MEETING MINUTES

The minutes are organized by topic per the agenda.

1.1 INTRODUCTIONS & MEETING GOALS AND OBJECTIVES

Brad Schmidt (CoE) opened the meeting by thanking everyone for attending and participating. We did a round robin of self-introductions. Brand then discussed the topics and objectives of the meeting which are captured in the agenda.

1.2 UPDATES ON CO-FPS DEVELOPMENT (NCAR)

Bill Mahoney and Jim Cowie (NCAR) gave a high level overview of the CO-FPS project status and system development work that has been conducted since the 23 May Stakeholder meeting. The focus areas included, but are not limited to:

- Preparing several deliverables including:
  - Functional Requirements Document (V-1.0)
  - CO-FPS Design Document (Initial Operating Capability)
  - May Monthly Progress Report
  - Performance Verification Metrics and Methodology Report
  - Minutes from the 23 May Stakeholder Meeting

CO-FPS System Development activities since 23 May have been focused on:

- Staging of additional CO-FPS datasets and products for CO-WIMS
- Testing of data flows using sample data and some "real-time" requests from CO-WIMS
- Testing a variety of CAWFE® model and computer configurations to optimize run-time performance (e.g., MPI vs. OpenMP options, etc.)
- Configuring daily CAWFE® runs over the mountains and plains to evaluate model fire prediction behavior and robustness
- Testing the wildfire ignition capability (workflow) to exercise the CAWFE® model
- Continuing development of a product viewing capability outside of CO-WIMS for system testing and evaluation purposes
- Preparing a computer server augmentation specification for a GIS product and data server
- Identified an initial set of hazard thresholds for the aviation hazard products (e.g., turbulence, wind shear, and up/downdrafts)

Stakeholder Q&A

- There was a question as to whether NCAR had received feedback from Firelab (Scott and Burgan) related to the needed data to support the use of the expanded fuel dataset.

NCAR Response: Firelab has not responded to our request for information. Brad Schmidt indicated that he will try to contact them to move this discussion forward.

- Sierra Nevada Corporation (SNC) offered up some fire aviators to help with the aviation hazard thresholds. Brad mentioned that the CoE plans to organize a telecom to discuss the aviation hazard thresholds in the next month or so.

NCAR Response: NCAR worked with its pilots to identify some initial default thresholds for the aviation hazards (turbulence, wind shear, up/down drafts, etc.). These initial values will be revised when we receive input from the fire aviators.

1.3 Presentation and Discussion on Initiating the CO-FPS Fire Model

Brad Schmidt led a discussion of the process and work flows associated with igniting a fire prediction simulation in CO-FPS.

- Initial fire event – The CO-FPS will assume a symmetric active fire perimeter unless it's given other information such as a burn boundary and active file line (or polygon)
- Satellite data (e.g., VIIRS) also needs some human QC editing before it's used to characterize the fire initial state. NASA Goddard and the University of Maryland are working on algorithms to process the imagery so little or no human QC is required.

- If the user identifies a "point" to start the CAWFE® fire animation, the model will actually ignite a fire grid box (30m x 30m or 0.22 acres) in size. The weather that the fire experiences will be taken from the 110m x 110m gridded weather dataset. **Note: During the meeting, NCAR incorrectly indicated that the smallest modeled fire will be calculated on the 110m grid. This was incorrect as this is the minimum weather grid resolution. The minimum fire grid resolution is approximately 30m x 30m (0.22 acres).**

- The meeting attendees indicated that the CO-FPS users will need to be trained on this detail. Make sure the users know the minimum acreage that the system can resolve.

- The project team will need to train users on how CAWFE® deals with unburned islands in the middle of the burn area, etc.

1.4 Presentation and Discussion on the Look and Feel of CO-FPS Spatial Products and Statistics

- Burned areas and barriers
  - Barriers are interpreted by CAWFE® as changes in the fuel and barriers will be assigned a length and width

  - Users can hand create or use an MMA fire line, barrier or mask. These items will need to be assigned some attributes (length, width, and "fuel" type) by the system so the model knows how to treat them

- Other model inputs
  - User name, fire (simulation) start time, and an initial fire prediction domain size (the system will have a default minimum domain size for running the fire model. [During testing thus far, NCAR has been using a 13k m x 13km (169 KM^2 or 42,761 acre) domain size.]
  - Perhaps if the simulation quickly hits the edge of the domain by a certain percentage, the run should abort and be restarted with a larger domain.
  - Users or the system should automatically try to select an initial domain size based on initial fire boundary. For example, if the initial fire boundary is large, then the domain to run the next prediction should scale accordingly to provide room for additional fire growth
  - There is a desire for CAWFE® to quickly send back the domain size (box) for viewing on CO-WIMS so the users can see the domain and perhaps decide quickly if it's the "right size" or if the run should be aborted and a large size domain be used as a starting point

- CO-FPS products – look and feel
  - "Time of Arrival" information (hourly fire boundary information)
    - Users want a polygon progression map
      - Unfilled polygons
      - Color-filled polygons
      - Animations also useful
- Rate of Spread
  - Can tell rate of spread from hourly boundary movement
  - Can show rate of spread magnitude using colors along the fire perimeter

- Heat Flux
  - Users want the system to create a flame length product since flame length drives tactical operations
  - Can show heat flux and flame length products' magnitude as color filled areas or using colors along the fire perimeter

- Animations
  - Useful for some users, but do not let the public or media have access to any of the CO-FPS data since the media would likely misinterpret the product and how it's used
  - CO-WIMS does provide a way to view animations. We may want to explore creating an animation file (e.g., mp4), but more discussion is needed about what

users would do with this product and how to protect the information from going public
    - If animations are created, some form of time indicator on each frame should also be provided

- Relative Humidity
    - Represent as color-filled (binned) values
    - Humidity time-series at user selected points may be valuable
    - Users expressed a desire to have the CO-FPS derive a 1-hour (fine-dead) fuel moisture map

- Wind Speed and Direction
    - Some users can interpret meteorological wind barbs, but almost all can understand wind arrows (with magnitude shown at the arrow root)
    - Wind data can be overlaid over fire boundary data
    - Wind speed (isotachs) could be show in colors, but it's hard to overlay on other color-filled products
    - Animating wind arrows seem very desirable
    - Users liked the ability to select wind gust information as an overlay

- Air Quality
    - Want to have $PM_{2.5}$ products at 2m level
    - Bin thresholds at EPA concentrations as described in the Functional Requirements Specification

2. ACTION ITEMS

The following actions items resulted from the meeting.

- The user feedback on CO-FPS functionality will be captured and included in updates to the CO-FPS Functional Requirements Specification (FRS).
- The presentation materials will be posted to the CoE project website.
- The CoE will contact Firelab to discuss how NCAR can obtain or fill-in the missing burn rate data in the Scott and Burgan fuel models.
- The CoE will provide NCAR with the desired algorithm or reference for deriving the fine-dead fuel moisture content.
- The CoE will review the calendar and identify the date and time for the next Stakeholder meeting which will be in July and/or August depending on the availability of the stakeholders.

Appendix A – Meeting Agenda

COLORADO
Center of Excellence for Advanced Technology Aerial Firefighting
Department of Public Safety

Colorado Fire Prediction System March Meeting Agenda
June 16, 2016: 2 p.m. - 4 p.m.

2:00 p.m. - 2:15 p.m.	Introductions & meeting goals and objectives
2:15 p.m. - 2:30 p.m.	Update on CO-FPS development
2:30 p.m. - 3:00 p.m.	Presentation and discussion on initiating CO-FPS model
3:00 p.m. - 3:10 p.m.	Break
3:10 p.m. - 4:00 p.m.	Presentation and discussion on look and feel of CO-FPS spatial products and statistics