January 13, 2022

Sustainability and Climate Action Plan Ad Hoc Committee Meeting
Focus: Wildfire Protection and Sea Level Rise

110 attendees + 7 additional via YouTube Live Stream

Questions and Answers

Wildfire Protection Questions

1. Is there any data on the correlation between green space / tree cover in relation to air quality in terms of wildfire smoke pollution?
    A. Some in terms of overall air pollution, but nothing to our knowledge on wildfire in particular. Our guess is that it could help a bit, but it would not be a big effect. You can sort of see that in the PurpleAir maps - exposure is very constant.

2. I am surprised that the data approach fails. It seems that having the contact information could inform the research. My sense is that you did not get the correlation and stopped. Perhaps this is an engagement that could occur with support of City of Palo Alto staff including building and GIS. Seems like a rich collaboration opportunity.
    A. Yes, we would love to do more here. We are trying to raise research funding for exactly this - right now all our work has been self-funded

3. Do you correlate the PurpleAir indoor monitoring to the parcel map? That will return basic home information based on the parcel intersect. Equally off the tax roll, you can gain the mailing address to survey for best practice.
    A. Yes, we do exactly that and we observe a ton about each house — and that information is not very predictive, to our surprise.

4. Former Palo Alto, and current State, Urban Forester Walter Passmore is reported to have stated or implied that persistent droughts may threaten Palo Alto's redwoods: "The decline of the redwoods is not a huge story — yet, Passmore said. But if drought persists, it could be. It generally takes three to five years or more before drought affects healthy redwoods. Weakened trees and those without irrigation would be the first to go." Did City Staff's assessment of wildfire and other fire risks in Palo Alto take account of the likely further decline of local redwoods in the next 10-20 years and

thereafter based upon likely more frequent and increasingly severe droughts in Palo Alto resulting from global warming?

   A. Walter's comments are a bit complicated. When he talks about redwood trees, he is talking about redwoods in broad terms – across Northern California Coast and in the Sierras, which is a big area. The story with our local area is a bit more nuanced as we get more coastal fog and moisture which lessens the impacts. Walter also says the decline of redwoods will be a big story if drought continues– that is a hard one to model as we see wetter years and dryer years. One key area that his comments don't address is that redwoods are very wildfire tolerant - they are a resilient species for this climate and our risks. We do not want to prematurely remove redwoods; they are a very beneficial species. We have not studied long term drought impacts of our tree population since Walter made these comments. This is something we could consider in future efforts.

5. According to that same report, "There are 923 redwoods under the city's direct care, and about 1,500 private trees that the city prunes to keep utility lines clear. Many more redwoods are located on private property…" Did City Staff's assessment of wildfire and other fire risks in Palo Alto include any specific models of increased fire threats posed to particular areas or neighborhoods within Palo Alto should the decline of redwoods described by Urban Forester Walter Passmore double before 2030?
   A. Our recent wildfire planning only includes the Wildfire Urban Interface (WUI), not the 'flat lands' in Palo Alto. However, our 2009 Foothills Fire Management Plan did look at all of Palo Alto. That analysis should be refreshed.

6. Did City Staff's assessment of wildfire and other fire risks in Palo Alto determine the threat radius of a declining redwood to neighboring homes based upon its height as a result of wildfires or other fires?
   A. Our recent wildfire planning only includes the Wildfire Urban Interface (WUI), not the 'flat lands' in Palo Alto, and this was not considered.

7. If, as stated in that same report, "The city is slowly converting its urban forest to more drought-tolerant trees," did City Staff's assessment of wildfire and other fire risks in Palo Alto consider whether Palo Alto's current tree protection ordinance should be modified to allow homeowners to replace redwoods with trees that are better able to withstand drought, such as certain cedars, just as the city appears to be doing?
   A. This was not considered. From an urban forest perspective, this is a transition process. As trees fail over time due to drought stress, they are removed and replaced with more appropriate species. Removing a healthy redwood is counterproductive as they are great at providing direct benefits to the surrounding neighborhood.

8. At roughly the same time that the S/CAP Ad Hoc Committee has been examining wildfire and other risks posed by global warming, the City Council has reportedly directed City Staff to work on an update to Palo Alto's tree protection ordinance that would expand the number of protected species and protected trees in Palo Alto. Did City Staff's assessment of wildfire and other fire risks in Palo Alto take account of other marginal risks that may be posed by making it more difficult for homeowners to remove trees over the next 10-20 that are notably less fire-resistant than redwoods?
   A. This was not considered. The current draft of the new ordinance would offer protection for more species (desired species at smaller diameter at breast height (DBH) and all species

except invasive and high-water users at larger DBH) but not necessarily make it harder to remove an unwanted species. We are considering an altered set of rules for properties in the Wildfire Urban Interface (WUI) (west and south of 280) that would place a higher priority on wildfire prevention than the rules for the more urban areas. This is still in progress.

9. Would it make sense for libraries to lend air monitors to people?
    A. Great idea and thanks for the suggestion. Monitors would be good, filters would be even better! The Karuk Tribe in Northern California has a lending library for portable air filters that is available to vulnerable members of their population (tribal elders and asthmatics). They proactively deliver portable HEPA filters to identified sensitive folks during wildfires and prior to conducting prescribed fires and cultural burning.

10. Wouldn't the infiltration rate be correlated to how well sealed and energy efficient the building envelope is?
    A. Yes, building envelope is important and new buildings post-2008 do seem a bit better, but these characteristics only explain about 5-10% of the variation in infiltration. Behavior and filtration seem much more important, which honestly was surprising to us as well. We have a huge 100,000 home dataset with blower door tests, and they are only very slightly predictive.

11. What can we do about older housing stock with windows that leak substantial amount of air? Are there ways to make it easy to retrofit windows?
    A. Installing new windows all through a house is an incredibly expensive proposition. Retrofitting windows come very close to the energy performance of high-performance replacement windows at a fraction of the cost. The federal government offers a California Weatherization Assistance Program to help improve the energy efficiency of homes.

12. How long after the Bootleg Fire was the picture taken? (picture depicting no treatment vs. thinning with prescribed burns vs. thinning only)
    A. The image was taken in a helicopter flight in early November, 2021 by Lake County Commissioner Barry Shullanberger. The Bootleg Fire started on July 6, 2021 and was fully contained on August 15, 2021.

13. Michael Wara mentioned the need to re-examine the relationship between laws and nature and CEQA/NEPA requirements for prescribed burns. What's the latest on studying and updating?
    A. In order to do prescribed burns we have to coordinate to get permits for air quality – it is regulated/monitored. The State is looking at this, see https://ww2.arb.ca.gov/our-work/programs/prescribed-burning/about.

       CalFire recently approved a programmatic EIR to hopefully facilitate more fuels management (the CalFire VTP EIR). Many smaller projects use categorical exemptions. A key limiter is availability of qualified biologists and archeologists to conduct needed surveys.

14. All this information is really great, but how does this translate to real city programs that will reduce our greenhouse gas (GHG) emissions and help us meet the 80 by 30 goal? When will we see real GHG reduction programs happen sooner as most people have been asking for?

A. The City is currently advancing programs that reduce GHG emissions. These discussions are happening in parallel with other programs the City is working on, such as recognizing the need to review extreme fire and sea level rise.

15. If electrification is a priority, how can we make it easier? We are three months into partial electrification (heat pump water heater and furnace) and have had difficulty and costs all along the way. The HVAC and electrical folks say Palo Alto is about the WORST city to work with on all this. How can we become the best? They both call out San Jose as a leader (online permits in a day vs weeks or months). Can we learn from our neighbors?
    A. We're working on it and learning along the way, from other cities and the private sector. Our Council has discussed various programs as well.

16. Our home is a prime candidate for electrification, and I've spent some time looking into it. After several months, I've come to the conclusion of "be prepared to spend more, and then more each year after that." That may be the cost of living here, but it's not an easy decision. I don't think any communication I've received from the city has been counter to this. So, I would like to hear more about what the city is planning, if appropriate at this time.
    A. Thanks for the comment. Please see some information on our webpage: https://www.cityofpaloalto.org/Departments/Utilities/Sustainability/Electrification. This is an area we are actively working on.

17. All of the electricity coming into Palo Alto flows through a single substation separated from the baylands only by highway 101. What would you recommend be done to protect this vital resource?
    A. This topic is being studied as part of the Sea Level Rise planning process. The City is also working with PG&E and California Independent System Operator transmission planners to create a second transmission connection.

Sea Level Rise Questions

18. Can you comment on how a rising shallow water aquifer may affect buried contaminants e.g. in landfills, auto repair locations? Recent studies have raised the concern that shallow water aquifers may mobilize contaminants underground, perhaps toward developed areas in addition to the Bay.
    A. As the elevation of groundwater will increase, it is likely that the movement of groundwater and associated contaminants will also change. This is a very important issue which has received much attention recently; however, we lack specific local understanding in many areas. More monitoring wells and better characterization of the sediment stratigraphy are important.

19. Has the following been considered as an additional source of sea level rise (a pattern in the moon's orbit will amplify high tides in the mid-2030's) —https://www.nasa.gov/feature/jpl/study-projects-a-surge-in-coastal-flooding-starting-in-2030s?
    A. The astronomical tides (driven by the sun and the moon) are well known and can be accurately predicted. They repeat every 19.6 years, called the metonic cycle. As the NASA article points out, we can expect the next high in the metonic cycle in the mid-2030s. These are included in the model projections. They do indicate that we can expect to see higher rates of sea level rise.

20. How do king tides compare to the 100-year or 25-year storm in terms of impacts?
    A. A king tide is about one foot above mean high water. A 100-year stormtide is about three feet above mean high water. The worst case is when they coincide to give you 4 feet!

21. Can we integrate this groundwater effort into the City's One Water program? I am hopeful of an integrated view. This ties into water supply. We keep climate/sea level rise perhaps as a separate silo from our One Water strategy.
    A. Excellent suggestion. The One Water program and Sea Level Rise are on different timing, but the current groundwater information will be incorporated into the One Water program.

22. Do the ground water changes suggest basements are a bad idea?
    A. This is something we will discuss during the adaptation plan development.

23. Has Palo Alto considered adoption of the zoning ordinance recently passed In Burlingame to raise infrastructure to account for sea level rise?
    A. We will consider actions like this during the Adaptation Plan development. We have reviewed Burlingame Zoning Ordinance changes and think this and similar models will be helpful in our own planning process.

24. How might we use the estimates of the cost to deal with worsening fire and flood damages to properly inform the boldness of action that should be pursued by our (some say comparatively well-educated and well off) communities?
    A. Staff members have public forums built into existing planning models; for example, the local hazard mitigation plan/floodplain management planning, community wildfire protection planning, sustainability/climate action planning to present to the community, including City executive leaders and policy makers. Only the decision makers (e.g., City Council) can determine how bold the actions will be based on risk ratings and resources available (funding, people, time, etc.).

25. Does the Sea Level Rise Plan include considering groundwater impacts vs. flood levee alignment? Currently the levee, which would have no impact on groundwater impacts, is expected to inboard large areas with exceptional groundwater impacts. Should these lands be placed behind such groundwater impact areas? Has that been considered?
    A. This is a great question and one that will need to be considered as part of our planning process. We will note this as a question to address.

26. What needs to happen so that we can bury electrical lines for fire safety reasons when we also have to worry about ground water level rise?
    A. High risk overhead lines are located west and south of 280 at higher elevations. Preliminary results from the Sea Level Rise Vulnerability Assessment show that underground utilities will be exposed to rising groundwater conditions. Options for protecting these assets will be considered as part of the Sea Level Rise Adaptation Plan.

27. Are the FEMA flood zone designations going to change in the city?
    A. Flood zone designations are determined by FEMA and shown on their maps. Maps and zone designations can change if new data is available. In the future, once the projects are completed we can submit new information to FEMA and request that they review and change designation based on improvements made.

28. How is City of Palo Alto planning to protect from "end run" flooding from Menlo Park and Mountain View?
    A. We are working with the cities of Menlo Park, Mountain View and East Palo Alto to address the concern of "end run" flooding.

29. Has your ground water rise data been sent to the Transportation Committee considering a trench for the train under Charleston and Meadow, as it will affect the design to remove ground water flow under the trench?
    A. The groundwater level near the train is much lower than the groundwater basin near the bay; the consultant working on that project is including groundwater movement in their consideration of the trenches.

30. Do the flooding maps that Julie Weiss displayed take into account existing levees and other forms of flood protection? In other words, would the blue areas actually be inundated or are they just areas with elevations below the projected elevated tide levels?
    A. The BCDC Adapting to Rising Tides (ART) mapping that Palo Alto uses to make the sea level rise inundation maps reflects current actual shoreline elevations, asset locations and future projected tide levels. This is different than FEMA maps which don't assume our current actual levee heights because our levees are not accredited to meet certain protection standards. Because Palo Alto's Vulnerability Assessment model doesn't assume the variety of complex soil and specific site conditions, not everything in the blue inundation area would necessarily be exposed to daily high tides, but it approximates the areas for which planning is needed based on elevation. In addition, the ART maps do not account for the duration of overtopping during a specific flood event. This means that there is not a direct simulation or analysis of the volume of Bay water that would overtop during a storm and to what depth and extent the overtopped waters would pond in low-lying landward areas.

31. Are fast breaking new estimates of specific changes in the forecast of sea level rise (like mentioned in this article on a Doomsday Glacier) included in the optimization decisions about how much to lead on emission reductions in order to avoid the avoidable part of future sea level rise?
    A. The extreme condition related to ice sheet loss, sometimes referred to as the H++scenario considered by State sea level rise guidelines, is not considered in Palo Alto's Vulnerability Assessment because of so many uncertainties around that scenario. It is a topic of active research and may be considered in the future when we have more information to inform those planning efforts. However, the future uncertainty of conditions is why all of our protection and adaptation strategies must be adaptable for iterative changing conditions.

Suggestions from Participants

- Almost all home heating systems (forced air) can run the fan only. This, along with good filters for these systems, can filter the air without having to have air conditioning, so more homes can have filtered air.

- As a CZU survivor, one low-tech 'hack' that worked pretty well for smoke clean-up was attaching 2x2 HEPA furnace filters to 2x2 box fans and setting them up all over the house. It helped keep us cool, while also cleaning up the air a bit.

- A worthy note I believe – current building code (since January 1, 2009) for new homes (both single and multifamily) require there to be induced infiltration via mechanical ventilation at about 0.5 air changes per hour

- The City could resume its active bulk buying role in procuring attic insulation services (like it did in the 1970's and 80's). The risk / reward ratio probably favors active city involvement if viewed holistically.

- The research needs to correlate poor indoor air quality with blower door testing. Many homes in Palo Alto have had this done as part of a home energy audit.

- Perhaps it makes sense to promote induction cooking and home air sealing as a package for healthy living

- I have found that the City can contract for services that can inform the research. I would scope it out and get this in front of staff. We like how City of Palo Alto can be a leader.

- The City should have an electrification "package" to minimize risk, cost, and time to install a heat pump water heater. Panel upgrades should be part of the package. Rapid response from contractors, inspectors, and quick access to inventory.

- Perhaps the City can develop a local Social Cost of Carbon (SCC) adder to add to the about to be updated national SCC to be useful in optimized climate planning.

- I am hopeful the Storm Water commission can enjoy a presentation on One Water. I find that commission-wise we lack purview and ownership of "water". The Utilities Advisory Commission is more rate and supply focused, and less "one water" and climate. I have offered into the future we might rebalance oversight at the commission level to bring more targeted emphasis to "water"

- Palo Alto citizens and policy makers should be actively working to keep Diablo Canyon open. Diablo Canyon, California's last nuclear power plant, is scheduled to begin shutting down in 2024. At that point the state will lose its largest single source of emissions-free electricity. The two Diablo Canyon units produce a total of 18,000 gigawatt-hours of clean and reliable electricity annually, enough energy to meet the needs of more than three million Northern and Central Californians (nearly 10%

of California's energy portfolio and 20% of the power that PG&E provides throughout its service area).

Polls

1. Please tell us about who you are (multiple choice):
    - Resident (61%)
    - Business (5%)
    - Nonprofit (25%)
    - City of Palo Alto Staff (5%)
    - Other government agency (12%)

2. What are your interests in SLR protection? (multiple choice)
    - Protecting my home and community (69%)
    - Habitat protection (45%)
    - General interest (40%)