

Weather App for Places at Risk of Wildfires

1. The primary stakeholders are people who live in areas at risk of wildfires, or whose loved ones live in such places. These include places such as the western United States, southern Canada, and southern Europe.
2. Some of the primary stakeholders are people who live in areas at risk of wildfires. For some, wildfires only occur sporadically. However, for most, their area has a yearly “fire season” during which wildfires predictably occur. During a wildfire they will often find themselves switching from a weather forecast app (to check humidity, temperature, and other weather events which affect the spread of fire) to a fire tracking app and vice versa. With the production of my app, they would instead use only this one app which provides all the information they would previously get from two. This would allow these primary stakeholders to stay up to date about existing fires in their area, and judge whether the weather conditions make them more at risk of new fires starting and/or existing fires spreading.

The other primary stakeholders are the loved ones of those who live in areas at risk of wildfires, such as relatives, partners, and friends. Though these people are not at risk of direct harm from wildfires, they still want to be kept up to date on the progress of fires and the weather conditions which might affect those fires so that they can offer support to their loved ones.

3.

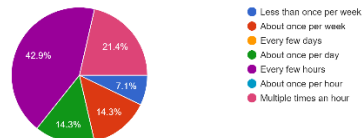
Primary stakeholders	People who live/whose loved ones live in areas at risk of wildfire.
Secondary stakeholders	Weather services and fire-tracking services from which we get our data. (These could also be thought of as facilitating stakeholders, but they do produce input for the system)
Tertiary stakeholders	The local authorities who benefit from residents being better-informed of fires. Insurance companies.
Facilitating stakeholders	Me. The people who filled out my questionnaire. My interviewees.

4. I chose to use a questionnaire because I could send it to wide range of people. I also held 3 semi-structured interviews over zoom to better understand how the primary stakeholders would be feeling while using the app. I gathered information from blogs and articles about

what it is like to live amongst California wildfires as during COVID I am limited in the number of people I can find to interview. I examined CAL FIRE, a fire-tracking website for California.

- My questionnaire received 14 responses. Of these, A majority said that in the case of an active fire, they would be checking the app either every few hours (42.9%) or multiple times an hour (21.4%). The high frequency at which some users will be checking the app was also reflected in the interviews, and I was surprised by it. It highlights the importance of making the relevant data quick and easy to access (i.e. as few button presses as possible between

When there is a wildfire near where you or your loved ones live, how often would you check live updates about the fires' progress?
14 responses



launching the app and seeing the data).

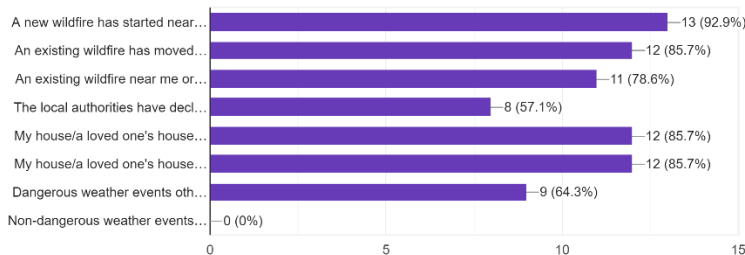
My questionnaire also showed me the importance of notifications. Most of the responses indicated that they would want to receive notifications under dangerous circumstances, as shown below.

Under which circumstances would you want to receive notifications from the app? (Select as many as appropriate)

- ☐ A new wildfire has started near me or a loved one
- ☐ An existing wildfire has moved closer to me or a loved one
- ☐ An existing wildfire near me or a loved one has been extinguished/contained
- ☐ The local authorities have declared the start/end of "fire season"
- ☐ My house/a loved one's house might need to be evacuated soon
- ☐ My house/a loved one's house presently needs to be evacuated
- ☐ Dangerous weather events other than fire, e.g. storms
- ☐ Non-dangerous weather events, e.g. "Today will be sunny"

Under which circumstances would you want to receive notifications from the app? (Select as many as appropriate)

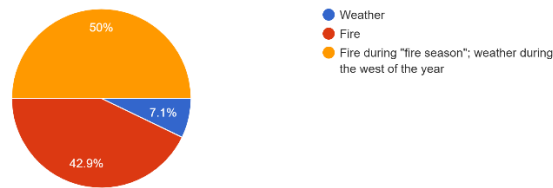
14 responses



The variability in these answers leads me to believe that notifications should be configurable. Perhaps the default should be to receive notifications for all potentially dangerous events, and an easy-to-locate settings menu would allow you to opt in/out of specific notifications.

I also found that the primary usage of the app was largely variable.

Would your primary use of the app be to check the daily weather or to track fire?
14 responses



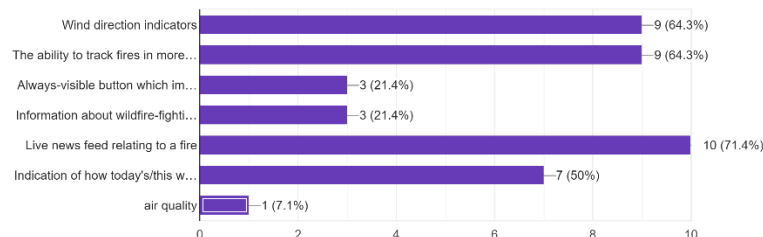
This distribution leads me to believe that the app should have two distinct modes: Fire mode and Weather mode, and the user should be able to switch between them, perhaps using the same settings menu as described above. These modes could be as simple as the weather data and the fire data being shown on different pages, and the mode determines which page is shown first when the app is launched.

Many responses also liked the idea of the app having live news feed related to a fire, wind direction indicators, and the ability to track multiple fires in different locations. I was surprised that so many people wanted the live news feature, and that so few wanted an emergency services button.

Which features would you want to see in the app? (Select as many as appropriate)

- ☐ Wind direction indicators
- ☐ The ability to track fires in more than one location in the world
- ☐ Always-visible button which immediately phones the emergency services
- ☐ Information about wildfire-fighting techniques
- ☐ Live news feed relating to a fire
- ☐ Indication of how today's/this week's weather forecast might influence fire growth, e.g. hot dry days given some warning symbol
- ☐ Other: _____

Which features would you want to see in the app? (Select as many as appropriate)
14 responses



The main thing I gained from the interviews and the blog posts was the sheer stress and trauma that comes with having your home at risk of wildfire. All three of my interviewees agreed that their priority when there is a fire nearby is making sure that they are up to date with the latest information and making sure they know if/when they need to evacuate their homes. Two also said that they spend a lot of time looking at the weather forecast and trying to predict what will happen to the fire.

This demonstrates the importance of the interface being simple and uncluttered. Users need to be able to navigate it quickly even under extreme stress. Having pictographic aids where possible will help users navigate the app even more quickly. This also makes me want to make heavy use of design patterns that are common amongst apps, such as having a

navigation bar along the bottom edge of the screen, so that users instinctively understand how to navigate the app.

6.

Aims	<p>Primary stakeholders need to be informed about the risk of wildfires in their area so that they can minimise property damage and loss of life caused by wildfires.</p> <p>They also need to be able to make decisions such as when to evacuate their homes.</p> <p>This can be measured by the size of insurance claims, or the number of wildfire-related deaths.</p>
Sources of satisfaction	<p>Primary stakeholders will feel safe and satisfied when they know that they/their loved ones are not in danger of wildfires or have taken the necessary precautions.</p> <p>They may become stressed if current information is hard to access or if they find themselves with less time to prepare than they expected.</p> <p>Note: stress is not a perfect measure of this app's merit. User stress is to be expected.</p>
Knowledge and skills	<p>Those who live in at-risk areas likely developed good instincts for which weather events can exacerbate fires, whereas their loved ones – also primary stakeholders – who live in safe areas might not.</p> <p>Primary stakeholders might also lack the knowledge of how to interpret air quality, and when you require a mask to breathe safely, or how close a fire can get before evacuation is warranted.</p>
Attitudes to work	<p>The primary stakeholders will include a wide range of attitudes towards technology; however, it is unlikely that any users will be particularly technophobic as the app will be accessed on a smartphone or tablet.</p> <p>The most important uses of the app will likely be under stressful circumstances, so users will be particularly opposed to unnecessary extra work to access information</p>

Work-group attributes	<p>By the very nature of the app, its users will be stressed and distraught. As such, the primary stakeholders might subconsciously associate the app with distress, and so accept it less.</p> <p>My hope however is that users who switch to using this app will find it so much easier to use than what they were using before that they instead associate it with peace of mind and security.</p>
Nature of activities	<p>In normal times users will typically check the weather forecast somewhere between once per week and once per day. This will be a low-stress activity.</p> <p>During a fire or “fire season”, most users will check the fire’s progress multiple times per day, cross-referencing this with the daily and weekly weather reports to predict the future progress of the fire/s. This will be a high-stress activity.</p>
Responsibility	<p>Users need to ensure that they are keeping themselves and their loved ones safe.</p> <p>Some are responsible for people who might need to be evacuated (e.g., children, elderly relatives, physically impaired loved ones).</p> <p>Some are also responsible for valuable possessions which might need to be removed from a building which is at risk from fire.</p>
Working conditions	<p>The primary stakeholders will be working in a wide range of conditions, but which may include extreme heat, and extremely poor air quality leading to low visibility.</p> <p>The users may be forced to stay away from their homes and so may not have access to device chargers.</p> <p>The app will also sometimes be used in situations of great stress and discomfort.</p>

7. Functional

- Daily weather forecasts
- Weekly weather forecasts
- Visualisations of existing fires on an interactive map
- Indications of the wind speed and direction
- Indications of the extent to which a weather forecast affects the spreading of fires

- Show air pollution
- Configurable push notifications for fire-related events
- The ability to view weather/fires in multiple user-defined locations
- Live updates
- Live news feed about the fires
- The ability to decide whether upon opening the app the weather forecast or the fire tracker should be shown first.

Non-functional

- Uncluttered, minimalist, calming interface
- Low battery usage
- Ability to work despite large volume of concurrent users
- Pictographic/iconographic aids where possible
- Common app design patterns/interfaces

Appendix

Questionnaire questions

When there is a wildfire near where you or your loved ones live, how often would you check live updates about the fires' progress?

- ☐ Less than once per week
- ☐ About once per week
- ☐ Every few days
- ☐ About once per day
- ☐ Every few hours
- ☐ About once per hour
- ☐ Multiple times an hour

Under which circumstances would you want to receive notifications from the app? (Select as many as appropriate)

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- ☐ Non-dangerous weather events, e.g. "Today will be sunny"

Would your primary use of the app be to check the daily weather or to track fire?

- ☐ Weather
- ☐ Fire
- ☐ Fire during "fire season"; weather during the rest of the year
- ☐ Other: _____

Which features would you want to see in the app? (Select as many as appropriate)

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- ☐ Other: _____

Interview questions

1. How often are there wildfires where you/your loved ones live?
2. What information helps you determine when a wildfire might break out?
3. When there is an active wildfire, what is your priority?
4. Describe your state of mind during a wildfire.
5. How often do you check on the fire's progress?
6. What information is helpful for you to know when there is a fire? How relevant is the weather forecast?
7. What are some good and bad features of the informational systems that are currently available?

References

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