1.1 Introduction and CO-FPS Contract and Legislation Update (Melissa Lineberger, CoE Director)

- Melissa Lineberger welcomed everyone and thanked them for their interest and participation in the meeting.
- Director Paul Cooke also welcomed everyone and expressed his interest in this project succeeding. Dr. Cooke then asked Rep. Tracy Kraft-Tharp to say a few words.
- Rep. Kraft-Tharp provided some background on the project and expressed her ongoing support for the effort.

1.2 National Center for Atmospheric Research Presentation (Bill Mahoney and Janice Coen)

During and following the presentations by Bill Mahoney and Janice Coen, members of the audience posed several questions. Stakeholder questions captured during the meeting are provided below. The initial responses provided at the meeting (paraphrased) are provided below each question in blue text.

- Can we include burned-out areas (backfire) areas in the model?
    - NCAR Response: It's technically possible to add these areas into the model, but that capability does not currently exist. If the backfire areas are part of an updated fire map, then the change in fuels related to this treatment would be captured.
- What is the return time on the model run? (There was no obvious objection to our stated 30-minute estimate.)
    - NCAR Response: We are targeting a 30 minute model run completion period for the initial operating capability (18 hour forecast). The completion time is primarily a function of the computing power, so faster run times can be achieved after year one for the same 18 hour forecast with modest computer upgrades.
- A firefighter mentioned that the High Park fire behaved very much like the simulation that NCAR showed. He was there.
    - NCAR Response: We were also happy to see the model perform well for this case.
- There was a question about how high (deep) the model extends vertically.
    - NCAR Response: The model depth is configurable, but typically extends to at least 35,000-40,000 feet above sea level. This is necessary to capture the atmospheric behavior properly.
- Can fire suppression activities be modeled? That is, either adding planned burned areas or tell the model that retardant has or will be applied over an area to reduce flammability of the fuel.
    - NCAR Response: The CAWFE® model does not currently include this functionality, but there are approaches that could be developed to simulate the suppression activities.
- Where do you have to be to get the fire forecast?
    - NCAR Response: The output of the CO-FPS model will flow into the Colorado Wildland Fire Information System (CO-WIMS). As the development progresses, CO-WIMS users will be provided access to the CO-FPS products. The rollout will be managed by DFPC.
- How will the CO-FPS interact with the federal system? What if they disagree?

    - NCAR Response: We anticipate that the output from CO-FPS will differ from the federal products. CO-FPS products will be an additional "tool in the toolbox". CO-FPS products will be considered "experimental" until the system is refined and tuned.
- According to one of the stakeholder attendees, there is some reluctance by the feds in adopting this technology; however, he encouraged people to keep pushing the technology and incorporate the federal skeptics' issues to prove they can be overcome.
    - NCAR Response: The feds will be informed as the project progresses so that they remain aware of the emerging capabilities.
- Where are the fuels information coming from? How is LANDFIRE data validated? The individual stated that he would like to get updated fuel info back into LANDFIRE but there is no real process.
    - NCAR Response: The default fuel dataset will be the LANDFIRE dataset. Other, more accurate fuel datasets can ingested into the system as they become available, but some research and development will be required to ensure the datasets are blended properly and are of high quality.
- A stakeholder mentioned an FS-PRO run produced a result that was very poor and he thought the fuels information was the issue. He is concerned about the input data quality of the fuels database.
    - NCAR Response: We concur that it's important to have access to the best available fuels database, so we will continually seek opportunities to incorporate improved fuels data as they become available. NCAR's research has shown that weather (wind speed, wind direction, and humidity) is often the driving force in fire behavior prediction and for larger fires, fire behavior is more sensitive to weather factors than fuel data accuracy.
- Is the MMA data required and can the model be run without it?
    - NCAR Response: The CO-FPS will be able to run without fire mapping data from the MMA as it can get its initial condition (ignition locations and fire size) from human inputs and/or from satellite infrared data sources such as the Visible Infrared Imaging Radiometer Suite (VIIRS). That being said, it's important to have accurate and timely fire map data updated frequently so high resolution fire data from the MMA will be very beneficial.
- Is the system going to run outside CO?
    - NCAR Response: The Colorado funding will only focus on creating a CO-FPS for Colorado. However, the core capabilities are extendable, with appropriate configuration and tuning, outside Colorado should there be interest outside the state.
- Has CAWFE® been compared to any other fire model?
    - NCAR Response: The CAWFE® system has been tested and compared for several cases against currently used tools (e.g., FSPro, FARSITE) and outperforms them particularly for large wildland fires in complex terrain and weather conditions.
- Could fire observations from the field be incorporated into the system? Can observer based observations provide a benefit over RAWS data?
    - NCAR Response: Meteorologists and weather prediction system like as much data as possible to characterize the initial state of the atmosphere. Field generated weather observations, if good quality, can be assimilated into weather models.
- Have we looked at multi-spectral data for fuel information?

- NCAR Response: Yes, the use of multi-spectral datasets from satellites and aircraft are becoming more available and useful for a lot of Earth prediction system applications (e.g., fire, agriculture, flooding, etc.). This is an active area of R&D with significant potential for improving fine-scale predictions.

1.3 Division of Fire Prevention and Control Toolbox (Brad Schmidt, CoE Wildland Fire Technology Specialist)

- Brad Schmidt gave a presentation providing an overview of the Colorado firefighting assets including the aerial firefighting aircraft, mission, goals, and operations. The slides will be available on the COE website:

URL: https://sites.google.com/a/state.co.us/dfpc/alerts/home/center-of-excellence

- Brad also discussed how the CO-FPS products will be introduced and used as the capability evolves. Specifically, the operations will not change for the foreseeable future until there is significant experience with the new capabilities.
- Brad introduced some of the activities of the COE and upcoming meetings

1.4 Colorado Wildfire Information Management System (Rocco Snart)

- Rocco provided an overview of the CO-WIMS. The slides are in the same file at the URL listed above.
- Rocco also encouraged more users to take advantage of CO-WIMS and to practice logging in before they need to learn it in a crisis.
- Question was asked about the role of drones. The answer was that aircraft and drones each have a role to play and complement each other.
- Question was asked about what impacts the ability of MMA to see the fire. Answer was that low clouds are the major problem. There was a suggestion that perhaps UAS technology can fly under the clouds to sense the fire. The COE is exploring experiments with UAS in this manner.
- Intterra indicated that the CO-WIMS can handle UAS datasets and others from multiple sources and the CO-WIMS is the single place to view the data.
- To clarify for the audience, it was mentioned that CO-WIMS is part of Intterra's "Situation Analysist" product line.

1.5 Small Group Discussion

- The stakeholders were asked to complete a form (see Appendix B) that will be used to guide the next steps of the project and identify persons interested in participating on the project user group(s).

1.6 Introduction to Stakeholder Committee Process and Next Steps (Brad Schmidt)

- Brad reviewed the expectations and next steps with the stakeholder committee. He talked about the 2016 demonstration and training program. The slides for this part of the briefing are at the same URL as provided above.
- Brad also mentioned the process to develop metrics for assessing the project results.
- About 11 stakeholders meetings will be held with the final one for this year being in November 2016.
- Feedback is welcomed all year even if stakeholders are not officially on a user group.
- Brad reviewed highlights from the Statement of Work (SOW) and discussed the CO-FPS system acceptance process.
- It is anticipated that this will be a 5-year development effort with a lot of stakeholder feedback to inform basic capabilities and enhancements.

1.7 Closing Remarks and Next Meeting (Melissa Lineberger)

- Melissa mentioned that the next stakeholder meeting will be in Rifle around the 26th or 27th of January to leverage the Nighttime Firefighting Summit. See:

  https://sites.google.com/a/state.co.us/dfpc/alerts/home/center-of-excellence/coe-announcements

- Melissa also encouraged stakeholders to spread the word on this project and thanked everyone for participating.