CHICAGO REGION TREES INITIATIVE

Our Trees.
Our Communities.
Our Future.

Size Matters:
Big Trees are Exponentially Better

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Chicago Region Trees Initiative

CRTI: Chicago Region Trees Initiative

Vision: The Chicago region will be the most verdant, most livable, most resilient region in North America

Mission: CRTI believes that trees are critical to achieving this vision.

- Trees are healthier and more abundant, diverse, & equitably distributed
- Provide benefits to all people and communities that live in the region
- 4 goals
  - Inspire people to value trees
  - Increase the Chicago region's tree canopy
  - Reduce threats to trees
  - Enhance oak ecosystems

Why Trees?

Social:

- Appreciated by people
- Increased beauty & aesthetics
- Increased social connections
- Reduced crime rates
- Increased property value

Financial:

- Return on investment -- $1.37-$3.09 for every dollar spent on tree planting
- Shaded streets and reduced impact on pavement
- Increased sale price of a home
- Reduced summertime energy use by 5-25%
- Reduced urban heat island effects
- Removed 711,000mT of CO, NO_2, O_3, PM_{10}, SO_2, valued at $3.8 billion

Physical / mental health:

- Faster healing
- Reduced blood pressure
- 7 years younger & $10,000 richer
- Increased physical activity
- Reduced likelihood of being overweight
- Reduced symptoms of ADD/ADHD in children
- Increased self-discipline in young girls (7-12 years old)

Stormwater:

- Reduced runoff
- Intercepted stormwater
- Slowed precipitation
- Sequestered pollutants

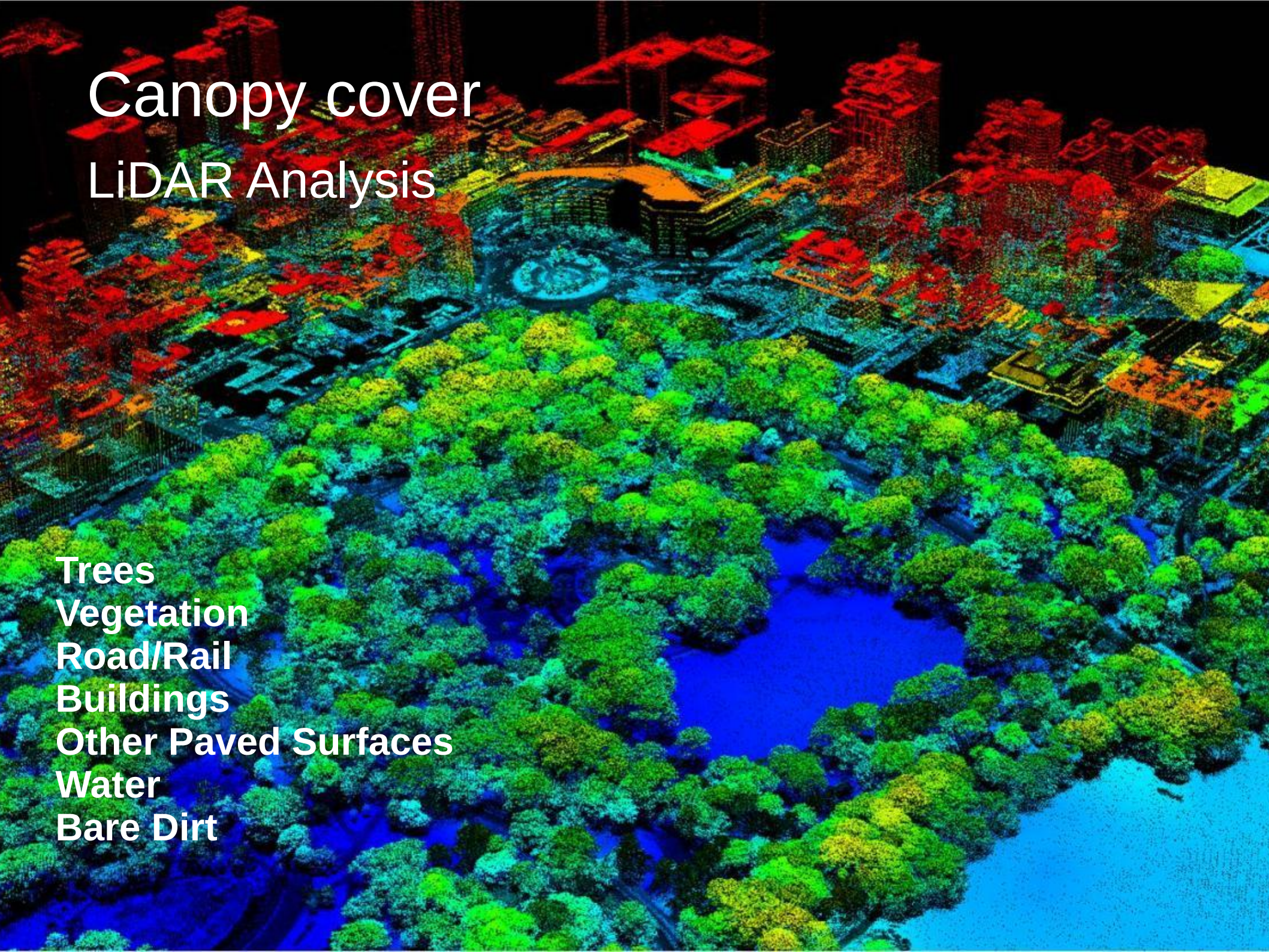
Why Big Trees?

First, a look at how we measure trees:

- DBH: diameter at breast height
- Canopy cover
  - Overhead perspective
- Rangefinders
- Other demographic data
  - Age, species, condition, etc.
- Urban trees = no age, no height

Measuring Trees: Making data usable

- Tree inventories
- LiDAR
- Ground-truthing / tree census
- Size classes
- Comparing to socioeconomic data


Canopy cover
LiDAR Analysis
Trees
Vegetation
Road/Rail
Buildings
Other Paved Surfaces
Water
Bare Dirt

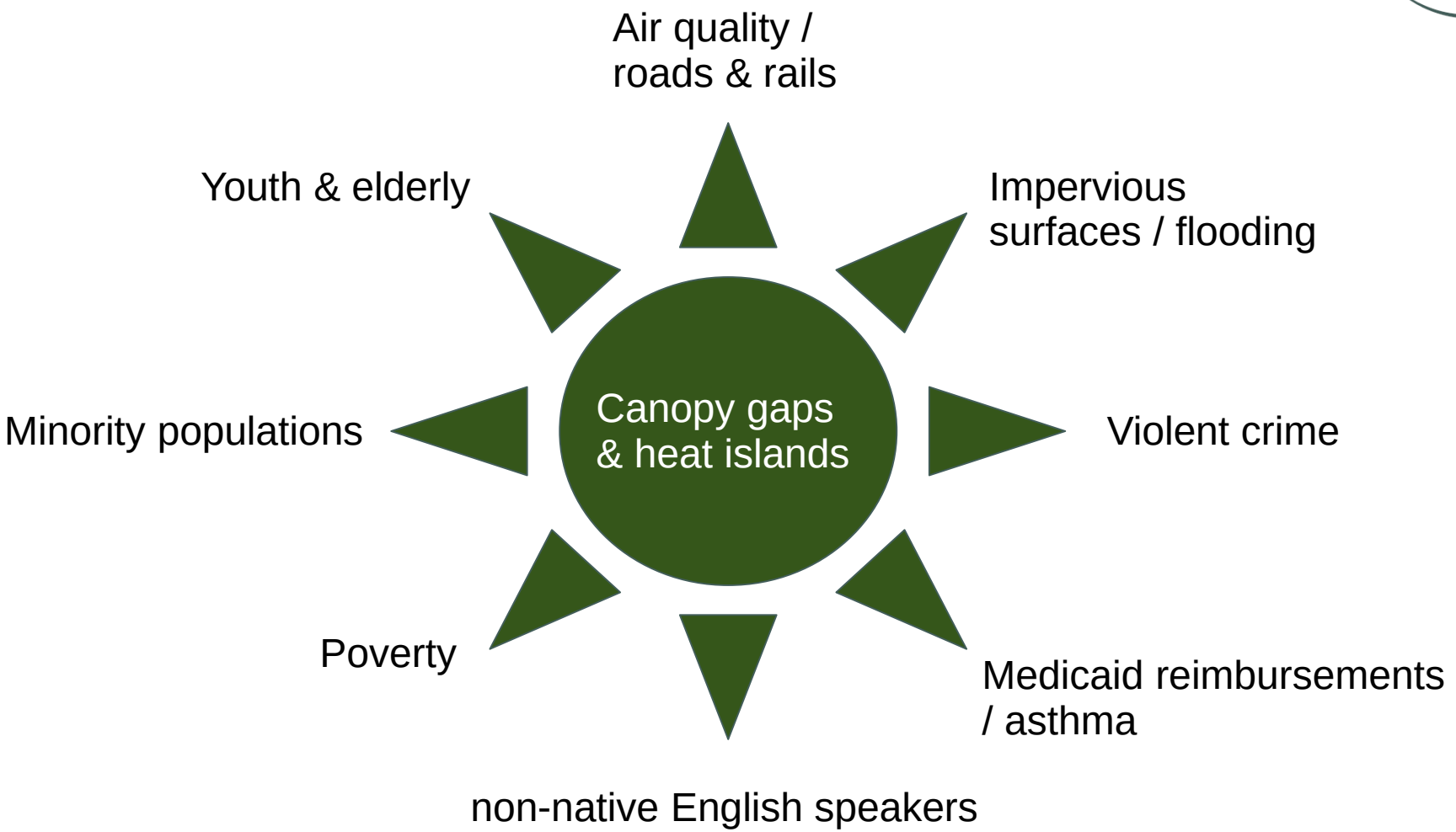
Chicagoland's Trees: 7 counties

- 157,142,000 trees
  - 14 million lost
- 15.5% tree canopy cover
- Pollution removal: 18,080 tons / year
  - $137 million / year
- Full value: $51.2 billion / year

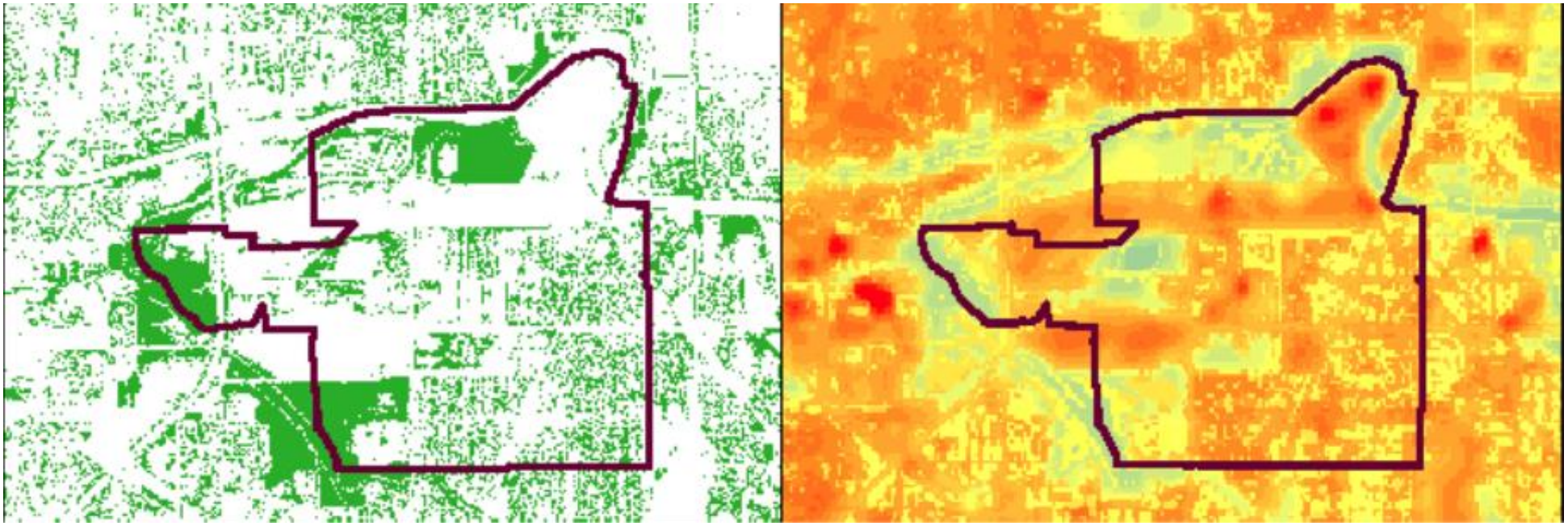
Cook County

- 28% tree canopy cover
- 32% buckthorn
- Chicago = 19%

Data Comparison: Vulnerabilities



Data Comparison: Heat Islands



Data Comparison: Vulnerabilities

	A	B	C	D	E	F	G	H	I	J	K	M	N	O	Q	T	U
1	Municipality	PopDensity	HousingDe	No English	Percent Poverty	Median Househ	Percent on foodstan	Percent unemp	Percent minority	Total medicaid	EPAToxins	Impervious	Temperature	Vulnerable populatic	zcanopy	Priority	Rank
2	Addison	3,509.57	1,175.21	12.20849485	6.932294497	59,372.36	12.06626712	11.08234794	29.45261587	1,470,900.81	2.43348172056	43%	79.29	-0.00296285822	-2.102224228	1.030735515	34
3	Algonquin	2,204.39	745.86	3.21588124	2.88828898	98,061.61	2.700196377	8.605452213	13.79015665	1,499,442.52	1.37126517699	23%	75.01	-0.27859614059	-2.102224228	0.20238192	167
4	Alsip	2,776.20	1,006.81	4.181532089	6.317561041	56,138.81	12.85547439	12.54974201	29.18934788	2,142,120.52	2.81718903235	45%	79.31	-0.03592402132	-2.102224228	1.143215208	30
5	Antioch	949.20	343.22	1.140301751	6.248879032	79,061.38	7.336568754	8.525373481	10.31405072	1,399,221.06	1.32948223849	18%	72.25	-0.22293392871	-2.102224228	-0.023805561	203
6	Arlington Heights	4,740.62	1,878.31	7.082211072	3.281870144	80,706.92	4.206002887	6.264979453	12.72532817	2,205,230.94	2.30638345885	35%	78.13	-0.32967372671	-2.102224228	0.75727889	100
7	Aurora	4,001.86	1,222.00	6.20863054	5.055791391	77,260.44	11.74851278	9.427685937	33.92709416	945,950.67	1.72505472434	33%	77.09	-0.06028355789	-1.852747521	0.537690473	84
8	Bannockburn	1,875.66	530.13	1.313723894	1.572239637	145,410.22	0.748606674	4.748683036	11.17107289	1,025,061.00	2.01014185459	19%	73.03	-0.37646668469	-1.769588618	0.097335272	246
9	Barrington	1,060.27	374.32	3.398896334	4.750180895	110,146.99	3.882257596	8.945155322	14.58066284	1,877,217.55	1.62629479851	25%	73.84	-0.29853201272	-1.686429716	0.136639401	214
10	Barrington Hills	544.28	177.65	2.128456846	6.249080359	118,908.95	3.260713848	8.136121782	16.82459636	2,524,187.42	1.34926503916	3%	68.47	-0.22669196419	-1.603270813	-0.54507909	301
11	Bartlett	2,140.62	726.70	3.867980634	3.121178425	96,723.96	4.154133641	7.25114427	21.80201681	1,643,637.50	1.52181569857	21%	75.13	-0.14101773548	-1.603270813	0.144297997	136
12	Batavia	2,086.02	758.89	1.63685001	3.341470839	97,048.40	6.350695911	7.688571512	10.34028348	1,424,911.77	1.58551329716	33%	75.15	-0.36673524490	-1.520111911	0.266695902	138
13	Beach Park	1,548.28	533.29	2.908273729	4.859522752	68,695.64	9.559171814	10.10861948	36.87638414	1,947,582.31	1.26281399729	14%	71.31	-0.02639619624	-1.520111911	-0.226084044	264
14	Bedford Park	1,660.20	552.59	15.24756133	5.884212002	49,965.19	9.308889027	10.69169953	18.08997812	2,183,821.14	2.19296535078	59%	80.26	0.03219118469	-1.520111911	1.145058189	12
15	Beecher	141.22	51.12	0	4.199983199	67,980.73	3.979984079	12.5999496	6.801822792	4,095,841.62	1.01099599307	21%	74.08	-0.37699849601	-1.436953008	-0.115667402	156
16	Bellwood	7,995.54	2,552.50	2.549483362	5.829685926	52,456.47	23.42434511	15.15943331	86.49708592	1,401,514.72	2.25353135133	48%	82.81	0.01554751653	-1.436953008	1.129839034	28
17	Bensenville	2,466.35	858.69	11.28981948	7.83576289	56,050.53	13.01348646	10.48885948	36.21183229	1,399,553.69	3.51930373328	50%	80.56	0.03218287814	-1.436953008	1.330009492	11
18	Berkeley	2,934.20	1,064.61	3.51019001	3.011355971	61,838.65	11.04947228	10.29681097	51.0516409	2,825,622.99	2.74910741476	51%	80.47	-0.01863312555	-1.436953008	1.148372857	23
19	Berwyn	14,530.36	4,710.29	9.174277113	6.471836862	56,969.78	17.05906756	12.22045675	37.8404441	1,745,721.50	1.95669581764	59%	83.29	0.01388058350	-1.436953008	1.241796986	17
20	Big Rock	49.18	18.40	0.30089291	1.900886375	67,114.25	5.798422754	11.39492394	4.474664601	2,116,274.76	0.97935139287	5%	73.22	-0.67576432296	-1.436953008	-0.456795523	239
21	Bloomingdale	3,416.54	1,327.00	5.100920609	4.130992855	70,945.17	6.616855379	7.451523343	22.40698381	1,412,693.97	1.87934222297	32%	77.24	-0.12576557183	-1.353794106	0.45530126	88
22	Blue Island	4,954.41	1,731.99	7.148934194	8.417439885	39,228.71	27.28234814	15.62418315	64.7645283	1,612,560.85	2.70910549295	41%	78.09	0.03517391192	-1.353794106	0.857245088	43
23	Bolingbrook	2,974.86	904.80	5.563705314	4.648778878	92,942.76	8.248575419	7.45675182	39.02088524	975,389.78	1.68340974283	34%	77.79	-0.05162044522	-1.353794106	0.483854618	65
24	Boulder Hill	4,841.69	1,678.80	2.378898464	5.800280183	72,245.08	9.10594948	9.049381587	13.20369666	1,008,071.84	1.64506103392	33%	75.46	-0.11460113061	-1.353794106	0.315743633	147
25	Braceville	202.85	80.92	0	5.499977999	53,522.79	6.199975199	15.5999376	3.610395558	1,197,474.21	0.96699613951	0%	80.64	-0.50809794074	-1.353794106	-0.090695334	122
26	Braidwood	695.20	274.25	0.008702837	5.451934587	57,551.58	7.71105433	13.92791124	3.744979742	1,063,502.19	1.17651296685	19%	73.93	-0.50938275065	-1.353794106	-0.156648162	221
27	Bridgeview	3,462.92	1,193.73	10.8221917	6.846919523	54,281.69	10.62369773	9.164856238	15.02074364	3,070,911.74	2.41644843392	57%	81.27	0.00478000078	-1.353794106	1.18823817	13
28	Broadview	3,713.55	1,472.26	1.585228997	5.13213797	55,798.25	13.55982554	14.38752338	68.16782051	2,214,076.75	2.04513894514	59%	82.69	-0.00011799505	-1.270635203	1.192133353	16
29	Brookfield	6,145.93	2,262.25	2.572856038	4.642843092	78,093.93	7.243357849	6.915166729	9.869628899	1,675,426.59	1.92702858904	37%	78.18	-0.36122808778	-1.187476301	0.510086925	121
30	Buffalo Grove	3,599.67	1,393.59	6.509242389	2.419401618	107,320.40	2.616886918	6.485814021	19.63628913	1,407,622.43	1.97426974030	34%	78.20	-0.16857570338	-1.187476301	0.518716416	91
31	Bull Valley	362.42	134.13	2.002042847	3.323632246	83,574.66	4.70563757	11.15711647	8.012615018	1,896,726.72	1.02086246250	3%	68.45	-0.39488287702	-1.187476301	-0.740233474	298
32	Burbank	5,585.07	1,669.10	13.04036432	6.737167342	57,496.19	12.97410809	10.93621358	18.55050342	2,092,664.18	2.21052648988	50%	81.59	0.02960410447	-1.187476301	1.03109708	24
33	Burlington	57.07	20.10	0.701216118	5.292868532	81,496.54	7.717739407	11.7834976	3.339806818	1,083,717.47	0.86819512003	2%	71.23	-0.70437085352	-1.104317399	-0.710234086	253
34	Burnham	2,155.35	712.22	4.70314876	6.601566293	38,753.47	22.91847978	24.38694398	73.93312817	1,555,913.81	1.46706782095	22%	73.55	0.01859149614	-1.104317399	-0.012740028	165
35	Burr Ridge	1,617.82	629.00	3.543687588	3.477698784	103,120.04	2.102369798	6.967447464	17.47825993	2,802,164.18	1.86631769508	28%	74.04	-0.23405708980	-1.104317399	0.142759696	171
36	Calumet City	4,853.28	1,801.37	3.096892686	8.08869478	40,296.89	22.08754568	19.71752331	80.70918822	2,038,441.67	1.63389136115	39%	77.09	0.02331968800	-1.104317399	0.467765888	93
37	Calumet Park	6,877.23	2,607.93	0.899314831	7.07250401	44,443.04	18.83990541	22.45631492	88.60612227	940,983.04	1.79979100023	48%	79.87	0.01736053240	-1.104317399	0.789785593	37
38	Campton Hills	521.46	166.01	2.159121751	2.911995237	109,294.58	3.404351086	5.288466294	6.415685106	2,332,493.22	1.18310257527	8%	70.56	-0.69063883612	-1.104317399	-0.587546943	280
39	Carol Stream	4,062.24	1,462.58	4.622247727	4.562478668	82,318.16	8.70570706	8.275805323	28.56568279	1,008,225.97	1.80150367513	41%	79.98	-0.06710412010	-1.104317399	0.681295369	39
40	Carpentersville	3,002.44	896.45	12.26008019	5.823617599	73,223.29	11.58438836	10.18450832	28.69297313	1,052,485.56	1.38027999783	26%	74.84	-0.03257829852	-1.104317399	0.086331449	183
41	Cary	1,566.00	525.84	2.41042021	3.334107018	100,346.88	2.099882443	7.157338184	8.079708411	1,686,696.31	1.31819239710	26%	74.49	-0.37559471082	-1.104317399	-0.016494668	189
42	Channahon	495.66	156.70	0.533300194	2.803361313	91,667.59	2.463832884	7.921938442	8.166339879	1,034,176.75	1.28738503725	18%	72.50	-0.62745909870	-1.021158496	-0.316134777	228
43	Channel Lake	324.09	142.04	2.008844448	4.8227022	59,655.98	5.275472181	13.62188325	4.300945985	895,081.49	1.17674951336	7%	68.09	-0.53163224012	-1.021158496	-0.728847634	288
44	Chemung	135.10	42.04	10.7621634	9.465992678	49,121.03	12.6080525	11.55830258	19.2699595	1,659,408.66	0.90753489133	18%	70.89	0.06682438479	-1.021158496	-0.358156736	256
45	Chicago	11,680.34	4,398.68	8.152812858	7.756675079	46,741.24	22.31169137	15.88917792	56.63189881	1,387,166.96	2.41700730041	52%	79.60	-0.00774408913	-1.021158496	0.953961913	27
46	Chicago Heights	2,972.18	1,005.73	2.559552732	8.672272221	40,178.55	27.67701104	21.84142525	67.03862832	1,858,514.82	1.47072091427	34%	76.14	0.02315372181	-1.021158496	0.288560534	111
47	Chicago Ridge	5,583.88	2,189.32	9.58741877	5.9358774	45,494.66	16.76325523	11.77673216	17.57069544	2,735,526.30	2.57069298021	57%	80.32	-0.02217088108	-1.021158496	1.098246573	14
48	Cicero	14,394.11	3,715.90	22.29125985	8.125065747	42,590.47	25.22303051	13.93904121	47.62666739	958,693.37	2.08425801240	68%	83.14	0.07045051466	-1.021158496	1.31782895	8
49	Clarendon Hills	4,851.48	1,748.91	6.034779282	4.281404861	117,610.16	1.502761559	4.558811005	9.566080402	1,378,785.69	1.99941476914	28%	75.33	-0.54051252743	-0.937999594	0.152495952	175

Why Big Trees? (Ecologically speaking)

- Big trees are resilient & have good genes*
- Big trees support more living beings
- Big trees have more complex soil ecosystems

* not an entirely accurate statement

Why Big Trees? (Selfishly speaking)

- Trees are planted at an average 2in DBH*
- When trees are removed, they are often 10-25in DBH
- So, what's the formula?
  - 5 trees x 2in DBH = 1 tree at 10in DBH?
- Spoiler = no.

* not an entirely accurate statement

Size Matters

Size (DBH)	Total $$	CO2 $$	Annual CO2	Storm-water $$	Runoff avoided	Rainfall avoided	Air pollution $$	CO2 $$ to date	Lifetime equivalent
2 in	1.28	0.39	16	0.37	42	116	0.51	0.49	5.7
5 in	3.89	1.33	57	0.93	104	290	1.63	4.54	53.26
10 in	11.23	3.61	155	2.31	258	716	5.31	25.35	297
20 in	25.21	6.07	261	6.15	688	1908	12.99	143	1681
30 in	34.06	5.43	233	10.54	1180	3273	18.09	395	4628
40 in	37.90	7.84	337	11.66	1305	3621	18.39	809	9482

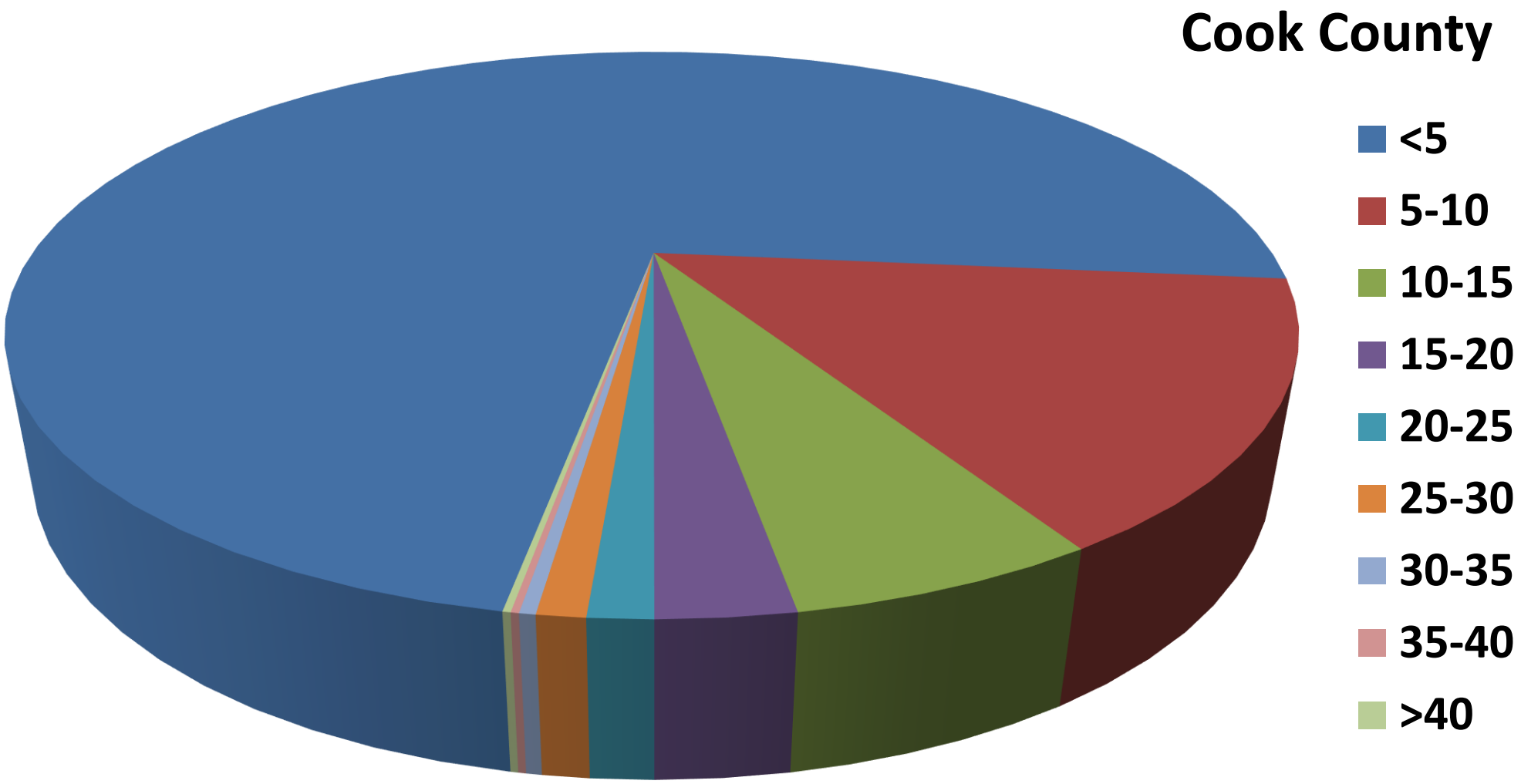
Size Matters

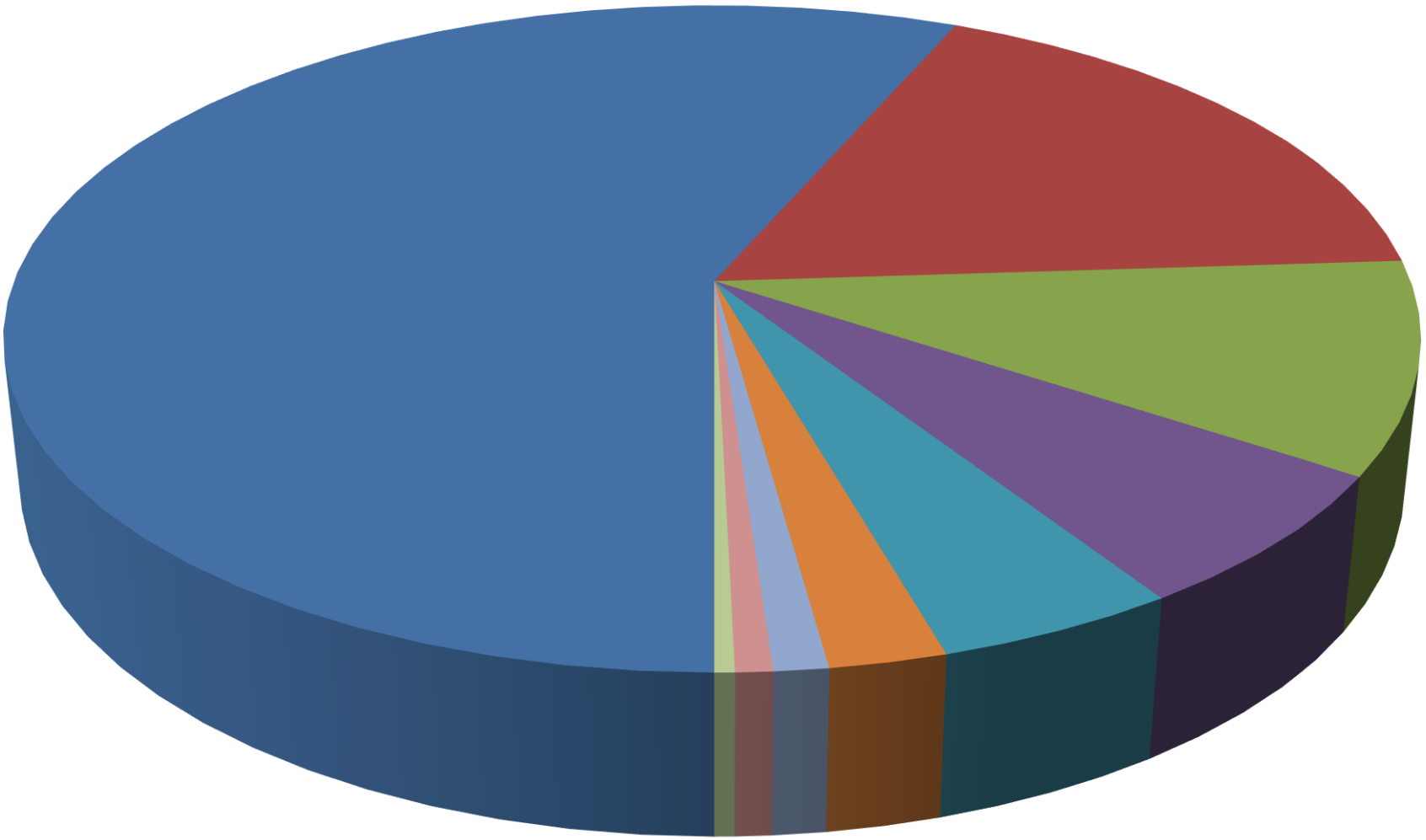
Size (DBH)	Total $$	Co-efficient	Annual CO2	Co-efficient	Storm-water $$	Co-efficient	Air pollution $$	Co-efficient
2 in	1.28	**1**	16	**1**	0.37	**1**	0.51	**1**
5 in	3.89	**1.21**	57	**1.43**	0.93	**1.01**	1.63	**1.28**
10 in	11.23	**1.75**	155	**1.94**	2.31	**1.25**	5.31	**2.08**
20 in	25.21	**1.97**	261	**1.63**	6.15	**1.66**	12.99	**2.55**
30 in	34.06	**1.77**	233	**0.97**	10.54	**1.90**	18.09	**2.37**
40 in	37.90	**1.48**	337	**1.05**	11.66	**1.58**	18.39	**1.80**

Size Matters

Size (DBH)	Total $$	CO2 $$	Annual CO2	Storm-water $$	Runoff avoided	Rainfall avoided	Air pollution $$	CO2 $$ to date	Lifetime equivalent
2 in	1.28	0.39	16	0.37	42	116	0.51	0.49	5.7
5 in	3.89	1.33	57	0.93	104	290	1.63	4.54	53.26
10 in	11.23	3.61	155	2.31	258	716	5.31	25.35	297
20 in (fair)	21.27	4.97	214	5.04	564	1565	11.27	143	1680
30 in (excellent)	34.06	5.43	233	10.54	1180	3273	18.09	395	4628
30 in (good)	33	5.15	221	10.02	1120	3109	17.44	395	4628
30 in (poor)	22.85	3.36	144	6.54	731	2029	12.96	395	4628

And yet…

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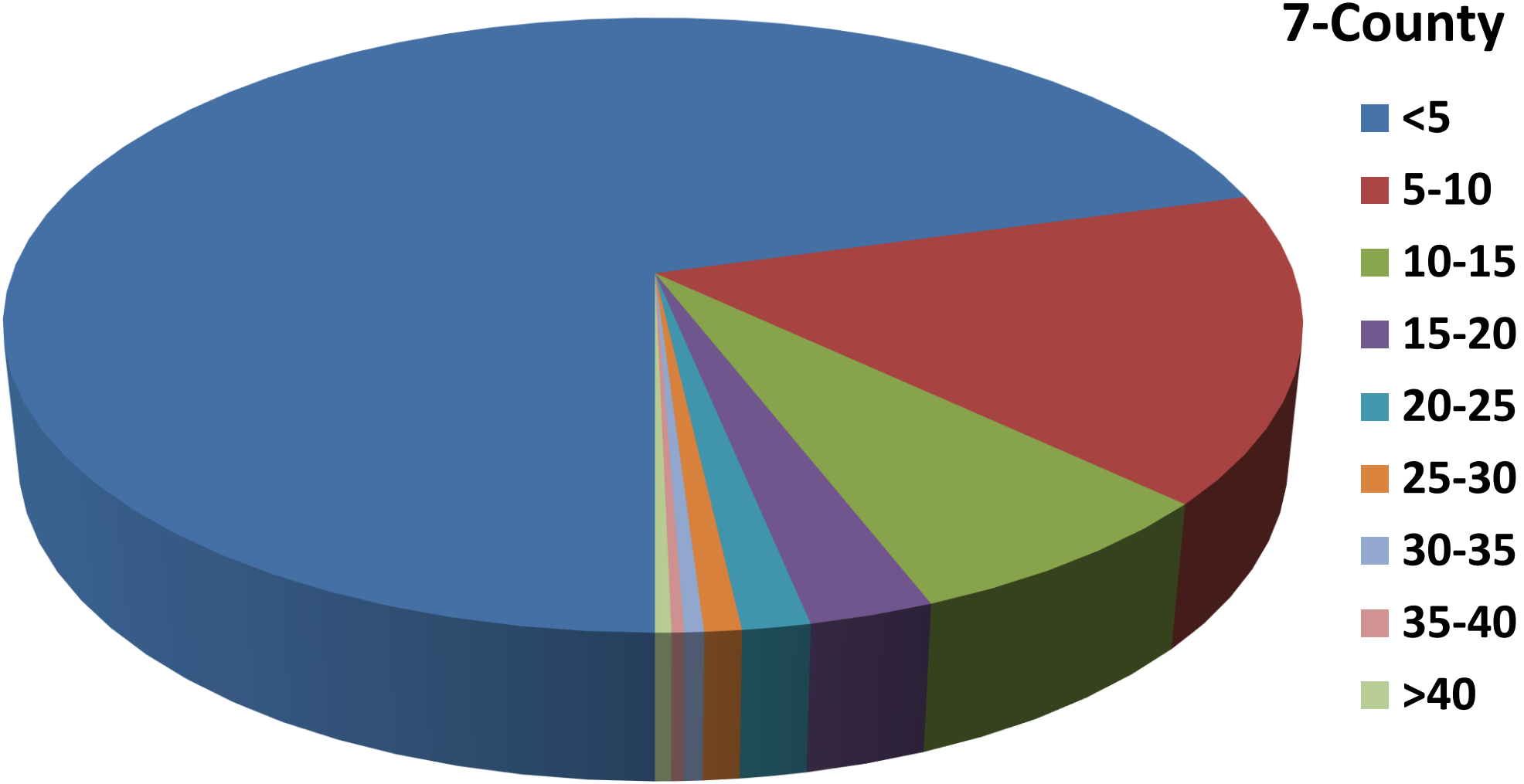
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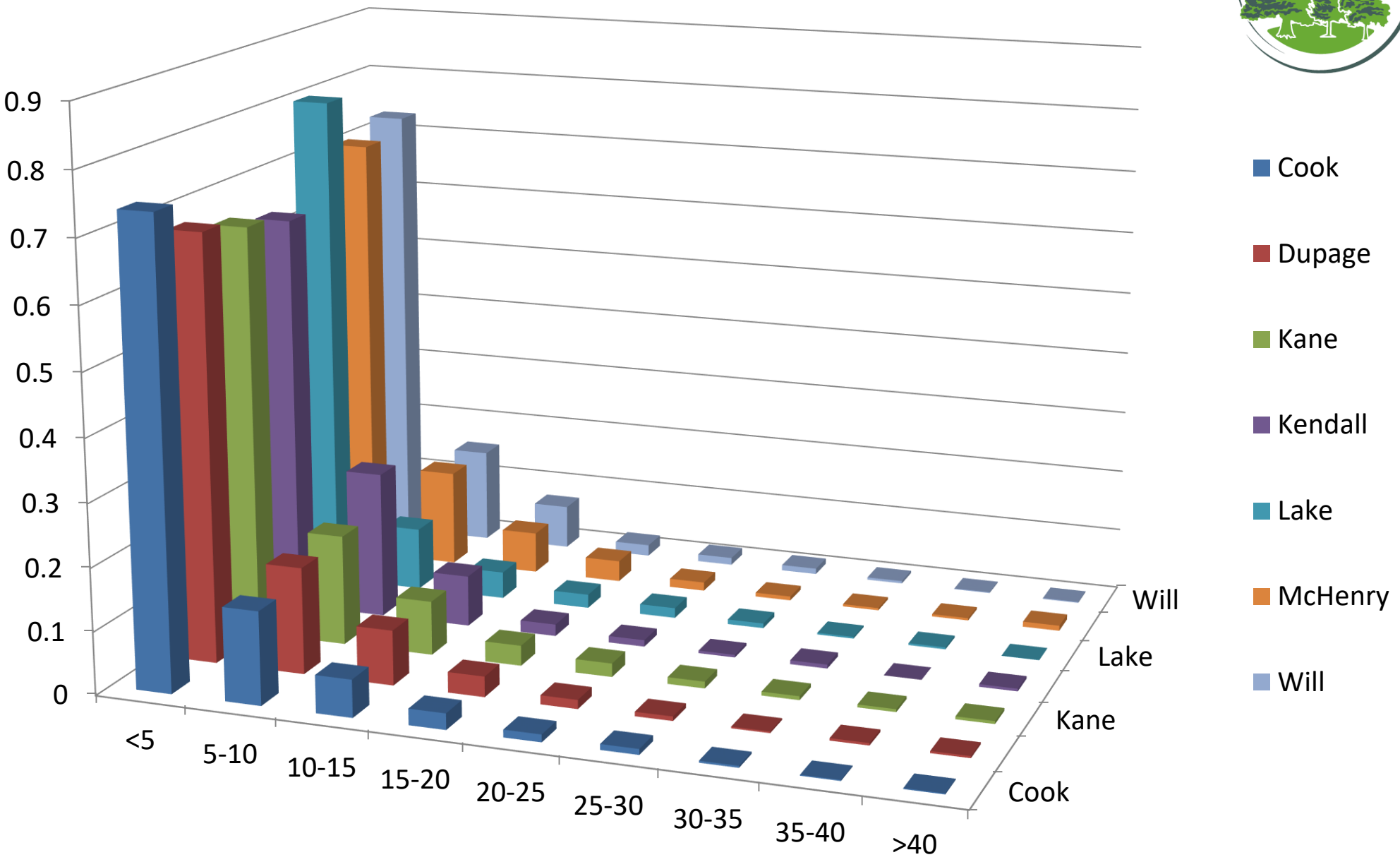
Size Classes by County



Big Trees are Vulnerable

- Need Maintenance
  - Ongoing time & $$
  - Planting is easier
- Bigger trees = bigger problems
- Lack of education / awareness
- Misconceptions

How can the CSC help?

- Data
- Policy
- Funding / budgeting
- Outreach & education

How can the CSC help?

- Data
  - Models, models, models
    - Stormwater, rainfall, soil, etc.
    - Incorporating trees into GI
    - Cost of building around trees (ie., sidewalks)

How can the CSC help?

- Policy
  - Not just tree preservation
  - Capital improvements, roads, engineers
  - Tree replacements
    - Demonstrate what a true replacement would be
  - Put a price / value on big trees

How can the CSC help?

- Funding / budgeting
  - How can we improve municipal tree budgets?
  - Where can we find money to protect trees?

How can the CSC help?

- Outreach & education
  - Municipal / public entity staff
  - Residents
  - Other decision makers

Conclusions

- Big trees are exponentially beneficial
- We need to take good care of the big trees we have
- We don’t have enough big trees
- Trees are people too

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