



Climate Change in Los Angeles County: Grid Vulnerability to Extreme Heat

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CLIMATE CHANGE IN LOS ANGELES COUNTY: GRID VULNERABILITY TO EXTREME HEAT

A Report for:

California's Fourth Climate Change Assessment

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DISCLAIMER

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Edmund G. Brown, Jr., Governor

August 2018

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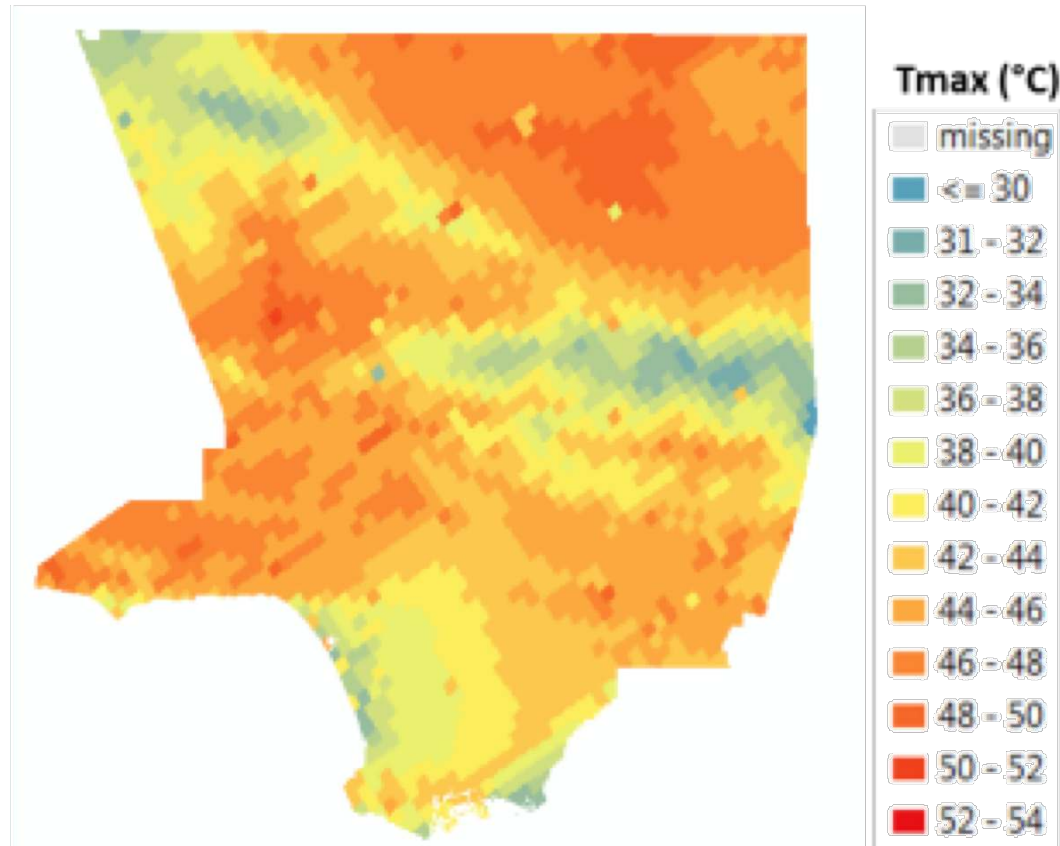
Local
Temperature
Change + Electricity
Demand
Changes + Electricity
Supply
Infrastructure

How and where might rising temperatures create
bottlenecks in the Los Angeles grid?

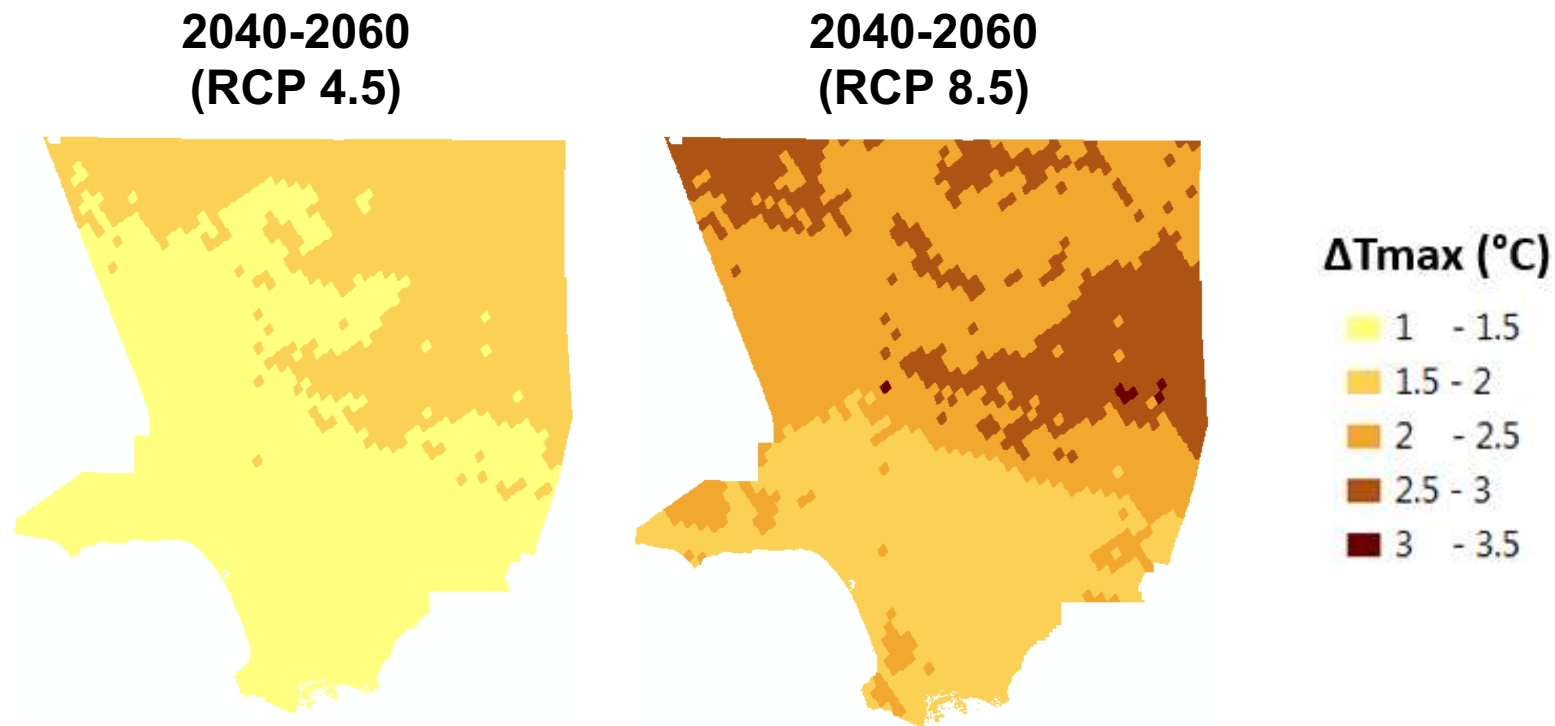


Temperature Change

Historical temperatures (1981-2000)



Future Scenarios





Demand Change



Building Energy Modeling



Building Turnover



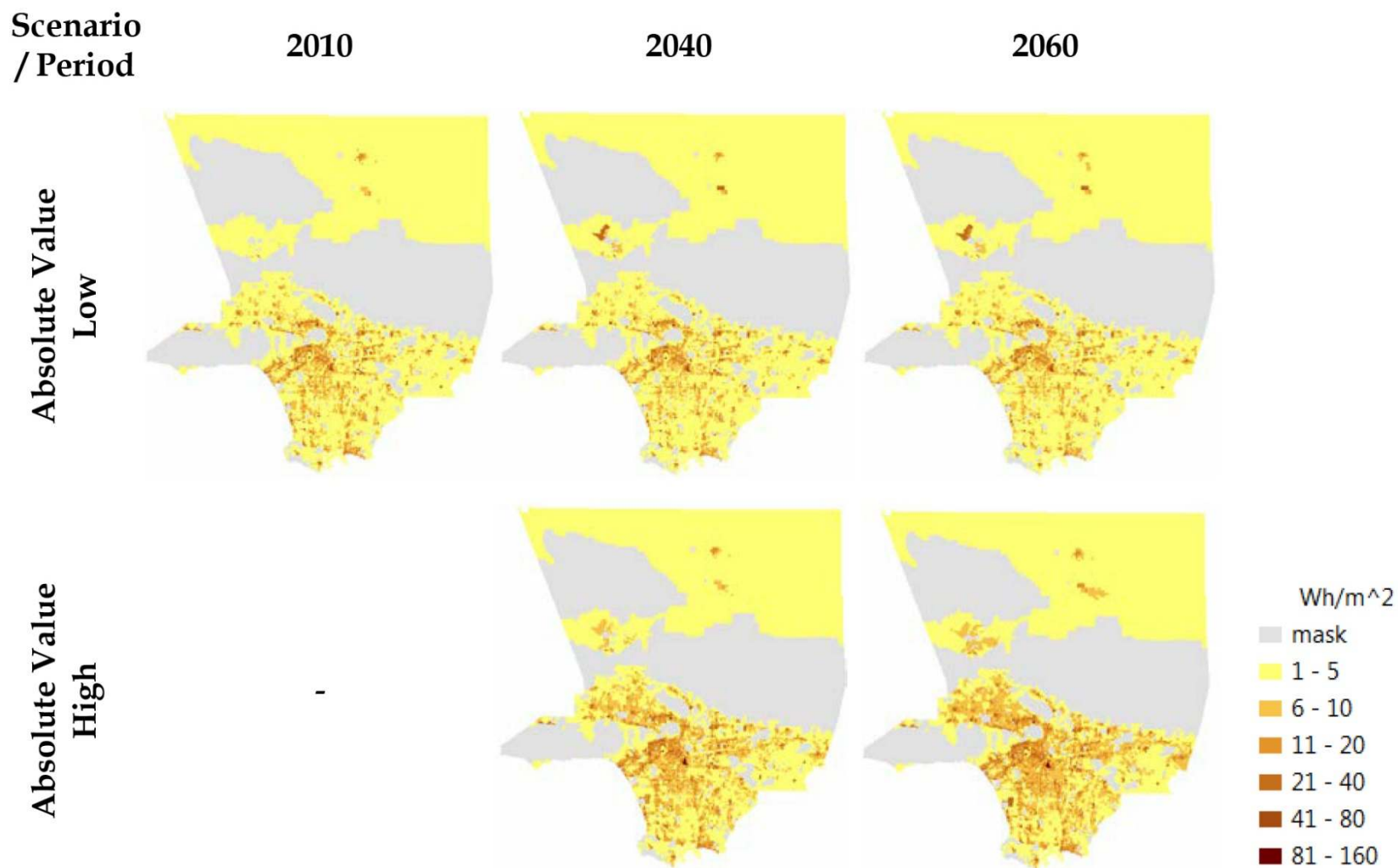
AC Saturation & Turnover



Population Change



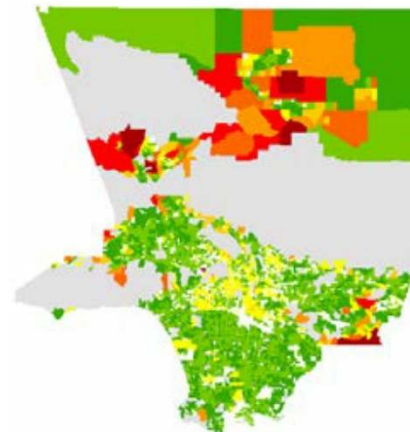
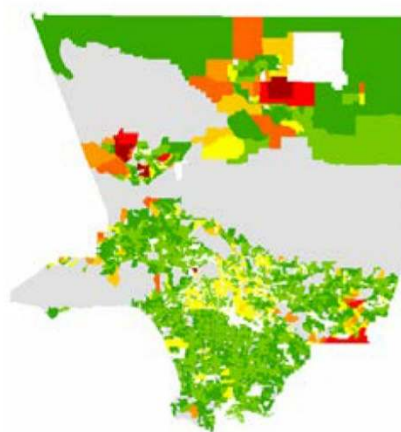
Appliance Efficiency



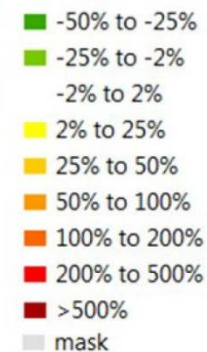
Final report Figure 12. Composite peak demand projections for base and future period high and low scenarios.

Percent Change

Low

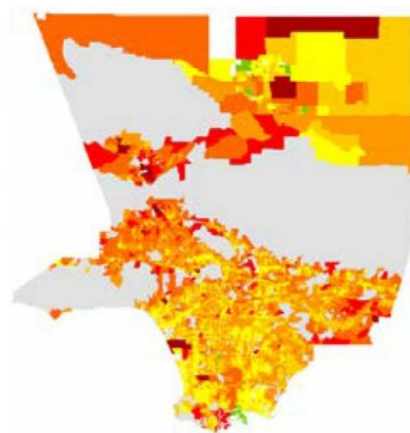
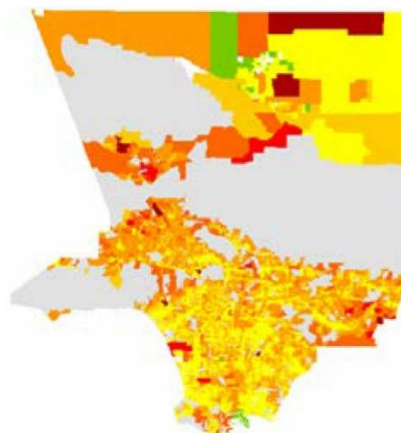


Percent Change
(% per Wh/m²)

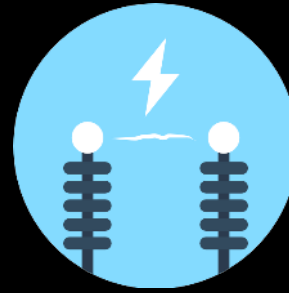
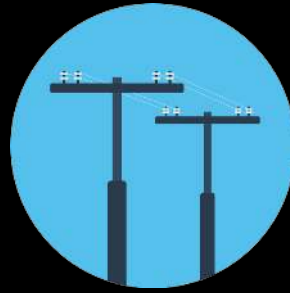


Percent Change

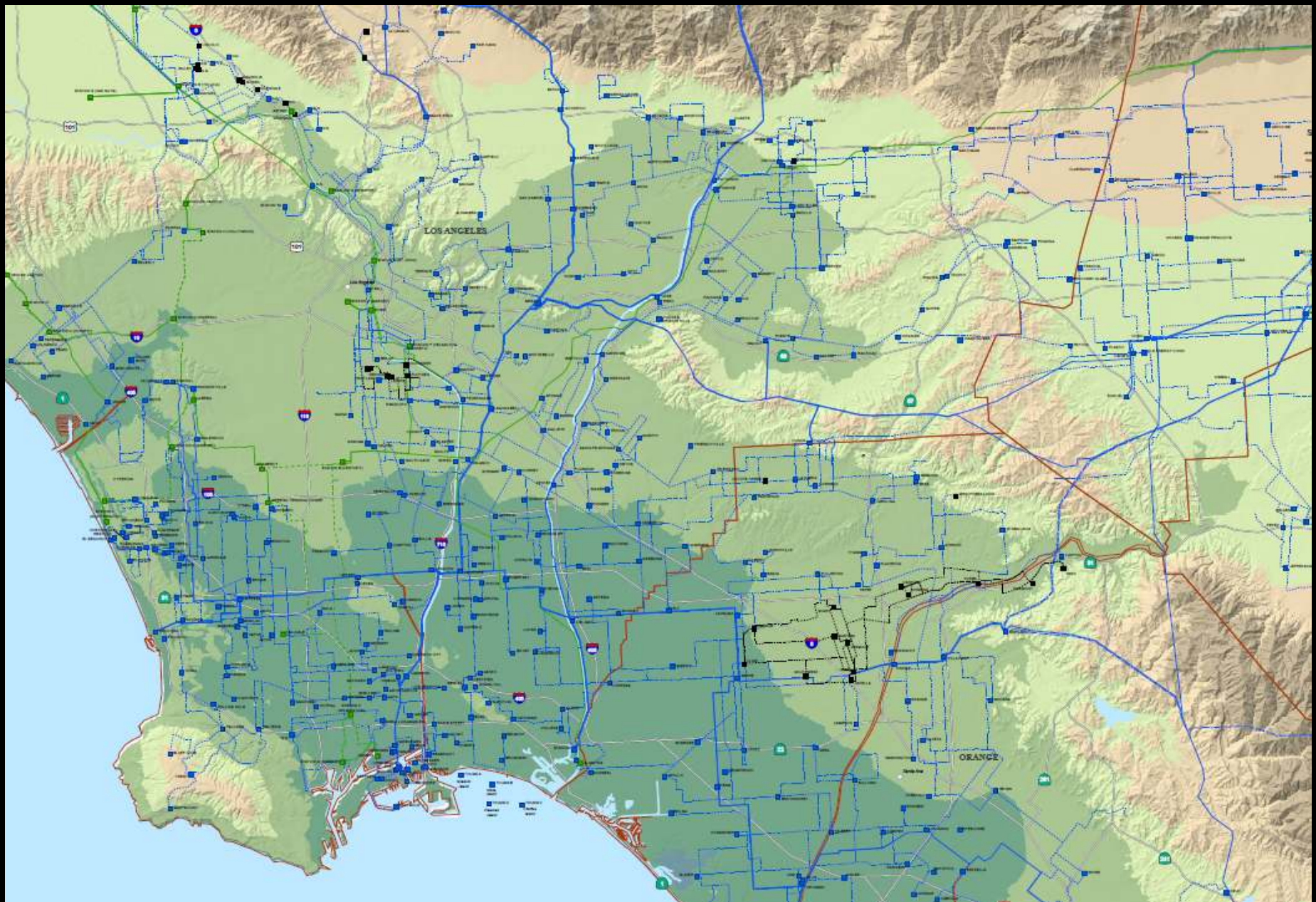
High



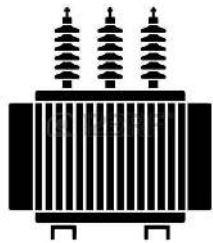
Final report Figure 12. Composite percent change projections for base and future period high and low scenarios.



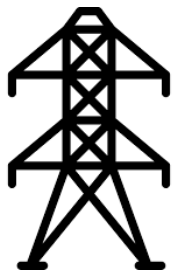
Infrastructure & Supply



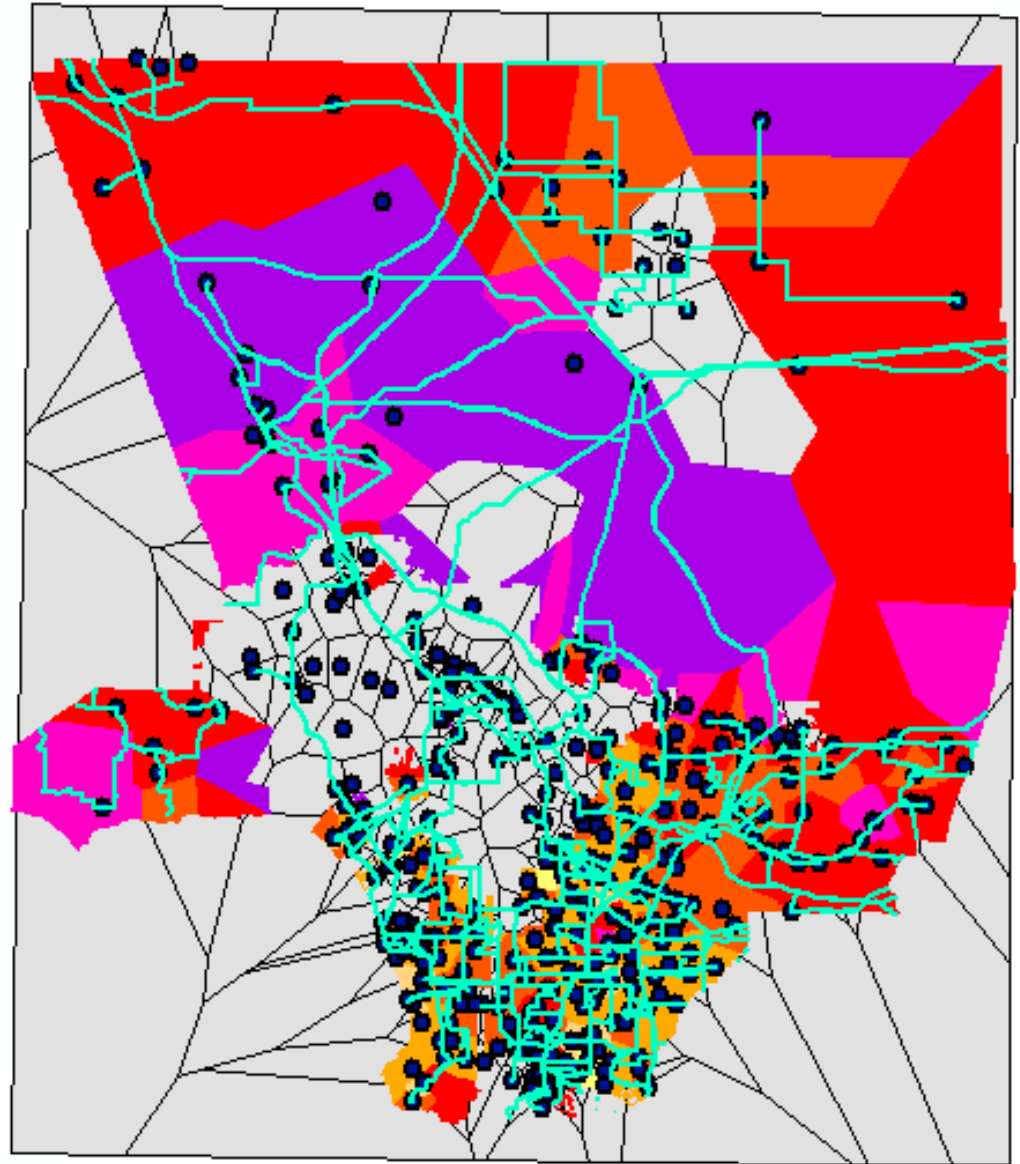
Delivery Infrastructure



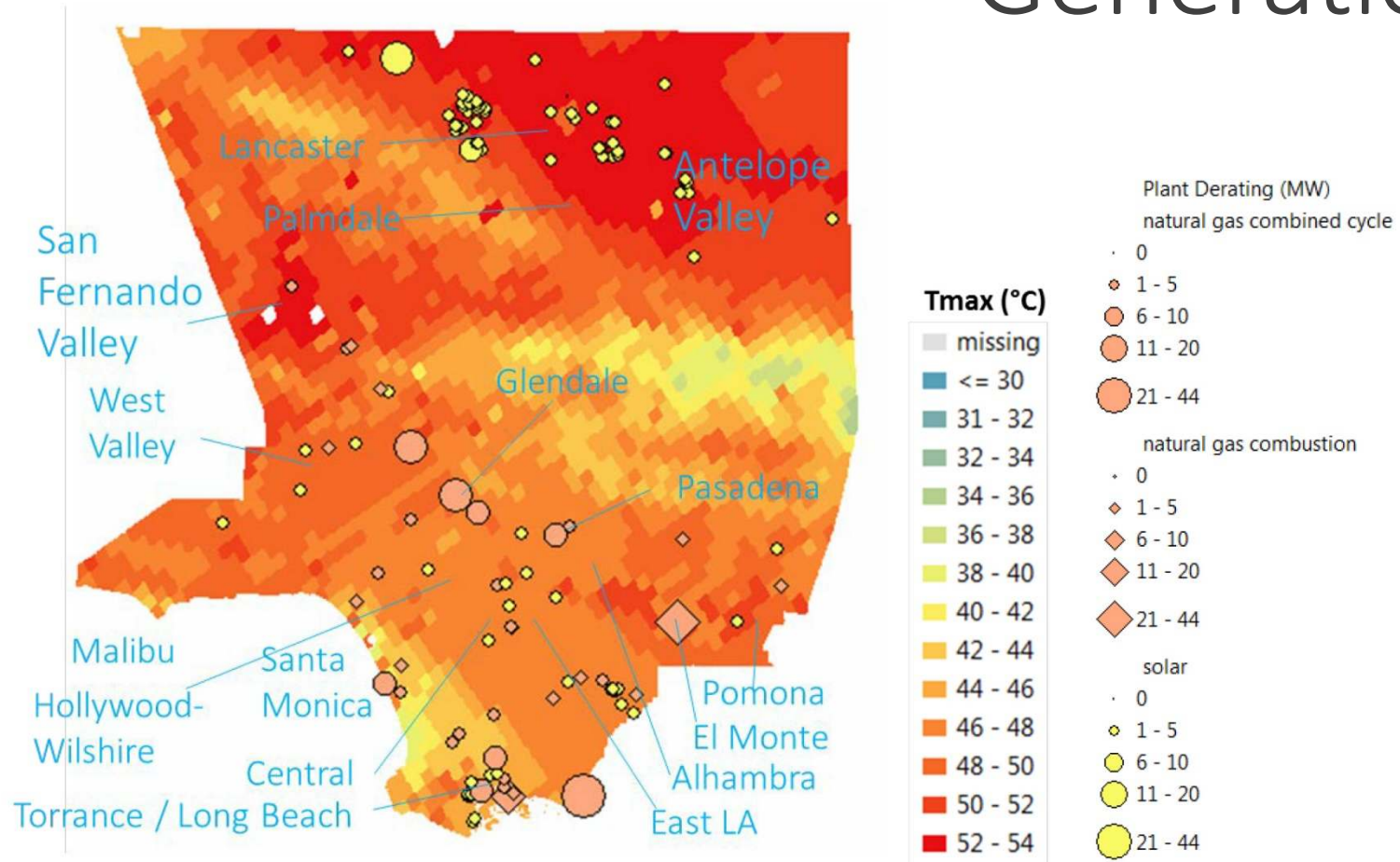
Substations



Transmission Lines

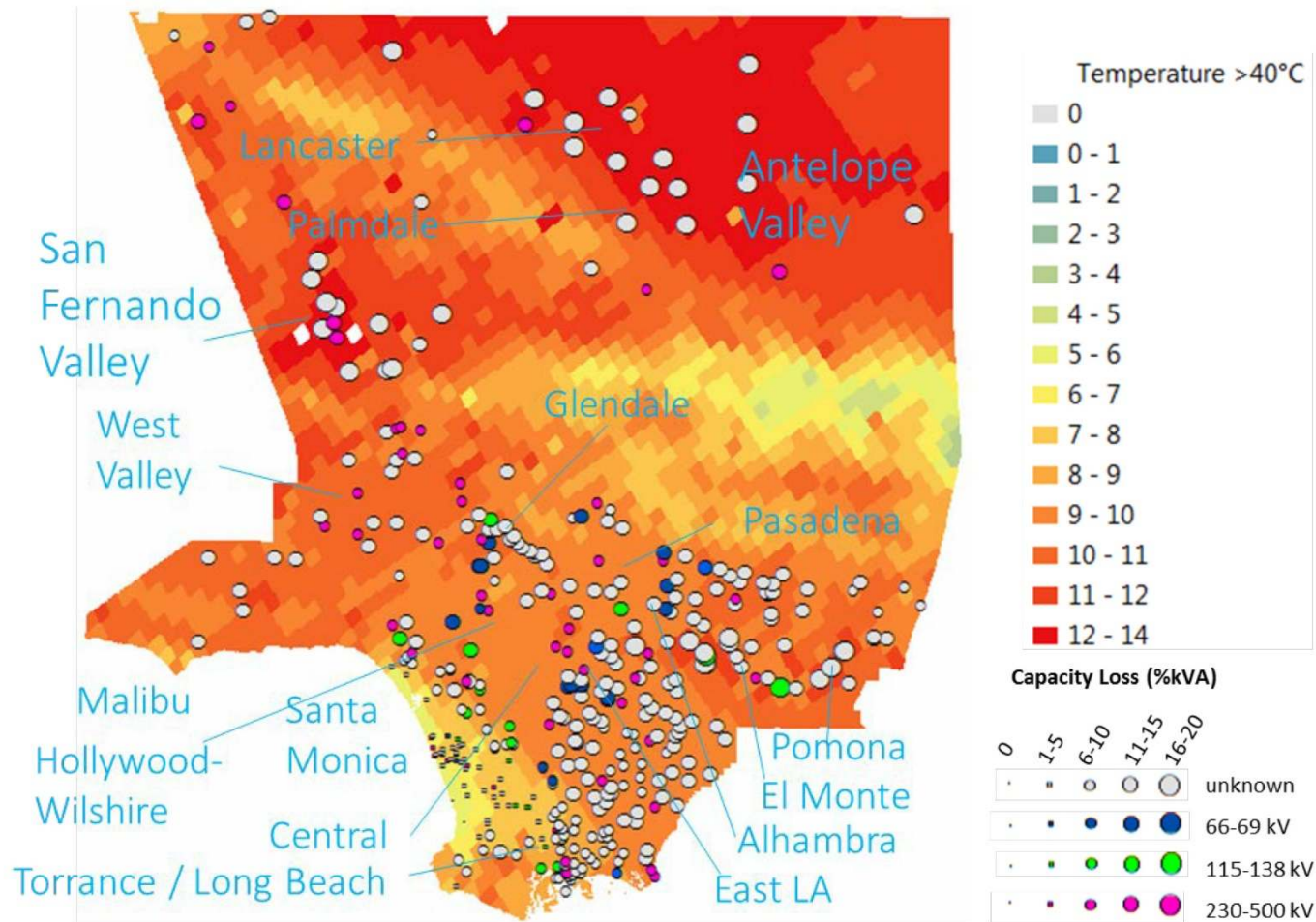


Generation



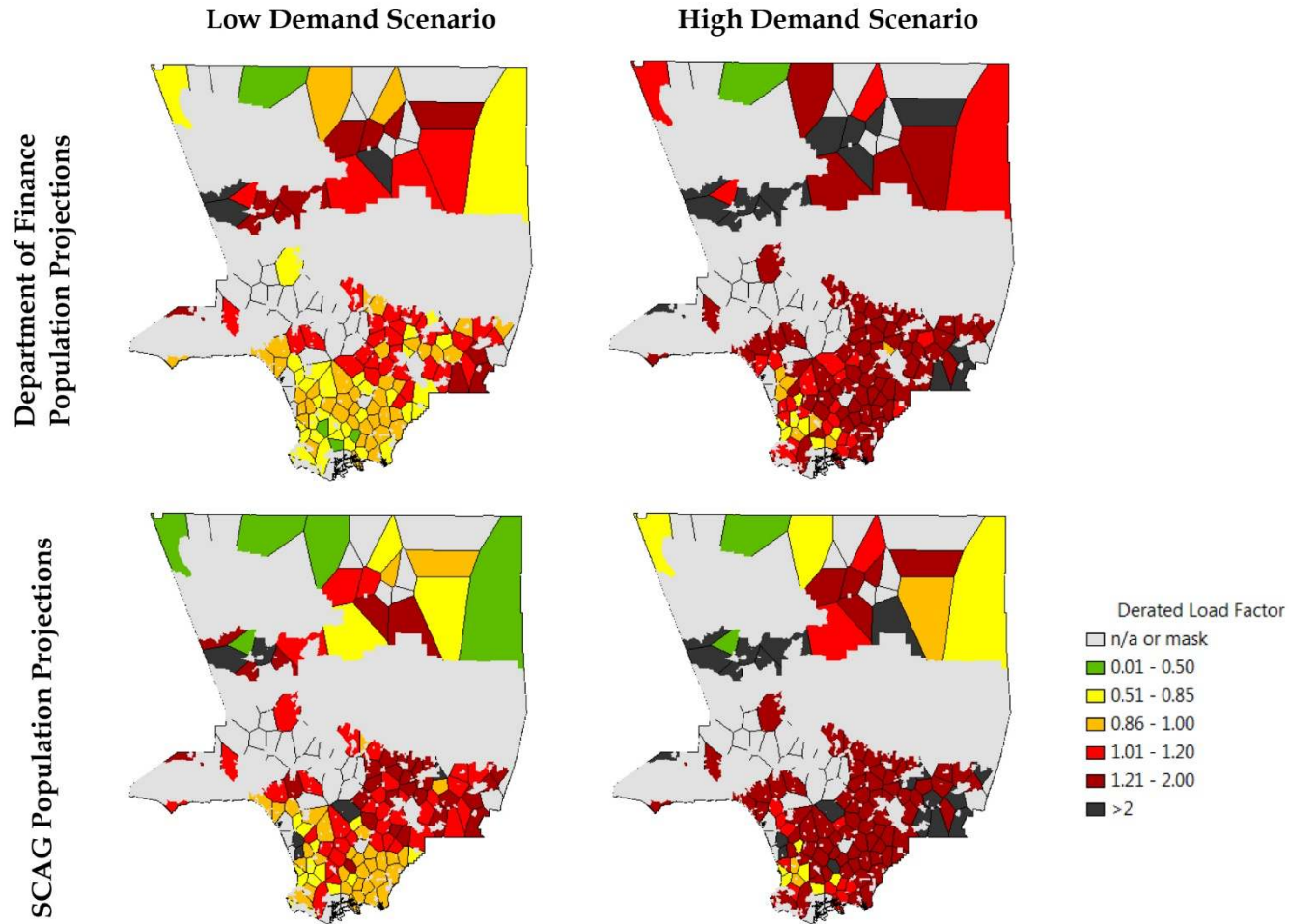
Final report Figure 23. Map of worst-case losses in plant capacity for composite temperatures in 2060 RCP 8.5.

Substations



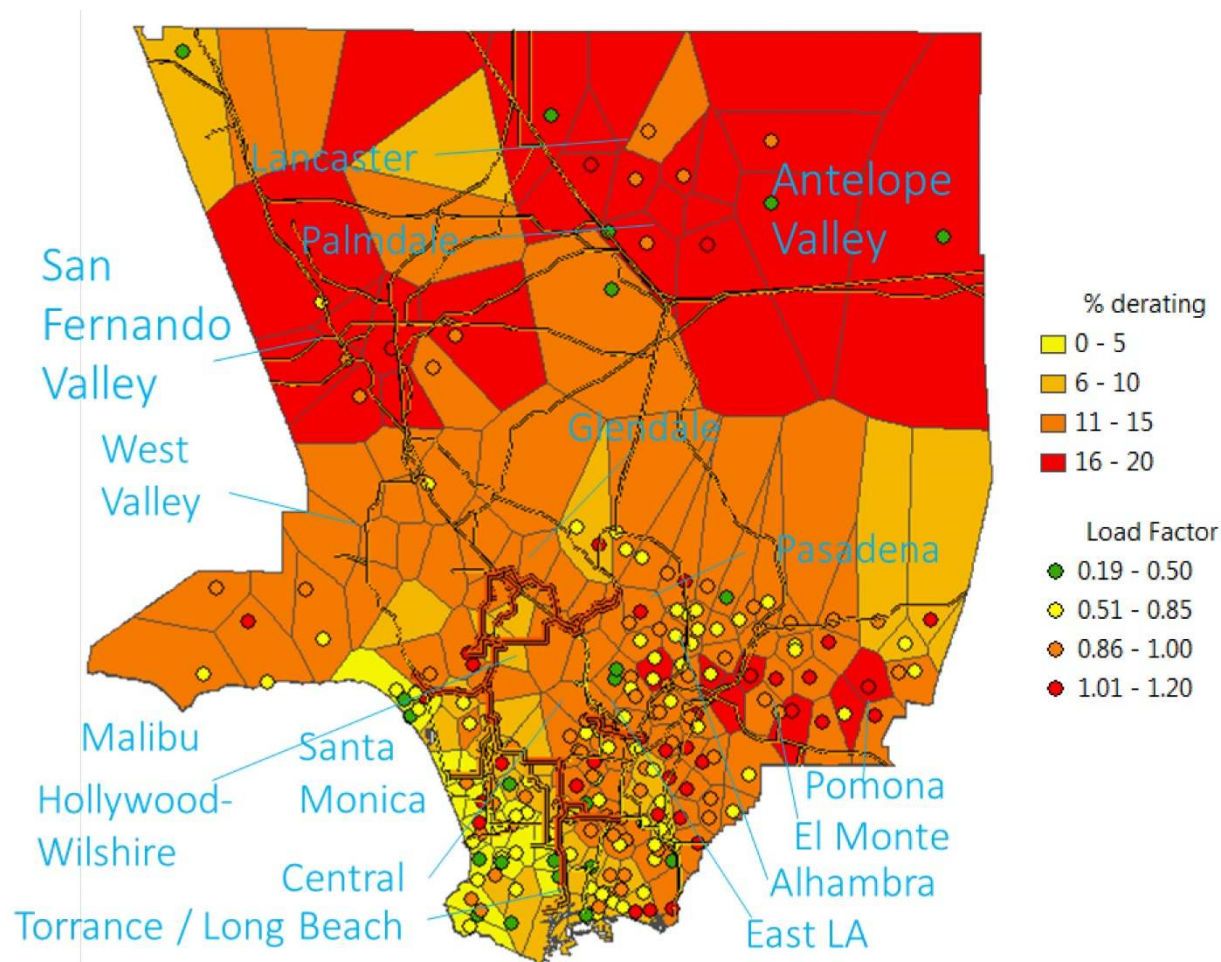
Final report Figure 25. Map of worst-case losses of substation capacity for composite temperatures in 2060 RCP 8.5.

Substation Risk



Final report Figure 32. Maps of substation risks in 2060. Future substation load factors derated for composite worst-case 2060 heat waves.

Vulnerability



Final report Figure 36. Map of worst-case percent derating in lines and substations from historical heat waves overlaid with present substation load factors.



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