUNITY
WORKSHOPS

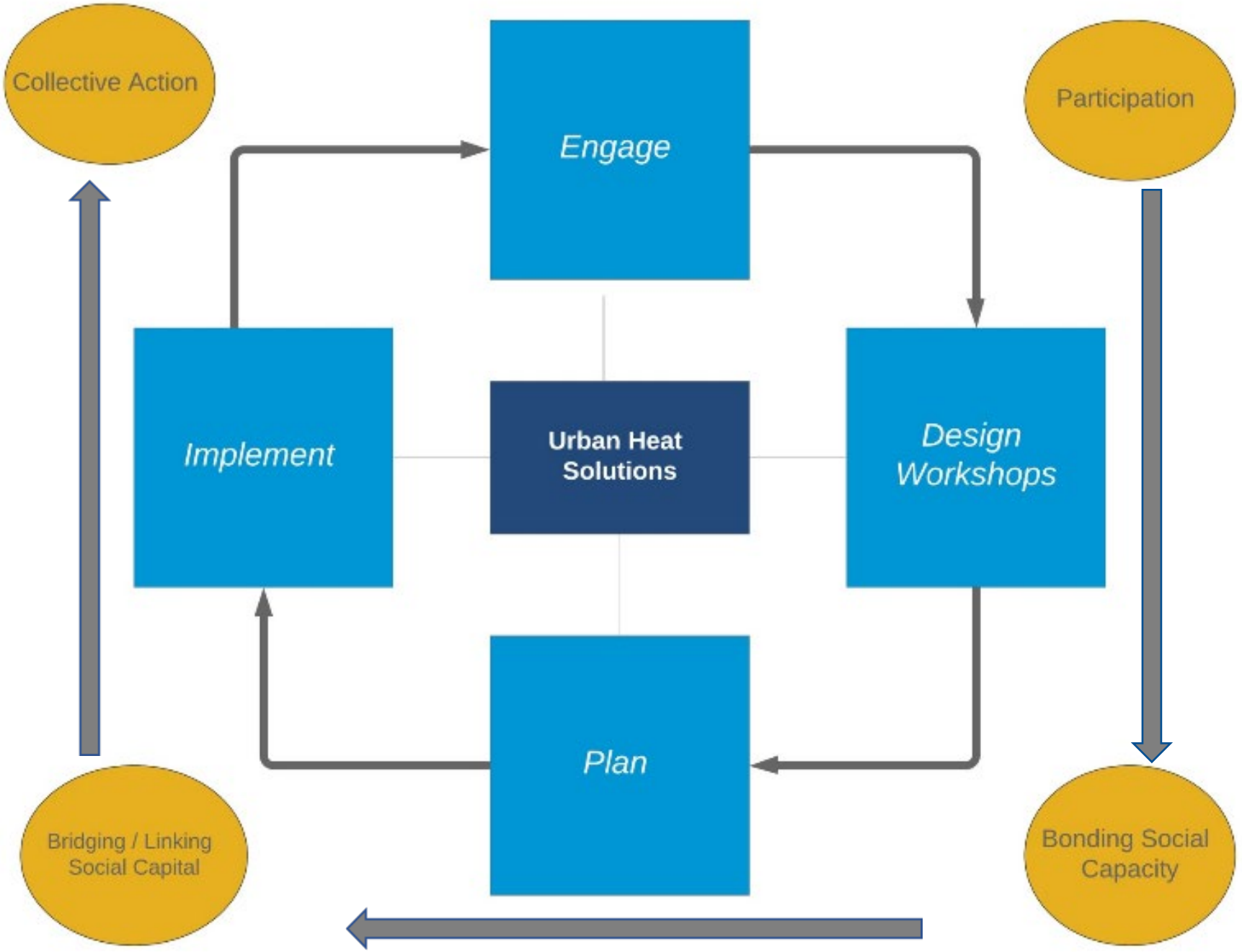

INVENTORY
CANOPY




IMPLEMENT
NATURAL
CANOPY


ENGAGE
YOUTH

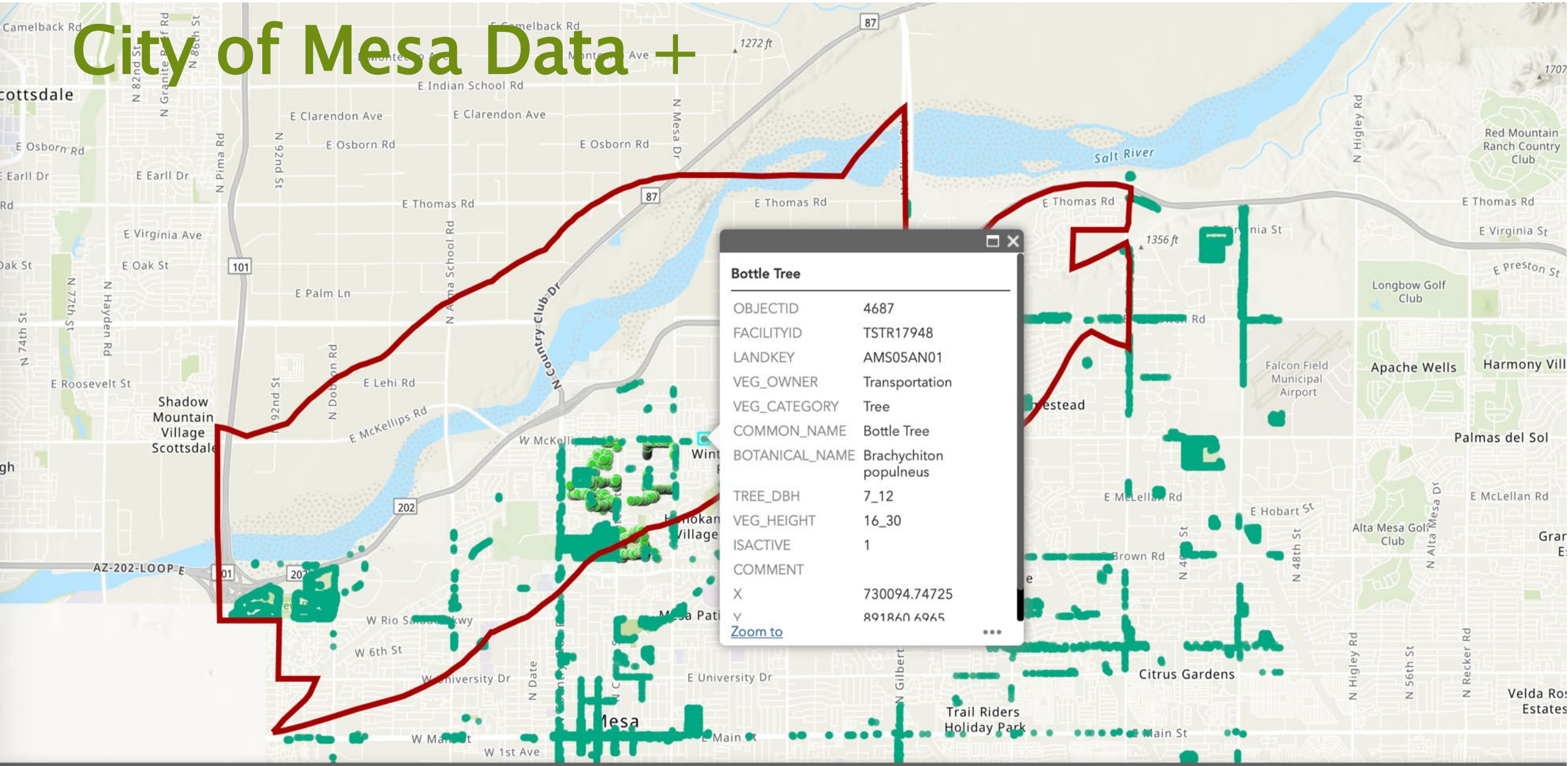

URBAN
OFFSETS
MEASURE
CANOPY



Nature's Cooling Systems Methodology

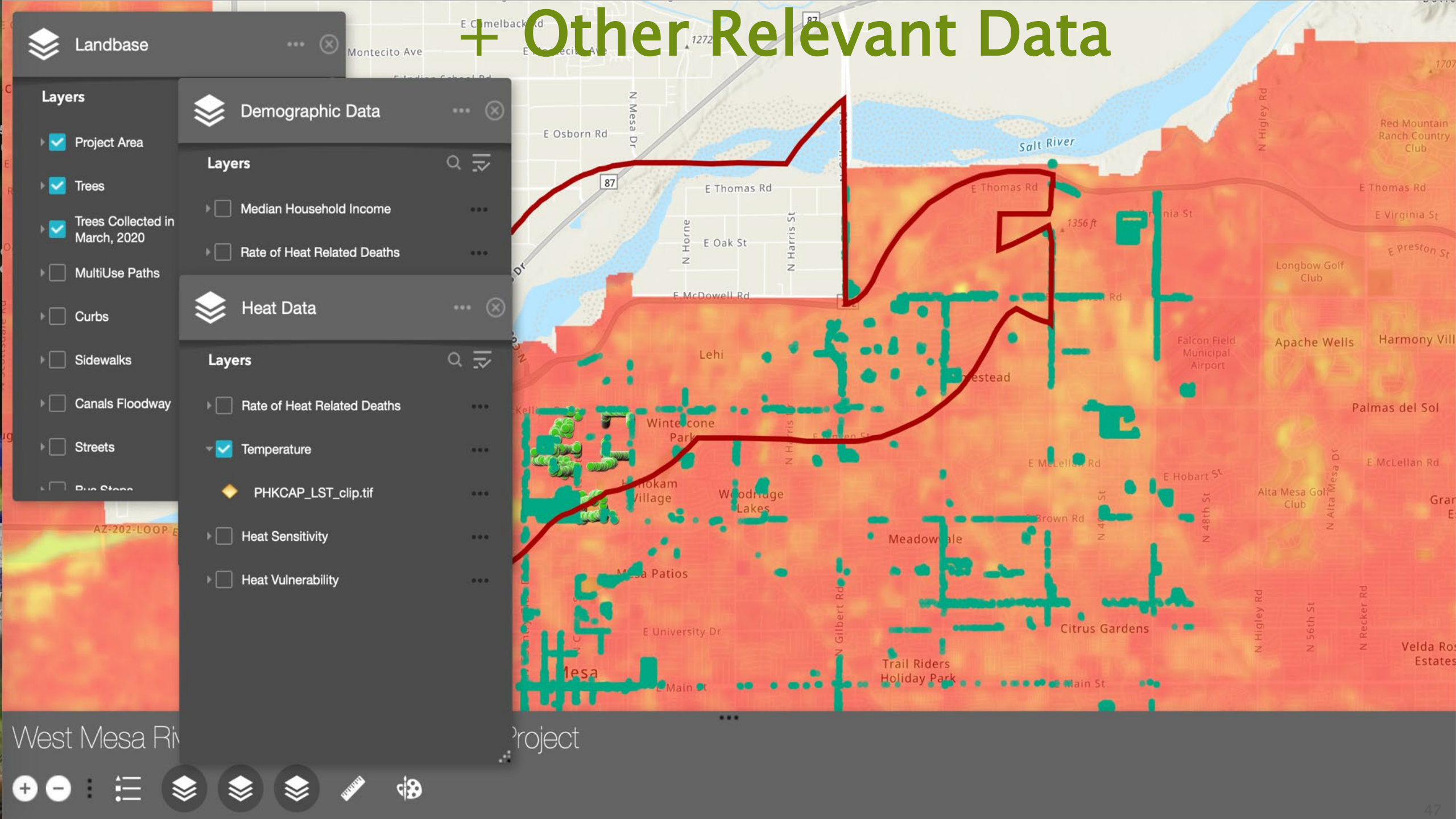
Adapted from Semenza, 2007

City of Mesa Data +



West Mesa River Community Heat Action Project

+ Other Relevant Data



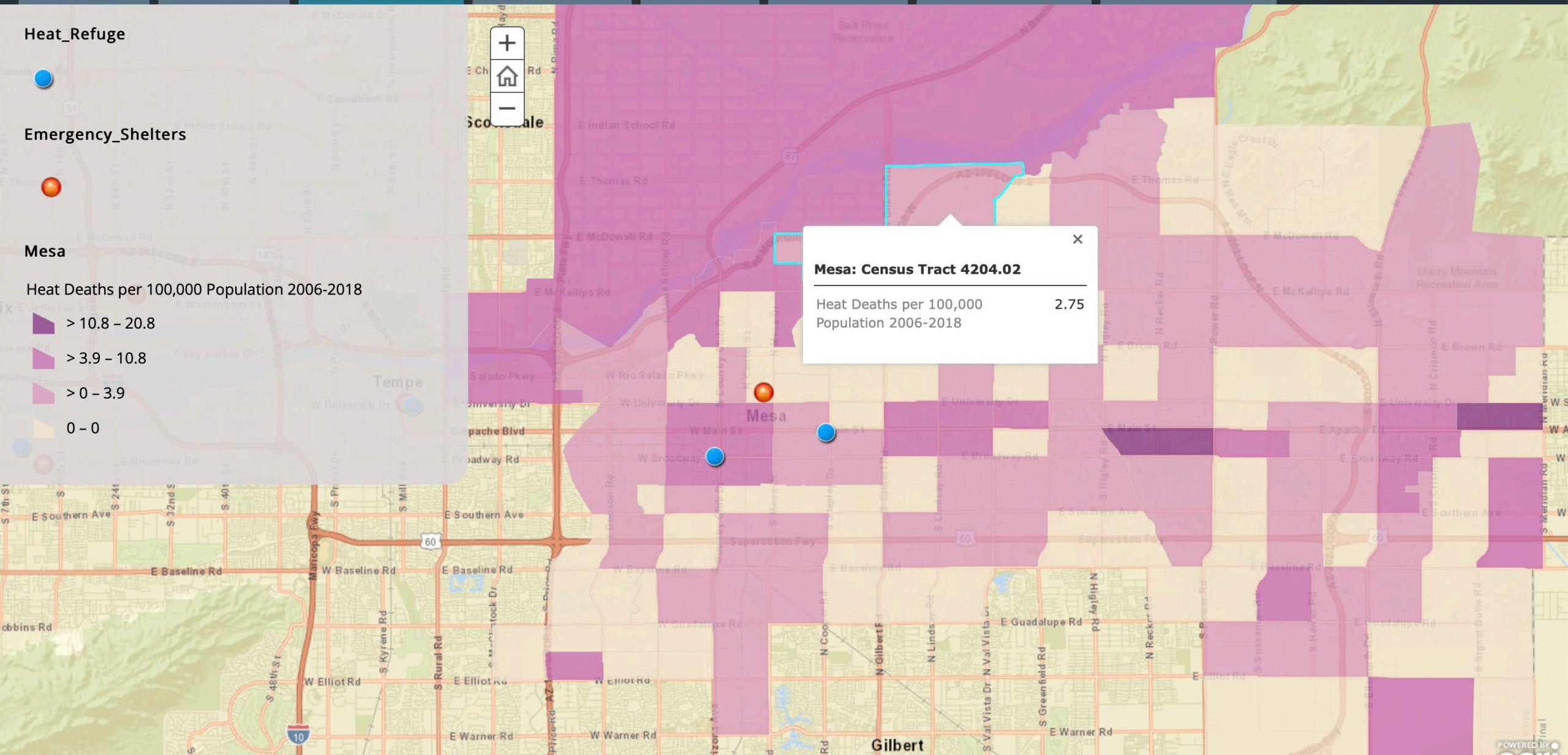
Mesa

+ Other Relevant Data

A Story Map

esri

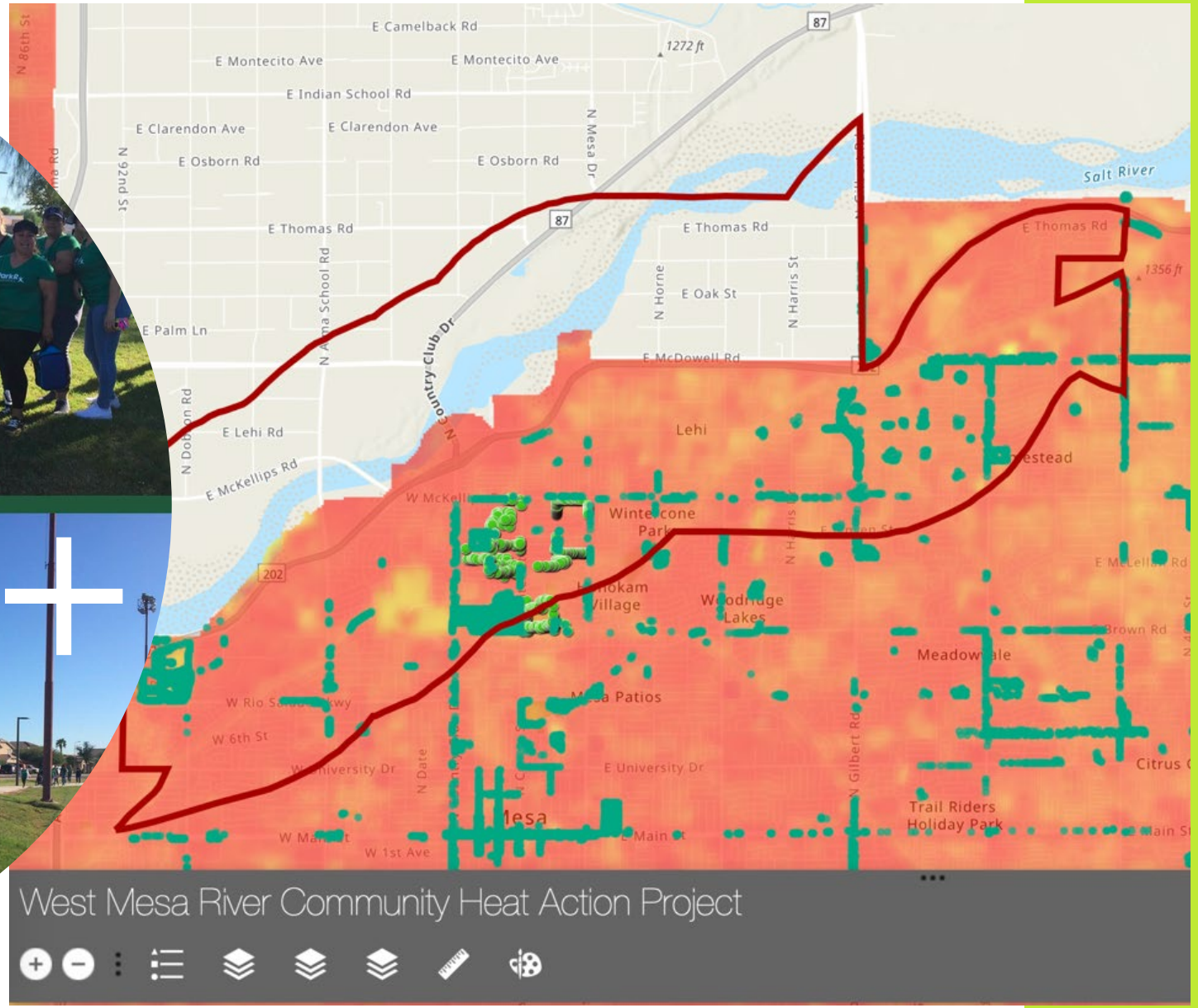
Mesa - Poverty | Mesa - Asthma | Mesa - Heat Deaths | Mesa - Heat Illness | Mesa - COPD | Mesa - Diabetes | Mesa - Mental Illness | Mesa - Heart Disease



Data Collection / Existing and Missing


Shade = MRT 79.1F
Sun = MRT 106F
MRT Difference = 26.9F
BUS
Country Spa
Live Oak
Bus Stop on northeast corner of N. Country Club & W. Brown

Community-Centered, Neighborhood Selection



ufrt

the urban forestry roundtable (ufrt)

The **Phoenix** Metro **Urban Forestry Roundtable** consists of nonprofits, private sector entities, cities, county and state level representatives, and university stakeholder all focused on solving the underlying challenges needed to improve the tree canopy in **Arizona**.

https://www.azsustainabilityalliance.com › Portfolio

URBAN FORESTRY - Arizona Sustainability Alliance

About featured snippets • Feedback

URBAN FOREST ROUND TABLE - TREE INVENTORY TOOL

The purpose of the Urban Forestry Roundtable Data Subgroup is to work with its voluntary participants to collect and consolidate relative urban forestry data, resources, and management practices that will help support a more regional, collaborative approach to urban forestry planning, expansion, and informed decision making.

What is Urban Foresty?

Urban forestry is the as the planting, maintenance, care and protection of tree populations in urban settings. Urban forestry is an important tool for the health of city residents and the natural environments around them. Phoenix once was called the "Valley of gardens and trees" due to its once abundance of green (Gardiner, 2017). Arizona hosts urban forests comprised of trees and vegetation in urban areas that provide environmental services such as shading and cooling properties, provide wildlife habitat, clean the air of pollutants and slow stormwater runoff (Department of Forestry and Fire Management, 2020).

Urban forests in the state are typically composed of a mix of native and introduced tree species. Planting nonnative the Valley, an arid region, leads to more water being needed in their maintenance. The benefit of native species is there adaptation to the hot, often dry environments. Approximately 6,016 square miles of Arizona land are classified as "urban" or "community", which supports an estimated 47.2 million trees (Department of Forestry and Fire Management, 2020).

Urban forestry benefits according to the City of Phoenix include:

1. Healthy trees have been found to increase surrounding property values by 2-10%
2. Apartments and homes located near a park have even higher values
3. Evapotranspiration and shade that trees provide help to cool down buildings and reduce the need for air conditioning, which in turn decreases energy consumption
4. Using less energy leads to direct costs savings for building owners and resource savings for the community at large

Trees provide significant storm water retention benefits by absorbing rainfall and by increasing the ability of soil to store water. Large trees take in over 2,000 gallons of rainfall annually. Trees improve air quality by catching particulate matter and absorb gaseous pollutants like NO2, SO2, and O3. They also help reduce atmospheric CO2 levels by capturing and storing it.

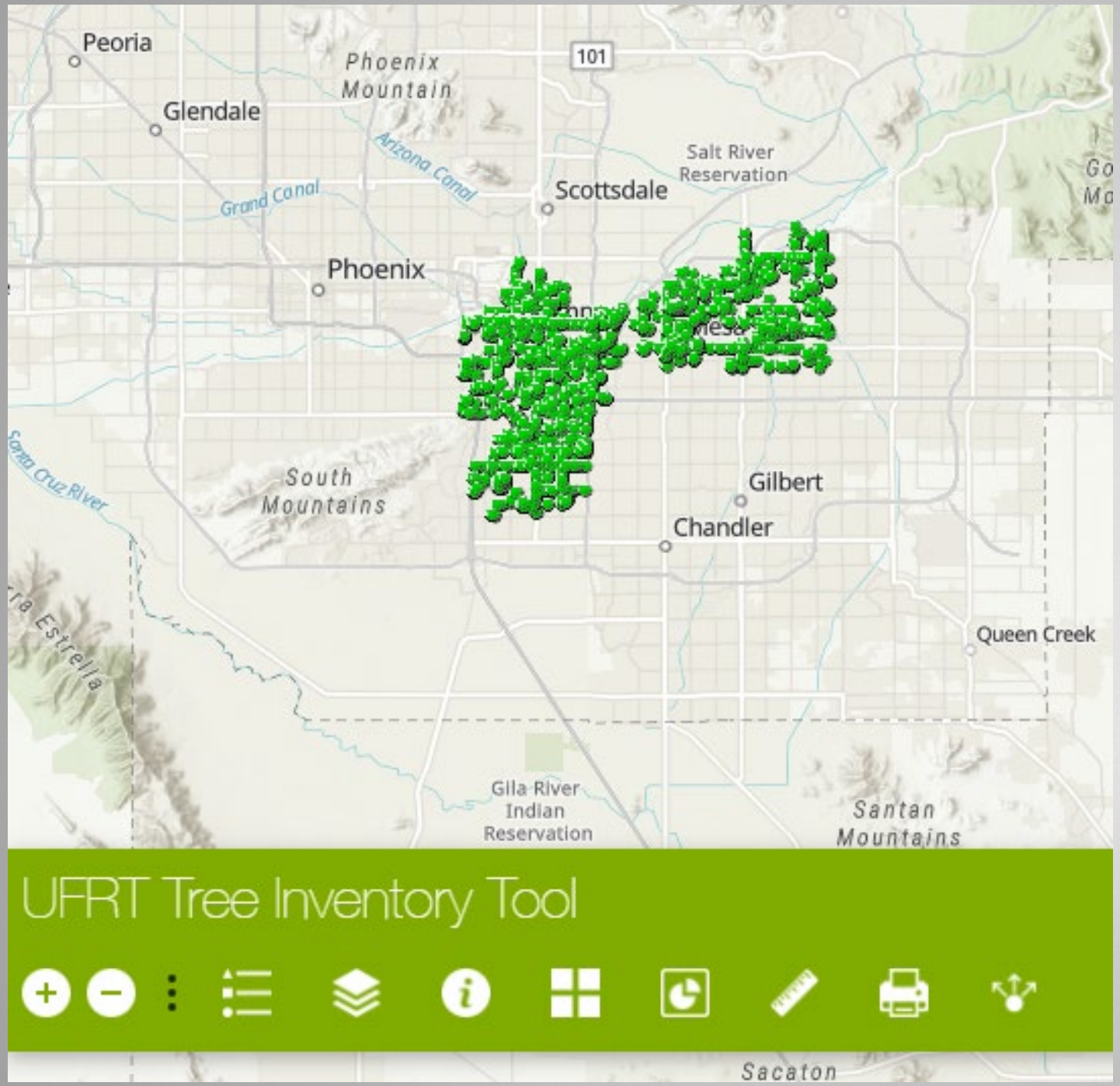
Every year trees in Arizona's urban areas store about 9 metric tons of carbon and remove about 297,000 metric tons of carbon and 8,760 metric tons of air pollution. Arizona's urban trees offset the carbon dioxide production of about 62,500 passenger vehicles per year (Department of Forestry and Fire Management, 2020).

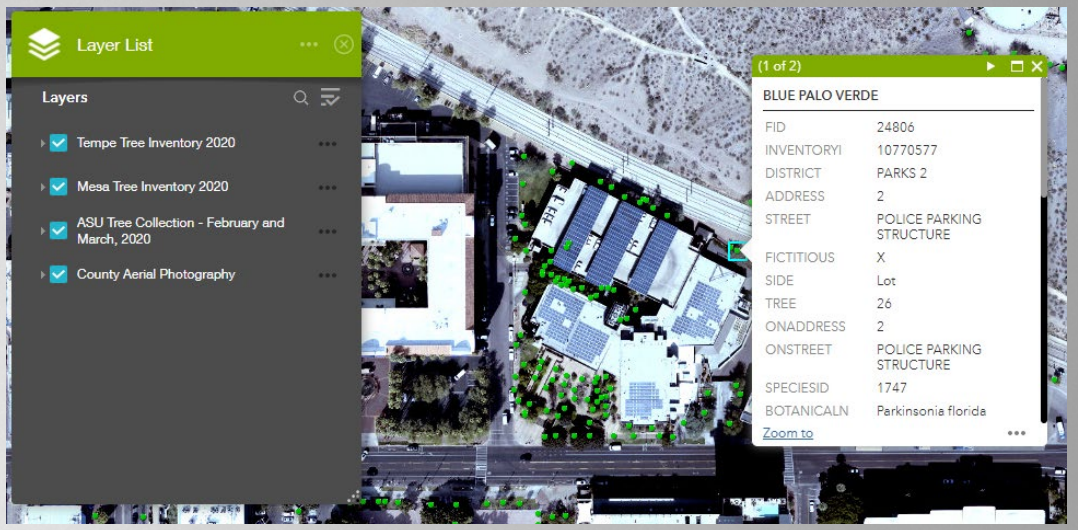
A national survey reported that communities in the Desert Southwest region spent an average of about $4.62 per tree yearly for street and park tree management. Due to the region's arid climate, newly planted trees require irrigation for three to five years and few thrive without irrigation after establishment. Once planted, trees typically require about 1,000 gal per year during the establishment period and 4,000 gal per year as they mature. (Forest Service, 2004).

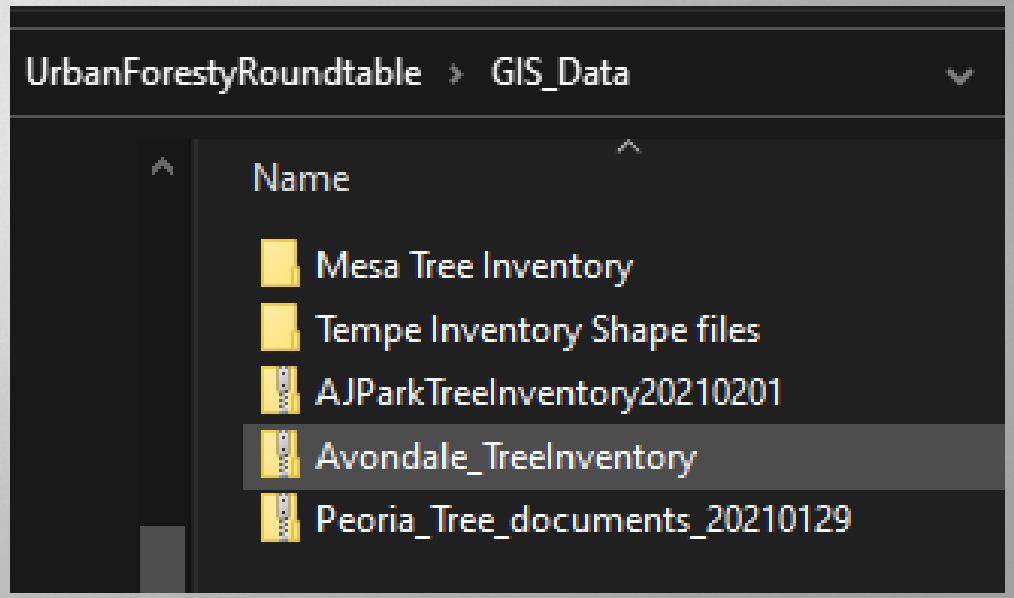
☐ Do not show this splash screen again.

OK

ufrt


Peoria
Glendale
Phoenix Mountain
101
Arizona Canal
Grand Canal
Salt River Reservation
Scottsdale
Phoenix
South Mountains
Gilbert
Chandler
Queen Creek
Santa Cruz River
Gila River Indian Reservation
Santan Mountains
Sacaton
UFRT Tree Inventory Tool


Layer List
Layers
Tempe Tree Inventory 2020
Mesa Tree Inventory 2020
ASU Tree Collection - February and March, 2020
County Aerial Photography
(1 of 2)
BLUE PALO VERDE
FID 24806
INVENTORYI 10770577
DISTRICT PARKS 2
ADDRESS 2
STREET POLICE PARKING STRUCTURE
FICTITIOUS X
SIDE Lot
TREE 26
ONADDRESS 2
ONSTREET POLICE PARKING STRUCTURE
SPECIESID 1747
BOTANICALN Parkinsonia florida
Zoom to


UrbanForestyRoundtable
GIS_Data
Name
Mesa Tree Inventory
Tempe Inventory Shape files
AJParkTreeInventory20210201
Avondale_TreeInventory
Peoria_Tree_documents_20210129

final thoughts

Exposure to forests and trees:

- boosts the immune system.
- lowers blood pressure.
- reduces stress.
- improves mood.
- increases ability to focus, even in children **with** ADHD.
- accelerates recovery from surgery or illness.
- increases energy level.
- improves sleep.

https://www.dec.ny.gov › lands

Immerse Yourself in a Forest for Better Health - NYS Dept. of ...

About featured snippets • Feedback

final thoughts

"A plant appraiser's responsibility is to provide an independent, objective, and impartial result without discrimination or accommodation of personal interests." – ISA

"Appraisal is a systematic process that uses both quantitative analysis and qualitative judgment to develop and communicate an assignment result of either a cost or a value." – ISA

Table 3.1 Questions that will be answered during the appraisal process. Each answer provides context for the problem and assignment. As more questions are addressed, the context becomes more specific.

Who
- Who will be preparing the appraisal?
- Who will be collecting the data?
- Who is the owner of the tree/landscape being appraised?
- Who is the client?
- Who are the intended users of the appraisal?
- Who are any other parties involved in this situation?

What
- What are the characteristics of the item being appraised?
- What is the intended use of the appraisal?
- What is the definition of the cost or value to be estimated?
- What approaches, methods, and techniques are relevant to the problem?
- What data are needed to develop the appraisal?
- What are limitations to developing the appraisal?
- What are the relevant dates associated with the appraisal?
  (effective valuation date, inspection date, date analysis was completed, date report was completed)

Where
- Where is the item located? (community, neighborhood, site description)
- Where is the item present, or has it been moved elsewhere?

Why
- Why is the appraisal needed?
- Why were specific approaches, methods, or techniques employed?

final thoughts

"Under ideal circumstances, a plant selection for a specific site should maximize benefits and minimize liabilities." - ISA

"How effectively plants achieve their purpose (function) is generally evaluated by professional judgment. Programs such as i-Tree Eco, however, can quantify the value of benefits such as the removal of atmospheric contaminants or energy conservation." - ISA

Table 4.1 Assessment of plant condition considers health, structure, and form. Each may be described in rating categories that can be translated into a percent rating.

Rating category	Condition components			Percent rating
	Health	Structure	Form	
Excellent	High vigor and nearly perfect health with little or no twig dieback, discoloration, or defoliation.	Nearly ideal and free of defects.	Nearly ideal for the species. Generally symmetric. Consistent with the intended use.	81% to 100%
Good	Vigor is normal for the species. No significant damage due to diseases or pests. Any twig dieback, defoliation, or discoloration is minor.	Well-developed structure. Defects are minor and can be corrected.	Minor asymmetries/deviations from species norm. Mostly consistent with the intended use. Function and aesthetics are not compromised.	61% to 80%
Fair	Reduced vigor. Damage due to insects or diseases may be significant and associated with defoliation but is not likely to be fatal. Twig dieback, defoliation, discoloration, and/or dead branches may comprise up to 50% of the crown.	A single defect of a significant nature or multiple moderate defects. Defects are not practical to correct or would require multiple treatments over several years.	Major asymmetries/deviations from species norm and/or intended use. Function and/or aesthetics are compromised.	41% to 60%
Poor	Unhealthy and declining in appearance. Poor vigor. Low foliage density and poor foliage color are present. Potentially fatal pest infestation. Extensive twig and/or branch dieback.	A single serious defect or multiple significant defects. Recent change in tree orientation. Observed structural problems cannot be corrected. Failure may occur at any time.	Largely asymmetric/abnormal. Detracts from intended use and/or aesthetics to a significant degree.	21% to 40%
Very poor	Poor vigor. Appears to be dying and in the last stages of life. Little live foliage.	Single or multiple severe defects. Failure is probable or imminent.	Visually unappealing. Provides little or no function in the landscape.	6% to 20%
Dead				0% to 5%

final thoughts

Tree Shade Coverage Optimization in an Urban Residential Environment – Abstract

Shade provided by trees, shrubs and other vegetation serves as a natural umbrella to mitigate insolation absorbed by features of the urban environment, especially building structures. For a desert community, tree shade is a valuable asset, contributing to energy conservation efforts, improving home values, enabling cost savings, and promoting enhanced health and well-being. 7 Therefore, maximizing tree shade coverage is an important component in creating an eco-friendly and sustainable urban environment. Strategic placement of trees enhances tree shade coverage of buildings. This paper details an optimization method to simultaneously maximize tree shade coverage on building facades and open structures and to minimize shade coverage on building rooftops in a 3-dimensional environment. This method **integrates geographic information systems and spatial optimization approaches** for placing trees that provide the greatest potential benefit to a building. A residential area in Tempe, Arizona is utilized to demonstrate the capabilities of the method. The optimization results show that two trees can provide up to 22.20 m2 shade coverage at 12:00 across a 54 m2 south-facing façade. This research offers a method to help homeowners, urban planners, and policy makers to quantitatively evaluate shade coverage from trees for building structures in a residential environment.

- Qunshan Zhao, Elizabeth A. Wentz, & Alan T. Murray (2019)

final thoughts

"With what you saw here today, how can you revolutionize your tree inventory process, so that you can optimize the benefits of technology?"

"With an existential environmental crisis on our hands, how can we responsibly educate future generations on the importance of trees and urban forestry?"

"In some circles GIS means *get it surveyed*. To that notion, there is no time to waste. It is time for you to inventory your neighborhoods, communities, and other communal 3rd places for better future decision making and environmental maintenance!!!"