Trees and Climate Action

- Climate impacts
- Climate adaptation
- Climate action planning
- Advocacy for trees

- Online resources:

http://sdrufc.com/trees-climate/

https://www.climatesciencealliance.org/

http://www.climateactioncampaign.org/

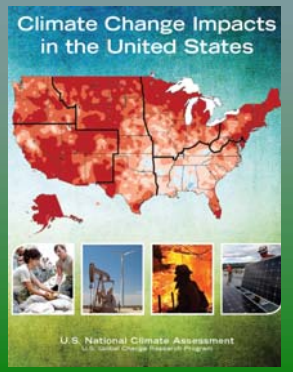
https://sandiego350.org/

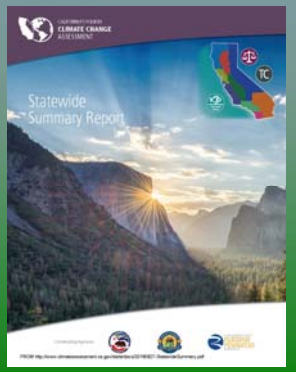
https://scripps.ucsd.edu/centers/adaptation/

https://www.sandiego.edu/climate/

Realities of climate change impacts

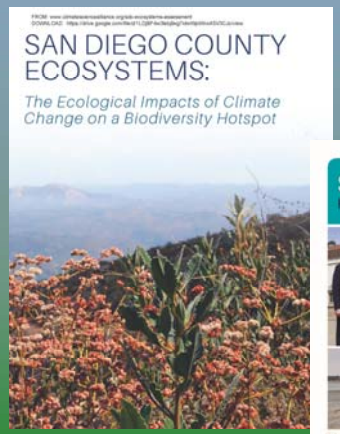
- Intergovernmental Panel on Climate Change (IPCC), 2014
- U.S. National Climate Assessment, 2018
- Fourth Climate Assessment, California, 2018
- U.S. Forest Service report, 2012

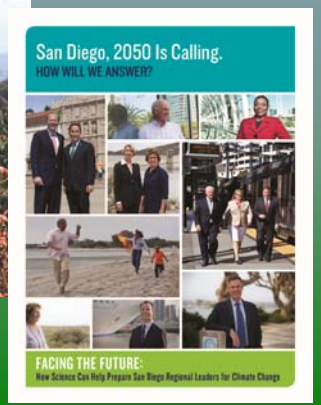




Local impacts of climate change

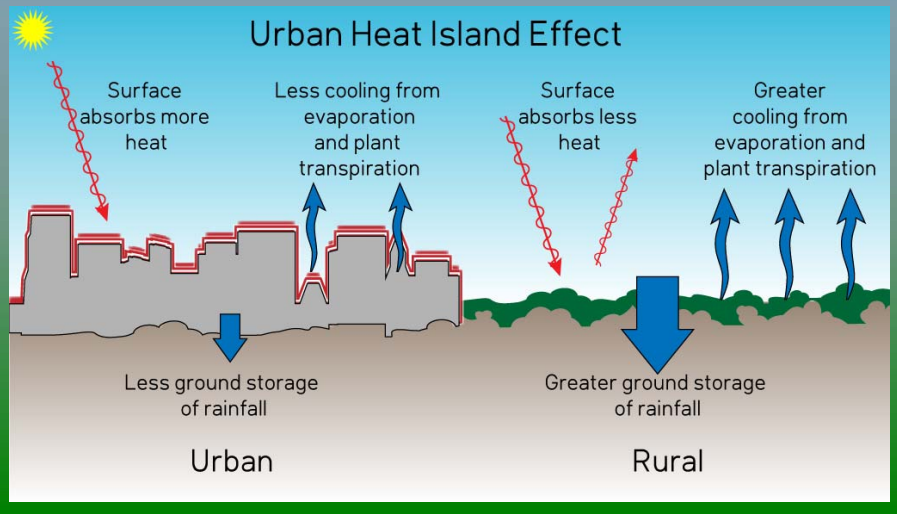
- Trees are affected by climate impacts
  - Drought
  - Temperature
  - Wildfires
  - Storms
  - Pests



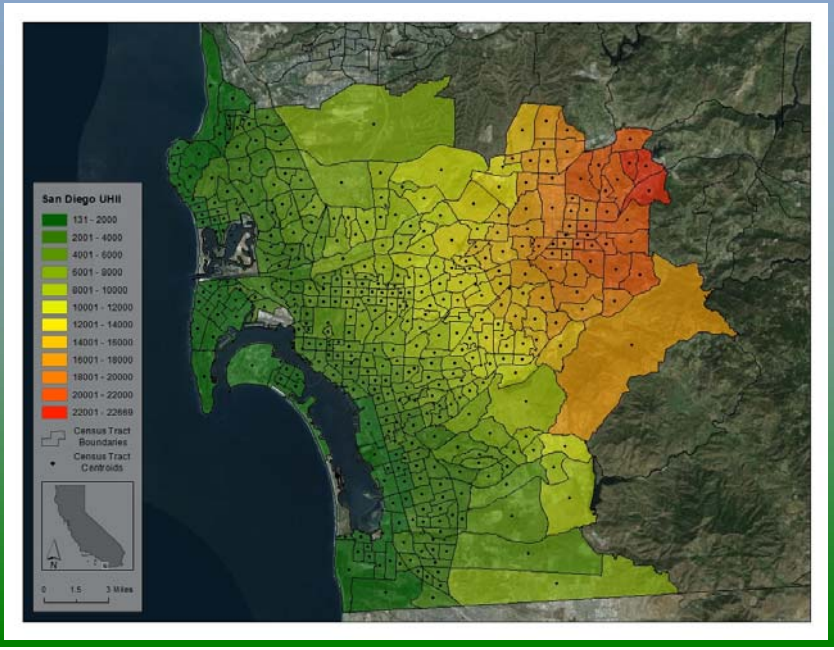


Climate change will increase urban heat

- Trees absorb heat and provide shade
- Trees cool neighborhoods by transpiring water vapor

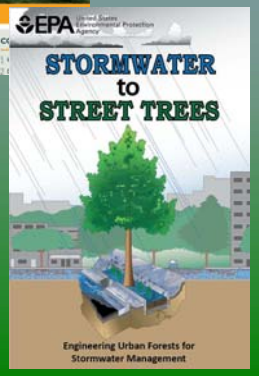


Urban heat patterns in San Diego



Cities need trees for climate adaptation!

- Health benefits
  - Shade, cooling
  - Active living
  - Most people live in cities
- Ecosystem services
  - Retain stormwater
  - Recharge groundwater
  - "Green infrastructure"
- Risk reduction
  - Ooops, also tree storm losses



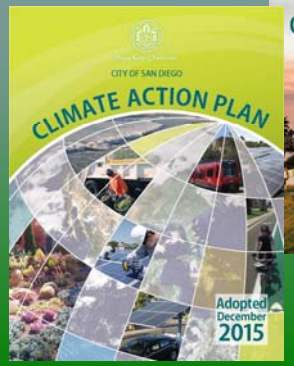
Trees are climate action tools

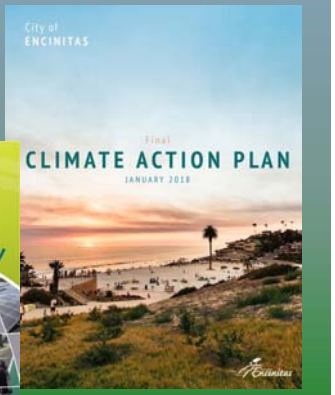
- Carbon sequestration
  - 4.8 billion annual value (Nowak 2018)
  - Urban wood reutilization
- Cap-and-trade programs
  - Protocols are challenging
  - Risk of not attaining survival or growth commitments
- Climate adaptation
  - Health and ecosystem benefits

- First "take care of what we have"
  - Then plant new trees
  - Consider future climate in selecting trees

What's in a Climate Action Plan?

- Projected impacts by location, sector, equity
- Greenhouse Gas (GHG) emission reduction
- Adaptation goals
  - Tree canopy cover
- Public involvement
- Implementation



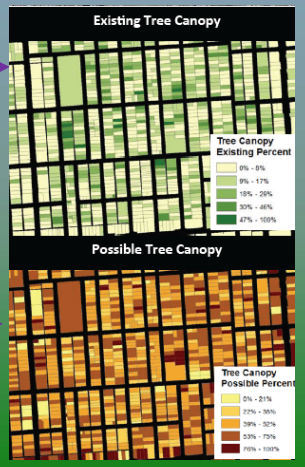


Tree canopy cover

- LiDAR-based remote sensing data ($$$$)
- Transform data to land cover types

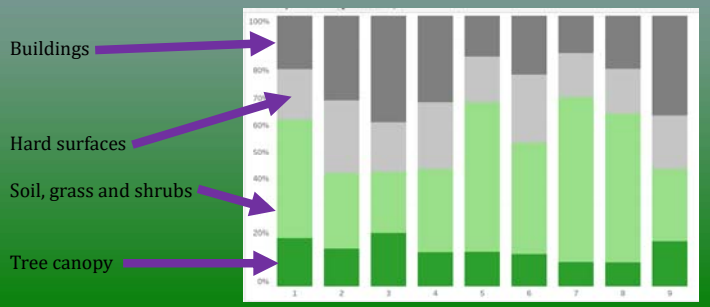
- Existing tree canopy
  - By land use (schools, parking lots)
  - By neighborhood (equity)

- Possible tree canopy
  - Community priorities
  - Ecosystem services



Tree canopy cover

- Actions to increase tree canopy
  - City-wide process or by district
  - Public and private land uses
  - Learn from other cities
- Set realistic 2035 goal for Climate Action Plan



Global Realities

- Faster rates of warming and impacts
  - Increased computational power for models
  - Stronger feedback loops for ice and permafrost melting
  - Ice cores show sea level can rise in a decade

- Many impacts will be irreversible “tipping points”
  - Drought and desertification
  - Wildfires and habitat conversion
  - Melting ice and permafrost
  - Urban destruction from storms and sea level rise

Emerging issues and trends

- Do youth and future generations have standing?
- What if negative feedback loops are faster than predicted?
- Is there equity in tree benefits and actions?
- How do community leaders and local professionals work together to fund tree care and planting?

CLIMATE SCIENCE ALLIANCE

CLIMATE ACTION CAMPAIGN