Climate Ready Trees for Albuquerque’s Community Forest
Albuquerque’s Context

- 200 sq miles
- 1.5M trees estimated
- <10% Canopy cover
- Siberian Elm most common
- 60% below 6”
- Severe heat island
Urban Forestry Policy Shift + Tree Goal
Who was Invited?

• NM State Forestry – Native Tree Nursery
• Albuquerque Parks and Rec – City Forester
• Local Nursery – Trees of Corrales
• State Urban & Community Forest Program Manager
• Tree Physiologists (University Researchers)
• Native Plant Society
• Landscape Architects/Designers/Builders
• Non-profits
• Water Authority
We used Downscaled CMIP5 Climate and Hydrology Projections and requested RCP8.5 data from Bias-Correction Spatial Disaggregation climate monthly models.

Data is averaged from 39 models for this area over Albuquerque.

In other words: We requested data from climate models across the globe that are utilized in IPCC reports. The scenario influencing the climate in these models is “business as usual.”

Mid-century = El Paso, TX
End of Century = Tucson, AZ

Annual precipitation = 8.62 inches
Our Process

Evaluate Climate Trends & Exposures
  Convene experts to identify the criteria for evaluation
Identify Promising Species
  Develop a master species list to evaluate with experts
Score Species & Select Finalists
  Habitat suitability
  Physiological tolerance
  Biological interactions
  Uncertainty
  Availability & other factors
Criteria Scoring

Soil type tolerance
+1 = sand, clay, loam, silt (3+ types);
0 = two of these types;
-1 = less than 2 of these types

*Add comment in Bonus Columns if requires well-drained soil, or tolerant of urban compaction, or tolerant of alkaline soils
Criteria Scoring

Drought tolerance
+1 = yes, or high tolerance
0= medium or relatively
-1 = no, or low tolerance

Photo: Roberto Rosales
Criteria Scoring

Extreme Temperature Tolerance (Next 30 Years) - All scored based on USDA Hardiness zones, unless species specific data is listed.

**Tolerance of heat**

+1 = if Zone 8 is included or up to 105 degrees F,
-1 = if Zone 7 or lower, or less than 105 degrees F

**Tolerance of cold**

+1 = USDA hardiness zone 7 or lower (tolerant of ABQ now)
-1 = USDA hardiness zone 8 or higher (not tolerant of ABQ now)
Criteria Scoring

Extreme Temperature Tolerance (2060-2099+)

Tolerance of heat
+1 = if Zone 9 is included or up to 120 degrees F
-1= if Zone 8 or lower or <120 degrees F

Tolerance of cold
+1 = USDA hardiness zone 8 included (tolerant of El Paso now),
-1 = USDA hardiness zone 9 and higher (not tolerant of Tucson now)
Criteria Scoring

**Bonus Columns:**
- Flooding tolerance
- Urban compaction tolerance
- Alkaline Soil Tolerance
- Well-drained soil requirement
- Pests/disease susceptibility
- Allergens/ Toxic parts
- Management requirements (pruning, tree litter, etc.)
- Branch attachment strength/ prone to breakage
- Edible parts
- Attractiveness (fragrance, blooms, color)
- Supports wildlife
<table>
<thead>
<tr>
<th>Rank</th>
<th>Tree Species</th>
<th>Common Name</th>
<th>Native Range</th>
<th>USDA Hardiness Zone</th>
<th>1.) Drought Tolerance (once established)</th>
<th>2.) Extreme Temp Tolerance (next 30 years)</th>
<th>3.) Extreme Temp Tolerance (2050-2099+)</th>
<th>Total Heat Score</th>
<th>Total Score</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Albizia julibrissin</td>
<td>Persian Silk Tree/ Mimosa</td>
<td>not native to north america (USFS Fact Sheet)</td>
<td>6b-9b (USFS Fact Sheet)</td>
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<td>2</td>
<td>Cedrus atlantica</td>
<td>Atlas Cedar</td>
<td>Atlas Mountains of Algeria and Morocco (Urban Forest Ecosystems Institute)</td>
<td>6-9 (Urban Forest Ecosystems Institute)</td>
<td>1</td>
<td>1</td>
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<td>3</td>
<td>Cedrus deodar</td>
<td>Deodar Cedar</td>
<td>E Afghanistan, N Pakistan, North Central India (Urban Forest Ecosystems Institute)</td>
<td>7-9 (Urban Forest Ecosystems Institute)</td>
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<td>4</td>
<td>Cercis canadensis</td>
<td>Eastern Redbud</td>
<td>North America (USFS Fact Sheet)</td>
<td>4b-9a (USFS Fact Sheet)</td>
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Notes:
- Does well in parks and courtyards (very messy tree). No known data that it is non-invasive (self seeds in Los Cruces?)
- Never seen invasive nature.
- Joran loves this tree. Not invasive.
- Not good for windy places. Would not plant in place of TX or OK redbud. Protected understory trees. Desert factor not good.
Next Steps for ABQ

• Finalize the Climate Ready Trees Report
  • Site Location specific lists (municipal parks, street trees, commercial/business)
• Share lists with local partners (outside expert team)
• Outreach to municipal departments
• Launch Awareness Campaign in March 2020
• Continue to revisit criteria and let the process evolve as we learn new information