Met One Instruments

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ES-808
S.C.A.M.P.

System Contamination and Meteorological Platform

Partnering with prescribed burn expert, **Sean Hendrix** of Grayback Forestry Inc., Acoem Met One delivers a focused design in direct support of Prescribed Burning and Fuels Reduction/Mitigation

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Acoem Met One introduces the SCAMP – a game-changer in Environmental Air Quality Monitoring with a focused design to directly support critical Prescribed Burning and Fuels Mitigation. The SCAMP provides crucial data points such as particulate levels at PM10 and PM2.5, as well as meteorological and personnel safety measurements for:

- Wind Speed/Direction
- Ambient Temperature
- Relative Humidity
- Barometric Pressure
- CO (Carbon Monoxide) monitoring, critical to personnel safety!

INTRODUCTION

The new SCAMP system provides measurement parameters necessary for making critical decisions for prescribed burning and has the added capability for providing crucial particulate monitoring at PM_{10} and $PM_{2.5}$ as well as for carbon monoxide. Some other applications for this system:

- Use on active wildfires and especially in fire camps to provide critical measurements in support of firefighter safety.
- Deployment after natural disasters to monitor air quality for human safety.
- Outdoor school/student activities during Wildfire season to provide a scientific tool for making critical decisions related to student/faculty safety.

The SCAMP is a very lightweight, mobile, and versatile instrument that can be deployed exactly where necessary and be up and running in just a few minutes with the single press of a button.

Acoem Met One Engineers worked directly with experts in the Wildland Firefighting community to design a useful, portable, feature rich instrument that is quick to set up and will begin producing data within a few minutes. Its primary design application is in support of Prescribed Burning. For example, modeling and measuring weather patterns in designated areas prior to prescribed burn is fundamental in creating effective burn plans. Executing a good burn plan is critical for fuels reduction and mitigation which in turn, is a primary contributor in preventing massive wildfires that have become an annual crisis across the globe. Also, for making crucial air quality decisions for schools and other public arenas. It has cellular capability and GPS locating to indicate precisely where it is deployed. Because of its small profile and weight, it will be compatible for drone deployment as well.

Because of its Cellular capability, it can be accessed either remotely or via your handheld device with the click of a button on a web link. This link will allow user access to our web-based application which provides a dashboard showing all measurement parameters in an instrument gauge look and feel in addition to a graphical format.

BACKGROUND

Acoem Met One is a world leader in environmental monitoring with instrumentation deployed in over 80 countries around the globe. Although it has served the Wildfire industry for years, we hadn't reached out to the private contractors that work hand in hand supporting all of the associated State and Federal agencies; USFS, State Forest Departments, Bureau of Land Management, etc. They provide support in the form of technical training, fire crews, equipment, and all manner of crucial experience and supplies. I spoke to a couple of wildland firefighters, and they suggested I reach out to Mr. Sean Hendrix, Burn Boss 1 of Grayback Forestry. Grayback Forestry is a local private contractor in Southern Oregon serving the Wildland Firefighting community and is a highly respected member of the NWSA (National Wildfire Suppression Association). I contacted Sean and he was gracious enough to meet with me. I explained who Acoem group is and asked how our line of products might be used by Grayback and similar private contractors. He mentioned the future of Wildland Firefighting will incorporate the use of drones for quickly delivering critical equipment in seconds, and are used in monitoring fires using infrared and thermal technologies, deployment of controlled burning ignition sources, etc. Sean mentioned the current weather stations were not always deployed in specific locations to make crucial decisions on crew and equipment deployment and the systems, although portable, were very large, heavy, required multiple personnel to deploy.
He stated that if we designed an instrument that was feature loaded specific for their needs, small and light enough to be drone deployable, and rugged enough, it would provide extreme value and serve a crucial need. Sean is a burn boss with nearly 35 years of experience in the Wildland Firefighting community. He works intimately with and is well respected by all groups in this community, i.e. USFW, State Forest, municipal fire agencies both rural and urban, BLM, State Fire Marshall, Nature Conservancy, Oregon State University Fire Ecologist, NWSA, and private contractors, and representatives from the Native American Tribes. Because Acoem Met One understands the importance of the voice of the customer, I worked closely with Sean, in addition to team members of the Oregon Department of Forestry and USFS to develop a list of user needs and a feature set for the product. The SCAMP was born… Acoem Met One personnel then built up one engineering prototype which was demonstrated to Sean and members from the ODF Use Module, and firefighter teams. This demonstration was focused on whether we were meeting the technical needs of the attendees and if the device size, weight, and feature set were acceptable. Due to the positive response, the decision was made to build 5 more prototypes with some needed updates to be ready for the prescribed burn season of late winter/early spring, 2023.

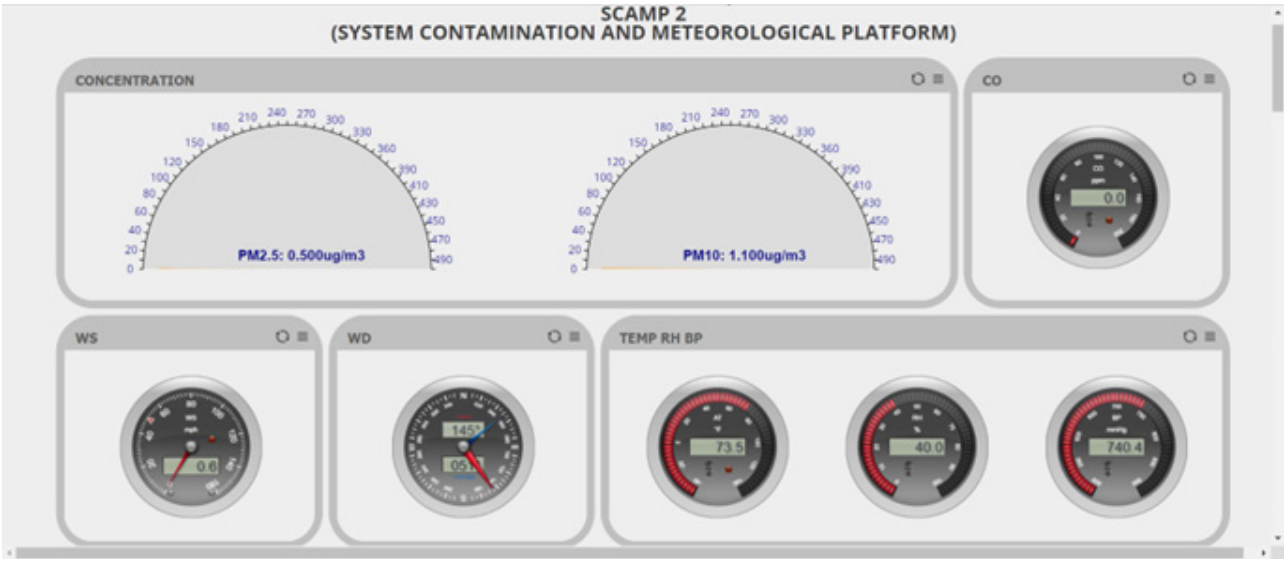
FIELD TRIAL

On February 8th, 2023, we deployed the first of the new versions of SCAMP in the middle of a 10 acre controlled burn site, in the Grants Pass, OR city limits, where 50+ piles of slash were to be burned in approximately a 2-3 hour window. The system hardware and tripod were set up in less than 2 minutes, the instrument powered up and running a minute later. The instrument includes a Cellular Modem (Acoem Met One CCS Modem) and GPS locater. As Sean was unable to physically be at the burn site that day, a web link was sent to him which enabled him to log onto our web-based application and view the dashboard of the SCAMP measurement parameters which were set to update on 5-minute intervals. In less than 10 minutes total time, the system was deployed, powered up, and sending out data that was accessible from Sean's office computer, 8 miles away. Even though he was on a remote meeting with colleagues, there were a number of folks present on his site that he was able to demonstrate the system to including; USFS Fire Chief, Rural Metro Fire Chief, Lead for the Nature Conservancy and Coordinator for TREX Training, Oregon State University Prescribed Fire Ecologist, District Ranger ODF and Director for the Wildland Fire Use Module, ODF Protection Supervisor, and Sean Hendrix, Grayback Forestry Burn Boss 1, and recently appointed to the Oregon Prescribed Fire Council (OPFC) https://www.oregonrxfire.org/

Each attendee was able to see in near real time updates in the meteorological and air quality data as the environmental conditions were changing including wind shifts.

Prescribed Burn Site, February 8, 2023.

THE FOLLOWING ARE EXAMPLES OF THE DASHBOARD, DISPLAYING VARIOUS METEOROLOGICAL/AIR QUALITY DATA, AND CORRESPONDING GRAPHICAL DATA AS DISPLAYED VIA MET ONE'S WEB-BASED APPLICATION.



SCAMP Graphic Data (Web Application).

CONCLUSION

The SCAMP is a remotely deployable unit that can be battery, power supply, or solar powered. It includes cellular capability with GPS functionality for exact location identification. It also provides five critical weather parameters:

- Wind Speed
- Ambient Temperature
- Barometric Pressure
- Wind Direction
- Relative Humidity

Additionally, the system is equipped with a Carbon Monoxide monitor and provides Particulate Monitoring (PM) for a robust combination of Environmental Air Quality and critical weather parameters. The SCAMP comes in a weatherproof, compact 10” X 10” X 20” package and weights a mere 20 pounds, furnished in a weatherproof, lockable shipping case which provides protection as it is transported to and from job sites

CONTRIBUTOR/AUTHOR INFORMATION

Sean Hendrix, Subject Matter Expert

Sean has 34 years of Wildland Fire Suppression, Prescribed Fire and Natural Resource Management experience, with the last 32 years being with Grayback Forestry. He began his career in 1988 with ODF as an Engine Crewman in Cave Junction Oregon, and in addition worked in 89 and 90 as an Interagency Rappeler. He has worked his way up through the ranks at Grayback Forestry doing all phases of Wildfire Suppression, Prescribed Burning, Fuels Reduction, Forestry and Sivi-Culture Management, he has attained Burn Boss 1, Prescribed Fire Manager, Strike Team Leader, Task Force Leader, and Division Supervisor. Recently Grayback developed a UAS Program and Sean is the program manager of UAS at Grayback Forestry. As Burn Operations (RxB1) Sean was the 1st to use UAS to deploy Ignitions on Wildfires (Taylor Creek Fire 2018) in the entire country. Sean has been Grayback’s Prescribed Fire Program Manager since 2002 and He still maintains ahands-on management style and is well versed in all aspects of crew operations, prescribed burning, and Wildfire suppression. He is responsible for the daily operations, recruiting, training, and safety of all personnel at the Merlin Base. Sean is also a Certified L1 Trainer for the NWSA (National Wildland Fire Suppression Association) and an active member on the training committee.burn season of late winter/early spring, 2023.

Over the last 30+ years Sean's passion for forest health has become a priority to make a difference in leading the reintroduction of Prescribed Fire on the land scape to help reduce the threat of Catastrophic Wildfires. He is an active member of many Collaborative Groups in the Rogue Valley. Most recently a contributing member of the Illinois Valley Fire Resilience Oversight Group (IVFROG) working to spread knowledge of forest management, prescribed burning and wildfire suppression to residents of the Illinois Valley. Working to study and develop new ideas with collaborative partners in the community to treat the heavy fuel loading of the forest and restore to a Fire Resilient Ecosystem. Sean is a voting member of the Oregon Prescribed Fire Council (https://www.oregonrxfire.org/) and heavily involved in Prescribed Burning in Southwest Oregon.

BILL F. BARS, Author

Bill is Business Development Manager/Applications Engineer for Acoem Met One located in Grants Pass, Oregon. Bars has 27 years of experience in the Particle Contamination industry and serves in many diverse capacities ranging from Manufacturing and Quality Engineering to Applications Science and Business Development. He is an active member of the National Wildfire Suppression Association (NWSA).You can reach Bill via email at **bbars@metone.com.**