Mapping Tree Canopy to Promote Sun Safety Policies on Elementary School Campuses

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Outline of Presentation

- Learning Outcomes
- Introduction
- GIS and Health Policy
- Sun Safety Policies
- Skin Cancer and Childhood
- Tree Canopy and Public Health
- LAUSD School Shade Tree Canopy Study
- GIS Based Reporting
- Next steps/Conclusion
Learning Outcomes

- To become familiar with CDC Sun Safety Policy
- To understand the role of tree canopy and reforestation for sun safety on school campuses
- To understand the potential uses of GIS for mapping tree canopy
- To consider further steps for elementary schools to improve tree canopy provision on school grounds
Introduction

- Lack of emphasis on the environmental and public health benefits of trees on school grounds.
- LAUSD School sites have been reforested with 1000 trees – Not the “right tree for the right place”
- LAUSD School Shade Tree Canopy Study
- Adding tree canopy to school grounds leads to increased public health
GIS and Health Policy

- GIS has been useful in understanding relationships between health and the environment (Yomiralioglu, Colak, Aydinoglu 2009)
- The use of GIS for health access and planning has been a major theme (Nykiforuk and Flaman, 2009)
- Through health impact and health risk assessments to understand how policies will affect populations (Nykiforuk and Flaman, 2009, Vu et al. 2013)
Sun Safety Policies

• In 2009, CDC created the Sun Safety Toolkit with policy recommendations to promote sun safety and skin cancer prevention.

• Sun Safety recommendations from the CDC include:
  • Staying in the Shade
  • Protective Clothing and Hats
  • Wearing Sunglasses
  • Use of sunscreen
Skin Cancer and Childhood

- Skin cancer is the most common type of cancer and may account for half of all cancers (CDC 2009)
- ~65%-90% of melanomas are caused by UV radiation
- During childhood, significant amount of lifetime sun exposure occurs. Best time for protective measures. Also, substantial exposure occurs by age 20
- Much time is spent at school for youth -- critical place for youth health education
Importance of Tree Canopy in Public Health

- Improved health and well being such as mental health improvement through stress reduction (Tyrvainen et al. 2006)
- Increased air quality and resulting improved lung function through reduction of particulate matter (Nowak, Crane, Stevens 2006)
- Reduction of heat stroke, often due to urban heat island effect (Tyrvainen et al. 2006)
- Prevention of childhood skin cancers (CDC 2009)
- *** It is also important to consider that some sun exposure is beneficial for sufficient Vitamin D production to avoid bone diseases and certain cancers. (CDC 2009)
The LAUSD School Shade Tree Canopy Study

- Total number of trees mapped: 33,729
- 509 elementary schools
- Measured canopy cover, pervious, and impervious surfaces
- Report based on 3 key indicators: % tree canopy cover, % unpaved surfaces (overall and playground), and number of trees per acre.
- ~20% of schools have both 0.0% tree canopy coverage and 100% paved surfaces
- Mean percentage of tree canopy on school sites: 11%
- Tree canopy play area: 4.5%
- Remote sensing from 74 flight dates Jan-May 2011. LiDAR data was also accessed for this time frame though hand digitization was used.
The LAUSD

- 2nd largest school district in the US
- Enrolls more than 640,000 students in over 1,124 schools
- Geographic Area: 720 square miles
- Although studies exist regarding sun safety policies in schools, there has been little emphasis on the benefits of trees
- There is no benchmark for tree canopy for LAUSD sites

Tree Canopy Map
Watershedhealth.org/treecanopy
The Dashboard

### Tree Canopy Cover

<table>
<thead>
<tr>
<th>School Site</th>
<th>Play Area 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>28.7%</td>
<td>40%</td>
</tr>
<tr>
<td>30%</td>
<td>30%</td>
</tr>
<tr>
<td>20%</td>
<td>20%</td>
</tr>
</tbody>
</table>

### Unpaved Surface

<table>
<thead>
<tr>
<th>School Site</th>
<th>Play Area 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>52.5%</td>
<td>60%</td>
</tr>
<tr>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

### Number of Trees

<table>
<thead>
<tr>
<th>This School</th>
<th>LAUSD Avg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3 per acre</td>
<td>46.8 per acre</td>
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</tbody>
</table>

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<table>
<thead>
<tr>
<th>This School</th>
<th>LAUSD Avg.</th>
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<tr>
<td>9.7 per acre</td>
<td>11.9 per acre</td>
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</table>

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<th>Play Area</th>
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</thead>
<tbody>
<tr>
<td>This School</td>
<td>11.5%</td>
<td>10%</td>
</tr>
<tr>
<td>LAUSD Avg.</td>
<td>20%</td>
<td>10%</td>
</tr>
</tbody>
</table>

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<table>
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<tr>
<th></th>
<th>School Site</th>
<th>Play Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>This School</td>
<td>70%</td>
<td>60%</td>
</tr>
<tr>
<td>LAUSD Avg.</td>
<td>40%</td>
<td>30%</td>
</tr>
</tbody>
</table>

### Number of Trees

- **This School:** 7.3 per acre
- **LAUSD Avg.:** 11.9 per acre

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washedhealth.org
Mt. Washington Elementary School

Mt Washington Elementary School
Est. 1955

Mt Washington Elementary School
Est. 1955
Next Steps

- Profile of sun safety attributes could provide planning and implementation activities, and provide "early warning" of sun safety conditions for disease modeling.
- Working with public health officials and school administrators to discuss more specific guidelines for what a “sun safe” school would look like.
- Environmental assessment of suitability of tree type and accessibility on sites.
- Development of an index to rank schools with lowest/highest levels of sun safety.
Conclusion

- Schools are often a “safe haven” for children to spend much of their time outdoors.
- Individuals could benefit from policies which include recommendations for tree coverage on school playgrounds.
- Analysis is also needed to determine best landscape and tree planting design for improved environmental and public health outcomes.
Centers for Disease Control and Prevention, “Sun safety for America’s youth toolkit,” Centers for Disease Control and Prevention.


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