

Team Jellyfish

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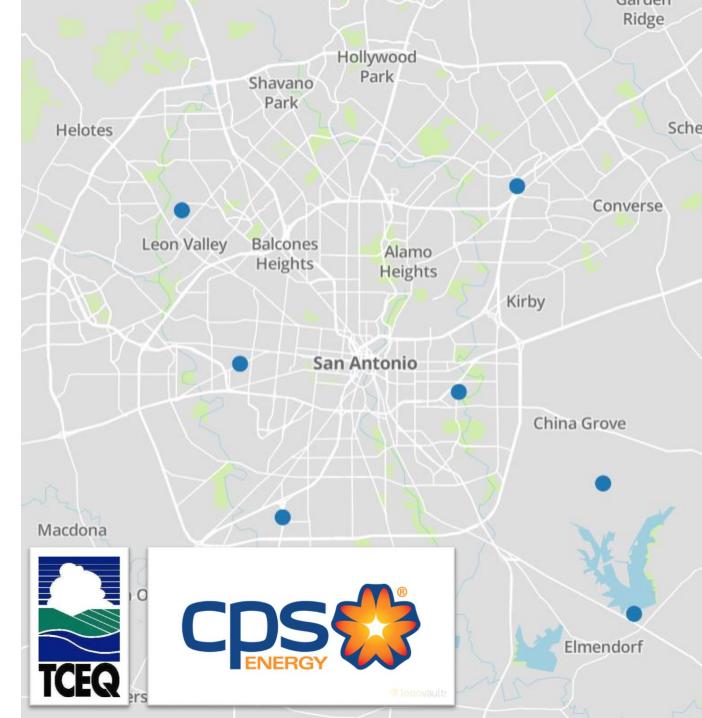
The Problem

PM2.5

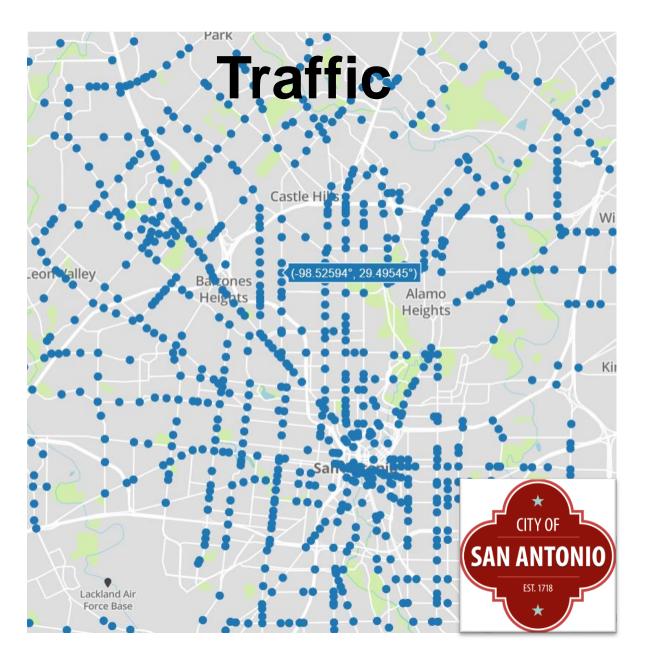
- General Measure for Air Quality
- Impacts Health
 - 22k to 55k Deaths/Year in US
- Impacts Climate
- Impacts Local Economy
 - \$3.2 to \$36.2 Billion!!!

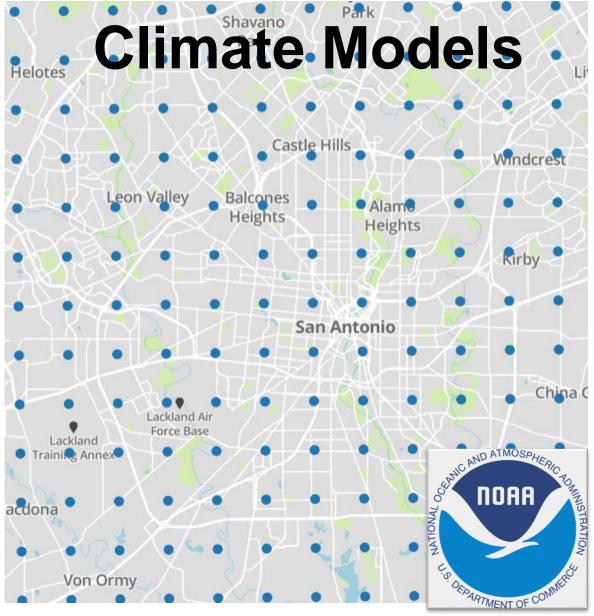
Not enough sensors

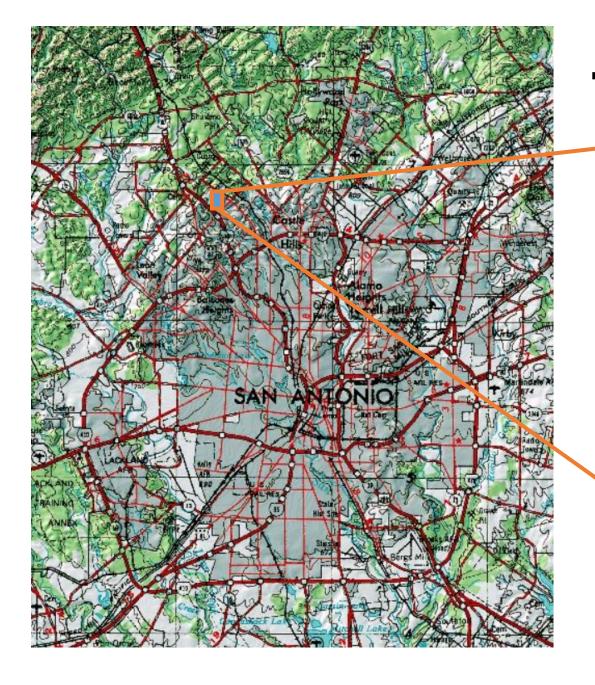
- 465 sq. miles
- Only a handful of measurement sites



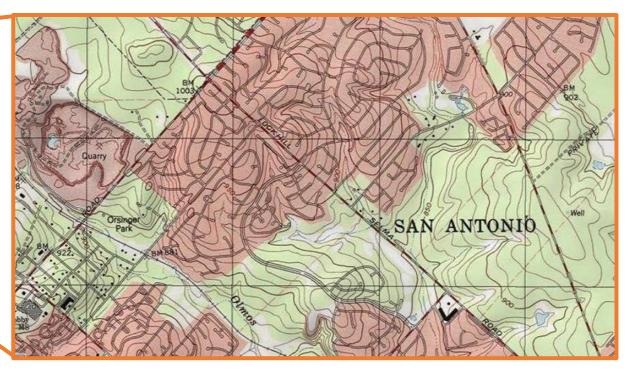
Camp Stanley Camp Bullis **Energy Usage** Garc hina Grove Balcones Heights







Topographical Data





Predictive Modeling

Surface Temperature

Wind Speed

Traffic Speed Traffic Volume

Road Occupancy

Local Energy Usage



Month

Day of the Week

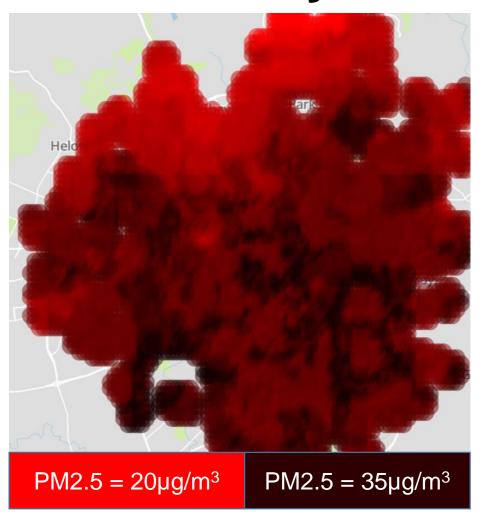
Time of the Day

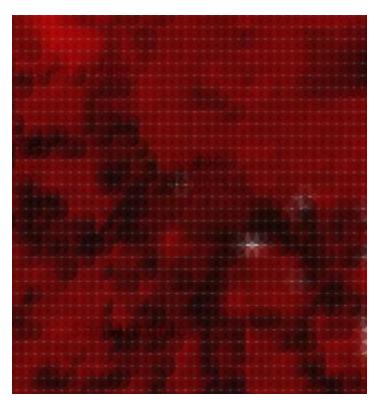


PM2.5 Prediction

- 40,000 Historical Data Points
- Built 1,000 candidate models
- Best performing model:
 - Test Set Error (RMSE): < 3.0 μg/m³
 - Test Set R² Value: 0.62

One of the Highest Resolution Depictions of Air Quality in SA Ever Created:





What pollution looks like on a relatively bad day in SA

Prediction of Future Air Quality in SA

Surface Wind Speed **Temperature Traffic** Traffic Speed Volume Local Energy Road Usage Occupancy



PM2.5 Prediction

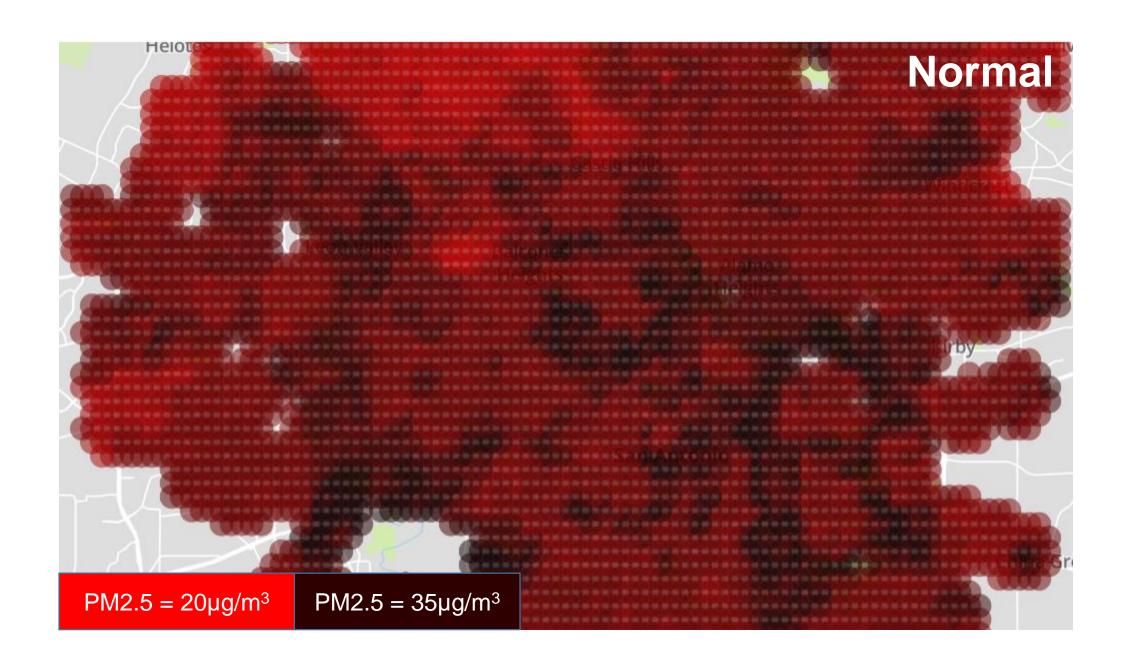
Elevation

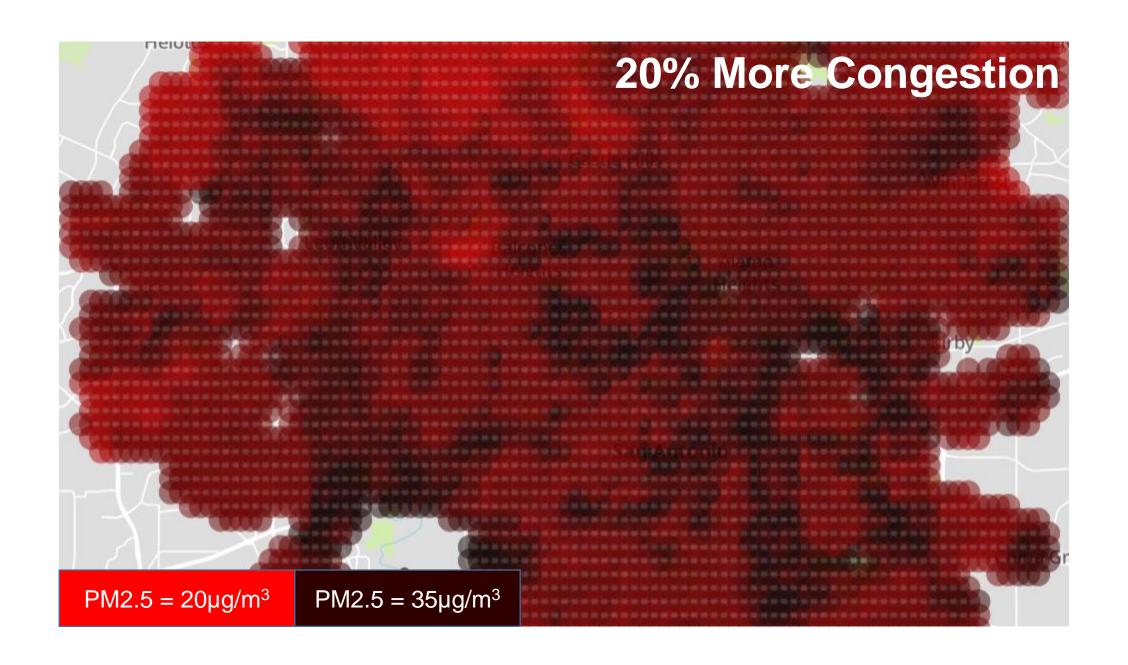
Month

Day of the Week

Time of the Day

- "What will pollution look like if traffic increases in this intersection by 20 percent?"
- "How will global warming influence air pollution in the city?"
- "How will future energy usage change in this neighborhood correlate with pollution levels?"





Air Quality Improvement Starts With Better Insight

Empower City Leadership

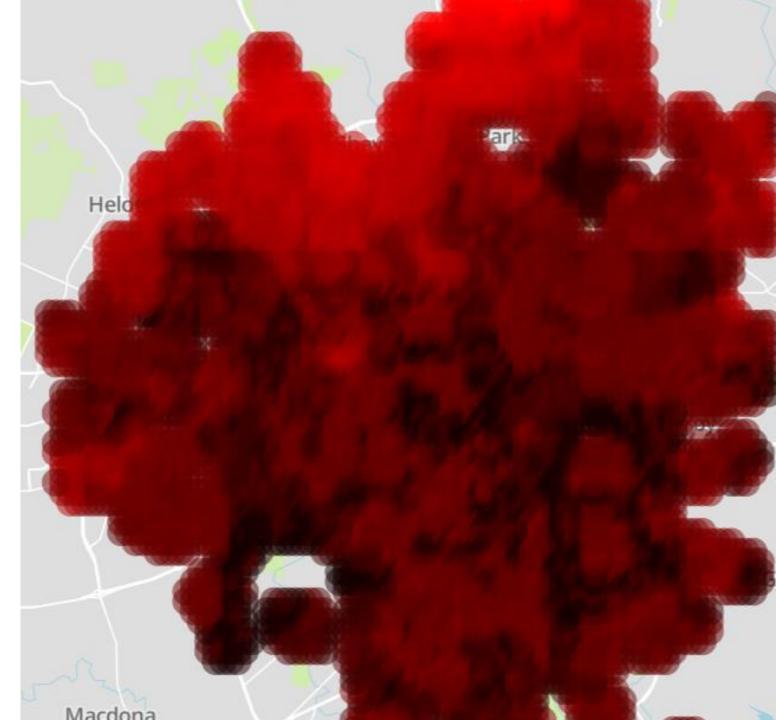
- Short term Weather Forecast
 - Telecommuting
 - Incentivizing Alternative Travel Plans
 - Carpooling
 - Bus Traffic
- Long Term 5 Year Predictions
 - Planning Future Green Space
 - Infrastructure Development
 - Zoning

Empower Individuals

- Plan activities based on local pollution
- Choose where to live
- More conscientious about health screening

Proof of Concept for Many More Applications

- Predict Ozone Levels
- Predict Water Quality



Try it out for yourself:

http://fr4nk.us/air